

From the Right to Science as an epistemic-cultural human right to the Right to Expertise

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There is no human activity from which every form of intellectual participation can be excluded: *homo faber* cannot be separated from *homo sapiens*.

Antonio Gramsci¹

Keywords: right to science, epistemic-cultural human right, epistemic communities, situated practices, inter-perspectival expertise.

Abstract

I discuss the Right to Science originally recognised by the UN Declaration of Human Rights (UNDHR) in 1948 and subsequently embedded in the International Covenant for Economic Social and Cultural Rights (ICESCR) in 1966 (henceforth abbreviated as REBSP). My aim is twofold. First, I give the philosophical arguments for taking REBSP as an *epistemic-cultural* human right, namely a right concerning scientific knowledge (*episteme* in ancient Greek) qua part of wider cultural practices. Second, I articulate a notion of expertise that can do the philosophical heavy-lifting for interpreting REBSP as an *epistemic-cultural* human right. Drawing on my work on perspectival realism, I present two varieties of inter-perspectival expertise and show how they underpins a Right to Expertise that—I contend—is a natural supplement to the REBSP understood as an epistemic-cultural human right.

1. The Right to Science

Among the rights listed in the UN Declaration of Human Rights (UNDHR) in 1948, there is the so-called ‘right to science’:

Art. 27 (1) Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to *share in scientific advancement and its benefits* (emphasis added).

The International Covenant for Economic, Social and Cultural Rights (ICESCR) in 1966 reiterated with Art 15 (1)(b) the Right “to Enjoy the Benefits of Scientific Progress and its applications” (REBSP). In 2009 the UNESCO convened a meeting to discuss limits in the implementation of REBSP (UNESCO 2009). In 2020 the United Nations published a General Comment n. 25 to clarify the normative content of REBSP and its wider relations to economic, social, and cultural rights (Committee on Economic, Social and Cultural Rights 2020).

¹ (Gramsci 1971), p. 9

The emphasis of the General Comment n. 25 on ensuring an equal and non-discriminatory access to the REBSP for the most vulnerable people in society is somewhat at odds with the rather specific (albeit fairly standard) operative notion of “science” underpinning the General Comment n. 25 (*ibid.*), p. 1:

5. Thus, science, which encompasses natural and social sciences, refers both to a process following a certain methodology (“doing science”) and to the results of this process (knowledge and applications). Although protection and promotion as a cultural right may be claimed for other forms of knowledge, knowledge should be considered as science only if it is based on critical inquiry and is open to falsifiability and testability. Knowledge which is based solely on tradition, revelation or authority, without the possible contrast with reason and experience, or which is immune to any falsifiability or intersubjective verification, cannot be considered science.

The word ‘falsifiability’ repeated twice in this passage is worth highlighting. It refers to a well-defined view articulated by the philosopher of science Karl Popper back in the first half of last century as the hallmark of science and the demarcation criterion between science and pseudoscience. For Popper science is defined by the ability to run severe tests that can falsify hypotheses, or conjectures as he called them.

The underlying picture of the UN General Comment n. 25 seems then to be the following. On the one side, there are the *scientists* “doing science” according to “a certain methodology”, “critical inquiry”, “falsifiability and testability”. On the other side, there is the general public under the proxy *Everyone* (including the most vulnerable and disadvantaged people), who are meant to enjoy the benefits resulting from scientists’s critical inquiry. Couched in this form, the right to science seems identifiable with the right to do scientific research (defined by testability and falsifiability as main criteria) by *freely* pursuing particular research programmes in a way that benefits democratic societies. Most importantly, the General Comment stresses the demarcation between scientists’s “doing science” and other forms of knowledge (including traditional knowledge) that might fall under the remit of cultural rights and are protected in ICESCR Art 15 (1)(a)²—but “cannot be considered science.”

² On cultural rights and ICESCR Art 15(1)(a), see General Comment n. 21 (Committee on Economic, Social and Cultural Rights E/C.12/GC/21 2009).

Here is a puzzle at the heart of the right to science so understood. How is scientists’s “doing science” meant to align with everyone’s *entitlement* to benefit from the outcomes of scientific research pursued by scientists? How to understand this *prima facie* unlikely alliance of scientists’s *freedom of research* and everyone’s *entitlement* to benefit from it? My question goes right to the heart of the problem of how to understand the nature of *scientific knowledge*, *who* produces it and *who*, accordingly, should get to benefit from its advancements. Philosophy of science enters at this crucial juncture of the discussion on the normative foundations of the right to science.

2. Sharing in scientific advancement vs. enjoying the benefits of scientific progress

2.1 The argument from membership vs. the argument from activity

Let me return for a moment to the two different formulations of the right to science to be found in the 1948 UNDHR and the 1966 ICESCR. The former speaks of the right to *share in scientific advancement and its benefits*. The latter is phrased as the right to *enjoy the benefits of scientific progress and its applications* (REBSP). In what follows, I take scientific progress and scientific advancement as interchangeable terms and I shall not discuss philosophical views about progress.³ I focus instead on the difference between the language of *sharing in* and *enjoying the benefits of*. What hangs in the change of formulation from 1948 to 1966? Something philosophically important is signalled by this terminological change, I maintain. Consider the following contrast class of examples about *sharing in*:

- Martha and Anna share in the grandparents’ inheritance
- Three companies share in an investment for renewable energy sources
- Humankind shares in the deep seabed and its mineral resources

In daily parlance, *to share in* suggests some kind of *apportionment* of resources and goods among several parties. Thus, one possible way of reading the 1948 formulation is along the lines of a non-exclusive use of science as a public good whereby *everyone* has a public use right which does not exclude others from exercising their own public use right. In the third previous example, different nation States can for example request to the International Seabed Authority to exercise public use rights to the ocean floor as a non-exclusive public good for e.g. deep-sea mining.

³ For a discussion on moral progress and scientific progress, see (Kitcher forthcoming).

There are two main problems with this possible reading. First, the very ability to exercise a public use right presupposes having infrastructures, financial capital, and human resources. Countries with low-income economies are not on a level playing field compared with countries with high-income economies when it comes to non-exclusive public use rights of either the deep sea bed, or scientific advancements. Second, the underlying assumption of scientific advancements qua ‘public goods’ would need to be justified and substantiated. Are scientific advancements public goods in the economist’s sense of non-exclusive and non-rival goods? Or, are they common goods in the legal Latin sense of *res communis* i.e. for communal / public use but not publicly owned? Or, are they participatory public goods—see (Besson 2023) building on (Réaume 1998)—in analogy with e.g. friendship which implies the ability of two agents to share a good that is inherently participatory?

I will not pursue these interesting questions in what follows because they are tangential to my focus here. Suffice to say that “doing science” is not typically a two-way relation—with the public and the scientists as *relata*—unless one conceives of a broad enough class to which scientists and the public are both *members* of, and “doing science” is in turn conceived of as a relation superimposed on this class. I argue in what follows that there are reasons for scepticism about the very idea of ‘membership’, and even more so for the prospects of identifying a class that could function as the unit of analysis for such a relation to hold upon (see Section 2.2).

Let us turn now to the 1966 ICESCR formulation in terms of *enjoying the benefits of scientific progress* and let us consider a possible contrast class of examples in daily parlance:

- Lucy and Mary are enjoying the benefits of their hard work
- Sophie and Mia are enjoying the benefits of the gym subscription
- I am enjoying the benefit of a democratic voting system

To *enjoy the benefits* of something does not suggest the *apportionment* of a good or commodity among parties, but instead some kind of acquired *entitlement* to something in virtue of either an activity (e.g. hard work) or a membership (e.g. gym membership; membership of eligible voters). Hence one can envisage two possible kinds of arguments behind the right to science so formulated, which I call the argument *from activity* and the argument *for membership*, and run respectively as follows:

Argument <i>from activity</i>	Argument <i>from membership</i>
1. To enjoy the benefits of some X is to stand in a particular relation to X.	1. To enjoy the benefits of some X is to gain membership access to X.
2. The particular relation to X involves some <i>activity</i> (e.g. hard work) that contributes to X, or brings about X.	2. Membership access to X can be gained in various (transactional or non-transactional) ways, e.g. paying fees to the gym, or civil protests for the voting system.
3. Therefore, to enjoy the benefit of some X is to do some <i>activity</i> that contributes to X, or brings about X.	3. Therefore, to enjoy the benefit of some X is to engage in (transactional or non-transactional) ways to gain membership access to X.

Table 1: Comparing two possible arguments for the ICESCR 1966 formulation of the Right to Science: the argument from activity versus the argument from membership.

In the third previous example, I enjoy the benefit of a democratic voting system by gaining membership of the community of eligible voters when, back in 1928, the suffragette movement led by Emmeline Pankhurst fought hard to have women’s right to vote legally recognised in the UK. In the rest of this paper, I concentrate on this ICESCR 1966 Art 15 (1)(b) formulation of the Right to Science (abbreviated as REBSP henceforth).

What grounds REBSP? Should REBSP be interpreted as a right which holds by *standing in a particular relation* that involves some kind of *activity* that contributes to scientific progress? Or, should it be understood along the lines of the argument from *membership*, namely, as an acquired entitlement similar to enjoying the benefits of a democratic voting system? The current formulation of REBSP does not help us see clearly through this distinction. As a result, it is not clear whether the pronoun *Everyone* in Art. 15(1)(b) should be interpreted as referring to a universal right-holder whose right has been acquired by doing some *activity* that contributed to science; or,

by gaining some kind of *membership* of the relevant community reclaiming legitimate access to enjoying the benefits of scientific progress (in a sense that remains to be clarified).

One problem here is that if enjoying the benefits of some X is understood as being acquired *via membership*, precondition for it is to gain membership. But what does it take to gain membership of the relevant community? How should the relevant community be understood in this context? What if membership is refused or denied? It seems that unless one already belongs to the relevant community, one cannot enjoy the benefits associated with membership of that community as per argument *from membership*. I cannot participate in the voting system and enjoy the benefits of a democratic voting system unless I am already a recognised member of the community of eligible voters. But as the story of the UK suffragette movement shows, entrenched power structures of exclusion often prevent people from becoming members of the relevant community who can enjoy the benefits of X.

When it comes to REBSP, it is unclear how the relevant community should even be defined. It cannot be just the *scientists* themselves who are engaged in scientific research, because REBSP is a universal human right that applies to *everyone*. For the same reason, the relevant community cannot be identified either with a selected group of economically high-income countries who can benefit from scientific progress by manufacturing new technological tools and commodifying scientific innovations. How to ensure that people in low-income countries do similarly enjoy benefits of scientific progress if not by recognising that they too are *somehow* members of the relevant global community? How to better qualify this community? Is *everyone* a scientist?

The argument *from activity* eschews these problems. For it does not presuppose some non-better-defined community of membership, but it assumes that *doing some activity* that contributes to scientific progress is all that is required for enjoying the right. In what follows, I build on this insight and unpack what I take to be the philosophical-normative foundations of the REBSP. I shall argue that REBSP should be understood, first and foremost, as an *epistemic-cultural* human right: namely, a right which applies to *everyone* in virtue of a range of *activities* which are an integral part of the *situated practices* of countless multicultural *epistemic communities*. Key to my philosophical analysis is that the right-holder proxy pronoun “*everyone*” refers to individual human beings in virtue of belonging to one or more among a multitude of *epistemic communities*: i.e. communities that produce scientific knowledge via their *situated practices* and associated activities thereof.

2.2. Epistemic communities and their situated practices. Or, why REBSP is not a group right.

One might reply at this point that universal human rights are rights whose duty-bearing institutions are nation States who sign up and ratify in domestic law documents such as ICESCR. Therefore, *membership of a State* is a pre-requisite for the enjoyment of human rights, including REBSP. In response, I do not doubt that membership of a State is a legal pre-requisite for the enjoyment of any human right. However, it is not this kind of membership—qua *legal* membership of a nation State—that is my topic here and the target of my aforementioned discontent with the argument from membership, but rather a different kind of membership: *membership of epistemic communities*. This in turn raises two further questions:

- (1) What is an epistemic community? How to define it vis-à-vis other kinds of communities, i.e. cultural communities, geo-political communities, linguistic communities, demographical and other varieties of social communities?
- (2) Do epistemic communities (as I understand the notion) count as right-holders so that for example the REBSP might be regarded as a “group right”?

In reply to (2), epistemic communities, as I use the term, cannot be right-holders because they are not a “conglomerate collectivity” in the word of (French 1984) pp. 5-18, namely they are not a collection of individuals with a well-defined unity and identity, by contrast with, say, cultural communities, linguistic communities, religious communities, or geopolitical communities. In reply to (1), an epistemic community, as I understand it, shares a historically and culturally situated scientific practice, which is how I define a “scientific perspective” in (Massimi 2022), pp. 5-6⁴, building on an important tradition about the situated knowledge thesis championed by feminist

⁴ “*Scientific perspective (sp)*: A scientific perspective *sp* is the actual—historically and culturally situated—scientific practice of a real scientific community at a given historical time. Scientific practice should here be understood to include: (i) the body of *scientific knowledge claims* advanced; (ii) the experimental, theoretical, and technological resources available to *reliably* make those scientific knowledge claims; and (iii) second-order (methodological- epistemic) principles that can *justify* the *reliability* of the scientific knowledge claims so advanced.” Massimi (2022), pp. 5-6.

Michela Massimi “From the right to science as an epistemic-cultural human right to the right to expertise”
In M. Farina, A. Lavazza, D. Pritchard (eds.)
Expertise. Philosophical Perspectives
Oxford University Press, 2024

philosophers of science, e.g. (Wylie 2003), (Haraway 1988), (Hartsock 1998). Let me briefly expand on these two points.

Any scientific practice is always situated in that the experimental, theoretical, and technological tools to *reliably* advance claims of knowledge are always idiosyncratic to the community which shares *that* practice at *that* historical point in time and in *that* culture. However, the situated knowledge of any epistemic community should be regarded neither as ‘siloed’, nor as membership-defining for the community. I stressed in (Massimi 2022), p. 337, how “the view that scientific knowledge is *defined* by the specific historical-geographical-cultural *membership* of particular epistemic communities” is a remnant of what I call “Kuhnian communitarianism”. Thomas Kuhn articulated a view of scientific knowledge production linked to *membership* of a scientific paradigm (e.g. Ptolemaic astronomy, phlogiston theory, etc.). In this respect, Kuhn’s scientific paradigms are at a distance from what I call ‘scientific perspectives’.

In *Perspectival Realism*, I articulated a dynamical and fluid view of how scientific knowledge forms and evolves through a multitude of scientific perspectives, and I argued that it is possible to track the evolution of claims of knowledge about particular phenomena in nature via

historical lineages [that] span and ramify beyond geo-geographical, national, and sociocultural boundaries. They have a history, evolve, and branch out rather than statically demarcate well-defined territories, scientific homelands or shared memberships (ibid. p. 343).

In practical terms, this philosophical move implies the recognition and re-instatement of a number of *epistemic communities* whose varieties of situated knowledges are usually ‘severed’ from scientific narratives about *who* produces knowledge, and *who* accordingly should be benefitting from it, including e.g. know-how about kelp-making being important for glass manufacture and for the subsequent emergence of e.g. cathode rays searches in the late 19th century (Massimi 2022), pp. 307ff.

Ultimately, the view of scientific knowledge that I defend in *Perspectival Realism* is cosmopolitan (Massimi 2022, Ch 11) in emphasising how different epistemic communities have travelled and traded their tools and techniques. It transcends the specific national, geo-political, and cultural boundaries. It allows one to position the Chinese Han geomancers along the same historical lineage of *interlacing perspectives* featuring Norse sailors, Amalfi mariners, and William Gilbert in Elizabethian England (among many others) in the production of a series of revised and

improved knowledge claims about specific phenomena (i.e. what we currently call the Earth’s magnetic field and its declination).

Returning one more time to point (2) above, it becomes clear then why epistemic communities (as I understand the notion) are not organisational or institutional groups with a governance structure like Universities, Banks, Churches, or with a well-defined unity and identity (e.g. the Scottish-Gaelic speaking community of the West Coast of Scotland; or, the Ladin-speaking community of South Tyrol in the Italian Alps; and so forth).

Epistemic communities are *porous*, *itinerant*, and *granular*. They are porous in that an individual can be part of more than one epistemic community at the same time, depending on their training, skills, research interests and activities. For example, Ebenezer Everett was a professionally trained glass-blower working for J.J. Thomson at the Cavendish Lab to produce high-quality cathode rays as well as being trained as a chemist—see (Navarro 2012), p. 51. The epistemic communities of the e.g. glass-blowers and of the chemists are not insular, disjoint, or isolated communities.

Epistemic communities are itinerant: their knowledge claims and their underpinning tools and methods and practices travel over time and across geographical regions and cultures. Through trades, travels, and encounters, varieties of knowledges get transmitted, re-interpreted, and re-used. Being porous and itinerant means that individuals in an epistemic community might often belong to different ethnic, linguistic, religious and geopolitical groups. The epistemic community of beekeepers—see (Massimi 2022), Ch 8—spans Yucatán beekeepers, Scottish heather honey producers, and my grandfather Eligio in Italy collecting *millefiori* honey, among other examples. Their situated practices might bear family resemblances in how apiaries are built and where are typically located, but also critical differences in what kind of local vegetation the local species of bees feed on, and the varieties and methods of honey production. Yet to be a beekeeper is to have the epistemic upper hand on a number of phenomena—from pollination peak to the seasonality of honey production—that do not fall under the remit of other epistemic communities such as botanists, entomologists, or plant morphologists.

Epistemic communities are granular: despite sharing a situated practice that delivers knowledge of distinctive phenomena, the beekeeping of my grandfather Eligio and the surrounding community in Lazio is different from the beekeeping of say ancient Romans, or Mayans, or nineteenth-century Scottish heather honey producers, or contemporary Yucatán

beekeepers. Epistemic communities are granular in containing a multitude of *differentiated groups* whose knowledge is distinctively *situated for* different purposes.

I draw here on (Massimi 2022), Ch. 11, pp. 341ff. in distinguishing between two notions of situatedness: *situated in* and *situated for*. What qualifies a community as *epistemic* is their practice being *situated in* a historical-cultural context and having the experimental, theoretical and technological resources to *reliably* make claims of knowledge about *some phenomena* which prove modally robust—i.e. phenomena that can be identified and re-identified across scientific perspectives. But practices are also *situated for* a particular purpose. The intertwined notions of *situated in* and *situated for* cater to different questions:

- A practice being *situated in* a historical-cultural context highlights the particular experimental-theoretical-conceptual tools and methodological-epistemic principles that underpin scientific knowledge production (as per my definition of a scientific perspective, ft. 4)
- A practice being *situated for* a specific purpose stresses instead the epistemic needs and purposes to which the knowledge so produced is put to use in that community, or better in the differentiated group within a much larger—porous, itinerant, and granular—epistemic community.

Incidentally, it is at the level of *situated for* that often practices become ways of worldmaking, namely ways in which particular groups within wider epistemic communities entangle their knowledge of particular phenomena with sets of metaphysical beliefs and values. For example, evidence from anthropological archaeology about Mayan pre-Columbian beekeeping suggests that it was associated with “two complementary productive industries: *balché* (honey wine with hallucinogenic properties), and metallurgical production, through the use of beeswax to make casting models” (Paris, Peraza Lope, Masson, et al. 2018), p. 1. For pre-Columbian Mayan beekeepers, honey was a “key ingredient in the preparation of *balché*, a fermented beverage used in ceremonial intoxication, purging and as offerings to deities” (ibid., p. 5) in a way that it was not for my grandfather’s local community in Lazio, Italy, second half of the 20th century, where beekeeping was mostly functional to local consumption of honey in milk and production of propolis sold in local apothecaries, often still run by monks in local abbeys (e.g., Abbazia di Farfa).

Hence, the granularity of any epistemic community is a way of recognising this plurality of *situated-for* knowledges that are often identity-defining for particular groups (including Indigenous people and local communities, IPLC), and could be linked to cultural rights for individuals belonging to groups (on the model of Kymlicka’s ‘group-differentiated rights’—see (Kymlicka 1995)). To better understand the complex relationship between REBSP and cultural rights more widely, it is then useful to acknowledge the difference between *situated in* and *situated for* when it comes to epistemic communities, differentiated groups thereof, and their respective practices. For the REBSP the relevant notion is that of *situated in*, whereas *situated-for* is mainly relevant to cultural rights.

Zooming in on the defining feature of epistemic communities and their situated-in practices, the idea is that there is a range of *activities* (experimental, theoretical, technological in a broad enough sense to include artisanal and orally transmitted ones) that any epistemic community might be engaged with to *justifiably* produce *reliable* claims of knowledge about *phenomena* — as per (ii)-(iii) in my definition of a scientific perspective in footnote 4. Crucially, those reliable claims of knowledge concern *modally robust phenomena*—i.e. phenomena that can be identified and re-identified by different communities using different pieces of evidence within the inferential boundaries of their perspectives (see Massimi 2022, Ch 6 for an analysis).

The emphasis on modally robust phenomena is important to understand how I use the term *activities* in what follows, and to distinguish it from similar uses to be found in the pragmatist literature (compare e.g. (Mitchell 2023) on affordances), most notably in Hasok Chang’s (Chang 2012), pp. 15-16 use of *epistemic activities* qua “a more or less coherent set of mental or physical operations that are intended to contribute to the production or improvement of knowledge in a particular way” and typically have an “inherent aim” and one or more “external functions” (Chang 2022) pp. 35-36. Chang’s notion of epistemic activities can be regarded as a kind of *internalism* in assessing their success in terms of operational coherence (see (Chang 2022), 40–47). Mine, by

contrast, is a form of *externalism* in that activities denote an array of *skilful performances*⁵ that latch onto stable events in nature and lead to the *identification of modally robust phenomena*.⁶

Disentangling activities from coherent sets of operations and linking them to the identification of phenomena bypasses a series of thorny problems concerning the relation between varieties of local, traditional, artisanal knowledge on the one hand and scientific knowledge on the other hand, as I discuss in more detail here below. If scientific knowledge is ultimately knowledge of modally robust phenomena (and open-ended groupings thereof via natural kinds understood as sortal concepts),⁷ then one can begin to appreciate why individuals can reclaim as their own the entitlement to enjoy the benefits of scientific progress in virtue not of *membership* but in virtue of a range of skilful performances which are part of their situated-in practices (or scientific perspectives, as I call them).

The phenomena-first ontology delivered by perspectival realism hooks scientific knowledge to phenomena. In so doing, it reinstates to their rightful role a range of epistemic communities that have been traditionally severed⁸ from canons about scientific knowledge production, maybe because they do not have the requisite ‘systems of knowledge’ in terms of what philosophers of

⁵ A word of caution on this terminology. The term ‘skilful performance’ has been used in the wake of the STS tradition which I discuss in Section 3.1 mostly in the context of management and organisation studies (MOS) and industry studies to unpack “the *resource-based view* (RBV)...[i.e.] that a firm’s sustained competitive advantage in markets is a function of the specific resources it possesses, combines, and applies in its performance” —see Introduction, p. 5 of (Sandberg, Rouleau, and et al. 2017). This literature is at some distance from the remit, scope, and concerns that motivates my paper and its underpinning philosophical analysis, much as we share a common ground in Collins and Evans’s STS work. However, there are some interesting analogies and disanalogies between what I call in Section 4. *inter-perspectival expertise* (building on my work on perspectival realism in philosophy of science) and what for example, (Nicolini, Mørk, and et al. 2017) define as ‘trans-situated’ expertise qua “a rhizome, a disorderly aggregate of uneven nodes, local roots, partial connections between nodes, shoots that become new rhizomes, and dead ends that lead nowhere” (p. 29), which Nicolini et al. illustrate with the example of how the respective competences of cardiologists, heart surgeons, and anesthesiologists are needed to perform a radical innovation such as Transcatheter Aortic Valve Implantation (TAVI).

⁶ In Massimi (2022), Ch 6, p. 207 I have offered an analysis of phenomena as follows: “Phenomena are stable events indexed to a particular domain of inquiry, and modally robust across a variety of perspectival data-to-phenomena inferences” and I made a distinction between the stability qua lawlikeness of events in nature and the modal robustness of phenomena as a secondary quality.

⁷ In Massimi (2022) Ch.7-10, I defend an inferentialist view of natural kinds which I call Natural Kinds with a Human Face (NKHF). I see natural kinds as sortal concepts (Ch. 9) for “(i) historically identified and open-ended groupings of modally robust phenomena, (ii) each displaying lawlike dependencies among relevant features, (iii) that enable truth-conducive conditionals-supporting inferences over time” (Massimi 2022, 249).

⁸ See Massimi (2022), 349-62, for the two epistemic injustices of epistemic severing and epistemic trademarking.

science have often called essential properties, causal dispositions, or powers. (Does anyone recall the old adage that if one wants to know what gold *really* is, one should ask the physicist for the atomic number, rather than a jeweller or an assayer?)⁹

The far-reaching consequence of this philosophical move is that the normative foundations of REBSP become very much continuous with the foundations of cultural rights (both rights are protected in Art 15(1)(b) and (a) respectively), as a number of legal scholars have long advocated for—see , (Shaheed and Mazibrada 2021), (Bideault 2021).

The price to pay for this interpretive move is to do away with the elitist term “science” still operative in the General Comment n. 25. The term “science” is too often used as a tacit proxy for a well-established canonical tradition that begins in Europe with the so-called Scientific Revolution. If REBSP is to be understood as universal human right, the broader notion of ‘scientific knowledge’ lends itself more naturally to fulfil the task and to ground REBSP as an epistemic-cultural human right. Scientific knowledge, as I understand the term, is social reliable knowledge of modally robust phenomena (Massimi 2022), p. 347, whose historical lineages can be traced across different epistemic communities that have “methodologically intersected” and “historically interlaced”. This philosophical stance is a powerful ally for interpreting the REBSP as an epistemic-cultural human right, as I argue in what follows.

3. From REBSP as an epistemic-cultural right to the Right to Expertise

3.1 The problem of extension of expertise. Lessons from anthropology and science studies

Key to my aforementioned argument from activity is the idea that “to enjoy the benefit of some X is to do some *activity* that contributes to X, or brings about X.” If one takes X to stand for ‘scientific knowledge’ (rather than the narrower term ‘science’), the next step consists in asking *what kind of* activities might be legitimately regarded as contributing to, or bringing about scientific knowledge, where remember how I defined activities back in Section 2.2 qua *skillful performances* latching onto stable events in nature and leading to the *identification of modally robust phenomena*. Let us consider some examples.

⁹ One of the first philosophers who challenged this narrative and drew new attention to the important works of jewellers and assayers was (Hacking 1991).

A mechanical engineer runs simulations for aircraft’s resistance to wind and strain. A technician calibrates a measuring instrument in a lab. A crofter harvests seaweed. A beekeeper collects honey. These are all examples of *activities*. What is common to them all is that *skills* are required to perform well in each case. The engineer needs be skilful in devising the simulation in a way that closely captures real storm conditions. The technician requires skills in identifying and rectifying possible miscalibrations of the measuring instrument. The crofter displays skills in distinguishing among varieties of seaweeds, their suitability for kelp manufacturing, and the best season for harvesting. A beekeeper needs be skilful in positioning apiaries in the vicinity of blossoming plants and monitoring the api-botanical cycle which is key to honey production.

Each of these skills come in turn in *degrees*. *Expertise*, I contend, comes in degrees in relation to the *skilful performances* associated with the *identification* of particular *modally robust phenomena*, which in these examples, respectively, are: aircraft’s *resistance* that the engineer is trying to model; *calibration* for the measuring instrument; kelp *manufacture* (production of ashes of seaweed rich in potash and soda); honey *production*. The emphasis on *skilful performances* follows a tradition that has highlighted varieties of ‘experience-based expertise’ vs. ‘certified expertise’ (Collins and Evans 2002); or what Boyer (Boyer 2008), p. 40 calls the “experiential-performative” pole of “skilled knowing and doing” by contrast with the “social-institutional” pole; or, what is sometimes still referred to as ‘lay expertise’ vis-à-vis ‘epistemic expertise’, see (Turnhout, Tuinstra, and Halfmann 2019).¹⁰ Let me single out some key aspects of this tradition of studies that matter for my discussion here.

The literature on expertise has flourished in the so-called “Third Wave of Science Studies—Studies of Expertise and Experience (SEE)” (Collins and Evans 2002), but also in the anthropology and ethnography of experts— see (T. Mitchell 2002), (Jeffery and Heslop 2020). For example, the anthropologist Boyer (Boyer 2008), p. 38 defines expertise as “a relation of epistemic jurisdiction” where the salient question is the following: “On what basis does the representative of one culture of expertise (the anthropologist) claim legitimate analytical jurisdiction over the members of

¹⁰ As Turnhout et al. (2019) p. 184 points out, “Lay expertise is often defined as the opposite of scientific knowledge because it is considered to be: contextual and localised rather than universal; culturally embedded rather than objective;...practice and experience based rather than based upon methodological principles”. And Martini (Martini 2019), p. 120 adds that “To be an expert is not to possess a more or less fixed number of traits, but to stand in a relation with someone else, namely, a layperson. In this sense, the epistemology of expertise can only be social epistemology, because expertise can only exist in a relational (i.e. social) context.”

another culture of expertise and how is this claim enacted?” (ibid., p. 41). Hence, the perennial risk of what Boyer calls “interjurisdictional rivalry and epistemophagy” (ibid., p. 43), i.e. the tendency to consume and incorporate other epistemic jurisdictions when cultures of expertise come in contact.

Collins and Evans (2002) have urged to abandon the oxymoron of “lay expertise” and to address the Problem of Extension (“How far should participation in technical decision-making extend?”). Drawing on Wynne’s famous case study concerning the relevance of local knowledge by the Cumbrian sheep farmers (and institutional neglect thereof) in the aftermath of the Chernobyl nuclear disaster—see (Wynne 1992),(Wynne 1993)—Collins and Evans have made a plea for a more holistic portrait of expertise that extends beyond what they call the “core set’s expertise” to include other pockets of uncertified expertise via social interactions. They call the latter “interactional expertise” and distinguish it from “contributory expertise”, which is taken as “continuous with the core set’s expertise” (Collins and Evans 2002, p. 252).

Boyer’s concept of “epistemic jurisdiction” is helpful to delineate the more general and thorny dialectic often at play between scientific knowledge and varieties of local knowledge and to avoid the perennial risk of epistemophagy lurking around the corner. In this respect a few caveats are in order:

1. I declare my positionality as a white non-English native speaker philosopher of science in drawing these considerations about the nature of varieties of expertise cutting across the boundaries of ‘experience-based’ and ‘certified expertise’.
2. I recognise as such the epistemic limits of my positionality and the need to tread carefully when discussing a broader notion of expertise which ought to treat varieties of local knowledge (especially indigenous knowledge) as legitimate ways of knowing *in their own right*, independently of and regardless of what they might (or might not) contribute to Western ways of conceptualising what ‘scientific knowledge’ is.
3. Accordingly, discussions about intercultural exchanges should be dealt with carefully and not couched in terms of overlapping, merging, integrating perspectives, or by considering different ways of knowing as interchangeable and feeding in some ahistorical Science (with the capital S). Doing so would only reaffirm historically unbalanced power structures over varieties of local knowledges—hence the risks of ‘scientisation’ of lay expertise and epistemophagy.

It is with caveats 1.-3. in mind that I have presented my notion of activities qua skilful performances as linked to stable events and to the identification of modally robust phenomena, rather than linked to systems of knowledge. Emphasis on the latter tend to raise inevitable questions about how and why discussions about local knowledge are often presented and couched from either a Western scientific point of view, or from the assumption that the two are somehow interchangeable at the risk of (willingly or unwittingly) reinstating Western forms of scientific authority (*whose* system of knowledge? by *whose* lights?).

By contrast, placing emphasis on how situated practices and their skilful performances latch onto stable events in nature is a way of putting a marker on what really matters here: namely, understanding how reliable knowledge production is effected by myriad historically and culturally situated communities over time. This is reliable knowledge production that different epistemic communities —beekeepers, cosmologists, plant morphologists, crofters, and so on—can each reclaim as *their own*.

A critic might reply at this point that my expanded notion of scientific knowledge qua reliable knowledge is too broad to be of any use. After all, there is a reason why the term ‘science’ is used to indicate particular varieties of reliable knowledge, my critic might insist: namely, those that have the hallmarks of critical inquiry and falsifiability. My envisaged critic might formulate the objection under the name of the Problem of Extension of Expertise (PoEE):

(PoEE) “What kind of skilful performances count (or do not count) as expertise?”

My critic might be (justifiably) worried that a generous account of what counts as reliable knowledge production and expertise like the one I am proposing may risk blurring important demarcation lines between *bona fide* scientific knowledge and all sorts of simply false beliefs, spurious connections, and bogus claims. The worry is real, especially in our time when social media are spreading scientific misinformation, and pose a threat to the public and democratic institutions.

Thus, to live up to the normative foundations of REBSP qua an epistemic-cultural human right, it seems that one must *both* acknowledge that truly global knowledge production requires, first of all, an answer to the PoEE that is not built on traditional dichotomies—i.e. scientific expertise vs. lay expertise; or, core vs. non-core; or scientific knowledge vs. local knowledge—and at the same time one must also shelter scientific-knowledge-qua-reliable-knowledge from the

perennial danger of misinformation, false theories, and crackpot ideas. How to steer clear from both?

4.2 When perspectives intersect and interlace. Inter-perspectival expertise

My answer to both PoEE and the demarcation problem takes the name of *inter-perspectival expertise*, a notion that I lay out in what follows building on my work on perspectival realism (Massimi 2022). I am going beyond Collins and Evans in suggesting that what is needed is a more refined notion of expertise qua *skilful performance* that is akin to what Collins and Evans call ‘contributory expertise’ in being continuous with core expertise, and therefore more substantive than what they call ‘interactional expertise’. I brand such notion of expertise as *inter-perspectival* in recognising that is it the product of a multitude of historically and culturally situated practices of *epistemic communities*. What is inter-perspectival expertise? And how does it work as an answer to both PoEE and the demarcation problem?

Back to my perspectival realism (Massimi 2022), p. 5, where I offered a definition of “scientific perspective” that is practice-centred and takes on board the situated knowledge thesis without taking any perspective as more foundational or core than any others. From a strictly epistemic (as opposed to anthropological or sociological) point of view, the title of ‘scientific perspective’ (see footnote 4) pertains to a variety of situated-in practices that have the experimental, technological and theoretical tools to *reliably* advance claims of knowledge and are able to *justify* such reliability too. This is already a stringent enough criterion to rule out practices that either do not advance claims of knowledge or, if they do, they lack the resources to do so *reliably* and *justifiably* so, in response to the worry about the demarcation problem.

But coming to PoEE, a critic might insist that my definition of expertise is overreaching and one might question the extent to which e.g. the activities of the crofter in kelp manufacturing or of the beekeeper in producing honey—each embedded into their respective situated-in and situated-for practices—count as ‘scientific perspectives’ at all. In reply, I use the term “scientific” in the same strategic and provocative way in which Sandra Harding uses the term “science” to refer to the practice of Micronesian navigators.¹¹ But how to negotiate among “epistemic

¹¹ “To be sure, the term ‘science’ is not what indigenous cultures use to refer to their knowledge systems. Indeed, Galileo, Newton, and Boyle were ‘natural philosophers’ to their contemporaries and to later generations. It was not until the early nineteenth century that the term ‘science’ was introduced by William Whewell (...). So it might seem

jurisdictions” so as to avoid Western-centric “scientisation of lay expertise”, on the one hand, and the risk of diluting “certified expertise”, on the other hand? This is where inter-perspectival expertise comes handy as a notion, I contend.

Inter-perspectival expertise is expertise understood as skilful performance embedded in a nexus of *intersecting* and *interlacing* of scientific perspectives. Scientific perspectives *methodologically intersect* when they “can be brought to bear on one another to refine the *reliability* of particular claims of knowledge” (Massimi 2022), p. 10. They *historically interlace* when they encounter other perspectives and trade “with one another some of their tools, instruments and techniques over time...[so as to] track the evolution of knowledge concerning particular phenomena in what I call a ‘historical lineage’” (ibid.).

In Ch 8 of the book I argued that e.g. when it comes to knowledge of the phenomenon ‘pollination’ for particular plants (e.g. a melliferous plant called *Gymnopodium floribundum* and very common in Mexico), it is necessary to *intersect* the knowledge of botanists and pollination ecologists with that of melissopalynologists and local beekeepers. The latter have the epistemic upper hand in knowledge of the peak season for the plant which is key to the honey production. Scientific knowledge of particular phenomena (e.g. pollination of the *Gymnopodium*) is produced by bringing to bear the perspective of the melissopalynologists on that of the plant morphologists, by asking whether the pollen under-representation of *Gymnopodium* in the honey of the region can be explained by the reproductive biology of the plant. And, in turn, the perspective of the beekeepers can be brought to bear on that of the plant morphologists by fine-graining the analysis of pollination to the timing of the nectar peak and related pollination peak which the beekeepers know best.

Claims of knowledge get refined and made more reliable through the *synchronic intersecting of perspectives* ranging from beekeepers’ local knowledge of the api-botanical cycle to plant morphologists’ knowledge of the reproductive biology of the plant. This is an example of the *intersectional* variety of inter-perspectival expertise. Its role is to improve the *reliability* of claims of knowledge by either bringing new data to the phenomena under study; or better triangulating

like one more piece of Eurocentric appropriation to refer to indigenous knowledge as sciences, as I will do here. Yet I do so for strategic reasons. I intend to level the epistemological playing field so that we can begin to understand the costs to us and to indigenous cultures of conceptualizing indigenous knowledge only as myth, magic, and superstition, or only as a residue of tradition that should be replaced by modern Western sciences’ rationality and technological expertise.” (Harding 2015), p. 81.

between the data and the phenomena inferred; or, by questioning some of the methodological-epistemic principles used to justify the reliability of the claim within a perspective.

The process of methodologically intersecting respects the situated-in knowledge of each perspective. It does not fall prey of any epistemophagy by overlapping, merging, integrating perspectives. Nor does it undermine core expertise within each perspective because it does not downplay the botanist’s knowledge, nor does it merge the beekeeper’s knowledge with the knowledge of the plant morphologist. It does not assess or evaluate the validity of one epistemic jurisdiction in terms of another one, reiterating patterns of epistemic exploitation and Western authority. The beekeepers’ expertise has its own epistemic jurisdiction, which is distinct from the plant morphologist’s expertise and associated epistemic jurisdiction. Yet perspectival pluralism—read through the lenses of this multicultural kaleidoscope of situated-in practices—does not see them as siloed, insular, and disjoint.

Inter-perspectival expertise of the *intersectional variety* accrues by respecting the situated knowledge of each relevant community vis-à-vis the phenomena under study (e.g. pollination), and simply bring them to bear on each other so as to improve the reliability of knowledge claims concerning the phenomena. The central idea is that knowledge of a phenomenon like the pollination of a particular plant *requires* this plurality of perspectives and cannot be delegated or sanctioned by any one singular epistemic community.

Another variety of inter-perspectival expertise is the *interlacing variety*. Here the expertise concerns mostly know-how related to particular tools, instruments, material cultures that were traded among situated communities and their practices *diachronically* over time. In my book, I give the example of how an object for divination (e.g. the Han-Sung dry and wet compass) became an object for nautical use (e.g. the mariner’s compass) to track the evolution of knowledge concerning a phenomenon such as the Earth’s magnetic field. The notion of historically interlacing perspectives does not anachronistically ‘scientise’ the local knowledge of Han-Sung geomancers. The use of dry and wet compasses was *situated in* the practice of the Han–Sung geomancers, and was *situated for* a particular purpose, namely divination —see (Massimi 2022), pp. 341-2.

At the same time, inter-perspectival expertise of the interlacing type originates when different perspectives come in contact and trade their tools, instruments, ideas and techniques within a well-defined historical genealogy of material cultures. Reconstructing how those tools changed role and function over time and across different communities becomes a way of tracing

the evolution of knowledge concerning particular phenomena. Inter-perspectival expertise of the interlacing variety takes then a diachronic long vista on the historical evolution of human knowledge by contrast with the synchronic outlook of inter-perspectival expertise of the intersecting variety. For example, Hebridean crofters’s kelp-manufacturing is part of a historical lineage where techniques for potash and soda production became eventually industrially produced with the Leblanc process in 1791 and later Solvay process in the 1860s.

In both the case of intersecting and interlacing perspectives, as I stressed in (Massimi 2022), pp. 341-2, it is paramount that these intercultural exchanges among epistemic jurisdictions do not become an opportunity for further epistemic injustices, epistemic extractivism, and exploitation. In the book I give four normative pointers to fend off this always lurking risk:

- (1) respect the historical and cultural situatedness of each perspective;
- (2) mutually and reciprocally agreed upon norms and methods of knowledge production sharing;
- (3) transparent mechanisms and pathways without blending and obfuscating the contribution of each community;
- (4) prevent exploitative systems of appropriation resulting in the commodification of knowledge at the exclusive socioeconomic benefit of one community.

When these pointers are violated, epistemic severing and epistemic trademarking ensue as distinctive varieties of epistemic injustices, I argued in (Massimi 2022), pp. 349-63.

To conclude, inter-perspectival expertise of both the intersectional and interlacing variety bypasses dichotomies such as core vs. non-core expertise, scientific knowledge vs. local knowledge. According to perspectival realism, *all* knowledge is always situated and perspectival. This does not gainsay the all-important question of how to demarcate genuine reliable knowledge from misinformation and conspiracy theories. All that is needed as a deterrent against the latter is an analysis of the historical interlacing and methodological intersecting of perspectives that does the heavy lifting in constraining (without policing) the boundaries of *reliable knowledge production* concerning modally robust phenomena across perspectives.

4.3 Toward a Right to Expertise. Concluding remarks

In this chapter I have addressed some foundational questions about the Right to Science. I have offered an argument from activity as the best way of understanding the philosophical-normative foundations of REBSP and of addressing the lingering elitism implicit in the term “science” still operative in the UN General Comment n. 25. I have advocated for replacing “science” with the broader notion of “scientific knowledge” and for articulating a generous view of what counts as ‘reliable knowledge production’ that does not trademark local knowledge as alien to, or peripheral to it.

If these steps are taken, then the REBSP can be regarded as an epistemic-cultural human right: i.e. a right concerning scientific knowledge (*episteme* in ancient Greek as opposed to *doxa* qua opinion or bogus knowledge) qua part of wider cultural practices. Such a shift has the potential to overcome the inevitable gap that seems to exist in the current normative foundations of REBSP between the *few scientists* pursuing freely their research, on the one hand, and *everyone* else as the generic proxy right-holder of the benefits resulting from scientists’s research, on the other hand.

I have argued that the philosophical-normative foundations of REBSP qua an epistemic-cultural right must be sought in an analysis of expertise that does not repeat and perpetuate distinctions between scientific knowledge and local knowledge, core expertise and peripheral one, certified vs experience-based. Latching on the literature in STS and anthropology, I offered a view of inter-perspectival expertise via intersecting and interlacing scientific perspectives.

This definition is broad enough to encompass a wide range of skilful performances—from seaweed harvesting to calibrating instruments. I have argued that such a view of expertise shares with the pragmatist tradition an emphasis on ‘activities’ and is at home in perspectival realism, which takes all knowledge as ultimately local, situated, and perspectival. The challenge of demarcating genuine scientific knowledge from the perennial risk of misinformation and flat falsehoods lies within the internal dynamics of how perspectives methodologically intersect and historically interlace to deliver reliable knowledge of modally robust phenomena over time.

Therefore, for the REBSP to hold as an epistemic-cultural right, one needs to expand the framework in which discussions of REBSP have taken place so far and supplement it with a Right to Expertise (RtE) that belongs to individuals insofar as they are part of one or more situated epistemic communities:

(RtE) Every situated epistemic community has a *right to expertise* in a relevant epistemic jurisdiction so long as expertise is understood in terms of skilful performances embedded in a nexus of intersecting and interlacing scientific perspectives.

The Right to Expertise so understood gives situated epistemic communities their due. It does not epistemically sever and trademark their local knowledge. Nor does it assimilate or ‘scientise’ their local knowledge. Most importantly, it has the potential of re-aligning the REBSP qua epistemic-cultural right with the Convention on Biological Diversity and UN General Comment n. 21 that have long legally recognised the importance of indigenous knowledge and local expertise in matters concerning biodiversity and cultural rights. It is time for the Right to Science to catch up with this legal trend. One way of doing so is by dissecting the very notion of “science” tacitly at work behind REBSP as I have done in this chapter.

Acknowledgements

I am grateful to Mirko Farina and Duncan Pritchard for inviting me to contribute to this volume. An earlier draft was presented at a workshop on the Right to Science at the University of Edinburgh and I am grateful to Samantha Besson for detailed and constructive comments on an earlier version of this paper, and to all participants for their helpful questions. Many thanks to Laura Jeffery for stimulating discussions and references on the ethnography of expertise; and to Eduardo Schenberg for reading and commenting on an earlier draft and thought-provoking conversations on Mazatec knowledge. Any error remains entirely my own responsibility.

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Michela Massimi “From the right to science as an epistemic-cultural human right to the right to expertise”
In M. Farina, A. Lavazza, D. Pritchard (eds.)
Expertise. Philosophical Perspectives
Oxford University Press, 2024

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