Artisanal Knowledge[1]

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Abstract: This essay is about the ensuing problem that in general it is not helpful to talk about non-standard knowledge practices as modeled after our Western ideas of what knowledge is. It negotiates this problem by arguing that artisanal knowledge is an independent and self-contained mode of knowledge and is arranged in three parts. In the first part an outline is given of the key assumptions of the interactionist conception of knowledge that needs to be put in place as an alternative to the basically Kantian mixture of empiricist and rationalist assumptions of the folk model of Western academic thinking about knowledge. In this interactionist conception of knowledge artisanal knowledge gets center stage. In the second part, the notion of craft knowledge is opened up as much as possible. The third and final part takes up the question whether craft knowledge is a cultural universal.

Keywords: *artisanal knowledge, comparative anthropology, epistemology, skills, social theory*

Magis satisfaciums curiositati studentium quam philosphiae. De particularibus enim philosphia esse non poterit. (Albertus Magnus, 1867, p. 383)[2]

I take the human condition to be that of a being immersed from the start [...] in an active, practical and perceptual engagement with constituents of the dwelt-in world. This ontology of dwelling provide us with a better way of coming to grips with the nature of human existence than does the alternative, Western ontology whose point of departure is that of a mind detached from the world, and has literally to formulate it—to build an intentional world in consciousness—prior to any attempt to engagement. (Ingold, 2000, p. 42)

Craft and theory are oil and water (Dormer, 1997, p. 219).

Introduction

The unproblematic claim made in this essay is that the artisanal knowledge conception of the hunter-gatherers is skill based.[3] The contentious claim is that the propositional conception of knowledge cannot account for the artisanal knowledge concept in an adequate way. Hence, in order to open up this kind of performative based knowledge, an alternative conception of knowledge is put forward. Let me pause a moment to explain what is implied here and why I state the issue so strongly. By way of sensitizing the reader to the kind of problem I am alluding to, here is a simple question: 'What does it mean to "grasp the native's point of view"'? According to the anthropologist Evans-Pritchard (1951, pp. 79–80) the answer is "when one has fully understood the meaning of all the words of (the natives') language in all their situations of reference". This answer only makes sense if one accepts what philosophers call the designation theory of meaning. In that theory, the meaning of a word is defined in terms of what it designates. More technically: knowing X is having a correct representation of X. However, construing the knowledge of, for example, Polynesian navigators in terms of representations makes no sense. Theirs is very much an embodied and ritualized performance, an attentive coping in the world, which needs to be understood as a practice or skill, that is, as a way of going about things.[4]

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[2]   Translation: "I am satisfying the curiosity of students rather than philosophy, for there can be no philosophy of particulars".

[3]   There are numerous books, mostly ethnographies, which provide evidence for this claim. Of the books of more theoretical leaning, I recommend Ingold (2000) and Turnbull (1991). An interesting collection of essays can be found in Harris (2007).

[4]   On Polynesian navigation, see Lewis (1994), and Turnbull (1991); on the skills required on sea in general, see Hutchins (1996).

The problem is not only that propositions are different from skills—this is usually phrased as the difference between knowing how and knowing that—but that the two models behind it are based on incompatible assumptions. For example, because a craft is at once a form of knowledge and a form of practice it is monistic in a way propositional knowledge is not (Ingold, 2000, p. 268). Propositional knowledge assumes a dualistic split between reason or intellect on one side and cosmopolis on the other.[5] It is this dualistic split that underwrites the traditional empiricist view of perception as involving distinct or distinctive phases of sensation and cognition. Perceptual experiences arise from applying rules or concepts to putatively meaningless collections of data gathered at our sensory receptors. In this model experience is measured against the world of nature. This picture is totally at odds with the one that emerges when skills are taken as the constituents of knowledge. If skills are taken as a starting point the world of nature is apprehended by dwelling in it. Experiences, especially the regularly recurring ones, are intrinsically tied to surrounding conditions.

At the core of what I call the academic folk model of knowledge are three key assumptions:

1. The unit of knowledge is a proposition. A proposition is a declarative sentence with a well-defined truth content—a sentence that is either true or false;

2. There is a dualistic split between reason or intellect on one side and cosmopolis on the other;

3. The cosmopolis cannot be understood (or acted upon) by direct sense perception. Concepts and categories of meaning are imposed on sense perceptions.

Understanding indigenous practices in terms of this academic folk model is troublesome to say the least. It is not just indigenous knowledge practices that come out scrambled. Take the attempt of Charles and Janet Keller to come to terms with what goes on in the blacksmith workshop in their *Cognition and Tool Use* (1996). (The book is based on first-hand experience of Charles Keller as a blacksmith.) To do so they develop a theoretical framework, which, they claim,

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[5]   'Cosmopolis' is my term for what philosophers normally refer to as the world 'out there'. Because different civilizations construe it differently there is a need for a more general analytical concept. Think about the cosmopolis as an in the first instance undifferentiated and seamless conglomerate of forces, social as well as physical and allow for a localized 'colorization' of it that can be called "X's version of nature". The various local versions will cut it up along different lines and will stress different aspects of it. The whole point of the agnostic attitude that is packed into the notion cosmopolis is that it is neither taking recourse to pre-given scientific models nor relying on a priori definitions of the categories to be used in any comparative analysis of knowledge practices.

allows them to do justice to the peculiarities of craftsmanship of the blacksmith. The second tenet of their programme states that there is 'a dialectic between knowledge and practice that gives an emergent quality to accomplishment' (Keller & Keller, 1996, p. 14) or their third tenet states that 'conceptual thought […] complement[s] and interact[s] with propositional components of knowledge' (Keller & Keller, 1996, p. 15). But these two tenets only make sense if you accept the academic folk model of knowledge. What the Kellers apparently are not able to see is that with craft knowledge there is no extra bit of knowledge that is propositional or that there is no dialectic between knowledge on the one side and practice on the other. The reason why there is no dialectic is that a skill is both practical knowledge and knowledge practice at the same time.

To understand the non-standard knowledge practices like the Polynesian art of navigating in a sensible and constructive way one needs a conception of knowledge that allows performative knowledge to be a self-contained unit of explanation—a unit that is fundamentally non-cognitive and deeply conventional. This is no small requirement for it implies

a) rejection of the idea that the formal conceptual analysis of the epistemologists, located in the logical realm of the philosophical a priori, exhausts all there is to knowledge;

b) rejection of the logocentricism of the Western tradition. This Western logocentricism demands that the external world needs to be given a conceptual expression before it can be acted upon. This implies the rejection of the derisory view of action as the 'mere' mechanical execution of the content of mental representations.

This paper is informed by the idea that most—if not all, but how does one argue that?—of the non-Western knowledge practices are best understood via a conception of knowledge that puts center stage the idea that knowledge is about the intervention and manipulation of the 'world out there'. The structure of this paper is as follows. In the first section an outline is given of the key assumptions of the interactionist conception of knowledge that is to replace the basically Kantian mixture of empiricist and rationalist assumptions of the folk model of Western academic thinking about knowledge. In this interactionist conception of knowledge craft knowledge gets center stage. In the second part, the notion of craft knowledge is opened up as much as possible. In the third and final section, I will briefly discuss the question whether artisanal knowledge is a cultural universal. For stylistic reasons, artisanal knowledge, craft knowledge, and skills are used as interchangeable terms.

Before getting on with this huge task one final important remark is in order. Of course I am aware of the many studies within STS that reject one or more aspects of the academic folk model of knowledge.[6] Does this invalidate my broad use of the proposition model of knowledge? Naive falsificationism never was and still is not a sensible position. At my university, I am one of the many people involved in teaching methodology to first-year social science students. The hard-core conception of science taught in that class is at best a nuanced version of the received view and most of these students are never taught anything else. For them Popper, Kuhn and Lakatos could just as well be names of distant solar systems. To make sense of what my faculty is doing, Fuchs's (1993) idea of 'Positivism as the Organizational Myth of Science' has to be invoked.

If Archer in her *Culture and Agency* proposes to make the "intelligibilia, i.e. all things capable of being grasped, deciphered, understood or known by someone" (Archer, 1988, p. 104), and which she describes as a society's "propositional register" (Archer, 1988, p. 105), as the sole constituents of culture she is correcting spelling out the implication of this myth has for comparative anthropology. This paper originates in my realization that this myth with its central assumption that propositions are the constituents of knowledge makes nonsense of any skill—by implication Archer's theory would do the same. However, the crucial question is this: is the set of assumptions that Archer is relying on wrong? Is Whitehead (1978, p. 30) wrong when he writes that "philosophy is explanatory of abstraction, and not of concreteness"? Is Jullien (2004, p. 23) wrong when he points out that Western thinking has been crippled by the "inevitable inferiority ascribed to practice as opposed to theory"? Is Sir Peter Strawson (2004, p. 7) wrong when he argues that propositions are "irreproachably respectable"?

I am writing this paper as anthropologist of knowledge whose primary interest is to understand different knowledge conceptions and how they are tied to specific cultural assumptions; my job is not to pass judgment on them. (An awkward position for sure but one that anthropologists are familiar with. "The history of anthropology is a sustained sequitur to the contradiction of its existence as a Western science of other cultures" [Sahlins, 1976, p. 54])

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[6]   The stress on interaction and practice as being the key to knowledge finds support in recent work such as Gooding (1990), Hacking (1983), Rouse (1996) and Pickering (1995) or older work such as Ravetz (1971). Shapin and Scheffer (1985) is one of the first case studies to use this perspective. An interesting case study, because based on actually repeating an experiment, is Sibum (1994; 1995), Golinski (1990) outlines the emergence of this perspective in recent science historiography; Tiles (1993) assesses the philosophical implications of the recent interest in experiments. On the craft dimensions of such highly abstract and supposedly universal activities as mathematics see Warwick's (1992; 1993) two part essay, and Raven (1996) for logical inference.

Whitehead and Albert Magnus (see epigraph) seem to be clear in that philosophy deals with the general—generality as transcendence of the obvious—and not specifics. In my reading of the history of Western thinking this is not an accidental coincidence but related to the rejection of the idea that all there is to knowledge is what Aristotle called φρονησις (*phronēsis*, practical wisdom) or εξις (*hexis*, possession of a socially embodied practice acquired through habituation). Instead the Western tradition went for *epistêmê equals alêthês doxa meta logou*, 'knowledge is true judgement with an account' (Plato, *Theaetetus*, 201c5–d6). The propositional account of knowledge is the best available account of this idea that knowledge is about statements with specific truth claims. This explains the commonly held derisory view of artisanal knowledge for it cannot classify as knowledge because truth does not come into equation.

The propositional account of knowledge is the kernel of the academic folk model of knowledge in the sense that it is the articulation of the prescribed and idealized conception of knowledge. Whether it is empirically adequate is an altogether different matter, which as an anthropologist of knowledge I can safely leave to others to worry about. All I want to do here is provide a framework to understand artisanal knowledge.

I
Interactions with an environing cosmopolis

Craft knowledge, that is the ability to manipulate things and transform them into an (endurable) artifact, will be put at the heart of the alternative for the academic folk model of knowledge.[7] To make room for this alternative conception the idea that knowledge is acquired through observation—detached contemplation might even be a better concept—needs to be replaced by one that puts interaction with an environing world as a starting point. In passing, I like to point out that this environing world is literally a cosmopolis—that is, an undifferentiated and seamless conglomerate of forces, social as well as physical. Actions are by definition inter-actions. To give actions analytic primacy implies that neither the

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[7]   In this essay, I will concentrate on the manual work required in making an object, for in general that is what artisanal knowledge is about. However, in the final instance one has to allow for a rather broad understanding of 'making an object'. Although in general the object is a material artifact, it might equally well be a dancing performance or knowing the Qur'an by heart; in which case the body itself becomes a 'work of art'. What these 'objects' have in common is the skill required to perform them is based on a practical mastery, sedimented in the body through going over the same routine again and again.

individual nor 'reality out there' can be considered in isolation. Human agency is as a matter of course put back into the picture. Because actions are always locally situated, the knowledge-making process becomes stained with the peculiarly local touches as well. The distinction between knowledge (being by definition general) and experience (being by definition particular) collapses into 'all knowledge is local', because it is lodged locally in the hands of the practitioner. Artisanal knowledge travels best through accomplished practitioners. Multiplication of context is what explains the generality of knowledge. Knowledge as construction replaces the idea of knowledge as representation. In Vico's famous dictum: *verum esse ipsum factum*, the truth is what is made.[8] The radical idea here is that the only reality with which an inquirer can have any commerce is reality as he constructs it to be. This obviously deeply affects the notion of truth. The issue here is not the moral aspect of truth as a sincere dialogical utterance that is believed as long as it is upheld—that is left intact—but what is effected is the idea that truth is something radically non-epistemic; truth as correspondence is deemed to be a flawed concept, for the straightforward reason that the evidence-transcending meaning surplus of the notion of the truth 'being out there' cannot be substantiated in an intelligible way.

Realist philosophers always worry about an independent ontological realm. What happens if 'looking' is to be replaced with interactive manipulative skills is that on the level of interaction with the world an inquirer is in contact with the world, like a blind person is with his cone? The cone, like the craftsman's hand, is an instrument for coping. Coping is about navigating oneself through a universe shot through with contingency and as such requires a lot of ad hoc improvisation and this makes it very much like a skill. But, as Heidegger argued in his *Being and Time*, coping is not mental, cognitive, or epistemological at all.[9] So the argument is that knowledge produced through interaction is ontological— what we can manipulate and what resists is real in an ontological way. Because our practical manipulative skills have an important amount of autonomy with

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8   Literally, 'The true is the thing made itself'. The places where Vico explores his *verum ipsum factum* argument are *De Antiquissima Chapters 1 and 3, Scienza Nuova Book I, Section 2 and Degli elementi* Section 14.

9   The famous Heideggerian inversion of the tradition amounts to making epistemology derivative to an involvement, a practical dwelling in the world. This involvement, this engagement, is a relation to what is available (*zuhanden*); it is an ontological relationship with the world. In the abstruse language of Heidegger (1962, p. 101) himself, "Readiness-to-hand is the way in which entities as they are 'in themselves' are defined ontologico-categorically". The distinctive trait of the pragmatic theory of knowledge is not that knowledge is in the interest of action but that knowledge is constituted by action. It follows from this that it makes sense to read Heidegger as a pragmatist. If we define the cognitive strategy of traditional epistemology as trying to understand knowledge in terms of aiming at a high probability of truth, deeper understanding and better explanation, then pragmatism is a non-cognitive strategy because it rejects all of these things and simply goes for instrumental efficacy, that is, programmatic success.

regard to epistemology, the claim is that (a) there exists a realm of reality that is independent of our cognizing powers and (b) through our evident ability to interact with it one can be sure it is within reach. Besides, by far the easiest way to account for the tentative character of our knowledge is to assume that there exists an ontological domain independent of all our conceptual representations. We may always be wrong because reality turns out to be different than we thought, and, equally, not anything goes, for reality does constrain things.

Situated mind

There is still a traditional philosophical air to the argument so far, in that implicitly I am still holding on to this ideal type of a universal epistemic subject that is completely disembodied and disembedded; in other words, the story I have been telling so far is still about an ahistorical individual who is not situated in the world he or she lives in. There is truth in that so let me remedy this by exploring the implications of the interactionist theory of knowledge for a theory mind. I start with suggesting why there is room for serious doubts about the thesis of psychological unity, that hallmark of the comparative method of anthropology and the cornerstone of 'The Enlightenment view of man' (Stocking, 1982, p. 115).

The thesis of psychological unity is parasitic on a particular theory of mind that is implicit in one's epistemology. The implicit theory of the mind in Locke (1975) is that of a passive conception of the mind: 'In the reception of simple ideas the understanding is most of all passive'.[10] If you accept the Lockean framework, you end up with the psychological unity of humankind as a matter of course. So why are at least some people contemplating giving up this almost sacred article of faith—the psychic unity of mankind? Well, for the proper reason that it no longer squares with what we know about the mind. The key idea of the psychic unity of mankind is the idea of the uniformity of the human mind. If we leave aside the question whether or not the brain secretes the mind, the idea is that

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[10]   See Locke, 1975, II.i.25; The passivity of the mind is central to Locke's empiricist philosophy in the sense that only by having the mind not intervening with the cognition of the (simple) ideas can he argue that "ideas in the intellect are coeval with sensation" (Locke, 1975, II.i.23), and this is central to his whole empiricist critique of the Cartesian idea of innate ideas. There is a twist of history in all of this. Locke's personal library was stocked with a large collection of travel literature (far beyond of what was average at the time) and he drew heavily on these sources to substantiate his view of the mind and critique of the doctrine of innate ideas. But "if the anthropological evidence supports Locke's ideas of the mind then Locke's account of the mind is compatible with cultural diversity that the world exhibits" (Rogers, 1993, p. 82). My argument obviously is based on the reverse situation.

the uniformity of the mind results from the universal features of a common biological nature. In modern parlance—human beings are wired up in the same way. But recent research into the ontogenesis of the brain suggests that this might not be correct; even in the case of genetically identical twins their brains are different. Here is how the argument goes. The synaptic connections needed for nervous tissue to have any adaptive function receives its organization not from genetic instructions but through interactions with the local environment (cf. Donald, 1991; Edelman, 1992). Vygotskian developmental psychology, which originates in Russia in the thirties of the last century, would give you a compatible result. The individual human being owes his or her psychological make-up to the appropriation of strategies and conversational modes that are available to him or her in the public domain he or she is interacting with. This is what is generally called internalization—the internal reconstruction, through appropriation of external operations. The intra-personal processes are appropriations of interpersonal ones. The individual psychological make-up is, at least in Vygotsky's view, a semiotically mediated product of the historically conditioned social consciousness. The typical Vygotskian idea that consciousness is 'an attribute of the organization of practical activity' implies that 'consciousness changes as the organization of practical activity changes' (Lee, 1985, pp. 67, 68). In Vygotsky's own words, 'If ones changes the tools of thinking available to the child, his mind will have a radically different structure' (Vygotsky as quoted in Crain, 1992, p. 200).

With this in mind now look at the following results of experiments with aboriginal children of desert origins and 'white' Australian children of European descent by Kearins (1981; 1986). Children between the ages of six and seventeen years were presented with different-coloured items displayed on a board and asked to recreate the arrangement after the items had been randomly piled up and placed together. Two interesting facts emerged. First, the aboriginal children consistently outperformed the Australian children of European descent. Second, the two sets of children used different strategies to accomplish the set task. The Australian children of European descent employed verbal mediation—rehearsing lists of verbal labels— whereas the aboriginal children showed little evidence of using it. Instead, they seemed to rely on visual strategies normally used in finding their way about in the desert. So here we have two groups of children who end up with a completely different psychological make-up and hence functioning of their mind because they live in totally different environments in which completely different demands are made upon their visual spatial memory.

Diederick Raven

Autopoiesis of the situated mind

Carrithers, in his *Why Humans Have Cultures*, tries to make a case of sociality being the genetically programmed disposition of a human to become a social being—humans are by nature social—because an individual growing up under normal circumstances cannot help but find herself engaged with others in the process of becoming a self. Except for autistic children, who are most likely to have a genetic defect that impairs their potentiality to engage in enduring interaction with another individual, sociality happens as a matter of course.[11] A child is born into a whole network of relations with others and ideas held by those who are obviously 'definitely independent' of the child. Sociality makes sure that a maturing child cannot do other then enter into a manifold of relations with others. The reason why I mention this is that this engagement with others, this creating of relations with them, is of crucial importance to the human autopoiesis, or self-creation. The mind is formed through the lived engagement with the peopled world, or more generally, with the environing cosmopolis. The mind, in other words, is the emergent product of a continual process of becoming and has to be understood as the emergent product of its becoming. Because the individual relations any child develops over time with the environing cosmopolis are different from one another, each individual mind is different. One obvious difference, for example, between girls and boys is that the relations are gendered, creating a clear difference in the way they bond with the cosmopolis. One final remark is that the process of human autopoiesis is not accurately characterized as socialization (Toren, 1999, p. 18). Socialization encourages one to see culture as molding the person into its mirror image and tends to give you cultural dopes. That is not how autopoiesis works. The difference with the socialization process is the active engagement with and active appropriation of the manifold external relations with the environing cosmopolis.

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[11] Carrithers's position on sociality only makes sense if one is willing to accept the orthodox neo-Darwinian view on the genome as a programme of specification. On this position the development of the organism is explained as a reading off of the epigenetic rules for the phenotype. But this makes biology as logocentric as cognitive psychology, linguistics and epistemology for it assumes that a design, in this case the genome of the organism, contains the specification of the organism and explains what and how the organism is. As Ingold (2000, Part III) has argued persuasively, if one rejects the logocentrism of cognitive psychology and epistemology then it needs to be rejected in biology as well. The alternative picture that he presents is one in which organic form is not seen as the property of genes but as "generated […] in development", as arising "as an emergent property of the total system of relations set up by virtue of the presence and activity of the organism in its environment"; see Ingold, 2001, p. 122. In this view development becomes an emerging property embedded in the field of interactions between the organism and its environment; development is the link between the genome and the organic form. In order not to burden this essay with the need to argue the validity of yet an additional radical break with tradition I will simply accept Carrithers's interpretation of the notion of sociality as correct and ignore Ingold's fundamental objection to it.

II
On artisanal knowledge

In this part of this essay, I will try to analytically open up the notion of artisanal knowledge.[12] Writing about craft knowledge is difficult because one must somehow negotiate the non-linguistic side of any practical activity. By this I mean two things. Language, with its linear and sentential structure and its assumptions that concepts are like dictionary entries, is not an adequate model for understanding performative behavior. Describing a sensorimotor activity and just performing it are not on a par; this mismatch is known as the 'phronetic gap' (see more of this point below). Like anyone else trying to analytically open up craft knowledge it helps if you have some first-hand experience with at least one domain of it. Mine is based on my experience as a junior chef.

"The Greek term for Art (τεχνη) and its Latin equivalent (*ars*) […] were applied to all kinds of human activities which we would call crafts" (Kristeller, 1951, p. 498).[13] Artisanal knowledge or craft knowledge is my term for what is variously called 'techné', 'indigenous technical knowledge', 'folk wisdom', 'metis',

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[12] At this point I want to draw attention to an ironic feature of this essay: I am arguing the fundamental significance of skill for a general theory of knowledge and I do so in a traditional philosophical way, in other words, by providing a conceptual analytical framework that allows me to talk in detail about skills. But skills are not theoretical in the way propositions are. Hence talking and writing about it in the way I do has a hollow ring to it. Anyone who is thinking along these lines needs to remember that the aim of this essay is purely theoretical. Because the propositional conception of knowledge cannot account for the artisanal knowledge concept in an adequate way an alternative theory is required.

[13] Kristeller's point that historically techné and arts signified the same thing still holds true when Samuel Johnson, in his Dictionary, defined craft as a 'manual art', but it no longer does now. (Interestingly for Johnson the semantic depth of the notion of craft is such that as a second meaning he mentions 'fraud; cunning; artifice' and he even has the adjective of 'crafty', meaning 'cunning; artful full of artifices; fraudulent'. The closest the OED comes to it is rendering 'crafty' as 'cunning, artful, and wily' but which usage is described as ME. We have lost that meaning dimension of the word, but something of it remains in the notion of 'trick of the trade'.) That is to say, that craft has 'become a loose kind of craft' (Dormer, 1997, p. 218). In the last century, the arts set themselves on a course of separation from the crafts. Arts and craft are now seen as fundamentally different activities. The crafts are seen as the physical expression of a mental idea. Craftsmen are looked down upon as 'virtuoso twiddles' (Dormer, 1994, p. 87), and the artists see themselves as creative people who have an idea; they are 'conceptual artists' and pride themselves for not knowing the crafts. For the philosophical underpinning of this downgrading of skill and the upgrading of the conceptual, see Collingwood, 1938. On the historical change, see Farr, 2000; Greenhalgh, 1997, and Rancière, 1983; Lucie-Smith, 1981, is a history of craft that acknowledges other artisanal traditions than the European one. That a signifier has no stable reference over time is of course nothing new, it merely reflects the inchoate and by no means internally integrated rhizomic features of human life. However, it signals that there is a need for being clear in one's terminology. I will use 'crafts' as 'dexterous coordination of perceptual and sensorimotor activity', that is as 'manual facility'; craftsmen are manual manufacturers; artisan is for me a synonym for craftsmen. Historians and sociologists of technology have taken fancy of the word design over that of artifact. I am unhappy with the use of that notion instead of artifact. The roots of the word design are to be found in the Latin word disegno, which means drawing. For me it still carries the connotation of preparatory drawing or preparatory work in general. In this essay, I will only use the word artifact to refer to the manufactured product.

'tacit knowledge', etc., and refers to a wide array of practical, sensorimotor skills and acquired intelligence that emerges in reciprocally constituted tinkering with and transforming of one's social/physical environment. Artisanal knowledge is immensely powerful in that it gets things built and consists mostly of hands-on experience. This hands-on experience is a stock of sediment knowledge, sedimented from experience; the experiential nature of craft knowledge can therefore never be in doubt. Craft knowledge embodies the ability and experience necessary to influence the outcome—to improve the odds—in a particular instance and is guided by rules of experience, known as rules of thumb; they depend on a close and astute recognition of recurring patterns in our environment. Artisanal knowledge is embedded knowledge and embraces experienced intuition of tinkering with one's environment. At the heart of a skill is knowing how and when to apply rules of thumb in specific situations. Craft knowledge is practice in the sense that it is the ability to act and accomplish practical tasks. It is this practice side of artisanal knowledge that resists discursive articulation.

Why does artisanal knowledge resist complete description? Why is it so "difficult to write or even talk about [it] with clarity and coherence" (Dormer, 1997, p. 219)? One reason might be the inherent static nature of the analytic language categories that are brought to bear on describing a performative task. Its accomplishment is spread out in time. If we could change our language habits in such a way that when dealing with performative actions we would speak of flows, contours, intensities, and resonances instead of ideas, concepts, categories then at least it would be easier to include the spread out temporal dimension of sensorimotor skills (e.g., Gatewood, 1985, p. 216 entertains this interesting suggestion). Another reason is the existence of the 'phronetic gap' that indicates a mismatch in economy of scale between describing a sensorimotor task and just accomplishing it. Here is an example taken from Dormer in his attempt to master the art of lettering.

> To draw a capital letter C to fit the lower case Johnston foundational alphabet, you are essentially trying to ensure that at both open ends of the C the line is flattened away from the course that a true circle would take. This move away from a true circle creates the 'right' internal shape. There is no word for this 'right' internal shape (even if there was it would not help) (Dormer, 1997, pp. 46–47, emphasis added).

Let us say that making the 'right' internal shape is known in the lettering trade as "to breaf" a letter. So what Dormer finds difficult is "breafing" C. Having a concept available is of no use to him because it provides no clues on how to do

the "breafing". So what having a concept available allows him to do is to put into words in a compact and straightforward way the task he has to fulfill (the "breafing" of C) but the actual accomplishment is a completely different thing altogether. Describing it would require a tediously detailed description of the sequence of actions that go into it. Would this be of use? Yes and no. Yes, in the trivial sense that any opening up of the wizardry of a craftsman's skill is helpful to an apprentice. No, in that it does not take into account the fluency in the execution of the sensorimotor task. The fluency, on which I will say more below, is the result of years of training and experimenting and results in having a feel for the job at hand, which shows itself at sometimes very minute details, which in all likelihood will escape even the most detailed description. Showing it on film would at least make it more commensurable with the performative action and as such might be more useful.

So if I have to describe in words what "thickened" cream is—not fully whipped cream that is slightly stiffened up; the sort of cream that goes on top of a traditionally prepared Irish coffee—I prefer to show it. Not only is that much easier, it is most certainly much quicker and I would be more confident that you would have grasped what I meant. To the extent that practical tasks are made up of strings of sensorimotor tasks, the description of these sequences of actions, all learned largely by accretion on previous ones, obviously becomes difficult—and this is clearly an understatement. The inference I draw from this is twofold. Firstly, that artisanal knowledge is necessarily implicit and partisan as opposed to generic knowledge. Secondly, that craft knowledge is largely non-linguistic in the sense that there are no common words available for describing it. The stress is on common words, for clearly there are words. At least they could be made up, as I have done above, but they lack a generally shared meaning and hence become close to private utterances, in which case, as Wittgenstein showed in his anti-private language argument, the communicative dimension of language functions evaporates.

The sensorimotor dimension of craft knowledge is often so implicit and automatic, that its bearer is at a loss to explain it and it defies being communicated in written or oral from. This defiance of artisanal knowledge to translation into a codified form explains the notoriously idiosyncratic language used in attempts to verbalize those vital aspects of the stock of sedimented knowledge that serve as resources in the making of a device.

Because much of the details of form and process of hands-on knowledge elude discursive articulation, it is extremely difficult to learn a skill apart from engaging

in the activity itself. The trick of the trade cannot be learned by discursive teaching but is learned very gradually through imitation and tentative participation—it is only learned through monitored participation. An enormous amount of artisanal knowledge is "learned, stored, and transmitted by experiential learning, visual/ spatial thinking, and analogical reasoning" or, to put it differently, apprenticeship learning relies on the assumption "that knowledge, thinking and understanding are generated in practice" (Pfaffenberger, 1992, p. 507; Lave, 1990, p. 310). This explains why most crafts and trades requiring a touch or feel for implements and materials have traditionally been taught by long apprenticeship to master craftsmen. This process of enskilment is all about "personal contact over a long time with opportunity for repetitive imitation of each process" (Harvey, 1975, p. 48). Enskilment is about attention education, that is to say, about developing a "sophisticated perceptual awareness of the properties of [the apprentice's] surrounding and of the possibilities they afford for action" (Ingold, 2000, p. 37). This education of attention involves training of all the senses and learning of specific pieces of information and techniques. Some of them require artisanal knowledge that is learned through familiarity, and is grounded in sensations; it consists in expert sensuous knowledge acquired through constant exposure to a subject and a gradual tutoring of one's senses and makes what in normal parlance is called a connoisseur.[14] In the rest of this paper I will simply assume that in the sensorimotor skills that are needed to manufacture something there always is an element present of these tutored senses and will not dwell on them in any detail.

Artisanal knowledge is acquired slowly and learned in a relatively primitive fashion. The novice learns the skill by watching and then copying as exactly as possible what he has seen his master doing. The route of learning is one from the periphery to the center of the activity. An apprenticeship starts with sometimes long periods of low-level participation in the daily routine of the workshop and doing manual and routine work and learning through watching and giving the occasional 'helping hand'. This 'helping hand' element reflects the 'string of beads' aspect of how craft knowledge is constituted.[15] It reflects the bewildering mêlée of sensorimotor tasks, which in a number of cases may require dexterously coordinated sets of muscular acts. Tennis players require a very high degree of finely tuned hand-eye coordination patterns. Apprenticeships are made up of learning these tasks. Learning these is done in a relatively primitive fashion by repeating the basic actions and sequences again and again and again. This going-

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[14]   On the distinction of learning artisanal knowledge through familiarity and through doing and making, see Janik, 1988.
[15]   I owe this notion to Gatewood, 1985, p. 206.

through-the-motions element of apprenticeship shows that learning a skill is nothing other than learning a long chain of sensorimotor tasks. This clearly is a slow, a very slow process indeed. Why this is so, see below. Through this act of indwelling does the apprentice acquire the occupational specialties, which require long familiarity with materials and the (sensorimotor) skills to manipulate them in the appropriate manner.

> This period of routinized low-level participation acts to lay down a basic framework of implicit meanings and premises, as well as of schemata which integrate the mental models and physical skills that are an indispensable preliminary to mastering the more complex aspects of a craft' (Goody, 1989, p. 247).

The relation between external events (enactments) and internal representations is one of a continuous feedback in both ways: from internal representations to enactment and vice versa. Continual learning is a potential consequence of this dialectical interaction, for the essential dialectic between internal representations and enactments allows for the growth of new craft knowledge and the revision of old.

The aim of the apprenticeship learning is to close the gap between knowing a craft's shorthand rules and its accomplished performance. The litmus test for craft-knowledge is practical success. But acquiring a skill is not merely being able to achieve the required result. It also involves the knack of fluency. Fluency, the automation of knowing what to do next, calls on considerable self-discipline. Without skill, smoothness of execution does not come easy. This is what Greene's remark "Your easy reading is my damn hard work" tries to convey. It also relates to the confidence one has built up over the years to find solutions to recuperate situations when things mess up. Part of one's expertise shows itself in recognizing these situations more quickly.[16]

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[16] A possible critique might be that up till now I have presented a disembedded portrayal of craft knowledge. This critique misses the point. I know that artisanal knowledge is situated and embedded in a social context which has its own 'cultural logic', imperatives, and layers of meanings attached to how and why you do (or do not) particular things in certain ways, who is licensed to execute them, and so forth. I have not alluded to this whole setting separately because (a) it is not distinct from the practice and skill and (b) because it can theoretically be covered by the notion of design, that is, the preparatory work that goes into the actual manufacturing process. For the outsider it may not always be clear which bit of the environmentally situated activity is part of it and which not. Richards (1993, p. 65) has this wonderful example of rice planting in Mogbuama (central Sierra Leone) which is accompanied by drumming which assures that per hour 20% more ground is covered than without drumming.

Mental templates

The crucial thing of this exposition is that these practical solutions are produced independently of and without the benefit of scientific method and generally valid principles. The master builders of the Milan Duomo were right when they emphatically stated in 1392 "*scientia est unum et ars est aliud*"—science is one thing, technology quite another.[17] Any suggestion that artisanal knowledge will in due time transform itself into scientific knowledge, which is explanatory and epistemic, is implausible.[18] Craft knowledge is practical and indifferent to epistemological worries whereas scientific knowledge is theoretical, and epistemological issues do have a bearing on it. I want to argue this point by exploring in some detail the mental models that one builds up in learning a craft.

Craft knowledge is the know-how of practical thinking and tinkering. What can be said about the mental picture that one builds up? As a first approximation, I want to take this mental realm as made up of knowledge of past projects. Because so much artisanal knowledge is made up of sensorimotor tasks, I suggest theorizing it in terms of a constellation of mental templates.[19] Dormer takes as its constituent elements recipes, jigs and schema, which suggests that it consists of what psychologists call scripts. In his view the memory of a particular sensorimotor task "is a sort of jig to hold in the mind and use". Here is why I am inclined to accept Dormer's position.

When I worked as an apprentice to a chef in a restaurant, one of the things I had to learn was cutting up onions. I am not going to argue that this task in itself is difficult—refrain from jumping to conclusions too soon!—but the reason I was set to this task is important for now. I had to learn to use the kitchen knives

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[17] *Annali della fabbrica del Duomo*, Vol I, pp. 209/10, quoted in Cipolla, 1993, p. 230. An insightful popular narrative of the building of the Cupola of the Duomo is King, 2000.

[18] This is a crucial flaw in, for example, Zilsel's argument on the emergence of modern science; see Zilsel, 2000, Part I.

[19] I have taken the notion of mental templates from Dormer, 1994, p. 42. Suppose for a moment I would have chosen to use the word techné instead of craft. The problem then would have been to describe the theoretical dimensions of techné. The obvious word to use here would be 'technology'; Koyré (1948, p. 628) uses the notion of 'technologie' in this way. Since the original meaning of this English word has long been lost this option is no longer available. It is exactly because I wanted to stay out of this conceptual muddle that I used the notion of artisanal knowledge instead. To put a less fine point to it, in my view the concept of 'technology' is a fake one because the word technology gives the wrong idea. It suggests that technology is the study of something or other, like anthropology, which is the logos of anthropos, the study of men. Circumlocutions as engineering science or technological science are oxymora to me. This is not to say that with the invention of techno-science the science-technology relation may not have become much more complicated. In new fields like nanotechnology the tinkering and thinking are now so seamlessly intertwined that for all intent and purpose it probably no longer makes sense to even try to separate the two.

in such a way as to minimize the risk of cutting myself. The trick is to set the knife parallel to the second set of phalanges of the hand that tries to keep the onion in place. This requires reprogramming of holding things when you cut them up, and hence it takes time and does not come easy; you normally try to hold things steady by controlling them while your fingers are only slightly bent. What I needed to learn was, when things needed to be cut up, to grab them automatically in such a way that the top of my fingers were bended into the direction of the palm of my hand, without losing grip of the thing I was holding. The chef who showed me how to do it, of course just showed me by cutting an onion, holding it steady all the time, making slices in all three dimension while at the same time keeping all slices together. I have never been able to copy this to the full, but to this very day I still have very vivid memories of this instruction.

While training myself in using the kitchen knives properly I would every time go back to this 'mental film' that captured this instruction and try to re-enact it. This 'mental film' is a mental template; it relates to a little task, a single bead of the string of beads that make up the execution of complex sensorimotor tasks. With a template you have the memory of the sequence of movements that go into a particular task and it allows you to use them as a resource to help you improve your performance. When something is difficult you use the mental template as an instruction device and articulate aloud what your mind's eye sees and in that way you become your own tutor. This also explains the tunnel vision of a novice who can only accomplish the task set to him if he ignores everything else around him. If he does not put his mind to the job completely he most likely messes up. A consequence of this is that the concentration on a skill is about getting your mind set to the template and re-enact it physically as close as possible. Mastering a skill requires the manual and mental to merge seamlessly; in other words, a skilled craftsman is literally living his body of knowledge. Competence is reached when the execution of the string of beads of little tasks has become fully automated. A set task can then be performed without an obvious reliance on the templates that one once used to learn it. After this point the execution of the action becomes difficult to explain even to the skilled performer himself. He becomes an acting-system, driven by 'phronetic insight', which apparently operates without a discursive set of rules.

The idea of a constellation of templates is: the mental realm with templates of the sensorimotor tasks is nothing other than a constellation of these initially quite simple templates. A skilled craftsman builds up ever more complicated templates, part of which are tinkered out of the ones he or she already had

mastered, part of which are an extension of older ones, or simply strings of the existing one, etc.

That these templates never come close to theoretical knowledge, whichever way that term is understood, I think should be beyond dispute. They never are even close to providing a conceptual illumination. Surely, one could argue, part of crafts knowledge consists of such things as heuristic principles, rules of thumb, etc? There is no way of denying that, but what does it imply? Here is Lucy Suchman's suggestion: rules of thumb "are resources for situated action, but do not in any strong sense determine its course". This explains why the efficiency of rules of thumb do not represent the practical actions and circumstances in any detail. Once you are in the thick of the action you quite easily forget about them and "fall back on whatever embodied skills you have available to you" (Suchman, 1987, p. 52). Therefore, the suggestion is that rules of thumb "furnish practitioners with a way of talking about what they have done, or about what they mean to do next" (Ingold, 2000, p. 35). Or, if I may add, what cannot be done.[20] Hence the inherent vagueness of these rules of thumb—they hardly ever specify concrete details for actions and are never a problem in either drawing up plans or in conversation. The conclusion therefore must be that in action a craftsman does not fall back on these rules of thumb but on the developmentally embodied and attuned capacities to move on with the task at hand. While accepting this I would like to add a Bachelardian touch to it: artifacts are reified rules of thumb. By this I mean that the very ideas, experiences, facts, etc. which are articulated in these rules of thumb are materialized in the artifacts. This discussion confirms what history of the crafts tells us: These rules of thumb are not even close to any form of theoretical elucidation, if that notion is at least understood in the common sense way of the abstract, conceptual, understanding of a phenomenon. They were never meant to fulfill such a function in the first place.

Let me come to a conclusion of this part of my argument (see Table 1). While learning a craft, artisanal knowledge is present in the mind, as a constellation of mental templates. Artifacts are normally discussed and judged by others and stories are built up around the object and hence around the mental templates.

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[20] In the fifteenth century, Italian artisans knew, as a rule of thumb, that a siphon would not "siphon", or function properly, if the water column it has to "uphold" is over 12 meters. This rule of thumb had proved itself time and time again and the artisans knew there was no obvious technological way around it. We, living in a science-based knowledge society, are almost automatically inclined to understand this rule of thumb as an empirical generalization. If the suggestion of Suchman and Ingold is accepted, one is forced to conclude: wrongly. Because there was no technological fix around it the artisans turned to the natural philosophers of the time whether they could come up with an explanation of this rule of thumb. This question is what is behind the Torricelli experiment and eventually led Boyle to do his experiments with the Air-Pump.

There are stories about why the result is satisfactory, or why it is a failure and why it did not go right, etc. Both the artifact and these mental templates are part of a narrative web. These narratives are of course loaded with artistic values and norms as well as social and political ones. In a vulgar sense, these values are sometimes referred to as a theory or philosophy. After the cities had become the socially dominant force of Italian cultural life, the Italian artists needed more schooling than the workshop could offer; skills alone were no longer enough (cf. Cole, 1983). Although, of course, all this learning is fed into this narrative web, it does not make this web a theoretical explanatory device in the sense that a scientific theory is. Alberti's theory of architecture is not a theory in that sense. It is a set of guiding principles—certainly, his idea of decorum (agreement among parts) is structured around the idea of proportionality of a building.

Table 1. Constituent parts of craft knowledge

Craft knowledge	Artifact
	Constellation of mental templates

III
Is craft knowledge a cultural universal?

Clearly propositional knowledge is not a cultural universal. But is artisanal knowledge? As indicated above, my thinking about traditional (non-Western and non-standard) knowledge practices has led me to believe that craft knowledge is a cultural universal. However, how does one substantiate that assumption? One obvious way is to bring out the craft dimension in various knowledge endeavors. Let me briefly give you two examples of this strategy: science and that quintessential form of Islamic learning—rote learning.

Lévi-Strauss's *La pensee sauvage* is famous for the suggestion that there is no distinction in principle between the 'science of the concrete', as he dubbed 'native thinking', and 'abstract scientific thinking' (Lévi-Strauss, 1966). Recent micro-sociological in situ case studies of science in action have lent credit to this idea by suggesting that science is about creating, collecting and deploying durable and manageable materialized strings of symbols, such as paper/clay/wood/stone/digital entities, which are called immutable mobiles.[21] This view of science construes the

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[21]   The notion of 'immutable mobiles' was first introduced by Latour (1986, pp. 11–14), as an elaboration of the notion of 'inscription device', which should be construed as something like recorded symbols, he and

intellectual endeavor that goes on in a lab as an "external" iterative process of manipulation of immutable mobiles. The lab is portrayed as a world of "indexes, bibliographies, dictionaries, papers with references, tables, columns, photographs, peaks, spots, bands" and the work going on there as the manipulation and recombination of these paper entities (Latour, 1986, p. 14). The additional claim made by Knorr and Latour is that this combinatorial shuffling around and/or modification and/or superimposing of "tables, columns, photographs, peaks, spots, bands" is similar to making a jigsaw puzzle or a card index with detailed cross references. The basic ingredients for both kinds of work are: discipline, the willingness to do hours of boring work at an end, lots of patience, and endurance. This is all clearly compatible with an interactionist conception of knowledge and it opens up the intriguing possibility of a theory in which thinking is construed as 'material', as intrinsically linked with the manipulation of external resources. I am inclined to accept such a theory of external 'thinking'—thinking is in the interactions—and believe it represents a fundamental leap forwards in our description and explanation of any kind of intellectual endeavor, whether it is in science or everyday thinking. It does not however indicate that craft-knowledge or science are similar but that what goes into the making of craft knowledge and scientific knowledge is the same; that is, it suggests there is a cognitive unity of mankind, by which I mean that general cognitive rationality and scientific rationality coincide. Artisanal knowledge and scientific knowledge have different aims—the making of an artifact versus theoretical elucidation—but the kind of intellectual work that goes into it is the same.[22]

Let me briefly indicate how this line of reasoning would go for rote learning, that quintessential way of knowledge transfer in the Islam. Qur'an means 'recitation'. Learning the holy message of the Qur'an is about placing that message in the mind of the pupil. He is not to question the message, nor is he required to make it his own; he has to let the message take over his mind in such a way that the Qur'an will make his mind. This is key to the Islam. Islam means 'voluntary submitting', 'voluntary surrender'. Repeating passages that are read aloud is the way one learns the Qur'an. Writing is only an aid in this process. It has to be done

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Woolgar laid so much stress on in their Laboratory Life and which was not much appreciated at the time. Immutable mobiles are graphic devices, and are equivalent to what Knorr (1979, p. 353) calls 'measurement traces' or what Donald (1991) has christened 'visuographic symbols' or 'visuographic markings'. Preference is given to Latour's terminology because the 'plasticity' of his formulation brings out more clearly, what is crucial to the graphic devices, viz that they are 'immutable' as well as 'mobile'.

22   In general, the distinction between science and craft is twofold: cognitive content and social status. Dorn (1991, p. 97) suggests that there might also be a third spatial element to it: craft being rural and science urban. If not pushed too hard—the building of the Florence Dome certainly was not a rural affair—there might be some truth in that a theoretical bid to comprehend the natural world requires institutional patronage of a kind only an urban center can provide.

this way because only when the holy message is spoken is the Qur'an realized and can it be received as divine. Here is why—only when words are spoken aloud does their meaning become realized, are the ideas they express 'brought in the open'. The reverse side of this is a skeptical attitude to written language. Written language becomes a veil to the ideas, the real meaning of which is in the auditory reality of oral tradition. This makes oral teaching a necessary concomitant to the written text. Understanding of words requires them to be spoken. To convey the true meaning of a text, the text had to be orally transmitted (see Nasr, 1992, p. 11).[23] As one of Nasr's teachers told him: written words just have literal meaning and are as concepts closed upon themselves. It is only by becoming familiar with the meaning these words have in the traditional oral commentary that one is able to fly from the earth of literal meaning to the heaven of symbolic meaning (Nasr, 1992, p. 13). But of course the pupil only comes to the stage of assessing the meaning of the Qur'anic verses if he knows the holy message by heart. This procedure explains the personalistic character of the transmission of scholarship and when Mottahedeh (1995, p. 65) stresses the craft-like nature of this learning process, he of course is spot on. The formal similarities between apprenticeship learning and training to be an Imam are striking. For a start we have the one-to-one relation between pupil and his teacher, which clearly mimics the apprenticeship-master relation. In both cases, the instructions are not to be questioned and both require a rigorous discipline, and perseverance as well as a total commitment of tuning the mind to the task. So both activities share the constitutive elements at the coal face of learning a practice.

To argue that craft knowledge is a cultural universal, this strategy has to be applied to all the various non-Western, non-standard knowledge practices that anthropologists over the years have canvassed. A cumbersome endeavor for sure that would have to be a collective endeavor. It would require detailed know-how of the numerous knowledge practices. Would it make a compelling argument? It would be an impressive undertaking but—compelling and convincing? I am not so sure. What is required as well is an argument why skill is at the root of all knowledge practices. Is such an argument available?

For philosophical anthropologists of the first generation, that is for people like Gehlen and Plessner the answer was "Sure, such an argument exists". The starting point of the answer would be what Gehlen understood man to be a *Mängelwesen*, a deficient being (Gehlen, 1988). In Gehlen's perspective, as a species, humans

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[23]   Nasr's essay shows clearly how an auditory reality affected the whole of the Islamic intellectual tradition and educational system, even to this very day.

are frail and as animals, humans are defective. Any newborn human being is very short on genetically determined instinctive patterns of behavior that allow him to negotiate in a successful way the challenges that come with being thrown into this world. In fact, a human neonate cannot survive on its own for a very long time and needs an extended period of cultural learning to overcome the fact of this biological deficiency. The frailness and defectiveness are compensated by the use of tools—these include the grasping hand and the relatively recent evolutionary acquisition of speech (on the hand see the excellent first chapter in Tallis, 2003). This suggests *ex negativo* that the origin of the crafts, practical knowledge, is rooted in biology. What centers this line of thinking is that only humans use tools. It is this idea that is behind the naming of the first species of human being as *Homo habilis*, handy man, in recognition of his ability to make tools far beyond that of other primates. The general conclusion of this argument is that human evolutionary history is grounded in the history of crafts and human evolutionary success is largely due to the mastery and transmission of making and using tools.

However, in this form the argument can no longer stand. It is now well established that humans are no longer the only tool users and tool makers. My favorite is the sea otter who, while floating on his back, balances stones on his chests to use as anvils for cracking mussels, but many more examples could be mentioned (fascinating reading in this respect is Hansell, 2007). We now know that many species modify objects before use so the privileged aspect of tool use and tool making in definitions of humanness have faded, "tool use and tool making are found in such diverse groups of vertebrates that tool behavior carries no implications for the relatedness of species and is in most cases simply an opportunistic solution to a local adaptive problem" (Wynn, 1994, p. 135).

The universality of artisanal knowledge has to be argued for in a different way. The best argument available is the following. With the act of birth, when a child is thrown into the world, all her basic behavioral strategies to negotiate the world have to be learned through in-dwelling. Learning to use a tool, that classic example of artisanal knowledge, is but a special case of learning to stabilize whatever kind of interaction with the environment, whether it involves finding one's way through the desert, weaving a basket, catching fish, ordering second-hand books via the internet, or preparing a leg of lamb.

Let me formulate this argument in a different way and bring in the issue of the cumbersome and primitive way of learning artisanal knowledge as well. Artisanal knowledge is clearly a learned and disciplined practice. It is culturally transmitted

and in no way genetically determined, as some of the tool use of, for example, the species of wasp that use a pebble to tamp down the entrance to a subterranean nest. The lack of any kind of genetic code for whatever skill explains why an artisanal knowledge is learned in such a primitive way. It is learned through imitation and emulation, through repeating basic actions and sequences until it can be accomplished with relative ease and competence. Artisanal knowledge is an emergent property of dwelling in the lived-in world. The basis of any kind of knowledge is craft knowledge because the natural human way of learning is through in-dwelling, through imitations and emulation. Artisanal knowledge is a cultural universal because "skill is the foundation of all knowledge" (Ingold, 2001, p. 136).

Theoretical knowledge is conceptual and dualistic because "it is knowledge about something, which a subject has; and such knowledge must discriminate one thing from another to assert some attribute about something" and neither of these two features make sense when dealing with skills or rituals (Loy, 1988, p. 4). Artisanal knowledge is a skill-based kind of knowledge; it is a reciprocally constituted tinkering with and transforming of one's environment. Like rituals, it is a performative practice. The implication is that knowledge of the practice is shown in the performative act while at the same time the performative act is a sign one is knowledgeable, is competent to perform the ritual. As explained at the start of this essay artisanal knowledge is monistic—skills are at once a form of knowledge and a form of practice. Any explanation of any kind of performative knowledge must take into account this monism. This means that the traditional explanation of performative behavior as one that requires to "incorporate a show-act of contemplating regulative propositions" (Ryle, 1971, p. 1) will not do. This is less a hindrance than it might seem in that the tradition explanation is found wanting any way: it inevitably leads to the 'ghost in the machine' problem.

Let me be precise here. There are two schools on how to explain performative behavior (Rubin, 1988). Either you devise mental structures, that is, conceptual representations, to account for the observed behavior in which case you make a complex structure out of a process or you account for behavior through a process of tuning one's interaction with environment, in which case the stress is on complex processes. Anything that can be understood using the complex structure metaphor can be understood using the complex process metaphor. The 'ghost of the machine' problem, however, only shows up if the complex structure option is chosen. That option assumes that a structure perceived in the world is copied into an analogous structure in the mind. Once you allow that to happen

the 'ghost' is put into the 'machine' (Ryle, 1963, p. 17). That fatal problem does not show up if one goes for the complex process explanation of behavior.

Ryle's "incorporation of a show-act of contemplating regulative propositions" is needed because of the Western template about practice: the inferiority ascribed to any performative act reflects the idea that somehow it is dependent upon some ulterior act of theorizing. Once you allow performative behavior to be explained by calling upon something extra, one ultimately has to evocate some version of the deep-seated Christian intuition about the relation between body and soul: "the soul excels the body and commands it".[24] Going down this route not only gets one into all sorts of trouble—like locating the soul, and of specifying how this commanding actually works—and directly raises the question in what sense the Christian solution of introducing a soul—this is 'the ghost in the machine'—would be of any help in the first place. Once one allows for a higher level to explain what is going on at a lower level, where does one stop? A regress *ad infinitum* seems inevitable. The inference is that understanding skills and rituals via the traditional philosophical way—a performative act is somehow steered by an ulterior act of theorizing—is self-defeating.

How is performative knowledge learned? Answering this question requires clarity in terms of what is it that needs to be learned if one is acquiring performative knowledge? The learning process is directed at the transferral of embodied behavioral routines from A to B. Skills are fundamentally non-cognitive. Conceptual learning, or learning through theoretical understanding, cannot be at core of the learning process of rituals. They are learned via imitation and emulation because the learning process is based on copying the behavioral routines and acting these out to see if it works out in the intended way. In short, performative knowledge can only be acquired through immersion in a practice.

This concludes my attempt to open up artisanal knowledge. It required me to develop an interactionist skill-based conception of knowledge. Truth is not central to this conception but embodied practice acquired through habituation is. In Table 2 an overview is given of the central differences between the more traditional propositional one, where passive observation and non-interference are the key ideas, and this alternative interactional view.

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[24] These are the words of Cardinal Humbert of Silva Candida taken from his 1058 tract Libri III Adversus Simoniacos, III, 21, p. 225 of the *Monumenta Germaniae Historica, Libelli de Lite*, I, 1891, edited by F. Thaner.

Table 2. Main differences between the propositional knowledge concept and the artisanal conception of knowledge.

	Propositional conception of knowledge	Artisanal conception of knowledge
1	Epistemology is a purely cognitive activity in which the application of logical thought and conceptual analysis can elucidate the warranting relations between evidence and generalizations	Naturalistic study of how people come to accept various claims about the world, and it is interested in the differences between the various knowledge regimes people have come up with
2	There is a central core of human thinking that is constituted of propositions that have to be true for everybody and which are proved to exist via transcendental arguments, i.e. by placing a constraint on what a rational human being has to believe to be true about this world	Starts from the assumption that man is equipped with an innate cognitive prowess to reason variously called 'basic rationality' (Atran) or 'natural rationality' (Barnes); this is a cultural universal
2-1	Central to this central core of human thinking is the psychic unity of mankind	Socio-cultural construction of mind, 'our colonization of each other's mind is the price we pay for thought' (Douglas)
2-2	The thesis of the psychic unity of mind is based on the Lockean theory of psychology that is implicit in an empiricist epistemology	Sociality is at the root of our drive to interact with our environment; ontogeny, i.e. individual maturation, through a Vygotskian kind of developmental psychology
3	Ontology of mind-body opposition	Ontology of dwelling
3-1	Human are composites of mind and body apprehending nature by grasping a view of it	Humans are 'organism-persons' (Ingold) relating to a cosmopolis, taken up a view in it
3-2	The world is an external nature 'waiting to be given meaningful shape and content by the mind of man' (Shalins)	The world is an environment constituted through the unfolding relations to a being
3-3	Observation—detached contemplation—is the causal bridge between the passive mind of the self and the external world, where the facts somehow manifest themselves	Active interaction is fundamental to the production of knowledge
4	Rationality is the power of the soul of the *Homo singularis* to argue from experience and through syllogistic reasoning to arrive at valid conclusion	Rationality is the skilled judgment of a *Homo sociologicus* and needs consent of the relevant peer group based on the idea of best practice

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