Legal Pluralism and Science and Technology Studies: Exploring Sources of the Legal Pluriverse

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Abstract

In introducing the contributions to this special section, we explore the links between social and juridical concepts of normativity and science and technology. We follow the Legal Pluralism challenge to the notion of state law as the sole source of normative order and point to how technological transformation creates a pluralistic legal universe that takes on new shapes under conditions of globalization. We promote a science and technology studies (STS)-inspired reworking of Legal Pluralism and suggest expanding the portfolio of legally effective regimes of ordering to include the normativity generated by materiality and technology. This normativity is amply demonstrated in the case studies included in the papers which make up this special section. We conclude that the inclusion of approaches developed in

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STS research helps analytically to overcome what we view as an incomplete law project, one unable to deal with the technicized lifeworlds of a global modernity. The contributions to this special section illustrate that tech-nomaterial change cannot be understood without recognition of the role of normative impacts, and conversely, the legal pluriverse cannot be under-stood without recognition of the normative role of techno-material arrangements.

Introduction

Recent theoretical trajectories in the social sciences aim to explore the interaction between law and science and technology. Some of those trajectories draw on older Legal Pluralism arguments that challenge state law as the sole source of normative order (Benda Beckmann 2002), explore the interaction of multiple sources of law in a single social sphere (Griffiths 2011), or illustrate how technological transformation introduces multiple legal lifeworlds (Turner 2016). Meanwhile, postcolonial feminist science and technology studies (STS; e.g., Law 2015) also shifted theoretical focus from (hegemonic) legal universality to (relational) legal pluriversality (Benda-Beckmann and Turner 2020). Such work has raised multiple questions about normativity, as is illustrated in the concept of nomosphere (Delaney 2010), which describes the spatio-temporal and scalar settings of a ubiquitous Legal Pluralism (Robinson and Graham 2018). In following this pluriverse focus and in line with an STS approach to the entanglements of law, technology, and materiality (e.g., Cloatre 2018), our aim in this special section is to push Legal Pluralism beyond its current role as a sensitizing analytical concept (Benda-Beckmann 2002) and to show the relevance of Legal Pluralism to STS research.

We start with a brief discussion of the concept of Legal Pluralism in anthropology and its more recent acceptance in legal science in the form of "global legal pluralism" (Michaels 2009; Berman 2020). We then turn to a discussion of the law and technology nexus, highlighting notable conjunctions of the two fields of STS research and legal studies. Finally, we suggest bringing anthropological Legal Pluralism into law and STS studies (see, e.g., Benda-Beckmann 2021), thereby expanding the portfolio of legally

effective regimes of ordering considered in STS research, including normativity generated by other-than-human species, materiality and technology. This expanded normativity is amply demonstrated in the papers that make up this special section.

Approaches developed in STS research and in legal geography are important analytical aids to overcome what we view as an incomplete law project, one unable to deal with the technicized lifeworlds of the anthropocene. The contributions to this special section illustrate that legal agency is codetermined by the normative power of techno-material networks and scientific knowledge. Techno-material change cannot be understood without recognition of the impacts legal regulation has on such processes, and conversely, the legal pluriverse cannot be understood without recognition of the normativity produced in techno-material networks.

Legal Pluralism—In from the Fringes

In the (post)colonial study of law in society, law had a plural appearance, which was described, primarily by anthropologists, as Legal Pluralism. The sources of this apparent pluralism were many, including customary, religious, mercantile, and colonial state law all at work in the same social sphere. Given this plurality of normative orders, actors saw themselves as having a choice from among more than one register of rules that could be applied to the same social interaction, such as establishing ownership, marriage, divorce, child custody, or religious affiliation (Benda-Beckmann and Turner 2020). At the outset, the scholarly aim was not only to describe how law really operated in the postcolonial society but also to understand the interaction between differing sets of normativity (Benda Beckmann and Turner 2018, 257). This allowed anthropologists to investigate how individuals navigated layers of legal registers and with what effects within society (e.g., Benda-Beckmann 2021).

Given this anthropological experience, defining law becomes more challenging, but it can be seen as an assemblage of strategically positioned networks in which human and nonhuman constituents interact (Cole and Bertenthal 2017, 361) and which extend far beyond formal institutional boundaries (Turner and Wiber 2020). Such networks connect seemingly disconnected items, documents, artifacts, and people to form plural legal configurations of hitherto unexplored complexity, reach and signification (e.g., McGee 2014, 2015). And importantly, such networks are not restricted to the purview of one state. As with the other universal domains that make up human societal existence, such as economy, religion, and

politics, law in its plurality involves the normativity generated by networks and wider assemblages. It includes many varieties of normatively active agents such that law takes form from practices enacted by people, other-than-human, and materiality in the everyday and across time and space. All such domains do not respect national boundaries, and never really have done so, contrary to much social and historical theory.

During the early anthropological phase of such research, this broadening definition of law led legal scholars to largely reject Legal Pluralism and insist that the nation state was the unique sociopolitical unit of legal sovereignty. Notable exceptions include legal scholars such as Ehrlich (1911), van Vollenhoven (1909), and Llewellyn, who collaborated with Hoebel (Llewellyn and Hoebel 1941) to publish the famous study of Cheyenne law in 1941 (for an overview, see, Benda-Beckmann and Turner 2020). However, this early work by legal scholars tended to view alternatives to state law as anachronistic. Llewellyn and Hoebel, for example, believed it important to document what they viewed as a disappearing landscape of primitive law (Twining 2012, 153-69).

Legal Pluralism, in anthropology and cognate disciplines, largely rejected a dogmatic legal monism[1] and continued to explore ubiquitous pluri-normativity, irrespective of what the state declared to be law. Pluri-normativity permeates semi-autonomous social fields (Moore 1973), communities of religious or customary law (Turner and Kirsch 2009), institutions of the global governance (see Krisch and Kingsbury 2006; Davis et al. 2012), and multinational corporate entities with no significant territorial center of gravity (Blackett 2001). Operations of standard setting, the setup of indicators and metrics that result in law making (e.g., Merry et al. 2015), take place at any given moment, scale, and place with different spatial and temporal scope. The descriptive power of the concept of Legal Pluralism, and the opportunity to better understand such rule-making, began to attract many in the legal discipline to adopt some of its methods. And Legal Pluralism scholars began to explore new theoretical approaches to understanding normative hybridity and complexity (Benda-Beckmann and Turner 2018).

Global Legal Pluralism

An ever-expanding production of law beyond state legislatures and the emergence of an international legal order gave the concept of Legal Pluralism broader acceptance among legal scholars. However, pluralism took a specific shape for legal scholars with the concept of Global Legal Pluralism,

which is a project seeking to unify across plural registers such as in human rights or environmental law (Berman 2020; see also Kotzé 2017; Philippopoulos-Mihalopoulos and Brooks 2017). Thus, it is quite distinct from the analytical understanding of Legal Pluralism as it is used by anthropologists, suggesting that the social science of law has not yet critically confronted emerging global legal ordering and the complexity of normativity out there. However, with collaborative work across disciplinary and epistemic boundaries, an expanding purview of Legal Pluralism has emerged as a boundary object representing at the same time, a theory of law, an analytical approach, and a normative claim.

Viewed critically, a global regime of ordering reflects the needs of an economic model that references calculability as the basic notion of any juridical operation. Under conditions of neoliberalism, the allocation of accountability poses a major contemporary challenge to state-centric notions of the law. Law production increasingly takes place outside of democratic processes and outside of the state. Negotiations take place between different law-making networks and communities of interest. In the process, actors mobilize different forms of law and merge legal registers in different settings and increasingly generate layers of connectivity with nonstate regimes of ordering, including soft law and voluntary regulations that are subsumed under the heading of "corporate social responsibility." Material and technological normative power also come into play and exacerbate threats to the crucial function of legal orders to determine relations of responsibility (see, e.g., Appadurai 2015). These threats lead to questions about how agency, intentionality, and accountability are reinscripted in larger assemblages (cf. Philippoulos-Mihalopoulos 2016).

Thus, any Legal Pluralism approach must increasingly deal with complex registers of ordering that draw from the normativity generated in human–nonhuman interaction and in material-techno-legal assemblages (see, e.g., Davies 2017; Braverman 2018). Such developments result in a pluriverse of law, including religion (or spirituality and tenets of faith), bodies of knowledge, values, technology, things, documents, infrastructures, and other protocols that routinize and standardize social practice and contribute to projecting blueprints of order into the future. These material and immaterial ingredients interact in emerging hybrid normative orders with components of state law, international and transnational law such as human rights standards, and a diversity of local legal traditions and ones that went global or became mobile (F. v. Benda-Beckmann et al. 2005). Indigenous communities, for instance, conceptualize (human) rights as extended to include multispecies and material agents and claim recognition

of hybrid legal concepts that express relational responsibility (see, e.g., Borràs 2016; O'Donnell et al. 2020). Such a worldview has found a place in constitution and law making across scales (see, e.g., Tănăsescu 2020; Collins 2021).

The resulting breadth and diversity of emerging theoretical approaches to law, particularly after the turn of the century, have not only exposed the multifaceted nature of law but also its world-making abilities (Patrignani 2016). Normative power may, in a variety of worldviews, be seen rooted in more-than human assemblages of which a decentered human is just a part (see, e.g., Philippopoulos-Mihalopoulos 2016; Braverman 2018; Dancer 2021). In particular, interest has grown into the interaction between law/normativity and materiality, technology, and scientific knowledge (e.g., Jasanoff 2015; Kang 2018; Graham et al. 2018; Cloatre and Cowan 2019; Kang and Kendall 2020). While some legal literature suggests remaining self-referential (Kang and Kendall 2020, 21; cf. also Pottage 2012), we call attention to the normative power of materiality itself. Material-based technologies—and the practices they enable—may assemble legal formative power (McGee 2018). Under the influence of rapid technological change, law is composed and composes itself out of a variety of techno-legal, material, and other components. These insights have led to an increasing demand for conceptual tools that can cope with the necessity to reassemble the legal under the conditions of a fragile multiple onto-legal order (see Bavinck and Gupta 2014; Graham et al. 2018; Braverman 2018). To explore these conceptual tools, we turn first to the encounters of law, actor–network theory (ANT), and STS before assessing the epistemic potential of an STS-inspired reading of Legal Pluralism.

Law and ANT/STS

ANT methods have proven useful in viewing both law and science as a social product, in exploring the interplay with formal law and scientific knowledge, in overcoming the nature-culture/society divide, and in analyzing the normativity of material technology (Lessig 2006; McGee 2018; Barrea and Latorre 2021). While the early interest in law among ANT and STS scholars produced seminal insights, one limiting factor was their concentration on the law of the state and of global governance institutions. Quite often "the law" is implicitly equated with US American Common Law, its adversarial system, and the ensuing specific logics of evidentiary practices (see, e.g., Faulkner et al. 2012, 5; Haack 2014). Moreover, despite the insights ANT studies of science have produced, STS scholars have often

conflated imaginaries of law and science with how these domains actually operate. Jasanoff (2008), for example, writes about the "national" character of legal cultures that complicate cross-cultural communication on law, and contrasts these cultures with the "universal" characteristic of science, which facilitate communication structures in science and technology. We suggest instead that a more sophisticated look at such complex configurations is called for (see Faulkner et al. 2012, 19).

Recently, for example, scholars in the anthropology of law have drawn from STS to investigate how people and things regulate the law and are regulated by the law. Central STS concepts helped to work out the emergence and effects of normativity in conjunction with materiality, technology, and processes of sociopolitical decision-making, including "legal assemblages" (e.g., de Sutter and McGee 2012; Sullivan 2014; McGee 2015), "law by association" (e.g., Riles 2000; Latour 2002; Levi and Valverde 2008), "boundary objects" (Wiber 2015), "translation" (Behrends et al. 2014), and "infrastructure" (Turner 2016). The encounter between ANT/STS and law was enormously productive, producing entangled fields of research (Faulkner et al. 2012; Cloatre 2018; McGee 2018; Barrea and Latorre 2021).

Using these approaches, plus rigorous ethnography, sensitive to contingency as a process, allows us to view law as practice enacted by people, other-than-human, and materiality. Regulation and monitoring, governance and calculability, provability and evidence, but also experimentation, the handling of risk, anticipation, preparedness, and prevention, all those and many more directives turn out as "effects" or "results" of the encounters of law, science, and technology and connote power differentials in society. Calculation as a legal operation goes hand in hand with the quantification of lifeworlds, the environment, natural resources, or nature by means of technological intervention.

From this perspective, the Jasanoff (2008) lawyer-scientist contrast may fade when their interaction is examined using anthropological approaches to both "legal reality" and actual scientific practice. The first step has been to reject any view of law as a closed system with exclusive and highly professionalized personnel. Law is generated in many social spaces aside from legislatures and court rooms. The second step requires examining techno-science in its entanglements with the nomosphere. The contributors to this special section query techno-legal operations such as access to natural resources, the regulation of property relations, and environmental impact assessment when the wider normative pluriverse is taken into consideration.

The articles that compose this special section also address the social consequences of the techno-legal intersection. The contributions explore how plural legal configurations and trans-scalar legal arrangements reflect hybridity in the nomosphere and how actors inscribe their respective technological agendas and social values into these processes. Hence, the contributors to this special section explore the intersection of law, science, and technology and examine in what way such intersection is legally effective and materializes in processes of law production at various scales.

Today, the acceleration of scientific and technological change seems to challenge existing legal orders and legal institutions across onto-legal boundaries to an extent never experienced before. The STS approach, we argue, is helpful in addressing some of these "law and science" interfaces, depicting them as domains that coproduce one another whereby law claims to regulate scientific processes, while science impacts on evidentiary juridical practices (Lessig 2006; Jasanoff 2008; Cloatre and Cowan 2019). Examples of such interdependencies can be found in LegalTech where big data, smart algorithms, and software development offer surveillance and policing technologies as well as prognosis for offenders. Digital interconnectivity of global value chains is also producing interconnecting normativity that is constantly evolving (Horst and Miller 2012; Knell 2021). Such processes reinforce the architecture of inequality upon which the dominant economic model is founded. This means such processes create different normative standards for different parts of the world and across communities, as has been graphically exposed through the 2020 COVID-19 pandemic.

Against this background, our contributions emphasize some of the interfaces that come to the fore when law, anthropology, and STS meet. Law and science are both involved in the social and political production of truth and enjoy the highest epistemic authority. On the one hand, law appears as a steering instrument of scientific research processes, but in reality, law generation is *reactive* to scientific progress, a phenomenon that is known as "law lagging behind" (e.g., Jasanoff 2008, 767-69, see also Faulkner et al. 2012; Cloatre and Pickersgill 2020). Stem cell research or the legal definition of brain death would be examples. On the other hand, science has become the determining factor in juridical processes such as the production of evidence, where scientific information is taken as a static fact and not the result of an often-flawed process (Jasanoff 2015). The article by Stewart and Harding (this volume) explores such interfaces of technologized evidentiary practices and legal truth involving an indigenous First Nation on the west coast of Canada, who seeks to legally protect their ancestral lands

from threats of oil spills arising from new petrochemical pipeline developments. Their rephrasing of "significant impact" involves innovative recombinations of state environmental impact assessment practices with indigenous knowledge. Here, the indigenous understanding of extended rights of people and nature allows for a production of evidence that brings together indigenous local knowledge enshrined in narratives and stories, with science-based practices of truth making, thereby challenging the "objective trustworthiness" of both the state and the proponent's science around future threats. Although ultimately unsuccessful in their attempt, "objective" science is employed by the indigenous community as a neutral broker and a connecting link across different legal ontologies or ontolegalities.

Approaching Legal Pluralism through STS

To recap, scholars interested in law and STS (Jasanoff 2008) drew attention to new ways to undertake the analysis of the legal uni/pluriverse, including ANT (Cloatre 2018). Such work casts a different light on the analysis of the social working of law. An STS perspective suggests looking at practices as the constituents of law, rather than at law as a determinant of practices, an approach consistent with Legal Pluralism. Proceeding from there, the nomosphere is seen as the assemblage of law that is connected to and intersects with wider assemblages of practices, most especially techno-scientific practices.

In the creation of future worlds, institutions of global governance as well as epistemic communities are involved in legislative processes that address the transfer of technology, science, and inventories of knowledge and monitor the effects of technological innovation in various settings. At the same time, technological innovation and knowledge production involve normative processes that account for their own inherent logics and combine in unexpected ways with the social, the political, the religious, and the economic.

The articles in this special section illustrate how local or indigenous communities engage in emulation and/or adaptation of technology to local needs or protest hegemonic techno-material and scientific interventionism (see both Turner, and Stewart and Harding this volume). Communities seize techno-normative projects, reject them or adapt them to local conditions, regulate them, and make use of them in specific ways unintended by their introducers. In addition, situations impact on the emergence of techno-legal assemblages, such as crisis, threats to security, or significant interference

with nature and landscape. Thus, focus is needed on the normative power invested in other domains in the nonhuman environment, including the built environment, technologies, and inventories of knowledge and of conviction as in religion (Vanderlinden 1989).

In the following, and in the contributions to this special issue, we utilize STS concepts in combined STS-Legal Pluralism approaches. We put grass-roots legal agents center stage (Moroccan peasants, Canadian Maritime fishermen, and Canadian indigenous communities) in analyzing initiatives to fight injustice in techno-legal ordering; we look at the hegemonic claim of technology-based evidentiary practices and the development of new techno-legal strands in the shadow of accelerated globalization. We address infrastructure (Turner, and Stewart and Harding in this volume) as a complex association. Infrastructuring as the way in which material and nonmaterial components are set in relation to one another is a technology of socio-normative ordering.

Inevitably, translation processes are at work in all the settings analyzed in the contributions. In Turner's Moroccan case, techno-legal dynamics allow for translating the internationally sanctioned model of cooperatives into a local version of cooperatives. Stewart and Harding trace the techno-legal process that translates "threat" into "benefit" through the magic of "mitigation" as a future-making practice. Moreover, this process of translation through "mitigation" as a normative category (i.e., future practices legally required of proponents) connotes notions such as likelihood and probability: the job of law here is to reduce the complexity of an uncertain future. Meanwhile, Wiber and Barnett trace the corporate practices that de-territorialize fishing areas (regulatory lines in the water) in order to materi-ally challenge the distribution of benefits from the commercial fishery. Here, the translation involves turning local morality into traditional ineffi-ciencies that can only be corrected through modernization. All articles specify aspects of the increasing hybridity of Legal Pluralism. They display various layers of techno-normative entanglements in plural legal assemblages.

In all of these cases, documentation practices such as recording of land-ings, bylaws for cooperatives, maps, mitigation plans, and more are inex-tricable parts of infrastructuring. Pinker (2015) addresses the material taking-shape of normativity in the form of documents that inform an infra-structure project and that explore the legal avenues to be taken to make the project materialize. Turner illustrates how multiple normative orders and their underlying value structures must be reconciled in alternative market-ing for argan oil. In Stewart and Harding's paper, the meticulous

engineering and environmental documentation of the technological setup of a huge pipeline project is used to legally project the limits of its possible risk, meanwhile masking the way that risk will primarily affect local indigenous communities.

Together, the papers deal with attempts to infuse a moral stand into contested economic-legal spaces. In Wiber and Barnett's example, a moral economy and fishing lifeworld is challenged by neoliberal intervention that in turn relies on commercial contract law; in Turner's case study, networks based on the moral economy are activated in an attempt to repair an infrastructure failure in a supply chain which originally aimed to integrate local organizations into capitalist extractivism. In the Stewart and Harding paper, local notions of relational morality that transcend nature–culture boundaries are deployed by aboriginal communities to reject the normatively grounded environmental impact process that views risk as "nonsignificant."

This take on legal practice, with its roots in social values such as "sustainability," is attractive for legal anthropologists. Law provides contours; it separates or binds together and is not self-imposing. Standardization techniques (such as defined lobster fishing areas) are tested and form into something inherently infrastructural. Such normative standardizations are designed to suspend uncertainty and risk; however, they produce their own unintended consequences as Turner illustrates in his example. The crucial question of how social and legal relations take on infrastructural properties (Simone 2004) deserves attention beyond the observation that law is part of infrastructural assemblages (Fischer 2005; Lessig 2006; Harvey et al. 2017).

All articles in this special section address techno-law as a breakpoint. Law is supposed to prevent techno-scientific assemblages from collapsing; however, law may also serve as the breaking point, as our ethnographic examples show. Legal mistranslation about the ascription of accountability between formal and local legal registers leads to a standstill for argan oil cooperatives (Turner). Fishermen successfully challenge federal fishing regulations in court (Wiber and Barnett). Once technological systems, industrial facilities, or infrastructures become dysfunctional, users may either withdraw or become active in repair work, trying to fix problems, or to explore alternative, giving rise to the proliferation of revamped or informal forms (Simone 2004).

What is the role of law when techno-scientific objects and systems break down? The legal scripts in such complex assemblages may persist and provide the framework for repair; they may also be exposed to normative bricolage at the grassroots and across scales and updated to maintain flows

and interactions. In Stewart and Harding's case, breakdown is the very scenario for which techno-legal "mitigation" has to be envisioned across a number of possible futures to the "benefit" of its victims. Mitigation, as Stewart and Harding show, implies a postdisaster reactive option, assuming that the techno-normative setup cannot protect against breakdown. Interestingly, in the litigation between the proponents of the pipeline project and the First Nation, it is the latter who insist on a local understanding of preparedness that includes an extended notion of care and responsibility for the environment. Breakdowns may not necessarily eliminate any inequalities inscribed in techno-legal assemblages, quite the opposite as Wiber and Barnett, Stewart and Harding, and Turner illustrate. Breakdowns can be the process needed to enhance extraction and inequality in the distribution of benefits.

Conclusion

We have introduced law as a worldmaking tool and shown that law, as a way of knowing and shaping the world, is itself shaped by more-than-human intervention. Law creates lifeworlds in which other-than-human coproduce law. Such assemblages bring about particular ways of being, knowing, and doing. We highlight the multiple production of normativity and ways of ordering the world and argue that no single techno-normative order dominates across spaces such as the maritime fishery grounds, large pipelines routes, or supply chains as scaled infrastructures. Legal Pluralism, cognitive justice, and legal knowledge are laid bare, embodied, expressed, and transmitted in narratives and stories, matter and artifacts, and technology and science, assembling a pluriverse of legal enactments of world ordering.

All contributions united in this selection contribute to an STS-inspired reconceptualization of Legal Pluralism, or the study of the legal pluriverse, and conversely, an expansion of STS through consideration of Legal Pluralism. They all share a closer look at grassroots choice-making from among multiple legal registers that may lay bare techno-scientific scripts. Actors use techno-scientific means in communitarian law-making that affects and transforms pluri-legal configurations in which these communities are embedded and, in the process, creates frames of relative permanence. In this way, the situations recounted all form legal spaces for which resilience and situational legal assertiveness are possible outcomes. They all refer to authoritative techno-scientific normativity but also hint at the fluidity inscribed in the assemblages in which technology, matter, and registers of knowledge interact with legal practice.

The inclusion of approaches such as translation, coproduction, and infrastructure in STS research and in legal geography proves useful for addressing the coevolution of legal and technological lifeworlds of global modernity (Pinch and Bijker 1987). Legal regimes of ordering are not necessarily coproduced with one corresponding epistemic knowledge system and one associated set of evidentiary practices and logics. A plurality of pluralisms characterizes techno-scientific-legal assemblages. As our case studies show, this incomplete law project of modernity demands at the very least a reinscription of accountability in techno-legal assemblages. Looking at law in its plural shape, we argue, also helps to identify those interstices where the normative power of matter interacts with human legal practice and sometimes translates into legal agency.

Declaration of Conflicting Interests

Funding

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Note

1. See the *Journal of Legal Pluralism* for contributions spanning the developmental history and scope of this concept.

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