



At the confluence of ethics, laws and society: global working theory merging bio-ethics

Antoine Boudreau LeBlanc^{1,2,3,4} 

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Abstract

The pressing global challenges facing humanity highlight the urgency of reconciling medicine, society and ecology. By shedding light on the role of theories of translation and justification, the intention here is to show the potential usefulness of an in situ bioethics that reconciles practices in medicine and ecology. Science and policy should be reassembled in hybrid working theories developed, adopted and reframed by/for Society. Yet, a major challenge emerges from translating ethics, sciences, and economics claims, both within expert and lay milieus. This paper proposes foundational pillars for operationalizing the Potterian view of global bioethics. Van Rensselaer Potter challenged the perspective that compartmentalizes values, knowledge and laws, proposing ways to bridge them by linking appreciative, descriptive, and normative knowledge. The missing link, however, is a coherent governance process that coordinates the thinking, ordering, and enacting in the world. Based on an extensive revision of the Potterian legacy and action-research case studies, this article applies the Global theoretical view in the complex in situ practice of bioethics. Little known outside the world of academic bioethics, Potter's primarily scientific curriculum helps translate and operationalize the socio-political reflections of notable contemporary philosophers of science and critical social theoreticians such as Karl Popper, Thomas Kuhn, John Rawls, Bruno Latour and Jürgen Habermas. In this era of mass communication, government education programs, and large-scale research funding, I propose a conceptual framework for operating a Community-based Global Bio-Ethics, echoing the 60th anniversary of Habermas' call for *The Structural Transformation of the Public Sphere* (1962).

Keywords Translational ethics · Collaborative governance · Governance ethics · Global bioethics · Organizational resilience

Bioethics means “biology combined with a variety of humanistic insights forging a science that establishes a system of medical and environmental priorities for acceptable survival”
(Potter 1988).

Bioethics, not science nor politics, can “aid in the search for sophistication in dealing with order and disorder in human affairs”
(Potter 1964).

Bioethics is “A proposal to cope with the gulf between scientific knowledge and political direction”
(Potter 1971).

Introduction

Pressing global challenges that are inherently complex to resolve, such as the fight against zoonotic pandemics, climate change, and biodiversity loss, highlight the urgency of reconciling medicine, society, and ecology, domains of research and intervention that have largely worked in isolation, one from the other (Beever and Whitehouse 2017). Recognizing that these challenges are interconnected is one of the major contributions of the One Health approach. In biological terms, climate change influences species’ migration, extinction and evolution, thereby increasing or decreasing local biodiversity and the risk of zoonoses emerging. Zoonosis echoes a fundamental phenomenon in evolutionary biology, highlighting the fluidity of boundaries. A pathogen that infects one species can stochastically move towards another, even if the new host is cladistically distant (i.e., categorized in very distant groups). For example, recent zoonotic crises include Lyme disease and the Ebola virus, each of which have multi-domain political connections and are indirectly linked (1) by issues of resource allocation that make the prioritisation of one a resource reducing factor for the other, and (2) potentially by natural landscape management and land use policies, as both are linked to human–environment relationships. More generally, zoonoses can be framed as concerns for public health and urban planning; climate change concerns transport, energy and human production; and biodiversity concerns hunting, fishing and forestry. They may fall within distinct political jurisdictions and economic sectors, but they nonetheless intersect a posteriori when allocating resources, prioritizing initiatives, and finding compromise solutions.

The translational conciliation between such issues calls for a large bridge between domains; that is, techniques, knowledge and economics should interact within a more encompassing context of Society and Habitat (Potter 1971, 1988). This bridging echoes the historical Science vs. Politics debates and the economy vs. ecology dichotomy that sought to move beyond “either/or” constructions of domains that do not “talk to each other” (Potter 1964; Callon et al. 2002; Law and Urry 2004; Paniagua 2022). Translational conciliation can thus refer, at first glance, to linguistics, terminologies, and concepts. Concepts and terms encapsulate cultural and paradigmatic nuances that are useful for preventing reductionist exchanges between various stakeholders—in part, this is the role of ‘jargon’, of establishing a common language wherein everyone agrees (more or less) on the terms of use. So, how could we produce a worldwide, intersectoral, and interdisciplinary jargon, and is this

even possible?¹ If yes, who should be responsible for setting up this new Tower of Babel? Further, whoever leads such a project would set the premises, beliefs and even biases that frame future dialogue. At a second glance, however, translational conciliation could refer instead to a more encompassing, inclusive and less directive process. This paper offers a conceptual path to overcome some of these challenges by reframing the role of science programs.

In this era of mass communication and vast programs (research funding and education), socio-political reflections and critical social theories can help to set the scene for bridging the public and academic spheres (Habermas 1962; Kuhn 1962; Popper 1963; Rawls 1971; Morin 1994; Max-Neef 2005; Latour 2010). By challenging a particular perspective that compartmentalizes values, knowledge, and laws, scholars have instead proposed ways to bridge these in a more organic manner (Ostrom 2000; Callon et al. 2001; Funtowicz and Ravetz 2008). To echo the 60th anniversary of Jürgen Habermas' call for *The Structural Transformation of the Public Sphere* (1962, translated in 1989, see his note in the Special Issue of *Theory, Culture, & Society* in 2022), I suggest that digitalization and mediation could be an opportunity to transcend those walls. But these techniques also could threaten valuable norms in society, *a fortiori* the criteria of scientificity (e.g., their validity and credibility). Thus, the know-how involved in translating techniques, knowledge and economics introduces profound and complex ethical dilemmas.

Indeed, “The devil [...] lies in the detail, which means that it is important to attend to specificities”, as John Law (2021) writes about his book *After Method* (2004). Getting into theories of globality, with these large-scale translational processes, is an excellent way forward if we do not lose sight of the local. We need “care-ful research” (Law 2021), which means bridging the reflexive and cognitive sides of research with the deliberative and collective sides of Science; and further, it requires a raising awareness about the large-scale processes of power and knowledge dynamics involved in conducting Laboratory activities (Latour and Woolgar 1979). The argument that I advance here mobilizes the conceptual framework of Bruno Latour's Actor-Network Theory (1947–2022; 2007). Following Latour, we need more translations to bridge communicative action and argumentation, for instance, to bring the ecology of climate change down to the level of real-world understanding of the most effective means for improving public health interventions (Bilodeau and Potvin 2018), managing the commons (McGinnis and Ostrom 2014) and governing urban resilience (Collier and Cox 2021).

However, we also need ethical reasoning to acknowledge the *Ethics Discourse* (1991) and Habermas' perspective on social communication (1962). Latour (1987) coined the idea of a *Science in Action*, thus emphasizing the need for a collective ‘reflexivity’ in Science. Under the vocabulary of Michel Callon's work (2002), this

¹ A few initiatives evolving within and beyond the academic world are One Health and Sustainability. These two evolved together since the 1991 Rio Earth Summit rapprochement between the political orientations of Health and Environment, which launched the rapid operationalization and institutionalization of the ecosystem approaches. As Beever and Morar outlined (2019), between Healthcare and Biodiversity there are two vast socio-intellectual worlds, with distinct points of view (ontologically and epistemologically) and imperatives (axiologically and teleologically). One is fundamentally anthropocentric and the other is ecocentric.

reflexivity means having a ‘distributed cognition,’ thereby opening up room for critical reflection and reasoning. To operationalize this, ethics must innovate because we need a translational (academic-professional) ethics that is concretely embodied in governance systems at the intersection of science and policy (Boudreau LeBlanc et al. 2022b). Callon et al. (2001) propose the ‘Hybrid Forum’ or ‘Hybrid Community’ concept to open such dialogue. But beyond these dialogues, we should also be aware of the risk of intellectual hegemony, fallacies and reductionism. This ethics should thus focus on the methodologies that could be used to reconcile interdisciplinary objects ‘in-action,’ that is, during the transition process of change. As a research-action practice, this new ethics conducted *out-in-the-world* would build on the process of a collaborative, adaptive and reflexive governance (Boudreau LeBlanc et al. 2022b).

Acknowledging the challenge of *translation* between ethics, sciences, and economics in the broadest sense, this paper aims to lay foundations for operationalizing the global bioethics theorized by Van Rensselaer Potter between 1970 and 1990.² Specifically, I apply this Global theoretical view of ‘Bio-Ethics’ in the complex *out-in-the-world* practice of bioethics (Boudreau LeBlanc and Williams-Jones 2023a). But is it possible for a bioethicist engaged in local action to keep alive Global Thinking? In bioethics, the philosophy of Complexity emphasizes the importance of synthesis, and even the use of thought experiments, which I will refer to as ‘Hybrid Working Theories’ (a nod to Callon’s translation perspective). This use of synthesis improves the in situ analyses of the context in which each actor lives and operates (de Langavant 2001; Wilson 2014; Maldonado and Garzón 2022) and, for bioethicists, sets the initial conditions that influence the *out-in-the-world* ‘multilemmas’ (or multi-domain dilemmas) and, subsequently, the adoption of functional compromise solutions.

Translation & responsibility

Translation involves bridging the views of intellectual disciplines, technological applications, societal activities, and factual communities, each of which may have different views of ethics and strategies to advance their respective agendas. Further, their various perspectives also interact with each other through the intermediary actions of technology and policies. Potter (1971, 1988) thus challenged the perspective that compartmentalizes values, knowledge and laws, and proposed ways to bridge them organically. In particular, he explored intermediary spaces or mechanisms derived from using the theoretical lenses of sociology and biology to look at these interactions (Boudreau LeBlanc 2023b).

² Potter was arguably the first to coin the term *bioethics* in the contemporary literature (1971) and propose a Global Bioethics (1988). While little known outside the circle of academic bioethics, his primarily scientific curriculum could help numerous socio-political reflections by translating the community-based management framework and the social-ecological system concept into the jargon of ethics and governance (Boudreau LeBlanc 2023b).

During the same period, ecology and sociology were forging a new and profound dialogue, which notably resulted in Howard (1924–2002) and Eugene (1913–2002) Odum's *General System Theory of Knowledge Organization* (see in particular Odum 1975). Many scholars have subsequently developed logical models for human development based on this system theory, notably Urie Bronfenbrenner (1917–2005), who integrates sociology and ecology theories in an (socioecological) applied model of psychology and medicine (1979, 2005), i.e., public health (Lee 2017). For Potter (1971), the goal was to reassemble ethics—a polysemous term and a complex practice—into a framework that meshes with the processes of economy in society but without reducing its value.

One of the key contemporary challenges in the philosophy of sciences is linking appreciative, descriptive, and normative knowledge in a coherent governance process for thinking, ordering, and enacting in the world without falling into fallacies or other cognitive and collective biases. This relationship between empirical theory and normative knowledge is a gap highlighted by Habermas (2022) in mobilizing the case of the rise of political populism in Western representative democracies (see Jaster et al. 2022) and of the militarization of infra groups of Society opposing dominant discourses (see Hodwitz et al. 2022).

With these existing challenges in mind, to conduct large-scale and profound translation we need a distributed ethics that enables individual stakeholders to recognize the challenges of living within broad and complex decision-making systems. These decisions have to do largely with, among others, resource allocation (e.g., of medical care) and Human cognitive development (e.g., from education to emancipation and well-being) in the context of diverse human collectives. A Latourian understanding of collectives or communities includes, alongside human individuals, the biological and political dimensions of economy and ecology. As pointed out by Potter, bioethics holds the potential to 'assemble' individual, economic and societal dimensions in one hybrid theory. Specifically, a global bioethics could reconcile medicine and ecology by drawing upon working theories developed, adopted and reframed by/for Society.

In line with the Potterian bioethics perspective, ethics ties-in to governance through the analysis of responsibility-sharing processes. However, more than a study, ethics also needs strategy and power, that is, a whole *economy* in the sense of a largely distributed (eco) set of norms, to continuously pursue this process of sharing responsibilities and allocating resources according to competencies. Without power, how do we ensure everyone is held accountable for collectively distributed roles (Ostrom 2000)? Thus, we need constructive hybrid working theories that reconcile lived experience and macro theories based on structuring pillars of knowledge. This process should favour interdisciplinarity and shape governance systems to be more transparent, intellectual, communicative exchanges.

What about ethics?

A link between the scientific and political dimensions is needed to ensure both constructive exchanges and a robust governance ethics (Boudreau LeBlanc et al. 2022a)—this involves integrating value systems in Science and policy (Potter 1964, 2001; Norton 2002; Funtowicz and Ravetz 2008; Wilson 2014; Beever and Whitehouse 2017).

We must remain critical when using scientific knowledge for policy-making but be alert when there is no knowledge to justify specific policies. It is not because age, ethnic origin, or gender, for example, have always been in the grip of injustices that this well-scientifically documented state of affairs (an ‘is’) should remain (an ‘ought to be’): a becoming is never (strictly) of the order of a (scientifically-based) natural Law (Habermas 2022). Otherwise, natural sciences become an Order of a divine nature (the *naturalist fallacy*). However, it is not because we raise awareness on the limits of the natural sciences that we must lose our responsibility to our fellow human beings, future generations and ecosystems, and our duty to better understand our (individual-up-to-anthropogenic) effects on the world (Latour 2013) through the powerful lenses of, among others, physics and biology.

When we scale up human behaviours, e.g., from *Barter* to the law of *Markets*, we tend to lose the capacity to see the singular, now intertwined in a complexified (social) organization. The *one-by-one* rational discourse of the trader or the consumer became an abstract, worldwide, marketing process. This scaling-up perspective is required to advance the understanding of justification (system) theories (Jost 2019) in Human interaction, Markets and governance. In systems, some justifications are rational, while other motives are emotional or physical. But beyond these, critical thinking is also needed to (e)valuate the individual-up-to-collective justifications and dialogical paths, which I referred to above in terms of a translational ethics.

The perspective here argues in favour of *Hybrid Working Theories* (e)valuating and (pro)posing justifications. Those theories must be built on three pillars:

1. Science to *synthesize* knowledge about the world;
2. Policy to *guide* human actions in the world;
3. Values to *empower* actors to change.

Values go beyond laws and finances, to normative knowledge and processes: they are appreciative knowledge that then qualifies the power, techniques and theory emerging, among others, from Law and Economy.

In line with the Potterian view of Global Bio-Ethics, these three socio-epistemological dimensions should be hybridized into one coherent framework. Thus, ‘bio’ includes *Nature*, but also *Nurture* (human politics, norms *-nomy*, rights, duties, behaviours, etc.), as both are parts of the descriptive knowledge (the ‘is’) characterizing human life and intrinsic ‘nature’ (Ingold 2000). For Potter, laws and norms are part of human biology, as an extension of animal behaviours (ethology), cognition (psychology), culture (ethnology), and sociality (demoecology), echoing several perspectives of the Chicago and Baltimore School of Urban

Ecology (Wahl-Jorgensen 2016, Boudreau LeBlanc 2023b). But along this line of thought, *What does 'ethics' mean?*

Ethics (as an academic discipline) is methodologically reflexive and critical. Axiology (as the philosophical branch of ethics) is the field of knowledge and disciplines studying values, orientations, justifications, beliefs, wills—that is, the *axis* of a decision, a policy, a norm, and so forth. Ethicists (as professional experts) assist decision-making authorities (as physical and institutional persons) in raising their awareness of values, concerns, and biases, that are inherent in their systems and practices. Mainstream bioethicists are (methodologically) trained to assist people in articulating rights, duties, and knowledge in complex situations to enhance the constructiveness of, for instance, the relationship between healthcare professionals, the patient, and family, as well as deliberative processes involving citizens, sectorial representatives, interdisciplinary expert teams and public authorities. In these two situations—which operate at very different organizational scales—the task of the ethicist is similar: to embed in the collective and ease the path towards untying the knots of these complex ethical dilemmas to construct and adopt compromise solutions then responsibly.

The Potterian *bio* further 'brings to life' this practice embedded in mainstream bioethics, by vivifying three dimensions:

1. Conduct: Responsible conduct bridging methodology, reflexivity, and values;
2. Code: Bioethical code bridging the scientific and ethical expertise in societies;
3. Action: Professional action bridging the individual, society, and ecology.

Shifting the focus from dilemmas and solutions to translational paths, this Potterian generation of bio-ethicists adopt a system thinking lens and engage in the reshaping of the socio-intellectual environment in which they are embedded to assemble ethics by design of the genesis of conducts, codes and actions.

Conduct

Ethics is intimately related to conduct—it is the disciplinary rationale for good conduct, referring to the daily choices that people make to 'do good', or not. Reflexive, ethical conduct further connects action to critical thinking. Normand Baillargeon (2005), a Canadian philosopher of science well-known in Québec for his criticisms of education, explains *critical thinking* as an ability for intellectual self-defence—a nod to Edward Herman and Noam Chomsky (1988), author of *Manufacturing Consent: The Political Economy of the Mass Media*—which can be scaled up (Baillargeon 2013) under a less structured hierarchical but still rigorously conceived framework for organizing education (Baillargeon 2016). Indeed, ethics navigates in a (broad) world of power dynamics but emerges from the will of concerned people.

However, ethics is challenging to scale-up from individual conduct (based on cognitive actors) to collective action (based on rhetorical agents). Ethics scholars are not the only ones who face this obstacle: this is conceptually one of the longstanding historical challenges of the social sciences. Callon's thesis on *The Economy of*

Qualities (2002) outlines this challenge of scaling communication up to the social dynamic of a *Sociology of Translation* (1986, 2001). And this organizational ‘scaling’ abstraction is at the very origin of sociology and ecology at the turn of the nineteenth century. Ludwik Fleck (1896–1961) and several others proposed the idea of ‘Collectives of Thought’ to discuss *Genesis and Development of a Scientific Fact* (1934). As an engaged scientist of his time (Grzybowski and Ciesielska 2016), Fleck embodied and advanced the position of Max Weber (1864–1920), founding father of a comprehensive perspective of sociology, in *Politics as a Vocation* (1919). He notably reflected on his experience of how a critical cognitive actor could translate discourse into punctual involvements during a lifetime and systematize this impact by getting involved in the reshaping of the socio-intellectual environment.

Ethics must become a social capacity. At the social scale, conduct remains driven by people. To some extent, everyone advances their goals, roles, interests, missions, perspectives, values, etc. (Boudreau LeBlanc and Williams-Jones 2023b), and so to some degree, we are all ‘strategic actors’ (a nod to Crozier et Friedberg 1977). This strategic nature of individual/collective action gives collective structures a certain flexibility and stability, while still embodying individual variability. Sociologically, these actors are a set of physical persons assembled in an institution (a moral person), such as universities, governments, and associations.

Made of individuals, institutions archive a form of consciousness and accountability in their policies, economy, and culture (Latour 2007). As an assemblage of distributed cognition, institutions have a mission and objectives (Boudreau LeBlanc and Williams-Jones 2023b). Depending on the power of the collective vision that emerges, institutions push towards lower / chaotic or higher / synergic engagement. To shift from (strictly) *strategic* to (adaptive) *responsible actors*, those ‘social assemblages’ must self-govern. This means having a (self) evaluating, questioning, and regulating function, that is, a self-reflexivity that is applied internally and externally to the norms shaping the organization (in the sense of Latour 2005).

This social perspective of ethics is rooted in the philosophy of John Rawls (1921–2002), in *A Theory of Justice* (1971), and the work of Normans Daniel (1996), which advance a procedural justice approach and processes anchored in reflective equilibrium. It further draws upon one of the vital Potterian objects of study in the Global Bio-Ethics program: the Code (Boudreau LeBlanc and Williams-Jones 2023a).

Code

Ethics is an evolving code, i.e., a set of codified knowledge about values. However, ethics must be more plastic than laws, dogma, and etiquette. Ethics should become ever-more agile to adapt and evolve with local concerns and realities. Although Law and Science are necessary as the structure of human affairs, their rigidity is insufficient to respond to world changes. Figuratively, Potter proposes by way of explanation the genetic program *versus* the agility of the protein network (Potter 1971, p. 107). For colleagues in health and biology, let us add the image of the bony skeleton

structuring the anatomy *versus* the cytoskeleton of cells in dynamic equilibrium³; two organizational scales and two different mechanisms, but one complex organism. For colleagues in technology and economy, we might think of computer science as managing infrastructural flaws and security (hardware) *versus* cybersecurity overseeing risks from the inside-out (software). In short, Potter's view is in line with *The Fables* of Jean de La Fontaine (1621–1695) that compares the resistant oak (strong but rigid and inflexible) *versus* the resilient reed (weak but flexible; 1868).

According to Potter, bridging the 'bio' to 'ethics' gives life to an adaptive code (Laws, Sciences, and Beliefs) through the reflexive process of critical thinking, in line with the perspective of the philosophy of science advanced by Thomas Kuhn (1922–1996) and Karl Popper (1902–1994). Indeed, bioethics has become polysemous since its appearance in *Perspectives in Biology and Medicine* (1970), which was thereafter popularized by the Georgetown School focus on (bio)medical health issues. In mainstream bioethics, however, the suffix 'bio' has also started to drift towards a more global, general understanding of life and of knowledge-making (Potter 1988).

The mainstream message of bioethics—which the Georgetown School promoted—uses the word 'bioethics' to designate the field of science and technology ethics as applied to biomedical issues, health and life (a synonym for 'biomedical ethics' or 'health ethics'). This understanding of bioethics tends to adopt a normative/legal view of ethics in which operationalization and normativity end with regulations and standards. By *vitalizing* ethics, Potter mobilized the more common meaning of 'bios' in basic biology and meta-philosophy circles such that *bio* here is understood in its broadest sense (1971). Instead of the regulatory ends of biomedical ethics, which are individual-centric, this Potterian understanding of bioethics outlines the more profound and sustainable power of education, cultural change, fact genesis, communication systems, information exchanges, and program governance—it is system-oriented and complex.

In developing the Latourian theory, the Hybrid Forum and Boundary-Object concepts are relevant to explain how this fuzzy viewpoint could be powerful and operationalizable. The concept of the *Hybrid Forum* was put forward by Callon et al. (2001), while the idea of *Boundary-Object* was advanced mainly by Susan Star and James Greisemer (1989). However, both concepts are relevant to operationalizing Callon's *Sociology of Translation* (1986). John Law and several colleagues also proposed the idea of meta-social forums for dialogue on methodological objects falling into the epistemic space. The forum becomes a place, an object, or even a thought on what 'good' means (or any other criteria of scientificity or values). Developed with a methodological angle, Law views these forums as a way to dive into the know-how to justify, challenge and operationalize epistemic claims.

Here, I propose the idea of a *Hybrid Theory* to stimulate an ever-ongoing discussion. This dialogue should focus on *uncertainty* and *values*, be anticipatory, and be conducted at the intersection of expert and profane circles. Advancing the idea of Kuhn's 'normal sciences' and 'paradigms', Silvio Funtowicz and Jerome Ravetz

³ See the outreach work conducted at Harvard University: *The Inner Life of the Cell*, url: <https://www.youtube.com/watch?v=wJyUtn0O5Y&t=1s> (1–1:30 min).

argue that we are entering the age of *post-normal sciences* (1993) and *transdisciplinarity* (2008), thus giving room to marginal or silenced parts of the community, as developed in Callon's work (2004). Ultimately, these abstract Forums, Objects, and Values must come down to earth—into the realm of the profane and give voice to persons, populations, beings, things and landscapes that hitherto may have been silent (or silenced). This global envisioning of science genesis is in line with the Popperian perspective. In the Potterian view, a formal place and set of frameworks are provided to critically (re)think action and responsibility within the science logic as research evolves in a broader *Uncertain World* (see the critical work of van den Berg and Jeong 2022 on the common use of postpositivism and the tendency of recalling positivism).

Action

Third, ethics is a vivid *in-action* practice (Abma et al. 2010; Frauenberger et al. 2016), enacted through lived experience and advanced with thought experiments. Entangled with a fear of the naturalistic fallacy (Boudreau LeBlanc et al. 2022a), as criticized by numerous philosophers, Potter (1988) urges concerned scientists to remain alert for dangerous knowledge (risk) about which modern science does not seem to be aware. Science is constantly faced with a choice: to use or not to use scientific knowledge (1971, p. 107). And Potter proposes bioethicists as intermediaries in this ongoing questioning (Potter 1964).

Action-research approaches have advanced this thought on the intersection of science and policy (Jason et Glenwick 2016), highlighting the need for more reflexivity in science and critical thinking in research (Lumsden 2019). This in-action perspective can also propose methods for deliberation and evaluation that involve both expert and lay knowledge in the public area (Piovesan 2022). Several avenues are being considered, including hybridizing qualitative research techniques with laws and other social regulatory modalities, including economics and political sociology (Fox 2000). These methodologies focus on the (re)assembling processes (literally, *socio-* according to Latour) to scale critical thinking at the level of 'Collective thought' (*sensus* Fleck).

The first initial working theory for operationalizing global Potterian bioethics, on which this conceptual framework is based, was constructed during a PhD project in bioethics conducted in collaboration with the veterinary, agricultural and innovation milieus in Quebec, Canada (see Boudreau LeBlanc et al. 2022b). The first version of the concept was drafted in 2019 based on the premises outlined in the previous section on ethics. This final framework develops on the feedback received from a 5-year lived experiment of a translational facilitatory ethics in bridging Science and Politics.⁴ This ethics—bridging theory and practice—echoes John Rawls' (1921–2002) *A Theory of Justice* and *Reflective equilibrium* towards procedural justice:

⁴ The following perspective builds on an article published in the *Canadian Journal of Bioethics* (Boudreau LeBlanc et al. 2022a), highlighting the role of management in bridging Science and Politics, but emphasizing the need for an ethics.

A second approach (called naturalism by an abuse of language) is to introduce definitions of moral concepts in terms of presumptively non-moral ones, and then to show by accepted procedures of common sense and the sciences that the statements thus paired with the asserted moral judgments are true. Although the first principles of ethics are not self-evident, the justification of moral convictions poses no special difficulties. They can be established, granting the definitions, in the same fashion as other statements about the world. (Rawls 1971, p. 506)

Framework

Linking science and policy requires a particular hybrid environment, partly *biological* (the ‘is’) and partly *ethical* (the ‘ought to be’). This missing space builds on pre-existing structures to simultaneously mobilize all the above ethics components. However, we must plan for the complex environmental assemblage in our upstream shaping (Boudreau LeBlanc 2023a)—i.e., meta-organization, the ‘ecosystem of bioethics’ (Bélisle Pipon 2013, Beever and Whitehouse 2017, Boudreau LeBlanc and Williams-Jones 2023a). To ensure its adequate shaping, we need a rigorously constructed theoretical framework that allows us to sharpen our eyes, justify our choices and be open to criticism (see below). As a premise, however, both our understanding of this environment and the ecosystem itself are in constant evolution. This is one of the challenges of Complexity (Morin 1994).

The framework must, therefore, evolve through lived and thought experiences: let us call them a ‘working theory’. Under this constraint of adaptivity, I argue for three settings (Table 1).

- Pillar 1 – thinking : laying solid foundations at the intersection of a *Hybrid Theory & Social Bioethics* for change that is capable of progress (e.g., in line with human dignity & ecosystem biodiversity).
- Pillar 2 – proposing : the intersection of *Collective Bioethics & an Empowerment Ethics* for translating science in Society and adding social functioning & societal challenges as a science priority.
- Pillar 3 – preparing : the intersection of *Collective & Social Bioethics* as an adapting governance process seeking individual, social, & ecological resilience. N.B. Potter poetically explained this idea as a ‘Council on the Future’ (1971).

These pillars have two purposes in governance functioning: they translate human knowledge into a tangible code while learning from the feedback of its application (conduct and actions). Thus, the code enacts a set of practical and embodied wisdom

Table 1 Components to translate theory into justification, governance and power**Thinking about change**

Hybrid change theory* *Object:* Synthesis of context to identify responsible actors based on a change theory that balances values and knowledge to coordinate actions toward a better future
Format: Discussion object for in-depth access to values and knowledge and for developing skills to use knowledge in a changing Society
Purpose: Prioritize, frame, or reframe (philosophically) problems and allocate, shape, or reshape (politically) resources as the situation is understood
Functioning: Potter (1971) proposes to bridge Science and Society by operating an evolving ethics, thus bioethics, learning from crises and knowledge

Preparing to change

Social bioethics *Object:* Political will to recruit new responsible actors to energize scientific and societal deliberations and justifications
Format: Intellectual space for learning and critical thinking to deepen responsibility for one's actions and shared resources
Purpose: Design the space for critical questioning of policies, knowledge and values, and to justify the common criteria of the 'best' future
Functioning: Latour (2007) proposes to (re)assemble the social through translation, justifications, and normalization

Collective bioethics *Object:* Political power through fair procedures and shared responsibility among actors, all set on a common ground about the problem and on resource management
Format: A governance body with the power to lead the conversation about responsibility through transparency and translations of the positions held
Purpose: Arbitrate the sharing of responsibilities based on justified courses of action based on credible selection criteria
Functioning: Several scholars ground governance in a collaborative and adaptive regime, whose guiding principles reflect a change ethic in transition management and within justification systems*

Proposing for change

Empowerment ethics** *Objective:* Ethical will and power of responsible actors to adopt reflective and critical governance of their conduct through well-trained and informed decision-making
Format: Tools for justifying decisions based on an ethical and everyday referential, whose collective principles progress in the light of social ethics
Purpose: To democratize access to critical and prospective thinking by introducing program evaluation, its impacts and resources, and the broader context early in the process
Functioning: Advancing collective bioethics based on the values codified in social bioethics and the knowledge synthesized in a hybrid theory of change

*Hybrid Change Theory roots in principle-based and casuistic approaches and criticism the basic guidelines for responsible conduct, social innovation, good governance, etc., in light of sciences and ethics. For instance, collaborative (Emerson et al. 2012), adaptive (Emerson and Gerlak 2014) and reflexive (Kemp and Loorbach 2006) governing processes or justification (Blasi and Jost 2006) and transparent (Jost 2017) systems in terms of ideology

**Empowerment ethics is favoured by bioethical tools that aim to produce a climate of transparency acknowledging how we (collectively and socially) arbitrate *good/wrong*—transparency favours trust (see Boudreau LeBlanc and Williams–Jones 2022 for an example of a bioethical tool). It also enables the identification of initial conditions, such as who is 'leading the ship', to prevent bias, injustices, and reproducing of previous mistakes

on choice, as a road map and a figurative Global Positioning System (GPS), giving the axis ‘to the Future’ (Potter 1971). Physical and metaphysical aspects are crucial to constructively criticizing the value of choices and wisdom in the learning process. The ‘metaphysical’ here means sense-building, justification-making, conceptual explanation, etc. Indeed, facts alone are never enough (Latour 2005). Scientific claims follow a rigorous grammar, and essential components are evidence, design strategy, anticipated uncertainties, and alternative hypotheses. But more than knowledge is needed. Wisdom should be accompanied by questioning of its own assumptions (Baillargeon 2005). For instance, claims must come with their criteria of quality and scientificity (e.g., validity as explained in Habermas’ works), something that is missing in the rise of populism, the politicization of science, and the technicization of politics (Habermas 2022; Jaster et al. 2022).

Discussion

Does Science Have the Power to Deal with Human Affairs in an Uncertain World? (Potter 1964)

Science is a social process that is part of Society (Potter 1964). Sciences (the *-logies*) provide knowledge on the surrounding world, e.g., ecology on ecosystem biological dynamics, sociology on market power dynamics, anthropology on cultures and knowledge dynamics. They give insights to ethics to advance norms and change behaviours (Boudreau LeBlanc et al. 2022b). However, Science can—and must—be studied in and of itself.

Indeed, there is a difference between the object of study and the rationale of a science. On one side, the *Science of economy* studies finance, market, regulation and—in a broader sense—social governance and power dynamics in Society. On the other side, the *Economy of science* applies the disciplinary rationale of a normative science to the analysis of scientific processes and influences in Society. Since sciences describe the world and their rationales could be transferred, scientific claims and knowledge quality criteria must benefit from reflexivity, criticism, and critical thinking. For instance, scientificity criteria such as transferability, validity, credibility and utility should be unfolded upstream to highlight their mean and value, and thus shed light on ways to operationalize and evaluate them. Since observations are monitored to validate facts, criteria should also be tracked down in the socio-intellectual environment to balance values (Latour 2007). Here, I argue that bioethics can play a vital role in these proactive studies of the sciences, which extend beyond the formal role of ethics oversight by research ethics boards (IRBs in the US).

Potterian Global Bio-Ethics operates through the means of an adaptive wisdom (Potter 1971). According to Potter (1988), this wisdom relates to and should be embodied in governance. He envisioned this role via a set of proactive interdisciplinary scholars engaged *out-in-the-world* but still with a foot inside academia. They would accompany leaders (persons and institutions) in charge of science, innovation, and intervention programs that are transformative, as they orient the future

of Society. These Potterian bio-ethicists would use a new integrative approach to research, education and development, which Potter called the *Science of Survival* (1971).

Leaders are the ‘protagonists’ of Potterian global bioethics studies. They live ethical choices daily. And, under an organizationally well-shaped socio-intellectual environment, they are able to sustain this burden. Among other things, leaders decide on infrastructural changes, resource allocation and exchange arbitration, which shapes the bio-ethics ecosystem’s technological, sociological, and anthropological dimensions. To make responsible decisions, however, they need a well-constructed justificative architecture. And *inter-* individual, institutional, cultural, etc., dialogues are needed upstream to untie dilemmas, prevent tensions and develop compromise solutions. In biomedical ethics and the life sciences, these protagonists are often physicians and researchers.

Bioethicists engage collaboratively with these leaders to propose tools for managing complex multilemmas. They may, for example, accompany clinical patients and research participants in their decision-making. Some examples of classic difficult choices concern medical aid in dying, triage for access to care, selecting (minority group) research participants, etc. The physician and the researcher then appear at the confluence of various narratives that are sometimes antagonistic, and other times of equal value, making their reconciliation challenging to manage. Often, no prioritization allows for a simple arbitration or the identification of a linear decision path.

Some situations push leaders to commit and leave their disciplinary comfort zone, working outside their habitual criteria of scientificity, accountability guidelines, and standards of practice. Physicians and researchers are not partisan jobs or activist positions. Engaging individually out of their disciplinary zone is even seen, to some extent, as inappropriate. However, collectively, physicians and researchers—and their respective organizations—have significant influence over the political and socio-cultural spheres (e.g., as lobbyists or consultants, or even just through their role in the social *ergo-nomy*). Both medicine and research have transformative ambitions to advise people about their health and so bring about specific and systematic changes in individual, societal, and environmental life. But both face a considerable challenge in balancing their disciplinary rigor and the required flexibility in practice to prevent bias and disconnection. As translational facilitatory actors, bio-ethicists could help in this ‘reflexive balancing’ (Ives 2014).

Theoretical analysis of justification systems is at the heart of ethics. Having upstream justifications in dialogue leads to the right (or at least the best possible) choice, and sheds light on the decision architecture, thereby opening its structure to criticism. Beyond this transparency, analyzing justification systems enables us to criticize the functioning of the decision-making process, its purpose, and initial conditions. These analyses then help to reframe and deconstruct ethical dilemmas and reprioritize. And this enables critical reasoning techniques to be deployed in order to then develop ethical strategies and the adoption of responsible, trustworthy compromise solutions.

To untie these *multi* -scale and -factorial dilemmas, we need disciplines and reasoning techniques, as argued by Tom Beauchamp (2004), and to involve experts and lay persons, as outlined by Callon (2004), without falling into perspective

reductionism. Beauchamp reminds us of the value of methods, including ‘Reflective equilibrium’ conceived by Rawls to arrive at his *Theory of Justice* based on the *Principle of Fairness* (1971, p. 19–21, 48–51). Daniels (1996, 2003) advances this method by applying the idea to politics as a rational methodology for analyzing the coherence between ideas, notably the epistemic justifications of assumptions, including ethical beliefs and statistical choices.

These theories on justifications find application in political science, many of whose strategies can be found in John Jost’s (2006, 2017) *Justification-Systems Theory* and the Latourian perspective in political sociology. However, these perspectives do not provide methodological guidance on the actual *know-how* required to proceed to critical reflexivity, although Rawls and Daniels provide some guidance. Consequently, community-based approaches, such as proposed by Callon (2004), and techniques suggested by Jason and Glenwick (2016), would benefit from going beyond the descriptive and strategic analysis of mainstream action-research and consultative policy-making by including a perspective of action-ethics (Widdershoven et al. 2009; Abma et al. 2010; Frauenberger et al. 2016; Groot and Abma 2022).

The argument defended here is the importance of having lived interdisciplinary experiences, i.e., integrating expert insights *prior to* and *after* engaging with translational bio-ethics facilitators embedded in the context (Boudreau LeBlanc 2023a). This context includes Sciences, Laws, and Ethics—that is, all descriptive, normative, and appreciative knowledge, as well as other sense-building fields, such as linguistics, cultures, and the landscape (Boudreau LeBlanc 2023b). This embeddedness goes beyond the role of clinical or research ethics boards; it implies entering research labs, the various science realms, and working on knowledge translation from its basics to technology and intervention. This echoes the ideas of Marcel Mertz and Jan Schildmann (2018), whose argument expands the mainstream methodological field of bioethics from human and social sciences to life and natural methods.

Regarding facilitatory bridges, note the critical synthesis work done by Paul Langley (2021) reviewing the *Economy & Society* articles to (re)start on solid ground after the COVID pandemic. He points out that interdisciplinary journals are a gateway for applied social science research to move into public health, disease and life sciences. Further, journals could become an abductive platform to return feedback to the (1) in situ operation challenges and (2) theory-building processes of the social by empowering (3) empirical field scientists and professionals to develop adaptive wisdom. This means including insights, methods, and domains of social scientists (Deflem 2022) within research teams with a ‘natural science’ tradition. But it also requires engaging with values, plurality, and analysis of social constructs to comprehensively reshape—if needed—the social in the natural and life sciences, and the practice of medicine.⁵

Integrating insights *before* and *after* the experience echoes the Popperian logic in the Philosophy of Science. According to this logic, we start with a *hypothesis*

⁵ See medicine broadly, as hospital systems, health care agencies, social service policy programs, public health epidemiology—intervention, control, prevention, promotion—or even positive measures to improve well-being and reduce vulnerabilities.

and end with an *interpretation* (Boudreau LeBlanc and Williams-Jones 2023a), both of which are falsifiable (Popper 1963). Beginning with an alternative hypothesis, the aim is look at the outcomes of the study, followed by interpretation to see if the hypothesis is fit for subsequent experimentation (Boudreau LeBlanc and Williams-Jones 2023a). Moreover, both are based on a disciplinary justification: one is conceptually driven at first, while the other is empirically *framed*. However, both merge in the process, as the hypothesis integrates previous knowledge through philosophical and statistical modelling.

Hypotheses synthesize a working theory (aka framework) in an intelligible format. As Kuhn outlined, these frameworks became ever more precise as a paradigm is built. However, this ‘normal-science’ path ends when the hypothesized premises, axioms, and values are challenged (Funtowicz and Ravetz 1994). This need for deeper integration of the natural, social and human sciences is becoming more urgent in the face of current One Health issues such as zoonosis, climate change and biodiversity loss. These issues have become much more complex, and the attendant interventions also have to be sustainable, acceptable, and responsible in light of daily short-term realities (of persons and communities) and encompassing long-term phenomena (trans-generational and ecological).

These broader frameworks (more *macro*) emphasise the importance of the researcher’s reflexivity and self-criticism on their choice of methods, tools, and measures. Moreover, these frameworks give ethical insights into more general principles, such as Rawlsian Justice and Jonasian Responsibility, and a deeper perspective on ontology (which can be derived from biological concepts, e.g., Ecological Resilience and Biodiversity). But they also pave alternative pathways for more constructive deliberations on applied knowledge and technical operationalization, such as having well-conceived systems of peer review, Research Boards and Think Tanks (Samuel et al. 2019). And this implies leveraging communicative processes (Boudreau LeBlanc et al. 2023).

Deepening one’s reflection on the epistemology and ontology of the research topic upstream, before the conception of hypotheses and the execution of the project, is vital to ensure a practical, rapid and maximal use of research results. It further enriches one’s understanding of the social system and outlines strategic communicative paths that can be used. Raising awareness on this, the research philosophy can then be aligned with a broader collective vision of the future (Osorio 2017) and thus prevent the possible drifts of a *wickedly* constructed populism. In short, responsible conduct in sciences involves rigorous reflexive reasoning and a dialogical social disposition in the public sphere. Bioethicists and their Bio-Ethics organization could help in that matter as a translational and facilitatory system that bridges Science and Society (Potter 1964, 2001).

Conclusion

This article explored the challenge of *translation* between ethics, law, and society. The arguments challenge a particular perspective that compartmentalizes ethics/law/society in line with the socio-political criticisms of philosophers of science and social theorists,

such as Habermas. It then reframes these perspectives by developing ethics in three organizational aspects, all of which co-operate to support laws and sciences in Society, in according with the Potterian global community-based approach. I have argued for the role of a “free radical” who is capable of revitalizing the ethics of science. From the Potterian view, bioethics is well designed to give this task a first try. Ethics must be revitalized (*Bio*), not in its most profound theories (metaethics or theories of values), but in how it operates. This *vivid* bioethics must have a place inside science, and not be limited to the (institutional) governance of responsible conduct as embodied by research ethics boards.

Bioethics must guide people and society in bridging the gap between philosophical rationality, scientific disciplines, and decision-making at the scale of people and Government. Thus, discourse, mediation, communication, and digitization should be joined such that these strategic techno-social devices are inseparable from ethics. Bioethics should also not be confined to an Ivory Tower; and *out-in-the-world* bioethicist must be alert for recreating the top-down pressures to translate values into norms without connecting with general facts and local realities. Ethics research and professionals must promote and build transparency and foster access to general knowledge. Rather than simply an academic project of a few—a Laboratory, a Faculty, the University, an Applied ethics, etc.—bioethics must be (ergonomically) a ‘Council on the Future’ that advises humans towards a better future, as stated by Potter (1971). That is, bioethics must become a system of councils that organizes the criteria of governance and knowledge quality and scientificity into a practical wisdom that can prepare the terrain, shape views, and orient policies and behaviours towards a better future.

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Declarations

Conflict of interest The author reports that there are no competing interests to declare with respect to the research, authorship, and/or publication of this article.

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Authors and Affiliations

Antoine Boudreau LeBlanc^{1,2,3,4} 

✉ Antoine Boudreau LeBlanc
antoine.boudreau.leblanc@umontreal.ca

¹ Bioethics Program, Department of Social and Preventive Medicine, School of Public Health, Université de Montréal, Montreal, QC, Canada

² CReSP Centre de recherche en santé publique, Montréal, Canada

³ GREZOSP Groupe de recherche en épidémiologie des zoonoses et santé publique, Saint-Hyacinthe, Canada

⁴ OBVIA Observatoire international sur les impacts sociétaux de l'intelligence artificielle et du numérique, Québec, Canada