Mētis and Technē in Scientific Knowledge

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I build on Elizabeth Anderson's account of local knowledge by defending a stronger relation between *mētis* and *technē* (**Dependency**). According to **Dependency**, the production of *technē* depends essentially on *mētis*. I argue for the stronger relation by appealing to the circulatory model of knowledge production from the history and philosophy of science. The refined account of local knowledge — based on **Dependency** — offers two key benefits: it strengthens the case for integrating indigenous knowledge in science education by demonstrating the foundational role of local knowledge in knowledge creation and it provides a more robust counter-argument to the superiority position advocated by Daniel Kahneman.

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0. Introduction

Elizabeth Anderson champions the value of theorizing about local knowledge in philosophy. In Anderson's view, *local knowledge* — knowledge rooted in particular persons, places, and artifacts — is local in four different ways. It is local because it is knowledge (i) of a particular object ('particularity'); (ii) acquired through direct acquaintance with an object rather than knowledge of facts acquired through a means other than direct acquaintance ('familiarity'); (iii) which is intelligible only to a particular group ('illegibility'); and (iv) which is valuable because of the parochial interests, values, and concerns of the knower ('value-parochiality') (Anderson 2025, 2). She contrasts this quartet of characteristics to the more conventionally celebrated *general knowledge* which is (i′) general; (ii′) articulable; (iii′) legible; and (iv′) value-neutral.

Building on the work of the sociologist and political scientist James C. Scott,

Anderson focuses on a particular type of practical local knowledge: *mētis* (Scott 1998). *Mētis* is the implicit practical knowledge, or knowledge-how as opposed to knowledge-that, concerned with a knower's interactions with particular objects of local knowledge. Unlike *technē* which is a general, settled, non-contextual, and propositional type of scientific knowledge, mētis is personal, improvisational, contextual, and not fully articulable (Anderson 2025, 7).

1. Complementarity and Dependency

Elizabeth Anderson's central aim is to show how the institutional marginalization of *mētis* has wrought significant social harm, perhaps most acutely evident in the suppression of indigenous knowledge and indigenous knowers. Anderson argues that although *mētis* is a type of local knowledge, it is 'empirically grounded, regularly corrected and fruitful' and hence is correctly characterized as scientific knowledge (Anderson 2025, 18-19). In her discussion of scientific knowledge and *mētis* Anderson is committed to the following thesis:

> **Complementarity** *Mētis* and *technē* are both necessary for scientific knowledge and its application.

Complementarity implies that any comprehensive understanding of scientific epistemology, and thus of science itself, remains incomplete without the integral inclusion of *mētis*. This provides the basis for Anderson's claim that indigenous knowledge should be a part of science curriculum.

She highlights this point by discussing the recent controversy about calls for the inclusion of mātauranga Māori in the New Zealand secondary school science curriculum. Moreover, **Complementarity** serves as the bedrock for Anderson's call for more authentic epistemic collaborations with indigenous knowers: collaborations where indigenous people have authority and autonomy on 'how they wish to engage and on what term' (Anderson 2025, 19).

I agree with Anderson about the importance of taking *mētis* seriously in philosophical theorizing; its merits in collaboration with different (groups of) knowers; and believe that her presentation of the different dimensions of *mētis* and its impact on various social problems is both correct and timely. In doing so, Anderson is contributing to the philosophy of science tradition of considering science *in and as* practice.

I believe Anderson stops short of fully acknowledging the importance and centrality

of *mētis* in science and to scientific knowledge. I think **Complementarity** is correct but I think a more forceful case for the inclusion of indigenous knowledge (and other forms of *mētis*) and for more authentic epistemic collaborations with indigenous knowers can be made in the Andersonian framework with an appeal to (as such, in this paper I want to '*Yes, and ...*' Anderson's view):

Dependency The production of *technē* depends essentially on *mētis*.

More fully, **Dependency** is the thesis that if E is a body of *technē* (universal, general, legible non-contextual scientific knowledge), then there exists E′ — a body of *mētis* (local, illegible, value-parochial, and contextual knowledge) — without which the production of E would not have been possible. **Dependency** is stronger than **Complementarity**. In fact, **Complementarity** follows from **Dependency**. I am not interested here in the relation between these two theses. Rather, I am interested in showing how **Dependency** finds a natural home in Anderson's view of local/general knowledge and how it can supplement the Andersonian project.

2. The View from the History and Philosophy of Science

I want to reorient our focus from the categorization of extant scientific knowledge to the process of the production of scientific knowledge. Let us, that is, look at the dynamics of knowledge production. How is knowledge produced? This is, of course, a vexed question across all of philosophy but I want to focus on one aspect of this question which has been cast into relief by recent work in the history of science (Conrad 2016) and the history and philosophy of science (Bakshi forthcoming).

A characteristic of the 'global turn' in the history and philosophy of science is the decisive rejection of the center-periphery model of knowledge production in science (Raj 2013). According to the center-periphery model — most notably defended by the sociologist Edward Shils and the historian of science George Basalla — knowledge is produced in a spatially confined region ('the center'), only after which does it disseminates outward to other spaces ('the peripheries'). For instance, the center-periphery model underpins much science studies where knowledge production is taken to originate — essentially — from *a* laboratory, only after which does it become universal through standardization of norm, instruments, and procedures (Collins 1985; Galison 1997). It also underpins much history of science which focuses on the dissemination of scientific knowledge from the Western ('the center') to the non-Western world ('the peripheries')

(Basalla 1967; Roy MacLeod 2000). In contrast, according to the *circulatory* model knowledge origination is not spatially circumscribed. Knowledge, instead, originates in the interaction and circulation of (locally-specific) materials, artifacts, people, practices, and ideas in a spatially diffused network. The circulatory model of knowledge underscores the indispensable role of movement in 'the historical contingency and mutation of scientific notions and practices' (Raj 2009, 20).

Andersons's framework of *mētis* and *technē* provides a fruitful conceptual tool to understand the circulatory model. For instance, consider the claim that it is the circulation of certain locally-specific objects (materials, people, practices, etc.) through which knowledge originates. I claim that we can fruitfully identify these with *mētis*: the objects of circulation satisfy the four characteristics of *mētis* noted above. The mobility and interaction of different mētis, of different locally-specific objects, leads to production of knowledge which is general, legible, value-neutral, and articulable. It is in this sense that **Dependency** holds: production of *technē* results from the circulation of many different *mētis* in a network of interactions, trades, contingencies, mutations, and negotiations. This conception of the formation of knowledge via integrative processes which iterate, reconfigure, and refine prior knowledge also provides a natural way to think about the methodology of the history and philosophy of science (Schikore 2011; Chang 2012; Scholl 2018).

I do not want to suggest that the case for Dependency depends vitally on accepting the circulatory model, for the center-periphery model can also be developed such that the production of *technē* essentially depends on *mētis*. However I do want to stress that **Dependency** is particularly conspicuous in the circulatory model because the model emphasizes the dynamics of knowledge production in a more suitable way than the center-periphery model. Think about a proponent of the center-periphery model, (say) one who holds that once knowledge originates in a circumscribed locality (such as a laboratory), it spreads immutably to other spaces and hence becomes universal (Latour and Woolgar 1986; Latour 1987).

On this view, *technē* – the knowledge produced out from the lab and which travels out to the peripheries – still requires local and practical knowledge: instruments need to be calibrated, techniques need to be learned, assays need to be titrated, grants need to be won. But it is unclear whether the local practical knowledge qualifies as *mētis* in the Andersonian sense because it does not mutate and reconfigure before traveling out of the lab as *technē*, as general scientific knowledge. For instance, on one way of reading Latour and Woolgar, knowledge produced in the lab already contains within it elements which are value- neutral,

objective, articulable, and legible. In other words, on the center-periphery model knowledge is born as *technē* while on the circulatory model the movement and mutation of different *mētis* produce *technē*.

3. The role of *mētis* in the creation of *technē*: an illustration

Here's an abridged scientific episode which will help illustrate the point I am making. Kapil Raj in *Relocating Modern Science,* his book-length treatment about the importance of circulation, meticulously chronicles cases of scientific knowledge production during the British Raj in India, highlighting the critical role of circulation. A fascinating case recounts the episodes of the Great Trigonometrical Survey of India, a nineteenth century colonial endeavor to map the entire Indian subcontinent. In particular, Raj focuses on the employment of 'local intermediaries' in the Survey (Raj 2007, chapter 6). These intermediaries — who collaborated with and were trained by the Survey officers — traversed vast distances on foot to map out chunks of Kashmir, Tibet, Turkistan, and Transhimalaya, often under false identities and in non-British occupied and hostile territories. Of special importance for us is the fact that these local intermediaries themselves became highly accurate *human instruments*.

These intermediaries developed skills to standardize their steps – irrespective of the terrain — so that they could then determine distances by tracking their number of steps. In one striking case Mahomed-i-Hameed, a local intermediary who was disguised as a merchant, walked from Leh (in modern-day India) to Yarkand (in modern-day China), determining with great accuracy the coordinates of Yarkand. Mahomed-i-Hameed, and other intermediaries employed in the Survey, developed strategies to collect geodesic data without the use of massive theodolites and heliotropes. Without their meticulous records and invaluable data, *without their knowledge*, the Survey as a grand scientific undertaking simply could not have been successfully executed.

How are we to think about the creation of scientific knowledge in this episode? Here Anderson's framework comes to our aid. The final form of the knowledge that resulted from the efforts of Mahomed-i-Hameed and others was presented by the Survey officers at scientific societies and published in scientific journals. It was general, legible, articulated, and free from the interests and concerns of the intermediaries. It was paradigmatically *technē*. But the knowledge that Mahomed-i-Hameed mastered, of using his body as an instrument, of dealing with the hostile geographic and human environment was not free from his concerns or interest, was valuable and legible only to his fellow intermediaries and the Survey

officers, and was acquired and honed by directly partaking in the Survey. It was paradigmatically *mētis*. The production of *technē* depended essentially on the mētis created by the intermediaries and those Survey officers they interacted with. We can draw the same conclusion from looking at the development of public health policies in the eighteenth century Spanish empire (Santos 2010) or tracing the work of French entomologists through their correspondence (Terrall 2010) — *technē* depends on *mētis*.

4. Benefits of Dependency

In advocating for **Dependency**, I have shifted the focus of Anderson's discussion of institutional epistemology from the end stage at which knowledge has already been produced and categorized (into *technē* and *mētis*) to the earlier stage of production. This has two benefits.

Firstly, Anderson defends recent calls for the inclusion of mātauranga Māori in the New Zealand science curriculum by arguing that it qualifies as scientific knowledge, despite it being local knowledge, because as *mētis* it is empirically established, regularly refined, and generally generative. Anderson thus rejects the false dichotomy that a body of knowledge must either be universal and scientific or local and non-scientific (Horsthemke 2008, 340ff). For Anderson, the characteristics of *mētis* also dictate how indigenous science should be taught in schools: with a focus on fieldwork, community collaboration, and appropriate authenticity. In arguing so, Anderson makes use of **Complementarity**.

I find her position appealing and think she is correct about the inclusion of indigenous science. But the case for inclusion can be made even more forcefully by appealing to **Dependency**. Because the production of *technē* depends on *mētis*, because general knowledge is produced by *mētis*, the importance of local knowledge, such as mātauranga Māori, is amplified in pedagogy. Unlike the strategy based on **Complementarity** where *technē* and *mētis* are taught as two distinct parts which come together to paint a full picture of science, this strategy *integrates mētis* and *technē*. This not only inherently highlights the collaborative nature of science and knowledge production — the Great Trigonometrical Survey yielded scientific knowledge precisely because of the collaboration between the intermediaries and the Survey officers — but also shores up Anderson's broader point about teaching *all* science within its rich sociopolitical, economic, and cultural contexts (Anderson 2025, 18).

Secondly, appealing to **Dependency** allays a worry Anderson notes for her view.

According to the *superiority* position, *mētis* can be replaced without loss by *technē* with superior outcomes (Kahneman 2011). Anderson has in mind cases presented by Daniel Kahneman who argues that expert judgment can be replaced by algorithmic or formulaic judgments with superior outcomes. Anderson responds by noting that in many situations both *technē* and *mētis* are required to make progress. She points out teaching and personalized medical care are some instances where the failure of substitution is particularly visible.

Again, I agree with Anderson on this point. Yet appealing to **Dependency** provides an even more robust counter- argument. **Dependency** allows us to recontextualize Kahneman's results in such a way so that they do not threaten to diminish the importance of *mētis*. For we can agree with Kahneman that in some cases — predicting whether a given X-ray is indicative of a cancerous tumor for instance — *technē* is superior to *mētis* while still holding that the production of the superior *technē* is dependent on *mētis*.

On these two pivotal points — the integration of indigenous knowledge in science education and the superiority of *technē* over *mētis* — I am in full agreement with Anderson's position. The difference between **Complementarity** and **Dependency** might be one of only stress after all, but in matters of education and comparison sometimes what we stress and what we don't makes all the difference.

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