Fieldwork in the Anthropocene: On the Possibilities of Analogical Thinking between Nature and Society

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Abstract

Interdisciplinary sensitivity takes into account the epistemic upheaval of the Anthropocene. However, the still fragmented academic organization between nature and society counteracts intellectual progress. The paper explores the possibilities of enhancing collaboration between biology and sociology by providing an empirical reflection of common methodological grounds. Building on practice theory, pragmatism, science studies and sociocultural anthropology, I discuss current nature–society relationships through an ethnography of a taxonomist's laboratory, followed up by a biodiversity expedition in Papua New Guinea. I address analogical thinking as a device for interdisciplinary collaboration through four modes of fieldwork enrollment: Ontological, disciplinary, transdisciplinary and experimental. The paper concludes with two arguments: Firstly, fieldwork could engender new knowledge in between differing epistemic cultures and, secondly, an analogical fieldwork approach based on the interrelatedness of experience, trial and cooperation facilitates promising pathways for sustainable futures of inquiry.

Keywords: Anthropocene, Biodiversity, Experimentalism, Pragmatism, Social Theory

Introduction

The planetary climate crisis and biodiversity loss have engendered many effects on the organization and understanding of knowledge practices. A considerable body of social and natural scientists agree that the 'Anthropocene' might replace, in the long run, 'modernity' as the core concept for the description of contemporary eco-societies (Folke et al., 2020). Some scholars from the human sciences criticize the holistic connotation of the term 'Anthropocene,' which blames humanity as such for the Earth's devastation – and not, for instance, particular extractive practices linked to the emergence of Western capitalism (Moore, 2017). Others contest its explanatory power, or usefulness to overcome the epistemic dichotomy between 'nature' and 'society' (Hornborg, 2017). While these criticisms contain powerful arguments, it is, however, hard to find a convincing alternative when seeking common grounds to realize problem-oriented interdisciplinary collaboration with natural scientists – which is the theme of the present paper. As a consequence, the terms 'nature' and 'society' stand here for two denoted research objects that have been conventionally separated by modern science (Felt et. al., 2013: 521ff).

While this separation has been fruitful for the sophistication of both the natural and the social sciences, it has also spawned their profound epistemic incommensurateness. Facing the urgent need for what Tsing and colleagues call 'pragmatic radical hope' in times of profound eco-social uncertainty, the Anthropocene invites "collaboration across multiple registers of knowledge and being" (Tsing et al., 2019: 193). Hence, while using the term 'Anthropocene,' I do so by embracing, with others, its experimental "event-character" (Haraway 2015: 160; James, 1976) for the transformation of interdisciplinary knowledge (Blok and Bruun Jensen, 2019). The Anthropocene event corresponds to a longstanding critique, particularly voiced within the humanities, against the epistemic dualism between 'nature' and 'society' as clearly distinguishable objects of research for either the natural or the social sciences.

However, when adopting the Anthropocene for interdisciplinary research, it will remain a 'poisoned gift' to the human sciences (Latour, 2014) if the effective entanglement of nature and society for which it stands remains unnoticed on the level of practical knowledge exploration. The 'practice' and 'pragmatic turns' by the turn of the millennium have indeed been reshaped through the unsettling of the dualism of 'nature' and 'culture' (Blok and Bruun Jensen, 2019; Descola, 1996, 2013). Science and technology studies (STS) researchers have eventually shifted their approaches from the observation *of* toward collaboration *with* the natural sciences (Bieler et al., 2020). The STS' longstanding training in observing and accounting other's scientific practices put them in an advantageous position "to actually work within and through interdisciplinary research projects" (Fitzgerald et al., 2014: 702).

Consequently, today, and even more facing the COVID-19 pandemic, an experimental sensitivity takes into account the epistemic upheaval of the Anthropocene event. However, collaboration across disciplines which are traditionally far alienated from each other remains a fundamental challenging task. This is especially the case within research settings, where human-environmental problems are processed primarily from the perspective of the natural sciences, with social scientists joining in later (Balmer et al., 2015): Firstly, because an already settled problem defines its own solutions, while other options tend to be marginalized (Dewey, 2008: 255ff.), and, secondly, because of the given epistemic and power inequality between the natural and the social sciences. Social scientists are frequently assigned to certain "roles," such as the "representative of the public" or "the critic" (Balmer et. al., 2015) but seldom as scientists with an equally valid research account, corresponding analytical models and agendas, let alone as a veritable "co-producer of knowledge" (Balmer et al., 2015: 9). How could STS collaborative research in the Anthropocene achieve such a more co-productive epistemic positionality?

There is, of course, not only one answer to such a vast question. Some classical STS accounts have developed reflections on how to enhance interdisciplinary research through, for instance, a pragmatist "cooperation without consensus" approach (Star, 1993), or through the distribution and adaption of different modes of expertise and their potential to foster cooperation between science and public issues (Collins and Evans, 2002; Marres, 2012). Recent debates turn around the idea of enhanced reflexivity on researchers' organizational positionalities and their mutual epistemic entanglements (Freeth and Vilsmaier, 2020; Marguin et al., 2021). However, my paper takes a slightly different perspective, combining pragmatism with enhanced reflexivity. It refers to the ideas of collaboration and mutual learning not as *add-ons* to interdisciplinarity. Rather, by insisting on *methodological similarities* from within the natural and the social sciences (Barry and Born, 2011), it carves out *analogical thinking through fieldwork*.

In the paper, I will develop this argument through some insights into a study on the works of a group of French taxonomists on the topic of biodiversity loss. My inquiry started in 2011/12 at the Muséum national d'histoire naturelle (MNHN) in Paris, followed by a two-month observation of a large biodiversity expedition in Papua New Guinea (PNG) in 2012 (La planète revisitée 2013), and a short stay at a workshop of the expedition's data assessment section in Besse, France, in 2013. The paper starts with a brief overview of the debate on the Anthropocene event and its effects on the social and natural sciences. I then present

four modes of analogical thinking, explored in four sections: ontological, disciplinary, transdisciplinary, and experimental.

During my stays with the taxonomists in 2011-2013, analogical thinking was, however, not at the core of my inquiry. Instead, it resulted from recently revisiting my fieldnotes in order to explore their use for the development of interdisciplinary methodologies. The paper accounts for this process of rethinking and reorganizing my material. While situating analogical thinking within the theoretical framework of pragmatism and experimentalism, I discuss it as a heuristic for possible future collaborations with naturalists in the Anthropocene. However, the paper is notably limited to a conceptual framework. To date, I have neither done a systematic analysis of my material, nor adopted this heuristic. Both of these tasks are currently set up in a project dedicated to the exploration of a joint natural and social scientific 'field sciences' approach. The paper traces back the origins of this approach and explains why I see potential in it.

Ontological enrollment through the Anthropocene event: Challenges for the natural and the social sciences

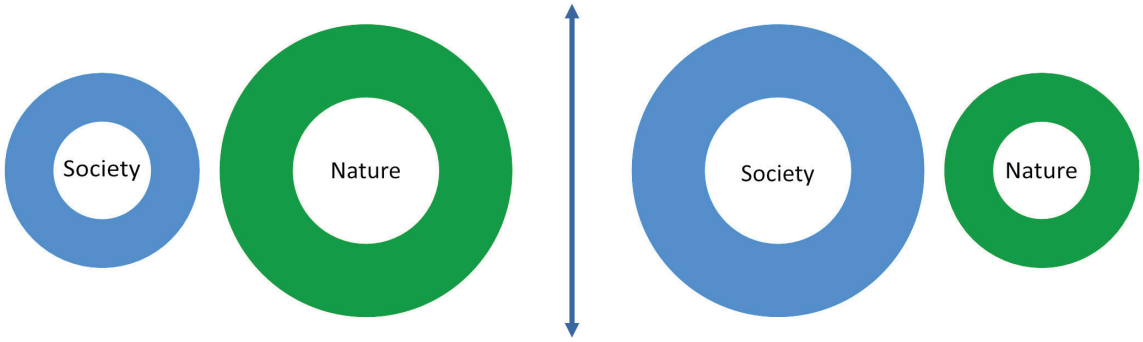
Before inviting the reader to join me in the empirical grounds of my experimental journey, I will address the recent transformation of the natural and the social sciences through a brief sketch of the Anthropocene event. World society had become aware of the alarming planetary limits of the modern exploitation of nature by the end of the 20th century. Human's modern degradation of nature, it turned out, impacts nature's fate more than ever, and much more than evolution could handle. Geologists named this epochal shift the 'Anthropocene,' where "humankind has become a global geological force in its own right" (Steffen et al., 2011: 843), assuming that "earth systems are seen to be decidedly 'post-natural'" (Brown, 2019: 107). This 'post-naturalism' has been assessed, along with climate change, through "the sixth extinction" of the Earth's biodiversity (Kolbert, 2014). The UN Conference on Environment and Development in Rio de Janeiro in 1992 was the first transnational convention to introduce the idea of saving and conserving terrestrial and marine biodiversity in the public sphere. Transnational, academic, and public attempts to improve global biodiversity assessment and, simultaneously, mitigate biodiversity loss, understood as a planetary core effect of the Anthropocene, have accelerated on a formerly unknown scale since the turn of the millennium.

Critiques in the human sciences, however, are concerned with the holistic take of the term 'Anthropocene,' blaming it for depoliticizing the unequal distribution and allocation of responsibilities, and the globally disparate power relations regarding the causes of nature's dramatic state (Moore, 2017; Hornborg, 2017). Yet, the success of the term within STS research on environmental-human relations consists of creating a productive starting point toward interdisciplinary collaboration with natural scientists (Haraway, 2015; Tsing et al, 2019). Therefore, I use the 'Anthropocene' as a tool which allows for an experimental integration of epistemic heterogeneity, or, in other words, as a conceptual opportunity to organize joint explorations together with natural scientists. It could be understood, following Donna Haraway (2015: 160), more as an "event than an epoch", thereby supporting the pragmatist assumption of the epistemic productivity of 'events' as the interruption of habits (Mead, 1929: 87ff.). This "ecological disruption" (Blok and Bruun Jensen, 2019: 1197) of the difference between 'nature' and 'society' which is taken for granted, here understood as the conventional baselines for the respective research domains of *either* the natural *or* the social sciences where echoed, for instance, through semantic transformation. To give but one example, 'biodiversity,' formerly a purely scientific term, transgressed the boundaries of biological research on life's inventory on Earth and became a normative and, thus, a societal issue (Robin, 2011: 26). However, this ontological shift did not affect language alone. Instead, it transformed the academic positionalities for modern natural sciences and the social sciences on a more basic level.

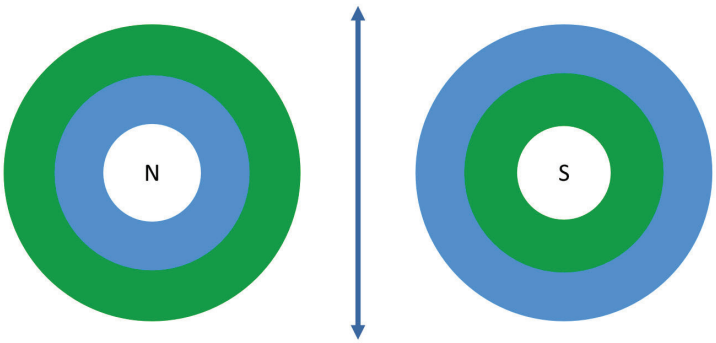
The use of the term 'analogy' seems appropriate here. Stemming from biology, analogy embraces a structural resemblance between two entities; a resemblance which originates, however,

in different histories. In contrast to homology – a term Pierre Bourdieu (2001) frequently employed in his theory of the field – it is not the structure itself that facilitates the resemblance but the way in which resemblance is enacted. Transposed to the natural and the social sciences, the analogy lies in their respective ontological, yet differently enacted, transformation. As suggested above, I define 'ontological transformation' here as an interruption of disciplinary *habits* (Dewey, 2008: 38) regarding their opposed epistemologies, where either nature included all but the human, or, vice versa, society included all but nature. Within this transformation, thus, the respective disciplinary ontologies shift from their mere dualist positionalities toward what Andrew Pickering (2009) called "ontological contingency". Ontology, as a term, here refers thus generally to a mode of existence as a reference point for either the social, or the natural sciences

Figure 1 gives a schematical account of the ontological transition between modernity and the 'Anthropocene event': Throughout the modern division of academic labor, 'nature' (in green) has described the sole research object of the natural sciences, based on the epistemic exclusion of 'the social' (in blue). And, *vice versa*, 'society' had described the sole research object of the social sciences, based on the ontological exclusion of 'nature' (Fig. 1a). Regarding the Anthropocene, this distinction gets fuzzy: 'Society' is enrolled within the natural sciences to understand nature's fate; yet, alternatively, for the social sciences, 'nature' is enrolled as an integral part of society's foundation (Fig. 1b). Michel Callon (1999: 74) defined enrollment as "a device by which a set of interrelated roles is defined and attributed to actors who accept them." Despite the fact that the actors described here – the disciplines – are still separated on the academic level of knowledge organization – expressed through the blue vertical arrow in between – their respective, yet analogical transformation within the two grand disciplinary families expresses what I call 'ontological enrollment':



1a. Modern Division of Labor between the Natural and the Social Sciences



1b. Ontological Enrollment through the Anthropocene Event

Figures 1a and 1b. Ontological analogies between the natural and social sciences

While biologists and physicians provide the empirical data to assess the scope and the sources for climate change and biodiversity loss, impacted notably through human societies, many social scientists today have integrated nature and non-humans into society. Consequently, the modern division of labor between nature and society underwent an analogical "enrollment" through the global critique of the consequences of the Anthropocene. Scientific and public awareness of these consequences are, thus, cocreated through ontological contingency. The Nagoya-protocol, being part of the Convention of Biological diversity (CBD) and coming into force in 2014, gives a striking example. It underlined the importance of the mutual benefit for scientific research arising from conservation strategies, "by strengthening the ability of [indigenous and local, T.B.] communities to benefit of the use of their knowledge, innovations and practices" (Secretariat of the CBD, 2011: 1).

If analogical enrollment can be observed on the level of ontology, analogy still does not mean symmetry. The epistemic boundaries between the natural sciences and the human sciences not only remain rather robust, they also tend to increase unequal funding, demarcated disciplinary training and often ineffective intergovernmental action. They engender "trials of strength" (Callon, 1999: 74), often being rather obstructive for mutual learning (Billi et al., 2019: 312). It is one of the core problems, as Rebekah Brown and colleagues (2015: 315) put it, that "so many well-meaning attempts at interdisciplinary collaboration fail to deliver tangible outcomes". However, the COVID-19 pandemic teaches us that interdisciplinarity today requires dialoguing epistemic cultures to foster "preparedness" (Keck and Lynteris, 2018). "Preparedness," in the sense of proactive engagement with unknown Anthropocenic futures, experiments throughout cross-disciplinary collaborations, which are generally based on *heterogeneous ontologies* (Keck and Lynteris, 2018: 10). This is hard work because it requires time, resources, and curiosity. In other words, where symmetry is scarcely available, the possibility of analogical thinking *between* disciplinary borders invites experimental enactment. Yet, according to Philippe Descola, such "analogism," either cosmological or scientific, could be comprehended as a consequence of "dissatisfaction," "bringing together through an operation of thought that which was previously separate" (Descola, 2013: 202). Analogical thinking, hence, "nurtures the hope of weaving […] heterogeneous elements into a web of meaningful affinities and attractions […]" (Descola, 2013: 202). In the human-environmental cosmologies Descola describes, this web is based on ontological continuity between, for instance, micro and macro events. In a slight difference to this, interdisciplinary analogical thinking between the natural and the social sciences results from their respective, yet, contingent resonances within the Anthropocene. In the following, I will take a closer look at such a resonance within a group of marine taxonomists. For semantic clarification, I use inter- and transdisciplinarity as follows: Interdisciplinarity consists of the collaboration between two or more different academic disciplines. Transdisciplinarity focuses on the integration of non-academic knowledge and experience. Cross-disciplinarity usually equals interdisciplinarity ('across' or 'between' disciplines), though it might potentially go beyond academia and integrate non-academic experiences, practices and knowledge as well.

Enacting disciplinary enrollment: Marine taxonomy in a museum's lab

My query regarding the disciplinary effects of the Anthropocene started in 2011 from the angle of the natural sciences. I chose the Parisian National Museum of Natural History (MNHN), one of the world's leading natural history institutions, as a site. I wanted to understand how the ecological crisis and the political charge of conservation strategies impacted the everyday work and the ontological configuration of nature as a research object for biologists. Embracing the consequences of their findings for society implied, in my first suggestion, a twofold ontological shift, firstly, of their very objects of inquiry and, secondly, of the accountability of these objects in terms of sustainable knowledge and conservation governance. How do biologists experience their disciplinary 'enrollment' through society? How do they deal with it?

After several detours throughout the MNHN, I finally gained field access in early 2012 through a contact with a Parisian anthropologist who had already collaborated with the museum. Professor Philippe Bouchet, head of the division of marine taxonomy, part of the Institute for Systematics, Evolution and Biodiversity, received me to do a laboratory study in his division. Today, the division is part of the Unité mixte de recherche 7205, which has been called the "Institut Systématique, Évolution, Biodiversité" since 2014. The institute integrates the taxonomic research of flora and fauna of all kinds and works in close collaboration with the Université Pierre et Marie Curie (also called Paris 6) and the École Pratiques des Hautes Études in Paris. I observed notably the team of morphological, anatomic taxonomy in the laboratories of the rue Buffon for two and a half months, and included several trips to the phylogenetic laboratory in the rue Cuvier on the other side of the botanic gardens.

Taxonomy is part of evolutionary biology and zoology and, hence, a foundational science. It consists of the determination of life on Earth through qualitative, morphometric, and genetic analysis, and the classification of living beings in space, time, and number. The taxonomists at the MNHN specialized in the assessment of marine invertebrates, i.e., sea mollusks, scallops, crabs, and all kinds of spineless small water species. Marine invertebrates constitute about 90 % of all species described and have a fundamental impact on the Earth's ecology. Taxonomy represents an interesting case to study in order to understand the current disciplinary dynamics for three reasons: Firstly, taxonomy belongs to the oldest classification practices in naturalists' inquiries and in biology becoming a science – think about Darwin, Merian, Linné, and Lamarck. Secondly, taxonomy plays a key role in measuring the current dramatic loss of biodiversity and, thereby, in orienting research programs. And, thirdly, though I became aware of this only years later, taxonomy is an experience-based field science, inviting the possibility of analogical thinking between nature and society.

"Biodiversity – It's Us!": Methodological collaboration against fragmentation

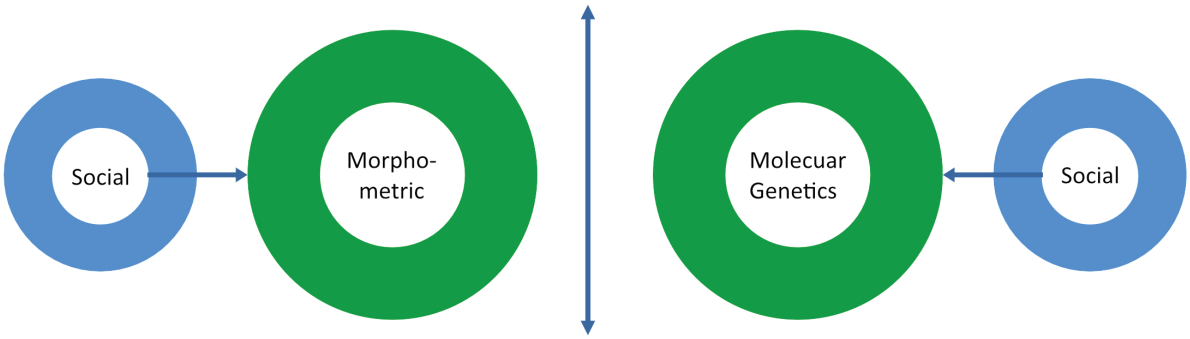
The taxonomist's inquiry has always been, as the marine specialists told me, about the state of the art of planetary biodiversity. "Biodiversity – it's us!" they used to confirm proudly. However, taxonomic methodology today is twofold, which provides another good reason to take it as an example for the investigation of analogical thinking in the Anthropocene. Comparable to sociology, current taxonomy includes outdoor fieldwork, qualitative description, the development of quantitatively dense databases and statistical (genetic) analysis. Despite the obvious differences between biological and sociological methodologies and their different aims and scopes, both are embedded in a methodological fragmentation (Abbott, 2006: 43) between qualitative and quantitative approaches. But the shock of the "sixth great extinction" had thrown taxonomy, by the turn of the millennium, into a fundamental methodological upheaval (Waterton et al., 2013: 9). This crisis arrived nearly coincidentally with the fast overturn of the molecular revolution in the life sciences, downgrading the century-old morphological approach into an apparently outdated practice, not least because of the new awareness of taxonomists' ignorance about the state of the art of global biodiversity (Bouchet, 2006: 33; Ellis et al., 2010: 500). However, methodological fragmentation turned out to be ineffective for the sustainability of taxonomy as a science. Instead, the concern of naming "earth's species before they go extinct" (Costello et al., 2013) featured a professional ethos motivated by what Geoffrey Bowker called "the panoptic dream" to "complete" the global inventory of life (Bowker, 2000: 645).

The shared commitment of the taxonomists (either in the rue Buffon or in the rue Cuvier) to methodological collaboration found its material infrastructure in the freshly established "MarBOL" curation database. MarBOL was launched in 2010 as a cooperation between the consortium for the Barcode of Life and the Census of Marine Life and had a strong impact on global marine taxonomic assessment and curation practices. In a joint paper, the authors stressed the importance of a "standardized workflow" (Puillandre et al., 2012: 397) combining new taxonomy and old collections,

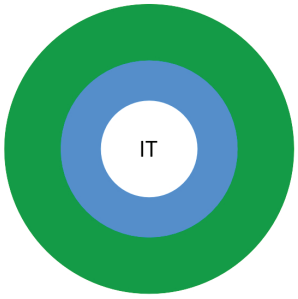
especially within the framework of the MNHN in Paris. This cross-methodological workflow linked the genetic databases of the rue Cuvier with the rue Buffon and spanned from fieldwork to scientific documentation through both lab facilities.

So, here was my first finding related to my previous question regarding a biologist's reaction to the ontological upheaval through the Anthropocene: The societal pressure through the global biodiversity crisis enhanced, in the case of the marine taxonomists at the MNHN, systematic collaboration between morphometric (qualitative) and molecular genetic (quantitative) approaches. Instead of increasing competition and deepening methodological fragmentation, they opted for mutual enrolment and collaboration. But collaboration as an experimental response to (the) crisis was not limited to assessment practices, as I will show in the following sections.

Figure 2 shows the dynamic of the disciplinary enrolment within the taxonomists' research practices on the level of method. While the classical morphometric analysis of species was formally separated from molecular genetics, the social pressure to sustain taxonomy's impact caused by the biodiversity crisis became virulent for both approaches (Fig. 2a). With their decision to overcome their separateness through their collaborative 'integrative taxonomy' approach, the Parisian taxonomists realized a 'disciplinary enrolment' in order to enhance their management of both the biodiversity crisis and their disciplinary crisis (Fig. 2b):



2a. Intervention of the Biodiversity Crisis Caused by Humans in two distinct Research Approaches



2b. Disciplinary Enrollment through "Integrative Taxonomy"

Figures 2a and 2b. Disciplinary enrollment within marine taxonomic practices at the MNHN

The disciplinary enrollment of biodiversity loss as a burning societal issue through the development of a collaborative methodology did not have any impact on the taxonomists' general distance toward the social sciences (see Figure 1b). This is not surprising given the robustness of the modern academic borders in academic institutions sketched above. However, during my observation post under the dusty rooftop of the lab in the rue Buffon, I began to wonder about possible modes of collaboration with the taxonomists around the topic of biodiversity loss and conversation practices in their research areas. Their disciplinary enrollment was instructive in that the idea of an effective 'external' intervention of a social/cultural-scientific approach through pathways which are alienated to their own modes of reasoning seemed now to me quite naive. But how did they approach 'society'? I witnessed, through my daily exchanges with the team, on the one hand, a certain familiarity with the fact of being observed by a social scientist. Occasional jokes while presenting me to visitors to the lab as a "spy" were accompanied by friendly smiles. They alternated with occasional pejorative remarks about sociologists as people "looking for problems." On the other hand, the team received me every day with the warm, trustful and unlimited candor for which not only scientists knew for the lab in the rue Buffon. What held these rather divergent encounters together?

Transdisciplinary enrollment: Doing biodiversity *between* nature and society

Within the museum, the taxonomists stressed their difference not only toward the social sciences, but particularly with biodiversity research typically associated with the human sciences, such as sustainable governance, public and participative sciences, or museology. Yet, this professional distance was not a sign of sociocultural distance toward non-naturalists. On the contrary, the lab in the rue Buffon was a place of enormous openness and even, in my impression, of exceptional hospitality. It was not only packed with a multitude of heterogeneous species but also with lots of people with diverse backgrounds. Colleagues, friends, amateurs, technicians, and volunteers from places throughout the world popped into the lab on a daily basis and moments of absolute silence were rare. Above all, the traditional support of amateurs regarding the museum's collections was constantly present. One staff member told me that "50 % of the mollusks collected come from high-level amateurs!" I witnessed, through the busy dynamics in the lab, a veritable example of the long history of collaboration between amateurs and natural history museums (Kohler, 2002; Lepenies, 1976; Manceron, 2015; Star and Griesemer, 1989). While most of the amateurs were retirees, their professional backgrounds ranged from lower middle- to upper-class members – there were ex-engineers, ex-school teachers and ex-ambassadors, to name but a few.

In addition to this diverse bunch of participants in the lab, I was not the first social scientist who had been received by the morphologists in the rue Buffon either. Several other sociologists and anthropologists had observed and accompanied them during previous expeditions since 2005 (Faugère, 2019). These encounters, including my own presence, were, to the best of my knowledge, based on the special convention of ethnographic fieldwork: Social scientists observe biologists and write accounts of their "laboratory lives" (Latour and Woolgar, 1986). However, was my observational approach not exactly rehearsing the good old modern ontological division of labor the Anthropocene event actually teaches us to overcome? As an ethnographer in the museum's laboratories, I started to think about a different, more 'natural' access to their activities within and beyond their workplace. Perhaps it was too obvious to be noted right away.

The Field in the Lab

Disciplinary enrollment through the integrative approach did not affect the taxonomists' methodology in such a way that they would integrate public, anthropological, or sociological knowledge on an equal footing. Nevertheless, there was striking evidence of their affinity for heterogeneous accounts based on daily enactments of transdisciplinary 'epistemic cultures' (Knorr-Cetina, 1999). This affinity was an indication of the potential possibility of analogical thinking between

nature and society. Such observations turned my attention toward a more profound reflection on possible commonalities between the taxonomic enterprise in the lab and my own as a sociologist. During the time of my two-month stay in the rue Buffon, I became a part of the laboratory. Through my existence as a well-received ethnographer persona, I experienced a certain similarity between us in dealing with heterogeneous people and things. A shared 'habit,' in the sense of John Dewey (1896), which originated in a century-old and longtime slightly ignored professional kinship. Only years later, through the analysis of my fieldnotes, did I realize that this kinship had a name. It lies in the congregation characteristic of *fieldwork*, consisting of an experience-based reconfiguration of heterogeneous people, things and living beings.
However, I did not see that at the time of my laboratory study. I was trapped in my own disciplinary observatory. Nevertheless, it was impossible not to notice that the 'field' was more than an external unit in the museum's marine taxonomist workplace. 'Doing biodiversity,' under the auspices of a civic engagement for nature, did not end at the lab's walls. Fieldwork campaigns were constantly present within the lab, precisely because they constituted 'the soul' of the lab; either in the molecular systematic service in the rue Cuvier within the sequencing machines and databases, or in the rue Buffon, through the overwhelming material presence of the geographical maps, collected specimens in the trays, compartments, lots, on the tables, in the books, posters and papers, or in a funny comic strip of a little swimming individual captioned by the phrase: "Wanted – dead or alive!" I never departed from the laboratory without at least one note testifying to long and intense debates and phone calls on the planning of the next expedition. They left me astonished and fascinated about the logistical, financial, geopolitical and, not least, *cultural* complexity of taxonomists' investment in organizing the next campaign, while constantly assessing the vast stocks gained through multiple expeditions. Thomas Gieryn observed that in "some scientific specialties, knowledge claims gain legitimacy by preserving and drawing on simultaneously – and in a complementary way – the assumed distinctive virtues of both lab and field" (Gieryn, 2006: 6). This virtue was, in the case of the MNHN taxonomists, expressed through a professional fieldworker ethos, actually encompassing nature and society and their academic, ontological and epistemic differences.

This fieldworker ethos can be traced back toward the 'pre-academic' era. It originated through the historical epistemic affinities and conflicts between naturalists, anthropologists, and early pragmatists, starting with naturalists' expeditions in the colonial epoch. Throughout history, the term 'field' shifted from the natural toward the social sciences through physical immersions in the study of human-environmental relations. Franz Boas participated in a polar expedition in 'Baffin Land' in 1883/84, converting him from geography to ethnology. Danish anthropologists Kirsten and Frida Hastrup credit the zoologist Alfred C. Haddon with having "imported the term fieldwork into anthropology from zoology" (Hastrup and Hastrup, 2015: 8). Haddon's pioneering expedition to the Southwestern Pacific Torres Strait Islands in 1898/99, where naturalists and anthropologists worked together, was a core epistemic event for the creation of anthropology as a discipline (Stocking, 1983). The Torres Strait expedition promoted the three-year stay of Bronislaw Malinowski in the Trobriand Islands (1915–1918), conceived as the foundational moment for the fieldwork approach in the human sciences.

This continuity between nature and society through 'field studies' also shaped early pragmatism and sociology. Charles Peirce was a professional land surveyor before he converted to philosophy. For John Dewey, who met Boas at Columbia University in 1904, the translation of fieldwork into cultural analysis constituted, along with Darwin's evolution theory, an important background for his analogical naturalism and his theory of experience (Dewey, 1983; Bogusz, 2022; Lewis, 2001; Torres-Colón and Hobbs, 2015). Later, sociologists imported the anthropological field approach through, notably, the First Chicago School of Sociology in urban studies (Palmer, 1928) and Pierre Bourdieu's practice theory (2000, 2001).

Distancing themselves from the armchair humanities of their times and the pure ratification of social theory or statistical data today,

most field researchers stress the central importance of experience. Within the human sciences, they circumvent the geopolitical and epistemic division between sociology and anthropology, supporting thereby a longstanding criticism against the consequences of colonialism for academia (Randeria, 1999). They embrace the embodied, reflexive and material encounter with inquired environments. So do biologists, actually defending their solid field approach against sole molecular assessments of nature's inventory (Fleischner et al., 2017; Rios-Saldania, 2018).

Field studies have, thus, grounded and anticipated the emergence of the natural and empirical cultural sciences since the late 19th century. Regardless of the vibrant debates on the constitution and the methodological challenges of fieldwork in the social sciences (Bourdieu, 2001; Hastrup, 2014; Marcus, 1995; Star, 1999), the historical kinship between naturalist and sociological fieldwork has been somewhat forgotten. Instead, it was the 'lab' which became a frequent topos to describe eco-social worlds and their disciplinary enactments. The 'lab topoi,' explored notably through the history of science and STS epistemics, comprises the idea of "laboratizing and de-laboratizing the world" (Guggenheim, 2011); experimentalist approaches to the interdisciplinary encounter between the natural and the social sciences through reflexive 'co-laboration' (Niewöhner, 2016); or 'real-world-labs' which promise to promote participative transdisciplinary research (Engels and Walz, 2018; Groß et al., 2005).

Some of these empiricist approaches retrace, though often rather implicitly, classical pragmatist philosophy, inspired by experience-based practical reasoning. Pragmatism for John Dewey and Charles S. Peirce consisted of the translation of laboratory logics into modes of dealing with the general challenges of humankind (Dewey, 1984; Peirce, 1997). Dewey's procedural evolutionism was particularly committed to the idea that an "experimental theory of knowledge" could learn from naturalists through analogical thinking (Dewey, 1906). Following the paths of William James' "radical empiricism" (James, 1922), Dewey aimed to provide analytical foundations to reconcile empiricism and rationalism. This reconciliation, for Dewey, would link nature and society through the heuristics of the naturalist's experiment, where ignorance and uncertainty fuel new and previously unknown terrains. However, this partly simplified transposition beyond the natural and the social sciences is of striking actuality today, where the planetary entanglement of science and society engages citizens, scholars and experts to address the environmental uncertainties of our times (Chakrabarty, 2021; Latour, 2018; Nowotny, 2016).

While the pragmatist renaissance by the end of the twentieth century helped social theory to promote actors' transformative capacities and nonhuman involvement in social enactments (Boltanski and Thévenot, 1999), the often overstated anti-structuralist gesture (Descola, 2013: 91) discarded such analogical thinking. However, the social and cultural sciences might miss opportunities to acknowledge naturalists' own experimental enactments by discharging social analysis from analogical thinking as a heuristic tool. While the 'lab' expressed a sociologist's "(cautious) welcome" of the natural sciences (Benton, 1991) through the upcoming, though partly contested, Anthropocenic framework (Lidskog and Waterton, 2016), a renaissance of 'the field' within the natural sciences is also given voice (Burt and Thompson, 2020). Geographers, botanists, geomorphologists, zoologists, and meteorologists stress the importance of qualitative description, improved sensitivity, and experiential knowledge. They counteract the overwhelming material, financial and epistemic hegemony of system analysis, molecular genetics or satellite remote sensing. Such concurring developments testify to the intriguing dynamics within the natural sciences and particularly within the domain of taxonomic biodiversity research.

Consequently, in the Parisian taxonomists' lab, where the integrative workflow standard was highly appreciated, my own observational fieldwork posture and its limits inspired a new question for me: Could taxonomists' fieldwork, similar to ethnography, pave a way to transgress the academic alienation between their research on the transformation of the environment and mine as a sociologist? I also wanted to participate in one of the lab's overseas expeditions to get a more complete view into taxonomists' *in*

situ fieldwork practices. As chance would have it, my ethnographic journey brought me into exactly the same geographic area where Haddon had converted from zoology to ethnography. However, if I enrolled nearly the same territory, history has not only shifted from modernity to the Anthropocene but also from the colonial to the postcolonial age.

The Lab in the Field: Expedition in Papua New Guinea

Seven months after my study in the Parisian MNHN, I attended a large-scale expedition in PNG in November and December 2012. The PNG expedition was part of the campaign "Our planet reviewed. Taking a closer look on biodiversity hotspots." The campaign had started in 2006 and covered terrestrial and coastal biodiversity surveys in Vanuatu, Mozambique, Madagascar, New Caledonia and, after PNG, French Guiana. The choice of PNG was, notably, data-driven: Being part of the so-called 'coral triangle,' the taxonomists mapped PNG as a largely understudied area of planetary biodiversity and considered it notably as the planet's richest "hotspot" of marine biodiversity (Press Kit, 2012).

As a particularly intense form of fieldwork, which is comparable to an ethnologist's in-depth stays abroad, naturalists' expeditions often build on (post)colonial infrastructures (Anderson, 2002; Kohler, 2006: 7; Weber, 2019: 83), diverse knowledge cultures and conflicting modes of nature/culture problematization (Helmreich, 2009; Hornidge, 2018; Thomas, 2015). Expeditions enact 'liminal' forms of experience, being dense endeavors of work, people and logistics. They feed myths of extreme bodily and cultural investment, as well as harsh critiques of epistemic and material exploitation of non-Western people (Leshem and Pinkerton, 2019; Robben and Sluka, 2012). Simultaneously, expeditions process heterogeneous sociomaterial goods (Law, 1987), globally 'circulating references' (Latour, 1999) and, as history has shown, generate specific forms of translocal knowledge.

The expedition was based on the campus of the Divine Word University near the city of Madang, which is also the capital of Madang province on the north coast of PNG and the Bismarck Sea – one of many territorial names still reminding one of the German colonial era. As a sociologist of science, my aim was not to study PNG in general, nor the people living in the prospected research area. Instead, I sought to understand the way in which the taxonomists' integrative research into biodiversity was realized *in situ* through their involvement in a particularly located area. However, the narration of expeditions as a practice of "discovering" "unknown" territories inescapably resonated the geo-political past of PNG in a particular manner here (Communiqué de Presse, 2013). Independent from colonial power since 1975, the oceanic island-country still triggers the imaginaries of western naturalists, cultural scientists, writers and adventures (West, 2006: 2ff, 2016: 35ff.; 87ff.). Therefore, for its long history of occupation, resistance, and natural and cultural diversity, the country has also been a prominent example of the complex entanglements between global environmental governance, (post)colonialism and science (Bamford, 2002; West, 2006: 222ff, 2016: 108). Moreover, New Caledonia, a former French colony and today part of the French overseas territory in the Pacific Ocean, provided important infrastructural support for the expedition, in particular the research vessel and local scientific expertise. While these entanglements were orienting neither the naturalists nor my own sociological research at first glance, the expedition enacted, inevitably, fieldwork in the Anthropocene also through their postcolonial imprint.

The marine and terrestrial program of the PNG campaign comprised about 200 participants from over 20 countries. The marine part that I observed was composed notably by taxonomists, specialized in the research of marine invertebrates. Their goal consisted of exploring the magnitude of marine invertebrate biodiversity in the coastal zone of Madang province, the Madang lagoon and the local freshwater and delta regions. The research was supported by students from the capital City University of Papua New Guinea in Port Moresby, from Madang city (Divine Word University), some of them living in Madang province, Bougainville, Kavieng and New Britain. The students guided the scientists in the freshwater regions and dealt with for communication and translation. In return, they could participate

in simple research tasks, such as sieving and sorting, and experience the general workflow of a large-scale expedition. Moreover, civic guides from Madang province also, as well as technicians, amateur naturalists and public visitors from Madang city and Madang province took part in the research activities on a daily basis.

My presence and research were financed through external funding I brought in myself. It covered boat and coastal trips to observe the taxonomists' different practices of species extraction from the waters and coastal sampling through different techniques (handpicking, brushing basket, dredging and sieving, first preparation for DNA analysis). I realized participant observation in the expedition's lab near Madang harbor, recorded the scientists' workflow, assisted in the sorting of the species, and followed them throughout water access negotiations with Papua New Guinean citizens, politicians, and nongovernmental organizations (NGOs). I had daily exchanges, breakfast, and lunch with them, and conducted a set of interviews with core representatives from the expedition's campaign and the receiving partners of the expedition.

Both morphological and molecular genetic taxonomists constituted the marine group within the expedition, thereby confirming their integrative approach not only on paper but through the shared experience of fieldwork. This infrastructural translation of the Parisian lab situation to the expedition was echoed by the large number of nonacademic support workers integrated into the everyday tasks. The Parisian museum's 'field in the lab' was now reversed to the 'lab in the field,' though this reversion correlated with an enormous increase of material and people within and outside the lab. This engendered many issues, partly exceeding the lab's concerns.

Biodiversity loss and the ecological crisis, though generally conceived by PNG people, clans, researchers, students, and NGOs as important global problems, were, however, not preeminent for most Madang province inhabitants. Instead, and similar to Europe and most world regions today, they were shaped through local ecosocial challenges of a different scale. In Madang province, these issues consisted of overfishing, rising sea levels, land erosion and the overturn of their territorial resources by multinational mining companies. Since the establishment of the Convention of Biological Diversity (CBD) effected by the United Nations in Rio de Janeiro in 1992, these and similar topics have given rise to conflicting modes of practicing and representing environmental concerns between PNG people and scientists (Bamford, 2002; West, 2006). They rivaled with the taxonomists' desire for access and political consent by claiming a mutual trade-off in the governance of transnational biodiversity research, thereby adapting the Nagoya Protocol (Secretariat of the CBD, 2011) in their own right.

Consequently, field (or rather water) access turned out to be a central concern for the taxonomists. The unintended effects of the postcolonial infrastructure as a typical component of taxonomic knowledge gained through an expedition of naturalists (Kohler, 2006: 7) were particularly striking here. Despite the will to overcome structural and epistemic disparities between Western scientists and local people, the expedition triggered the postcolonial conjunction between Papua New Guinean customary land tenure and Western science politics: "[T]he recognition of customary landownership is located within complex matrices of colonial history, government policy and legislation, ideology, indigenous property rights and relations to land" (Weiner and Glaskin, 2006: 12). Moreover, different to any properly prepared fieldwork and quite surprisingly, a certain number of concerned customary communities were not informed by the PNG government about the researchers' arrival and survey. People were shocked to see them extracting species from their properties, seemingly without having asked for permission. Occasionally, they attacked the researchers with stones, or their findings were dropped back into the sea.

Such issues led to many public and informal gatherings, where the villages, clans, NGOs, scientists, and the expedition's leaders negotiated access. These events not only reminded me again about the analogy to ethnographic fieldwork, as access is always a critical point which can potentially yield to political conflicts. Moreover, and very similar to ethnographic fieldwork, the taxonomists were confronted with altering and

formerly unknown approaches regarding their very research topic. Such incidents were especially evocative when a trial situation – for instance, a rejected water access and *in situ* ad hoc negotiations – had not been expected, or when heterogeneous ontologies of nature met. This could lead to occasional transdisciplinary enrollments linking nature and society as objects of inquiry, as I will outline next.

'Worlding'

Leaving aside the marine species themselves, around which the daily marine fieldwork was organized, not only humans and sea animals were involved in such enactments. The following event was related to me one night in the lab by a French researcher who took part in it. During my presence in Madang, I did not realize its analytical potential and did not double-check the report. Although I am lacking key information, such as the local origin of participants, their language and original quotes, the event merits being recounted as it stands for a quite typical way of scientists dealing with ignorance, surprise, and adaptation during the expedition. Ignorance, surprise and adaptation belong to the core principles of fieldwork, either naturalist (Burt and Thompson, 2020: 39) or humanist (Strathern, 1999: 3). Experienced and reflected by a marine biologist, such incidences invite analogical thinking. So, here is the story.

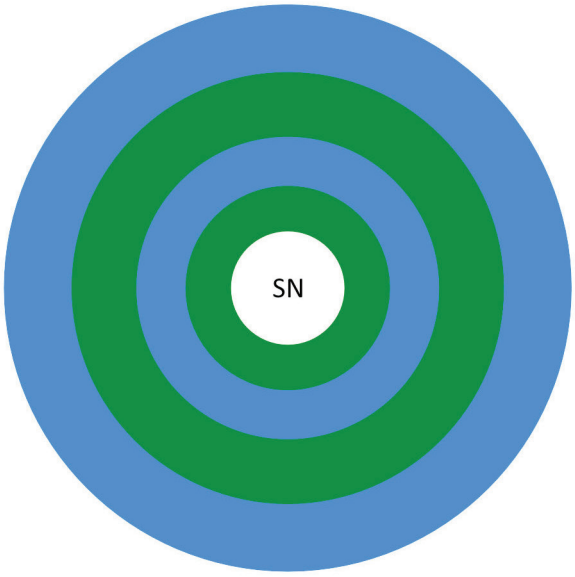
A daily sampling boat trip took place at the coastal zone of Kananam, a region situated about 16 km to the north of Madang city, between Alexishafen and Rempi. The trip was officially confirmed by the Madang government. In the morning, a small group of biologists, together with two local guides from the rural environments of Madang province went with a motorboat in the sea. The biologist immersed themselves in the water, using the brushing basket technique, brushed samples from the seabed, collected them in a basket and sent the basket lifted with air-filled balloons up to the surface and the boat, where the local guides would take them. However, when the biologists returned to the water's surface, they became aware that the basket full of samples had disappeared. The scientist expressed his profound stupefaction when telling me the story late at night in the lab. They had searched everywhere, he told me – in the boat, on the seabed – and found nothing. To their complete astonishment and surprise, finally, the two guides explained that they had violated a local law. It turned out that the taxonomists have dived into the sacred territory of a sea goddess called 'Samalangdun.' Unfortunately, I do not possess, even after follow-up research, any information on Samalangdun and her status within the prospected era. It was reported that Samalangdun prohibited access to her waters, and, following the account of the two guides, no inhabitant of this coastal area would ever enter her domain.

Embarrassed by the deception of the researchers about the loss of their findings, the guides and the researchers wondered about finding a solution. After the lunch break, they returned to the place in the sea. The guides proposed delivering a prayer to Samalangdun asking for forgiveness. The taxonomists agreed, though they were uncertain if this could be of any use. However, after one of the two guides had delivered the prayer, the scientists went back into the water. To their complete surprise, the basket reappeared at the same place in the deep sea where it had evidently been lost some hours before. Taking note of this insoluble enigma and the compromise resulting from it, they happily brought the basket into their boat. As a consequence, they regretted not having adapted their habitat mappings to the local conservation laws. One of them wrote in the expedition's blog on the night of the event: "One thing is sure, next time, before diving into a new site, we will take notice of the local beliefs. At any rate, the cultural richness of Papua New Guinea is as diverse as its biodiversity" (Faure, 2012, translated by the author).

Following Anna Tsing, we could call this incident "worlding": "All researchers develop their work in context-making collaborations […]. Worlding is the only way to take difference seriously in a collaborative research practice" (Tsing, 2010: 49). To me, Samalangdun represented what the western culture usually knows through intergovernmental conservation laws promoted by, for instance, the United Nations. From a pragmatist angle, taking difference seriously by maintaining the possibility of acting through heterogeneous worlds confirms

a basic assumption for the success of democracy (Dewey, 1956). The postcolonial moment enacted by Samalangdun and "worlding" led, thus, to a compromise between different worlds. Boltanski and Thévenot assumed that, "[i]n a compromise, people maintain an intentional proclivity towards the common good by cooperating to keep present beings relevant in different worlds, without trying to clarify the principle upon [which] their agreement is grounded" (Boltanski and Thévenot, 1999: 374). Such a compromise, or "cooperation without consensus" (Star, 1993), was a postcolonial moment, in that the top-down governmental politics on which the expedition was organized clashed with the bottom-up customary tenure in the Madang coastal area. Nevertheless, the actors involved then solved the conflict in a peaceful and respectful way. Regarding the possibility of analogical thinking and, thus, for heterogeneous collaboration, it is not primarily important why or how exactly the basket had disappeared before. What counts is the shared acceptance of the effect Samalangdun has created. As an authority transgressing the western nature-society dualism, Samalangdun (and not the taxonomists) enacted a transdisciplinary enrollment of a 'postcolonial moment' (Verran, 2002) in the Anthropocene.

I visualized the taxonomists' transdisciplinary enrolment in Figure 3. The taxonomists integrated nonacademic participants not only within their everyday museum's transdisciplinary habits but also through their fieldwork within the expedition in Papua New Guinea. Moreover, the encounter with the sea goddess Samalangdun suspended, at least temporarily, the very existence of the epistemic dichotomy between 'nature' (N = green) and 'society' (S = blue). This suspension, instead of producing a conflict, effected heterogeneous collaboration between 'society' and 'nature,' both being represented by Samalangdun. The taxonomists, the two guides, the local people of the coastal area, the goddess and the sea enacted a respective transdisciplinary enrolment through a shared postcolonial fieldwork moment:



Heterogeneous collaboration through a postcolonial moment in the Anthropocene

Figure 3. Transdisciplinary enrollment

The 'Samalangdun event,' as I named it later in my notes, expressed a core feature of fieldwork; either natural or social-scientific: Fieldwork knowledge is not acquired through an external perspective of the object of inquiry but through interactional involvement with it. It is a relational process facilitated by conflicting ontologies, epistemics and values channeled through experimental enactments. According to Dewey's classical experimentalist theory of knowledge, the taxonomists, similar to ethnographers, reconciled fieldwork experiences with disciplinary reflexivity. They experimented in their observed environments through flexible practices, adapting themselves to often unpredictable encounters. While it could be argued that the taxonomists maintained a certain naturalist universalism which is easy to criticize from a social science perspective (Boltanski and Thevenot, 1999: 364-365; Brown, 2019: 103; Faugère, 2019: 62ff.), the expedition's infrastructure, based on human and nonhuman support, allowed, despite its postcolonial features, a successful collaboration while taking difference seriously. Transdisciplinary enrollment facilitated through fieldwork enabled the taxonomists to embrace, at least occasionally, a reflexive approach vis-à-vis their own critical potential (Bieler et al. 2020: 83) toward this very universalism. 'Society,' thus, entered the taxonomists' research practices through and within fieldwork, often through contingent and unpredictable encounters which were integrated either pragmatically, or even experimentally, into their daily workflow.

I left Madang impressed and puzzled. Back at my desk at home, I tried to relate my observations to my own disciplinary positionality and approach. While seeking possible collaboration, I felt, indeed, that the 'poisoned' character of the 'gift of the Anthropocene' makes it even easier for ethnographers to remain stuck in the social science observatory. However, this, at times, awkward situation increasingly fueled my thoughts on how to leave it – while appreciating the *in situ* opportunity for "a more dialogic kind of cooperation" (Sennett, 2012: 28). Could the enrollments observed in Madang eventually contribute to a pragmatist analogical thinking *between* nature and society – that is, between biological and sociological fieldwork?

Experimental Enrolment: Toward an Analogical Field Sciences Approach

"'These are the specimens we processed during the expedition. They have been sitting in these bags for nearly one year.' Sandra shows me the bag. I am relieved to hear this because this also holds true for my fieldnotes." I wrote that observation down in October 2013, about one year after my ethnography of the expedition in PNG. In 2013, I visited the taxonomists for a short follow-up observation of a determination workshop on the expedition's findings at the biological station in Besse, near Clermont-Ferrand, which is part of the MNHN structure. From then, it took again several years until I realized that there are more similarities between taxonomy and ethnography which deserve closer attention. Collecting information translated through nonhuman beings, or language, and bringing them back home to the desk; then other tasks intervene, the collected beings are set aside, partly even forgotten. Feelings of discontent occur; even guilt, raised through the knowledge that there is a treasure "sitting in these bags," as taxonomist Sandra said, waiting to be looked at. The battle against and with the time needed to return to the bag, to open and to rediscover it … And the joy when finally exploring the material again, to re-experience being in the field and experimenting with its outcomes.

My encounters with the taxonomists before, during and after the expedition indeed again confirmed that fieldwork is 'experienced' rather than 'conducted' – a statement constantly rehearsed by anthropologists and sociologists since the classics. Moreover, experience, trial and collaboration regarding ethnographers and naturalists' encounters are impacted and enhanced by moments of uncertainty and mutual learning. This fits perfectly with the pragmatist legacy. Dewey created an ontological continuity between 'experience' and 'experiment' by stressing the entanglement between observation and object construction. His concept of democratic experimentalism was driven by the idea that political cooperation would reflect human undefeatable curiosity to discover the unknown, based on the entanglement of experience and knowledge. Thinking about this further through Richard Sennett's works on the craft of cooperation, a

"cooperative mindset" is not only difficult to establish within an interdisciplinary encounter but is a fundamental democratic challenge as well: "[C]ooperation needs to be developed and deepened. This is particularly true when we are dealing with people unlike ourselves; with them, cooperation becomes a demanding effort" (Sennet, 2012: ix). This is, as I have outlined in this paper, not only true on the broader societal level, but also on the level of the academic organization and collaboration between the natural and the social sciences in the Anthropocene. Stemming on Sennett's idea of heterogeneity as a precondition for cooperation, we can distinguish the term 'collaboration', generally meaning 'cooperation / working together', from 'co-laboration'. 'Co-laboration' consists of explicitly seeking a common ground, or "a third space" between disciplines and other communities of practice (Niewöhner, 2014: 350; Bogusz and Holtappels 2021). Analogical thinking, thus, could be understood as a precondition for the development of inter- and transdisciplinary collaboration heuristics which might possibly lead to the experimental creation of third knowledge spaces.

While, for various reasons, my material kept sitting in the bag, I immersed myself the following years in a deeper study of pragmatism, neopragmatism, and their possible articulation with anthropology, social theory and STS. Consequently, the return to the empirical material presented in the paper is equally impacted through my acquaintance with the experimental perspective inherited through the pragmatist legacy. It made me sensitive to an experience-based approach that might contribute to a collaborative heuristic, although, by the time of my research, I was not focused on collaboration but on observation.

From this positionality transformation, the Parisian and PNG studies, still approximately explored to date, allow the determination of three similarities between taxonomist and ethnographic fieldwork: Firstly, they are exposed to similar contextual challenges through the current ontological reconfiguration of nature and society; secondly, they adopt experimental methodologies to sustain their research infrastructures and adjust them to their goals; and, thirdly, both taxonomist and ethnographic fieldwork enact transdisciplinary collaboration between human and nonhuman participants in particular geopolitical environments. Hence, it seems reasonable to suggest that a more systematic exploration of these similarities could pave the way for analogical thinking between nature and society and foster cross-disciplinary collaboration in the Anthropocene.

Accordingly, figure 4 shows "experimental enrolment through a shared field sciences approach". The epistemic separation between the natural (N = green) and the social sciences (S =blue) is still maintained on the level of academic knowledge organization – expressed again through the two distinct core rings. However, both of them have enrolled important epistemic features of what was formerly excluded (Fig. 2b), that is (left circles) 'society' is part of 'nature' as an object of research, and *vice versa* (right circles). They are related to each other through a shared field sciences approach, containing epistemic features of research in both disciplinary families, and through analogical thinking on the level of methodology (blue arrow), that is, through an experimental exploration of the similarities between their respective fieldwork practices and knowledge:

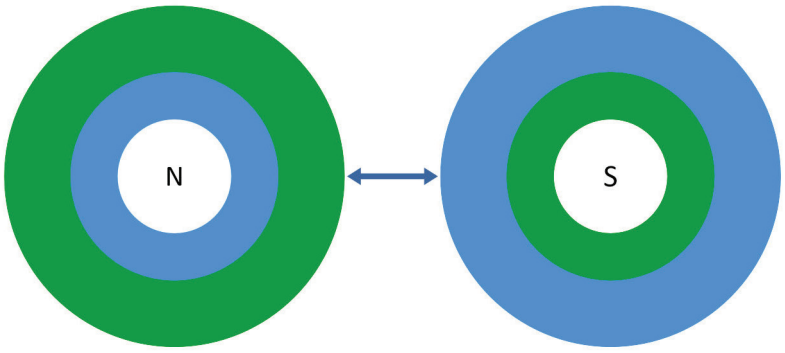


Figure 4. Experimental enrollment through a shared "field-sciences" approach

With the theoretical resurgence of classical pragmatism, fieldwork in the age of the Anthropocene points to a core epistemic continuity between nature and society as objects of inquiry, which is strikingly topical again today. While the laboratory as a metaphor for the observation and enactment of knowledge sometimes "tends to obscure rather than help to think" (Guggenheim, 2012: 15), fieldwork stems from concretely located places where naturalists and social scientists meet with heterogeneous participants. By featuring continuity between observation and object construction, 'the field' embraces alterity, difference and contingency where symmetry is unattainable. Aligning with pragmatism, science studies and the anthropology of nature, the social and cultural sciences have proliferated and innovated inter- and transdisciplinary instruments and concepts for "both observation and thought experiments" (Tsing et al., 2019: S000) which are good to think with. The analogical fieldwork heuristic outlined here allows one to set such an experimental methodological focus as a starting point for the organization of co-laborative research – thereby encouraging joint enactment with natural scientists on a more equal footing.

Conclusion

Pierre Bourdieu (1987), aiming to reconcile ethnology, sociology and philosophy, described his practice theoretical approach as the "fieldwork in philosophy". 'Fieldwork in the Anthropocene,' as I tried to demonstrate, consists of the realization of experimental collaboration in times of eco-social crisis and epistemic sensitivity. At the start of this paper, I wondered about the possibilities of analogical thinking *between* nature and society throughout the Anthropocene moment. Throughout an observation of a French team of marine taxonomists doing research on biodiversity loss, I have explored a set of arguments showing that taxonomy and ethnography are good candidates to encompass the modern disciplinary nature/society divide. This divide concerns preeminently alienated epistemic cultures and research practices. For the taxonomists, establishing a collaborative methodological workflow, negotiating field access and "worlding" constituted three fundamental modes of knowledge enrollment to sustain and advance their disciplinary impact through the Anthropocene. It is similar with ethnographic inquiry; this includes the generation and reorientation of research experiences, trial situations and heterogeneous modes of collaboration. From here, I deduced a fourth, however, still hypothetic mode of enrollment, that I named 'experimental.' An experimental field sciences approach relating taxonomist and sociologists' methodologies of fieldwork, I conclude, could provide a good starting point for collaborative encounters between nature and society as research objects.

Today, social-scientific knowledge is increasingly solicited for participation in research projects and programs driven and led by natural scientists. This has effected, especially within STS research, hopeful expectations concerning the epistemic impact of our knowledge within such settings. Yet, this hopefulness often clashes with the rather "awkward forms of 'experimental politics' that […] animate" such collaborations (Fitzgerald et al., 2014: 703ff.). The question of how to navigate, as social scientists, within natural scientific-dominated frameworks where the "understandings of 'the social' […] become the most significant force against which our work to negotiate a deeper collaboration must be orientated" (Balmer et al., 2015: 20) remains a challenging task. This is why methodology matters. Analogical thinking could encourage interdisciplinary work by combining methodological pragmatism and enhanced reflexivity with "radical hope." Such work does not exclude difference and critique – on the contrary. But my guess is that it is more challenging – and more important actually – to carve out similarities beyond heterogeneity. This is, not the least, a democratic concern in times of mounting political disparities.

Admittedly, my account presented in the paper only gives a very general idea of what "analogical thinking" beyond academic division means exactly when putting it to the empirical test. Moreover, the twist of '*analogical* thinking' in the *digital* age plays with the slight, yet ironically, self-limiting preference for methodological exploration through classical scientific craft experience as 'making and repairing,' another pragmatist '*clin d'oeil*' (Sennett, 2012). However, as the example of

the Parisian taxonomists shows, fieldwork, either naturalist or ethnographic, does not exclude digital and quantified knowledge but can provide opportunities for their problem-oriented integration (Niewöhner, 2021).

The Anthropocene event is a good momentum to explore the possibilities of analogical thinking – without being naive about its epistemic limits, as well as its practical impediments. Such possibilities are, in a time of planetary ecological destruction and the global crisis of democracy, precious antidotes to the 'poisoned gift of the Anthropocene' for the human sciences still waiting to be further explored. Exchanging with taxonomists and other natural scientists while doing fieldwork in the Anthropocene provides an excellent starting point for mutual learning. By discussing methodological similarities and fieldwork experiences either in scientists' workplaces, in a rural area or during an expedition overseas, those being formerly "research subjects" for STS research, can become "epistemic partners" (Bieler et. al., 2021: 91). To be sure, such a transformation needs epistemic partners that are open "to confront, discuss, and transform the challenges and contingencies of epistemic practices" (Bieler et al., 2021: 91). Reassembling these practices could foster true collaborative research so much needed these days. Analogical thinking through fieldwork allows STS researchers, as a heuristic, to immerse themselves into the fascinating world of natural-scientific research while mentally staying on familiar methodological ground. It consists of discovering, exploring, and profiling analogies across methodological divisions where they are far from obvious. Such, still tentative, assumptions will constitute the baseline for the further development of an empirically based interdisciplinary *field science* research framework.

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