# The International Journal of Critical Psychology

## Embodiment

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The main theme of this issue engages with two different foci: the body, and embodiment. The contributors tackle psychology's implicit mind/body dualism in different ways, but together they present the reader with an important set of tools for understanding and going beyond this dualism.

There is also a group of three articles which continue the theme of counter stories from Issue 4. These are mainly concerned with academia's crisis of legitimacy in the global, postmodern world.

Embodiment includes: Nicki Sullivan's exploration of body inscriptions such as tattoos, scars and cuts; Nicole Vitellone on the male sex drive discourse; Lawrence Johnson on the mind-body problem; Christopher Peet on Michael Polanyi's understanding of scientific enquiry; Robert Steele on sexual abuse and the issue of recovered memory; Estelle Barrett on creative practices as forms of reparation and healing; William Cross on 'where' we teach; Linda Powell on 'how' we teach; Anne Marie Tupuola on 'what' we teach; and John Cromby and David Nightingale on the usefulness of social constructionism for critical psychology

*'A very important contribution to current debates about social and psychological changes ... a voice to those who are looking beyond the frameworks of orthodox psychology as we seek to explore the new uncertainties and social problems we now all collectively face'*

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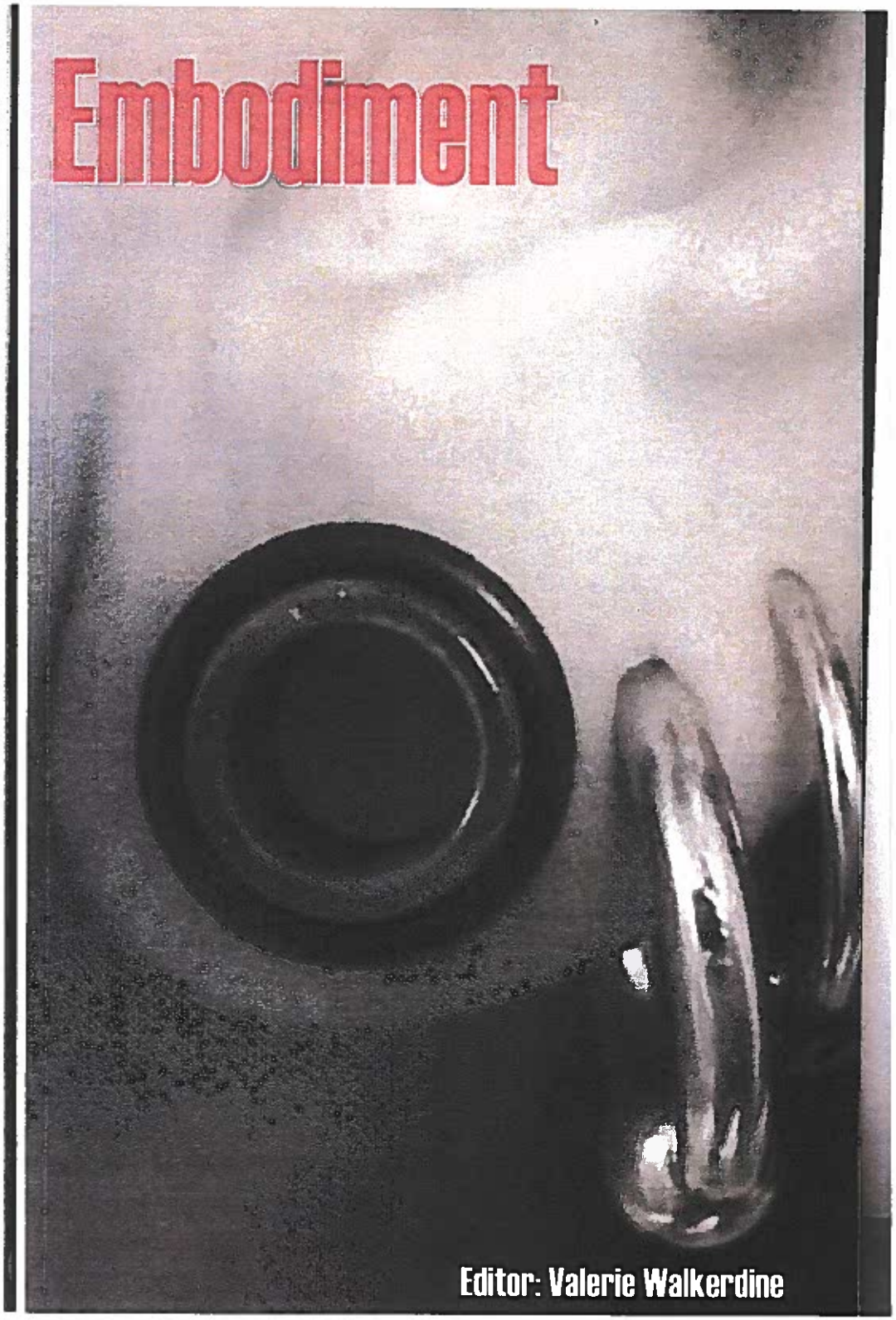

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Embodiment

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# Embodiment and commitment in scientific inquiry: recovering Polanyi's sense of personal agency

Christopher Peet

*Within contemporary science studies there is a lacuna around the notion of agency. Michael Polanyi's sense of the personal agency of the scientist addresses this lack. Polanyi articulates agency around the two foci of embodiment and commitment. I situate Polanyi's articulation against the better-known and more influential work of Thomas Kuhn. I argue that Kuhn appropriated Polanyi's notion of tacit knowing in a manner that confused and occluded Polanyi's focus on agency. Recovery of Polanyi's sense of agency within scientific inquiry substantiates our understanding of science, and complements already-existing, ideological critiques of science.*

In this essay I argue for a recovery of Michael Polanyi's understanding of scientific inquiry. Polanyi's conception of scientific inquiry in terms of personal knowledge contains throughout a sophisticated articulation of human *agency*. Polanyi articulates agency around two foci: that of 'tacit knowing', which for Polanyi is a fundamentally embodied activity, and that of the person as committed, a fundamentally existential, moral activity that defines the person within his or her social, historical, and universal situation. Within the burgeoning field of science studies, there is a lacuna around precisely these issues of personal

agency, embodiment, and moral commitment. A recovery of Polanyi's work such as I propose here serves, then, to address a neglected facet of science studies.

The constellation of reasons for the neglect of agency within science studies is complex and unclear. Consideration of the relation between Polanyi and Thomas Kuhn is illuminating in this regard, because Kuhn's appropriation of Polanyi occludes and ultimately confuses the issue of personal agency. Kuhn's enormous impact has overshadowed Polanyi's work, entrenching a perspective on science that tends to bypass and ignore the potential focus on agency Polanyi raises. Recovering Polanyi's work not only addresses the neglected issue of agency, but also redresses an imbalance of perspective within science studies.

I propose to pursue this redress according to the following scenario. Science studies, post-Kuhn, follow his lead in offering sociological, anthropological, and historical analyses of science. I characterise these analyses as external, ideological critiques. In contrast, Polanyi's emphasis on the person serves as an internal critique of science that *complements* the ideological analyses. Contrary to sociological or historical emphases on the impersonal and supra-personal factors determining the working of science – which marks their critiques as 'external' – consideration of agency emphasises personal factors, making such a critique of science 'internal'. The personal focus of an internal critique on responsibility and commitment has a consequent conservative, tradition-affirming potential, that complements the supra-personal focus on power of external critiques and their consequent revolutionary, transformative potential (hence my characterisation of these as ideological). The complementarity of these different types of critique should therefore not be understood as one of comfortable fit, but rather of persistent and recurring tensions. I am not sure it can be otherwise.

To make my case I locate Polanyi in relation to the better-known and more influential Kuhn. Focusing on shortcomings of Kuhn's position in terms of agency, I summarise Polanyi's articulation of personal knowledge. This articulation divides within the context of Polanyi's work into the themes of embodiment and commitment.

## Science Studies: Kuhn and the dismantling of the traditional view

Science, whether conceived as a diverse set of social practices or a body of knowledge, or even as a culturally-instituted heritage of modern



Europe, is still far from being understood. Critiques of science are in their infancy. The aim of these critiques is to assist in bringing about positive transformations of science's practices, knowledge claims, and its functioning as a cultural institution. The burgeoning field of science studies is a much needed development along these lines, and there is now a proliferation of anthropological, feminist, historical, and sociological analyses of science.[1] It is appropriate to make two points here, which are, I think, also related: first, that the impetus for these studies can be traced back to the enormously influential work of Thomas Kuhn, specifically *The Structure of Scientific Revolutions* (1970). Second, that there has *not* been a corresponding explosion of psychological studies of science (see Gholson, Shadish, Neimeyer and Houts 1989). I understand the second as in part an effect of the first, in that the ideological, external configuration of Kuhnian-inspired studies systematically neglects the personal, agentic aspects of science. However, the explanation for the second point runs deeper. The neglect of agency is not restricted to science studies nor to a fledgling psychology of science. The deeper problem resides in that psychology in general has no sophisticated, coherent notion of agency, much less a theory of the person. Such a notion or theory is precisely wherein psychology could make its distinctive contribution to science studies. Although a good argument could be made for a potential psychology of science to be in principle more encompassing than the focus on agency I am concerned with here, my claim is that psychology's contributions to science studies will remain piecemeal and meagre until the issue of agency is addressed.[2] The cross-disciplinary neglect of agency emphasises the crucially historical nature of the problem. Within psychology, historical and theoretical studies of the discipline demonstrate that the neglect of agency is a subset of larger problems intrinsic to psychology (see for example Danziger 1990, 1997; Koch 1976, 1999; Taylor 1989).

Kuhn helped dismantle the myth of science as a purely rational and progressive project. The Popper-Kuhn debate occupied the philosophy of science scene in the 1960s and 1970s (Lakatos and Musgrave 1970). While Popper (1958, 1933) made drastic revisions to the logical positivist vision of science, these revisions amounted to a logical extension of their program of rationally reconstructing science, culminating in Popper's (1967) proposal for an 'epistemology without a knowing subject'. This program devolved on the assumption that the objective content of scientific knowledge was independent or detachable from its

context. What Kuhn and Polanyi go to great pains to establish is the nontrivial contribution of *the situation* to scientific knowledge; put differently, the inescapable context-dependence of the knowledge content.

## Paradigms, confusion, and occlusion

What was so influential about Kuhn's work, as is well known, were his novel and interrelated concepts of normal science, revolutionary science, and paradigms. His notion of paradigm proved compelling to many in spite of, or perhaps because of, its exceeding vagueness. (Masterman, 1970, charts twenty-one uses.) What is not so well known, however, is that his notion of paradigm derives in large part from the work of Michael Polanyi.[3] I will confine myself to two observations that highlight a confusion within Kuhn's thinking that takes on an ironic significance in comparison to Polanyi's understanding. In the process of Kuhn's confusing Polanyi's notion of agency, he simultaneously occludes it as well.

First, Kuhn's attempted clarification of his initial formulation of paradigm shows clearly the idea of 'tacit knowing' – Polanyi's concept – to be central and that Kuhn has misappropriated it in a confusing fashion. Kuhn (1970, 1962) makes the following two claims: 'First, if I am talking at all about intuitions, they are not individual. Rather, they are the tested and shared possessions of the members of a successful group ... Second, they are not in principle unanalysable' (p191). The second claim brings Kuhn to the 'essential point' he wants to make, that this 'shared group intuition' is 'a process' that is 'potentially fully explicable in terms of neuro-cerebral mechanism' (p192). Kuhn proposes the psychologistic reduction of a social phenomenon to 'neuro-cerebral mechanism' in order to avoid the charge of individualism! That this strange move bypasses both the person as agent, and the very embodiment that the concept of tacit knowing was meant to illuminate, speaks to the depth of Kuhn's misappropriation of Polanyi.

My second observation involves an equal degree of strangeness and irony. Polanyi brings this point out by way of commentary on a Kuhn paper. Polanyi (1961) criticises Kuhn's distinction between normal science and revolutionary science as well as the proffered explanation for the transition from the former to the latter in terms of the scientist's 'discriminating' between 'essential anomaly' and 'mere failure' (pp376-8). Polanyi argues that Kuhn is missing the point of what is involved in the scientist's discrimination. Discrimination is the ongoing exercise of the scientist's personal judgement. Throughout all scientific work, normal or revolutionary, the scientist is perpetually appraising the noteworthiness of results, occurrences, unexpected phenomena, and anomalous effects. The criticism is in large part historical: Polanyi is claiming that in science it is only ever possible to decide on what is normal and what is revolutionary, and therefore which anomalies become 'essential' and which are simply never accounted for, *after the fact*. Kuhn is then reading in ahistorical fashion that hindsight back into the history. The criticism is a historical one that assumes a taking on of the agent's perspective, which does not have the advantage of hindsight. Kuhn's response continues his anti-individualist stance, albeit with dubious reasoning, and attempts to avoid Polanyi's criticism by raising sociological issues instead. In the turn to sociology, Kuhn bypasses not only Polanyi's criticism, but passes over the notion of agency as well.

In summary, my claim is that Kuhn's notion of paradigm is essentially a sociological notion that relies uncertainly on an untenable psychologism that is Kuhn's version of 'tacit knowledge'. Neither the sociological nor the psychologistic level address the issue of personal agency, whether construed in terms of embodiment or in moral terms of commitment. While the notion of commitment is central to Kuhn's work, as it is for Polanyi's, it is clear that Kuhn understands commitment solely in a cognitive sense that is determined by the social context and reducible to neurology. Further, Kuhn's account resides on a basic ahistorical premise that provides the link between his interrelated conceptions of normal science, revolutionary science, and paradigms. Polanyi, on the other hand, understands the person as always necessarily historical and social, and as practically and morally embodied. He explicitly does not allow for a reduction of the person – or knowledge, or the psychological – to 'neuro-cerebral' explanation. To grasp this argument requires a more comprehensive recovery of Polanyi's position.[4]

## Recovering Polanyi

The division of Polanyi's position thematically into embodiment and commitment follows naturally the chronological division of his work into a first and second period. In the first period Polanyi is primarily concerned with articulating science as a social organisation, the history of its development, and the moral, political and sociological implica-

tions of that form of social organisation. For this period, the fundamental principle upon which Polanyi's argument relies is that of commitment.[5] The transition to the second period occurs in *Personal Knowledge* (1958), in which he begins to work out his insights into tacit knowing. In his second period Polanyi attempts to consolidate his initial work through developing a consistent theory of knowledge that, in grounding the notion of commitment in embodiment, links in an indissoluble way the person to tradition in the very development and exercise of a personal agency. It is this second period for which Polanyi is best known, and the fundamental principle upon which his arguments could be said to rely here is that of embodiment.[6]

My strategy for recovering Polanyi's work is in three parts: 1) outline briefly the relations of embodiment to commitment within scientific inquiry; 2) explicate Polanyi's most advanced notions of tacit knowing and embodiment, from his second period, and 3) concluding with the more general conception of commitment of his first period. My purpose for this strategy is on the one hand due to his earlier work being better comprehended conceptually in terms of his later articulation. On the other hand, the trajectory Polanyi follows is revealing for conceptualising agency for science studies in general and also more specifically for an incipient psychology of science. Polanyi's later thinking around embodiment elaborates his thinking around commitment through making explicit his understanding of personal agency which formed the basis, implicit but assumed, of his first period.

## 1) Embodiment and commitment in scientific inquiry

Polanyi along with Kuhn argues for the context-dependency of all scientific knowledge, over and against the rationally reconstructed, abstract conception of a context-independent objectivity put forward by the logical positivists and Karl Popper. Unlike Kuhn, Polanyi's emphasis on scientific inquiry departs more radically from philosophy of science (a term Polanyi never uses to describe his own work). Polanyi develops his conception of personal knowledge through a sustained critique of the myth of a value-free, impersonal objectivity, a critique that depends in large part on his reconstrual of the stronghold of scientific objectivity: method. Every step of this reconstrual aims at retrieving the inarticulate and informal, and potentially inarticulable and unformalisable, moments of personal decision and responsibility on the part of the scientist in his or her application of the method. On this account,



scientific method is more precisely described as a set of discursive and technical practices, employing various technologies, instruments, measurements, theories, and assumptions in a complex interplay of magnification, exclusion, enhancement and distortion of a subject matter in order to derive highly specified facts which fit into some systematic ordering. These practices, however, do not exist *as such* outside of their use by persons. They are integrated, in use, into the person of a scientific investigator. This use is skilful; a skill learned by doing. Such skill cannot be reduced to rules, as this begs the question of the personal application of the rules, but comes closer to an artistic activity in which rules are more aptly described as maxims. Through this skilful use, these various technologies, instruments, measurements, etc., are incorporated into the body, extending particular capabilities.

In integrating these practices in one's person, in learning and refining the skills that accomplish this integration, and in incorporating the techniques and technologies into one's body, one has – usually unwittingly – already embarked on a particular course of commitments. Polanyi describes these commitments as existential; they are not taken up after rational deliberation, pre-meditated choice, or carefully considered judgement. Rather, they are the commitments necessarily made in order to constitute that position which makes deliberating, choosing, or judging possible at all. Our bodily inhabiting of the world is an inescapable prejudice, for which we need not apologise except to those who have *impossibly* escaped a point of view. These types of commitments are existential precisely insofar as Polanyi understands our form of being, or consciousness, to be always and inescapably an embodied condition. The corollary to this existential committing, which Polanyi (1958) describes variously as 'pouring ourselves' into things, 'assimilating' them, 'dwelling in' them (p59), and so forth, is emotional and moral: there is a risking and hazarding of one's self, for what one has committed oneself to cannot be determined prior to the commitment. The commitments, then, prior to reason or criticism, are not merely embodied in some neutral way, but are infused with a passion; any existential commitment of oneself is a passionately embodied act. Polanyi accomplishes through this articulation a way of relating embodiment, as the ground or active site of the person's moral, existential sense, to commitment. As he had already worked out an understanding of science based on commitment in his first period which precedes this articulation, it only remains for him to clarify his notion of embodi-

ment, which he does in terms of the body as a bi-polar, 'from-to' structure of knowing.

## 2) Embodiment: the 'from-to' structure of knowing

Technologies, techniques, and symbol systems, as bodily extensions, not only enhance bodily ability, but are also integrated into a background of possibilities against which a specific actualised figure can stand out. Polanyi's utilisation of the Gestalt dynamics of figure/ground leads to the crucially important implication that, as background, those existential, embodied commitments that make up this background are simultaneously occluded and overlooked. One's commitments are rendered invisible, tacit or absent for the sake of something to be made visible, explicit or in some wise present. In Polanyi's terms, in attending *from* the background particulars *to* what they conjointly bear on, one has subsidiary awareness of the particulars and focal awareness of what they bear on. This double effect, of the disappearance of what enables the appearance, of a becoming invisible in rendering something visible, of tacit operations that support the explicit, is the fundamental characteristic of bodily activity, of perception, of what it means to know something. Polanyi calls this the 'from-to' structure of knowing. Perception, which provides the prototype for this structure of knowing, is then the taking up of a particular stance within the world by a resolution of the world's essential ambiguity. Analytically, the world is not *given* so much as *presupposed*; the inescapable supposition being that continuous prejudicial activity of the body in the world that provides a coherence necessary for knowing. The integrating of the subsidiaries *from* which we know is a personal partaking and participating in the world, with the focal entity *to* which our subsidiary knowledge bears being the achievement of that participation. The import of this conception of knowing as a from-to structure, that Polanyi realises clearly, consists in its thorough-going preclusion of a subjective-objective dichotomy: although knowledge is both personal and particularised it never leaves the 'objective' world to become 'subjective'. This point is crucial for any conception of agency, in defence against the inevitable accusations of subjectivism. Further, the double effect of knowing as a from-to structure – a bringing into focus simultaneously with a rendering subsidiary – proffers an explanation as to the success of the subjective-objective dichotomy. The roots of the dichotomy in undifferentiated, embodied experience, in



both self and world, fade from focal, explicit consciousness in the very act of constituting focal, explicit consciousness. Either extreme, of complete subjectivity or total objectivity, prove to be inadequate abstractions, incomplete parts of a greater whole, figures disavowing their grounds.

Significant as the opposition to the subject/object distinction is, the type of exploration that would do the topic justice falls outside the scope of this essay. In this connection it is worth mentioning, however, that Polanyi's account bears many similarities to phenomenology, in particular to the phenomenology of Merleau-Ponty. Taken together, they combine to form a profound alternative conception of the body, of perceiving and knowing, that consistently precludes subjectivist or objectivist extremes. They seem to have derived their points of view independently, despite strong convergence.[7] Merleau-Ponty (1962, 1945) gives the most extensive treatment of what I have been calling the double effect in perceiving and knowing, of the simultaneous rendering subsidiary of various bodily operations for the sake of some focus. Merleau-Ponty (1964) revisits these themes later, re-examining the body in perception and in knowing and exploring the implications of the non-homogeneity of invisibility. Polanyi and Merleau-Ponty contribute originally and richly to understanding the role of the body in the constitution of experience: both stand at the end of positivism prior to the various conceptual turns that underwrite, more generally and across disciplines, the postmodern.

Polanyi's consistent emphasis on scientific method in terms of the embodied practices of the scientist, an embodying that structures scientific knowing in particular ways, provides the grounds for the strong claim that the workings of science are inexplicable without an understanding of the scientist's agency. The basis for agency is constituted, tacitly and bodily, through the scientist's active appropriation, in doing, of those discursive and technical practices that make up the scientist's tradition. Formulating agency in these terms might suggest that the very notion is illusory, as it is determined by tradition, by supra-personal factors of the social, historical, cultural, and contingent context. Recalling Kuhn, agency can be bypassed as it is fully determined by the paradigm. Polanyi, however, argues that what is determined by the tradition are those initial conditions on which basis the scientist's agency is initially formed and then developed. These initial conditions provide an orientation and starting point that is

supra-personally determined, but from this it does not follow that therefore all of the scientist's actions are also determined. A basis is not equivalent to a determinant. One could substitute person here for scientist, to generalise the theory, as arguably becoming a person consists of actively appropriating one's traditions into which one is born, like one's body or one's language. This appropriation is not explicit, and in fact never need be made explicit. According to the logic of Polanyi's argument this appropriation is, despite its tacit, inarticulate status, a valid form of knowledge and is ultimately the reservoir of knowledge from which *all* our explicit, formal, highly specified knowledge draws. In Polanyi's oft-cited phrase: we know more than we can tell.

Three features of this account recommend it: first, it feasibly suggests a nondeterministic but interdependent relationship between the tradition and the person that locates the person historically even as it explains that person as an independent agent. Second, it demonstrates how the person's appropriation of the tradition is concealed in the very act of appropriation, offering an explanation of how Popper or Kuhn could, given an excessive rationalist emphasis or sociological preoccupation, consistently overlook what Polanyi argues is most essential to science. Third, it initiates a hermeneutics that, although in this instance applied specifically to scientific investigators within the context of scientific work, generalises well to psychological theorising (on this point see Koch 1976; Campbell 1989). Polanyi's account immediately translates into a starting point for a psychology of science. For example, the explicit self-descriptions of scientists need to be placed into the practical and historical context of their particular research tradition. Where those descriptions invoke ideals or abstractions, they are not to be bypassed, but understood as a particular manner of orienting a mostly embodied, mostly inarticulate, practice. The *explicit* self-understanding of a scientist's sense of agency has to be weighed against its *tacit* background, which underlies and supports the self-understanding and composes the body – literally – of the scientist's *sense* of agency. The components of the tacit background consist in, on the one hand, the practising community of scientists of which the scientist is part, and on the other, the history of his or her scientific tradition and therefore, by implication, the broader cultural tradition in which the scientific tradition is situated. Again, an implication here is that agency is in actuality illusory, that the entire sphere of the personal reduces to



social, historical, and cultural constituents, and therefore the notion of person or agency can be done away with in terms of, for example, paradigms. However, this conclusion assumes only one pole of the bi-polar, from-to structure of knowing; while the background of subsidiaries is essential for there to be a focal figure at all, the focal entity itself, in becoming the coherent integration of particulars it is, thereby becomes irreducible to its parts. What confers this irreducible status upon the focal pole of knowing composes the second theme of agency Polanyi is concerned with, that of commitment, understood as a primarily existential, moral activity. In examining Polanyi's articulation of this aspect, we also examine more closely the relation of the personal to the social, historical, and cultural traditions in which the person is constituted.

## Agents vs paradigms: the personal in the social

I want to pause here momentarily to recall the critique of Kuhn: the emphasis on the sociological, as based on an ultimately psychologistic reduction, bypassed the person of the scientist as an active agent. What does Polanyi offer by contrast? Polanyi describes the scientist's active appropriation of the tradition as a 'plunging' and 'groping': learning by doing means an uncritical, or more accurately, an a-critical acceptance of those various techniques, assumptions, and instruments upon which scientific work is based. What is interesting here is that this a-critical mode is itself a form of knowledge or way of knowing, albeit non-explicit; that is, it is a tacit knowing, known in and by the body. Tacit knowing, although perpetually absenting itself in rendering itself subsidiary for the sake of some focal or explicit awareness, is not therefore inaccessible to the scientist, but is in principle available to some extent – unlike Kuhn's appeal to 'neuro-cerebral mechanism' for an explanation – upon *reflection*. An a-critical commitment, made tacitly, can be made explicit and considered critically. In the person's a-critical, bodily taking up of tradition, it becomes possible through reflection to read commitment into this action, a commitment which catalyses the integration of those particular practices and defines not only those practices and the tradition in certain ways but also the person. The implication here, which I want to countenance, is that the personal is constituted in the social by means of commitment to pre-existing social practices, but that precisely due to this commitment and the capacity to reflect on it the person defines him or herself as a self-determining

agent who is therefore irreducible to the social. The most insightful clue to getting clear on this complex reflexivity is that for Polanyi the domain carved out by the agent's constitutive commitments is at base the *moral* domain, a clue to which I return below.

In terms of a critique of science, the implication is that to understand scientific method as some impersonal, value-free procedure which insures objective results by keeping out subjective distortions (like values or personal commitments) is dead wrong; to the contrary, 'scientific method' is dead and ineffectual save when animated by a personal commitment which for the most part is embodied tacitly, in doing, by the scientific investigator. This is the *endpoint* of Polanyi's philosophy. It emerges in its fullest complexity with the articulation of embodiment in his second period. His philosophy followed a persistent trajectory from its origins in his first period that described scientific inquiry in terms of commitment, origins that took the social aspects of science into account before concluding with an articulation of the personal.

## 3) The commitment to freedom: the autonomy and social organisation of science

That Polanyi's thinking culminates in a focus on the scientist as an embodied, committed agent was neither premeditated nor even foreseeable in its beginnings. Polanyi leaves his career in chemistry behind and turns to philosophy in the 1930s and 1940s in order to deal with pressing social and political issues. Specifically, Polanyi is opposing Marxist-inspired proposals in England calling for state planning of science based on the model of the Soviet Union. More generally, he sees this proposal as symptomatic of a widespread destructiveness manifesting across Europe, in every sphere of life, which was not to be attributed to any particular nation, state, or event. European civilisation was destroying itself through war, totalitarianism, and nihilism. These were the logical consequences of the misunderstanding and malpractice of its own tradition. Polanyi understands the misapplication of science to be a crucial contributor to this self-destructiveness, an understanding based on his own experience as a scientist, powerful intuitions concerning the role of science in society and in politics, and the particulars of his personal background that throw him continuously into the confluence of these destructive processes.[8]

Polanyi's enterprise in this early period can be described specifically



as an argument for the autonomy of science and more broadly as a defence of traditional formulations of European social and political practices in terms of ideals and principles. Science as a body of knowledge and as a social organisation exemplifies a particular way of embodying ideals, upholding tradition, and preserving Europe's free, democratic civilisation. Ultimately, Polanyi's goal is to protect freedom, particularly freedom of thought, from the self-destruction afflicting so much else. At the heart of Polanyi's enterprise, although it takes a prolonged effort over decades to uncover, is his assumption of personal agency as the locus of freedom. The person, as agent, is therefore also the locus of responsibility, and the linchpin about which the successful functioning of science, and in turn a free society, turns. The scientist's exercise of freedom and responsibility takes place within a particular social organisation – the community of scientists – which itself must be autonomously self-regulating in order to provide to its members appropriate support, space, and constraints. Polanyi's appeal for autonomy in science cuts both ways: autonomy sets limits to science's authority, even as it allows a freedom for scientists within those limits. The Marxist argument for state planning denied that science was ever truly autonomous, but was always and fully determined by social and economic factors. To plan science was to make this truth explicit and take conscious control of this truth. That the Marxists appealed to the scientific basis of historical materialism as informing the truth of their own arguments was the prime example, for Polanyi, of science overstepping its bounds: the implications of its theory aimed to destroy the very premises which, according to Polanyi, the theory had to presuppose in the first place. This vicious circularity becomes self-fulfilling in its logical consequences, for with its premises destroyed science becomes unlimited in its application. The premises for science at the level of social organisation are the basis for its autonomous functioning within society; without these premises, science loses its freedom. That these premises rely on personal agency, which in turn also becomes suspect, means that the political implication of an unrestrained application of science is the loss of personal freedom. Government becomes totalitarian.

Polanyi counters with an argument for autonomy in science that he claims is also therefore an argument for a free society. Scientific knowledge, claiming both universal validity and normative status, sets up as its authority a relation to a universal and normative truth that lies out-

side not only particular special interests, but also outside and above political powers, such as the state's. Science as an institution and a community serves as a power check on potential excesses. Science, in combination with other democratic institutions embodied in the different political bodies, the legal system, organised religion, the education system, and so on, asserts a presence that limits state power. An infringement on the autonomy of any of these institutions, such as state control and planning would effect, is an infringement on democracy. What is essential for making this reciprocal relationship of state to institution work inheres in the subservience of both to standards oriented to supra-institutional, supra-political ideals taken as authoritative: ideals of truth, justice, equality, freedom, and so on.

To argue for autonomy for science is to argue for its freedom from state intervention. This is not an unconditional freedom, for the very conditions that support freedom also constrain science as an institution by means of responsibility. Science demands freedom on the basis of standards that define it as a science and to which it holds itself accountable. The entire process of upholding these standards through the interplay of education, training, funding, promotion, peer review, publication methods, conferences, invisible colleges, and so on, becomes according to Polanyi a self-organising system too complex to be overseen by some executive centre. It is self-organising in terms of lateral controls exerted through collegial discussion and criticism; scientists are constantly engaged in assessing the validity of findings and the consequent acceptance or rejection of hypotheses, explanations, and theories. Obviously these judgements are not made on an ad hoc basis but according to prevailing standards. As such, Polanyi concedes science is inherently dogmatic but claims that this is unavoidable: to relax the standards will invite correspondingly inferior quality. To allow freedom for science demands an expectation of responsibility from scientists, and an extension of trust from the rest of the society of which the scientists are part accompanied by all the risks and hazards such trust entails. There is neither guarantee of this trust nor proof against risk. But the scientists are accountable to certain standards, on a particular basis, which is the basis for science's autonomy as a self-organising social institution. This basis is personal agency. It is only on the basis of personal agency that scientists' accountability to others, and hence their own personal sense of responsibility, can make any sense at all.



## Personal agency and universal intent

Polanyi's thought followed, from his first principled arguments for the tradition of science, to his examination of science as a social organisation, to the political implications of that form of social organisation, a trajectory that depended throughout on the assumption of personal agency. That it takes the time and thought it does for this assumption to become explicit is testimony to the complexity and depth of Polanyi's intuitions and the problems he faced. The argument for freedom, in science particularly but more generally in thought, is an argument for an orientation to universal ideals – of which freedom itself is one – that devolves on some centre from which responsibility cannot be further deferred, and this centre proves to be the person. The exercise of personal agency takes place within a framework of universal intent, the comprehensiveness of which forms the basis for understanding tradition, the social, the political, and ultimately, moral questions around the true and the good. Freedom manifests at the political level in democratic practices; at the level of social organisation, it manifests in autonomy; while at the individual level, it manifests in personal agency. And therefore, just as the argument for autonomy in science is two-sided: setting limits to science and securing freedom within those limits, so the argument for personal agency is also two-sided: demands and obligations are set upon the scientist, within which his or her freedom is constituted. In this articulation of the two-sidedness of agency, the first inkling of a possibly profound psychology within Polanyi's work emerges, too.

In the simultaneous affording of freedom and placing of responsibilities upon the person, the whole range of a person's resources (moral, emotional, intellectual and spiritual) is mobilised. For neither freedom nor responsibility can be experienced neutrally, impassively or non-committally, but these are always experienced as involving one's very person, as evaluative of one's very self: that is, existentially. This existential sense of involvement or evaluation begins from, and/or against – but always *within* – one's social context. The individual's social context sets the parameters and outlines the conditions in which his or her sense of freedom, responsibility and self, develop, and it does so through providing the tacit background of practices, standards, norms, values, and mores, that make the existential commitments meaningful. The development of one's person and agency is inescapably a moral process actualised through commitment. The person emerges as an

independent moral centre through inculcating the standards implicit or explicit in the background. Polanyi will later come to articulate this background as forming the tacit, subsidiary pole of the bi-polar structure of knowing: what the individual *knows from*. Agency – experienced in, and as, freedom and responsibility – is defined within an orientation to supra-personal standards that the person cannot 'know' in any explicit, formal, or critical sense, but to which he or she inarticulately and existentially has already committed *in order to know*. These supra-personal standards, in turn, do not only define the person in relation to the social: they define the social and the personal in relation to the universal. That is, these standards are not upheld by the community or society, or person, as conventions, but as ideals that (are presumed to) hold universally. (In fact, according to the logic of commitment laid out here, to expose some collectively held standard as 'mere convention' presupposes a broader background that situates the standard and defines it as convention; the greatest breadth ascribable to any such background would be one of universal proportions.)

The ideals as 'standards', then, are standards of orientation, which 'orient' a person not primarily in any cognitive, rational or explicit sense, but through demanding one's deepest and hence most inarticulate commitments. If the person is oriented to the highest of ideals, such as truth, goodness, and justice, he or she is put into the position of always at best trying to live up to them. The ideal is never exhausted by a person's actual performance. In making these existential, a-critical commitments one defines oneself in relation to ideals to which one's commitments always fall short. But through these acts – a striving that defines through falling short – one both exercises agency and sets its limits. These acts of commitment, of striving and defining, presuppose a passion animating them even as they also simultaneously set the conditions for the realisation of the moral. Just as an autonomous democratic institution in service to the particular ideals it holds to be universal and normative serves as a check on the power of the state, so too at the personal level does an orientation to higher ideals serve to form and check the range and application of our morality and our passions.

What the person acts from in making these commitments, and what charges the very stuff of these commitments so that they are existential for one's person, experienced as passionate, and moral in their supra-personal implications, are the supra-personal standards of his or her



social tradition without which he or she would have no basis for an orientation to higher ideals. The possibility of realising the universal is always and necessarily inescapably personal, a personal that always presupposes pre-personal social particulars. The universal and the particular, as embodied in the person, are not opposed but inextricable. The inescapability of particularity as the basis for universal intent does not invalidate the notion of universal, but underscores that the intent is always precarious and hazardous, always carrying the risk of failure to realise its intent. The notion of the universal is not invalidated because if it were, neither it nor the notion of particularity would make sense, and this would in effect undercut the very basis for having any coherence, for making any sense, at all.

## Conclusion

Given this three-part recovery of Polanyi, I think we are now in a position to appreciate some of the scope and implications of his sense of personal agency. Polanyi's defence of freedom in science, and by extension freedom in society, depends on an ascription of responsibility to some autonomous centre from which responsibility cannot be further deferred. This centre proves to be that of the scientist, and by extension the person in general, as a free and responsible agent. The scientist's agency is actualised through commitments, moral and existential, to ideals held to be universal, from social standards that orient the commitments. It is only within this framework of universal intent that commitment, and by implication agency, makes sense. Commitment is actualised bodily in terms of the bi-polar structure of knowing, wherein the person knows from a tacit background of subsidiary particulars to a focal entity that is their integration. For Polanyi the experience of this achievement, which is in most cases an explicit achievement, is that personal knowledge of the scientist that is both the foundation of science and that aspires to universality. Within the framework of universal intent, such personal knowledge risks failure and challenges scientific normativity in its potential; through its acceptance, it affords reflection and criticism even as it re-instates a new normativity.

To adequately assess or address personal knowledge claims made within a framework of universal intent, then, requires more than either ideological, external critique, or sociological or 'neuro-cerebral' explanation, as Thomas Kuhn suggested. For regardless of whether the claim realises its universal intent or not, and therefore transforms its

conventional status into the *question* of its universal status – within the person, this would mean transforming one's community conventions; within a social setting, this would mean transforming its cultural conventionality; within a tradition, this would mean transforming its historical conventionality – the assessment of the claim in terms of its success or failure requires a recognition and exploration of the scientist's active sense of agency. This results in an internal critique of science that complements the external critiques and redresses a lacuna within science studies around issues of agency. This would also be an important step in developing an incipient psychology of science that also lacks an adequate thematisation of the person in terms of agency. Retrieval of Michael Polanyi's sophisticated sense of agency articulated around the foci of embodiment and commitment affords a profound starting point for such an internal critique, a starting point that deserves renewed attention and deeper exploration.

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## Notes

1. A brief but representative list of the literature I have in mind here: Barnes (1974), Bloor (1976), Haraway (1991), Harding (1986), Knorr-Cetina & Mulkay (1983), Latour (1993), Latour & Woolgar (1979), Shapin and Schaffer (1985), Woolgar (1988).
2. For example, Grover (1981) offers a cognitive psychology perspective; Keller (1985) approaches science from a feminist psychoanalytic base.
3. Kuhn (1961) explicitly acknowledges Polanyi's providing 'the most extensive and developed discussion I know of ... my apparently strange usage [of paradigm]' (p392), later relegating this acknowledgement unobtrusively to footnotes (Kuhn 1970, 1962), and yet later making a single mention of Polanyi on an unrelated note (Kuhn 1977). Other important influences are also offhandedly acknowledged by Kuhn; most prominently, Mannheim (1936, 1929) and Fleck (1979, 1935).
4. The sad and strange neglect of Michael Polanyi's work in the latter half of the twentieth century requires attention in its own right, but as it is a topic tangential to this paper I do not address it here. The fundamental difficulty Polanyi presents the reader is an originality of perspective outside traditional disciplines and vocabularies. A superficial exposure to his eclectic and idiosyncratic approach to science and social theory can serve to distract from the insight and profundity of his thought. The strategy I adopt in this paper to offset this initial disadvantage is a simple, two-fold thematic breakdown of his work around the focus on agency in order to best suggest the scope and coherence of Polanyi's thinking. A more particulate reading would better delineate my own gloss from Polanyi's work proper, but at the risk of losing the broad scope. Consequently I eschew citation in favour of overview in the hope that what is gained outweighs what is lost.
5. What I am designating as Polanyi's 'first period' in terms of years covers approximately two decades, from the mid-1930s until the mid-1950s. In terms of texts, this period is covered by Polanyi (1940, 1941, 1946, 1951).
6. Polanyi's 'second period' covers the last two decades of his life, from the mid-1950s until the mid-1970s (Polanyi 1959, 1966, 1969). Deserving especial mention for refinement of his articulation of embodiment are Polanyi (1966) and the lattermost essays in Polanyi (1969).
7. There is no mention of Polanyi's work in Merleau-Ponty's writing. The first reference to Merleau-Ponty by Polanyi does not appear until 1964 (Polanyi 1969, 1964), most likely corresponding to the fact that the first English translation of Merleau-Ponty's *Phenomenology of Perception* did not appear until 1962.
8. Polanyi's life story is such that he experienced in turn the emergence of Communism in Russia, fascism in Hungary, and National Socialism in Germany. For biographical information, see Allen (1990), Ignotus (1961), Nagy (1994), Wigner and Hodgkin (1977).

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