

Embodiment for Non-Cartesians

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*It is not a question of how the soul acts on the objective body, since
it is not on the latter that it acts, but on the phenomenal body.*
– Maurice Merleau-Ponty

Abstract

The majority of cognitive science is Cartesian in that it accepts the Cartesian cut between mind and body. The cut makes it impossible to take seriously either the mental (understood as the experiential) or the bodily. Rejection of the Cartesian cut leads to the simultaneous rejection of both “pure mind” and “mere behaviour”. It also leads to a reconceptualisation of embodiment. The living body is not a machine, but it actively brings forth a world. It is explained how situations are “the other side” of the habits of the body, drawing on the work of Dewey, Merleau-Ponty and Brooks. Finally, an attempt is made to explain how even abstract thought can be understood as essentially depending on embodiment.

1 Introduction

Cognitive science is a science of the mind. Unfortunately, most of its practitioners take that to mean that it need have no interest in the body. Subsequently, cognitive scientists concern themselves with mental phenomena as if they were phenomena belonging to a disembodied entity. Orthodox cognitive science still is Cartesian. GOFAI¹ has always looked down on what it considered to be mere implementational issues. Connectionism too treats the body as no more than an input/output system for the mind-brain. We have in cognitive science a principle of *explanatory disembodiment*, “which states that the details of the physical embodiment of the agent can safely be ignored for the purposes of cognitive explanation” (Wheeler, 1995). This is also evident in the common assumption that there is such a thing as the “purely mental” (e.g., Strawson, 1994), an assumption which is also implicit in most theories in cognitive psychology.

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¹Good Old Fashioned Artificial Intelligence.

Even when bodily features are attended to, they are treated merely as clues for their mental, causal precursors. That is to say, bodily events as such, e.g., gestures, are deemed not to be meaningful by themselves, but only because there is meaning *behind* them. The locus of meaning is the mind, which is an inner entity and therefore not itself perceptible. This brings into existence the *other minds problem*. Theory of mind theories (e.g., Perner, 1991) are good examples of Cartesianism: the understanding of others is a purely mental matter (an abstract theory is constructed) and what is understood (but only hypothetically) is supposed to be purely mental itself. Bodily features are used only as evidence and are then discarded.

In other words, orthodox cognitive science holds on to a “principle of independence of consciousness and behaviour” (Searle, 1992). Experience as such has no bodily/behavioural consequences (epiphenomenalism; and the idea that there is such a thing as a “pure mind”), and behaviour is thought to be insufficient evidence for conscious experience (“zombies” are possible). A strong motivation for holding on to this principle is the idea that if you don’t, you fall foul of behaviourism. That, however, is a mistake. It follows only on a conception of the bodily *as opposed* to the mental. In other words, the notion of “mere behaviour” (like that of pure mind) only makes sense if you already accept the Cartesian cut.

2 The Cartesian Cut

The Cartesian cut is between the mental and the physical, the subjective and the objective. It also leads to oppositions between mind and world and, since the body is seen as falling on the side of the world, between mind and body. Once the cut has been accepted, a notion of mind necessarily follows which is such that it is neither necessarily embodied nor necessarily situated in the world.²

Of course, the Cartesian cut allowed science to flourish, because it demarcates an objective realm. Once phenomena can be seen as belonging to that realm, they are up for scientific investigation, usually involving reductive strategies. But, as Searle (1992) points out, the success of the scientific method depends on the carving off and *discarding* of the subjective elements of phenomena. For example, we had to get rid of the *feeling* of heat, before temperature could be understood as mean kinetic energy. It seems to follow almost immediately that the mental, since it inherently involves subjectivity, cannot be investigated by traditional (reductionistic) scientific means. The “solution” in cognitive science has been to deny that the mental is the experiential and to claim instead that it is the meaningful. Meaning, in turn, was objectified to “aboutness” (intentionality, representationality), making possible reductive strategies in the project of naturalising content. However, there is no meaning without mattering, a thoroughly experiential notion. In short, orthodox cognitive science is *not* about the mind.

In order to regain the mind, I suggest, we have to deny the Cartesian cut. This has many far-reaching consequences, but in this paper I will focus on the cut between the mind and the body.³ The denial here implies that the mind is *essentially* embodied. Recently, there has been growing interest in the notion of embodiment, but usually the notion of the body is still a Cartesian one,

²Modern day Cartesian, being physicalists, may object that minds are necessarily parts of the physical world, but that is not the point at issue here. The point at issue is that the Cartesian mind is self-contained, in the sense that its activities as such, as well as its mental status, are logically independent of any relationship to the world. The other side of this point is the assumption of a fully objective, cognizer-independent, pre-given world.

³The cut between mind and world also has to be denied. The world is not pre-given and objective, but it is constituted in a dialectic between animal and “otherness” and it is always already meaningful.

the body as an object. What tends to be overlooked is that if you are going to recognise the bodily aspects in the mental, you also need to take account of the mental aspects in the bodily. The body is not a mere input/output system for the mind. Essential embodiment means that the mental and the bodily are mutually intertwined. The body is a subject, it has its own intentionality.

3 The Body-Subject

How, then, are we to understand embodiment, such that it can be understood to be essential to all mental activity? I want to suggest that the answer to this question is to be found in the work of two, apparently disparate, philosophers: the pragmatist John Dewey and the existential phenomenologist Maurice Merleau-Ponty. The first thing to do is give up the idea of an objective body (the body according to the physiologist) and replace it with that of the phenomenal (the living and lived) body. This has two important aspects to it. One is that we give up the normal scientific (detached, unsituated) point of view and replace it with a phenomenological perspective. I will not make much of this here (but I can point out that one of the merits of the first person perspective is that it is easier to come to understand that *I am my body* than that *her* body experiences). The second important aspect is that it gives more room to understand the body as *active*, as *doing* (meaningful) things.

In order to make clear that the body is not a machine, both Merleau-Ponty (1962) and Dewey (1968) criticise the notion of the reflex in its traditional meaning as a blind, mechanical process, which implies a machine-like notion of the body. This traditional notion buys into a conception of cognition and behaviour which is such that there are three stages—perception, thought and action—which are temporally distinct and theoretically separable (see Wheeler (1995) for a discussion of how this conception is part of the Cartesianism inherent in orthodox cognitive science). A reflex is seen as simply leaving out the middle stage, thus making it non-mental and non-intentional. But Dewey and Merleau-Ponty insist that even the most basic habitual sensorimotor co-ordinations, such as reflexes, have a certain intentionality (for Merleau-Ponty, the intentionality of the body is an *operative* intentionality, which is pre-reflective and pre-predicative); they establish and maintain the animal's relationship to its world.

Reflexes and other actions should not be analysed as “sensation-followed-by-idea-followed-by-movement” (Dewey, 1968, p.234), but they should be seen in a holistic way, forming a circuit which runs not only through the animal but also through the environment. Behaviour is not the “output” of a cognizer, but it is an *ongoing* interaction between cognizer and world, one action leading to the next, rather than stimulus leading to response. The indispensable contribution played by the environment, demands a recognition of the cognizer as essentially situated.

In our analysis of the cognizer, we should take its movements, or rather its acts, as primary. We can then see the sensation, the experience, the idea, the cognizer's physicality, the objective motion, etc., as *aspects* of the act, aspects which should not be considered in isolation, since isolated they are nothing but idealised abstractions. For example, think of a gesture. A gesture is a bodily event, but it is “mental” as well, since it is meaningful and experiential. The meaning of a gesture lies not in a mental realm behind it, but is *immanent* to it. When a new gesture is created, it does not give expression to an already existing meaning, but new meaning is created as well.⁴ In a gesture, then, as in all acts, the mental and the physical are inextricably intertwined. This leads Merleau-Ponty to talk of a “third genus” which is reducible neither to the physical nor the mental, but which rather

⁴This also, crucially, applies to linguistic gestures, or speech (Merleau-Ponty, 1962, p.186).

provides the foundation for that distinction. Acts, which include gestures and perceptions, belong to the third genus, and so does the body properly understood, as I will try to show.

The other entities that are of the third genus are “situations”, which for Merleau-Ponty are the real constituents of the world (Mallin, 1979). This is obvious as soon as it is understood that situations are “the other side” of the living body, a point which expresses the mutuality of an animal and its world. Situations are not objective, pre-given entities, but they come about in and through the interaction (or dialectic) between cognizer and world. Situations thus are co-constituted by cognizer and world, both cognizer and world participate in the bringing forth of situations. A mechanical body can not be understood as participating in this bringing forth. This is why Merleau-Ponty replaces the notion of the reflex arc with that of the *intentional arc*; a function which we find *beneath* intelligence and perception. “[The] life of consciousness—cognitive life, the life of desire or perceptual life—is subtended by an ‘intentional arc’ which projects round about us our past, our future, our human setting, our physical, ideological and moral situation, or rather which results in our being situated in all these respects.” (Merleau-Ponty, 1962, p.136). Still, this ‘projection’ appears rather mysterious. Let us turn to the field of Behaviour Based Robotics to dispel some of the mystery.

4 The Habit Body

Brooksian Robots and an Ethological Perspective

Orthodox cognitive science is wedded to functional (or homuncular) decomposition, hence to the idea of the mind as inner, to perception-thought-action sequences, to representationalism and finally to the Cartesian cut. But instead of a decomposition by function, it is possible to have a decomposition by activity. Such is the case in the subsumption architectures of Rodney Brooks (1991). In these robot architectures there is no question of the traditional internal world models. Instead, there are a number of layers which work independently of each other, in the sense that each layer has its own transducers and effectors and simply “tries” to produce its activity, circumstances allowing. Examples of activities are **avoid** objects, **wander**, **explore** the environment, and **grasp**. There is no central locus of control, but there is a subsumption relationship between the layers: the higher layers can moderate or inhibit the activity of the lower ones. In this, there is no sending of messages or instructions going on between the layers. For example, the **explore** layer simply relies on the **avoid** layer for taking care of those deviations of the straight path that are necessary in order not to bump into things. And a **grasp** layer inhibits the **wander** layer in order to be able to perform its activity. Out of all the interactions between the activity layers and the environment emerges, if everything goes well, some kind of adaptive behaviour.

No Cartesian cut between mind and body or between mind and world is made. The adaptivity of the behaviour depends on the cognizer being situated in the right kind of environment, the environment to which it is adapted. Since an activity is a pattern of *interaction with the world*, some of the properties of the environment are as important to the production of the behaviour as are the cognizer’s body-internal mechanisms. We won’t, therefore, in general be able to understand behaviour simply in terms of cognizer-internal structures and processes. Rather, we always have to take into account the situatedness of the cognizer. In general, this means that the “mechanisms underlying cognition” are not found exclusively inside the cognizer, but cut across the physical boundaries of the cognizer and include aspects of the environment. So, cognitive activity happens “in the world”

(in and through the concrete interaction with the world). There is no detached, internal mind which is the “real” bearer of the meanings or which is “really” responsible for the purposefulness of the behaviour. This is because, qua mechanism, the robot does not consist of a hierarchy of functional modules, but of a collection of activity producing layers, all with their own sensory and motor aspects (no perception-thought-action cycle). It does not apply some detached, abstract knowledge to the situation it has stored in internal structures, but it plays out some of its activities, without reflecting upon them.

A non-Cartesian cognitive science, then, will be helped by finding ways of decomposing, understanding and modelling cognition in terms of activities, rather than in terms of functional modules. Hendriks-Jansen (1994) argues that we should take our cue from ethologists who have already established methods which allow us to figure out species-specific activity patterns. Ethology also teaches us that we should think of the world in which a creature lives (its *Umwelt*) as determined by its perceptuomotor capabilities. The simpler a creature’s activities, the simpler its world. In this context, Hendriks-Jansen’s notion of *interactive emergence* is important. Out of the interaction between simple reflexes and environment, some structure emerges. On the one hand, it is a higher-level pattern of activity, on the other, it is new structure in the creature’s *Umwelt*. These are two sides of the same thing. If you develop new kinds of behaviour, your world changes. Hendriks-Jansen uses the example of a navigational robot designed by Maja Mataric to show how to make sense of this point of a world emerging through interaction. The lower layers of the robot produce reliable, although non-repeatable, wall-following behaviour. It is only on the basis of the way that the robot now “experiences” walls that a higher-level navigation system can exist at all. Through interactive emergence structure is created in which navigation is now possible. The higher level activities take place in a world as it is brought forth by the lower level activities.

This dependence relationship between higher level activities and lower level ones implies that the proper explanations of cognition and behaviour have to be historical or genetic. An explanation of *what* is evolved or learned has to involve an account of *how* it was evolved or learned, because each stage of the developmental process requires the interactive context provided by the stages preceding it. A second implication bears more directly on our investigations concerning the nature of embodiment. For the genesis of the higher level activities to be possible (either in an ontogenic or a phylogenic sense), the lower level activities have to be counted upon. A particular higher level activity may be a one-off (the first time it occurs it is), but the lower level ones must occur reliably, or *habitually*.

(Hendriks-Jansen (p.206) points out that “This type of configuration confers the status of a natural kind on the lower levels of activity, since it establishes a history of use for that activity in the creature’s evolutionary past. Darwin’s Theory of Natural Selection can thus be harnessed to ‘ground’ such explanatory entities”. He also speaks of a “stamp of approval” issued by evolution.)

Habits in Pragmatism and Phenomenology

Although Brooks’ ideas on cognition are often presented as revolutionary, they are in fact remarkably close to some ideas in the work of both Dewey and Merleau-Ponty. Both thinkers emphatically reject the Cartesian cut and think, like Brooks, of cognizers not as semi-detached observers, but as *agents* who are inextricably involved in situations. They both stress the practical roots of understanding; that is to say that they recognize that understanding *consists in* skills and abilities, which are not had by the brain, but by the whole, embodied and situated, cognizer.

A notion used by both Dewey (1925) and Merleau-Ponty (1962), which, I think, we should understand as coinciding with that of activity in the Brooksonian sense is that of “habit”. Our understanding of our world is embodied in our habits⁵, which have the same kind of layered structure that Brooks and Hendriks-Jansen talk about. We are born with a limited number of innate habits (basic skills and reflexes), and development is a matter of either honing the skills we already possess or establishing higher-order ones. Both Dewey and Merleau-Ponty think in terms of a continuity of similar cognizer-world interactions all the way up from organic interactions to abstract thought. But it is the latter who analyzes most thoroughly the acquisition of habits and the roles they continue to play in further behaviours and cognitions. For example, he discusses the acquisition of colour (p.30), instinctive operations in animals (p.78), reflexes as tracing out situations (p.79), and, more generally, the genesis of the world as a correlate of the acquisition of habits.

Maybe the best way to bring out Merleau-Ponty’s ideas of how we bring forth our world, is in terms of what happens when we pay close attention to what has thus far eluded us or, more generally, when we perceive something for the first time. We start with something general or indeterminate, something on which our perceptual skills do not yet have a firm hold. There is then some “primary act” which *articulates* its object into something more determinate. For example, we know that young children do not yet have the perceptual dimension of colour (Smith 1989). When they separate out objects into different heaps, they always do so on the basis of global, dimensionally nonspecific relations, which suggests that the whole object and whole-object relations are given first to experience. According to Linda Smith (p.147), “The basic developmental notion is one of differentiation, from global syncretic classes of perceptual resemblance and magnitude to dimensionally specific kinds of sameness and magnitude.”

Combining ideas from Hendriks-Jansen and Merleau-Ponty, we can say that there is some “primary act” by which the child sees colour (in the adult sense) for the first time, and which establishes a new dimension of experience. The primary act itself emerges out of the interactions between the environment and several more basic activities of the child, such as paying attention, shifting of vantage point, and manual manipulation of objects and sorting them out. The child thus actively participates in the constitution of the object. For Merleau-Ponty this generalizes to: every cognizer co-constitutes its world in an ongoing interaction with “otherness”.

Once a new dimension of experience has been created, it can be used in subsequent circumstances. Or rather, like a layer in Brooks subsumption architecture, it will apply itself whenever it can. As Dewey puts it: “A newly acquired meaning is forced upon everything that does not obviously resist its application Meanings are self-moving to new cases. In the end, conditions force a chastening of this spontaneous tendency.” (1925, p.156). With practice, this application will proceed more and more automatically, until we can speak of a habit. Now the process does not require any attention anymore, it simply gets to be triggered by the environment, after which it smoothly unfolds. They now “form the platform of development and apprehension of further meanings” (ibid., p.246).

Habits, thus, are sedimentations of those patterns of situated action that bring forth a meaningful world. At the same time, they are the embodiment of the cognizer’s understanding of its world. It is because of this complementarity of cognizer and world, which is similar to that between an organism and its *Umwelt*, that Merleau-Ponty can say “Thus the thing is the correlative of my body and, in more general terms, of my existence, of which my body is merely the stabilized structure.”

⁵And in cultural institutions.

(Merleau-Ponty 1962, p.320).

Note that a habit only establishes itself through surviving a “history of use”: only those emergent patterns of activity that prove themselves continuously in the world have the chance of wearing the kind of groove (Dewey 1925, p.229) that turns them into a sedimentation. This means that we can extend Hendriks-Jansen’s idea of a “stamp of approval” for activities from evolutionary to developmental cases. Consequently, acquired habits have the same kind of legitimacy qua explanatory constructs as those activities which evolution endows us with.

It is thanks to their active nature that habits can be creative in the sense of interactive emergence. The world is not ready-made, waiting to be registered, but we are actively and creatively bringing it forth. Not only in the sense that we have to create meaning in a “primary act”, as discussed above, but also within every perception that we have of the world. We always start with a *general* experience of a situation, which is made more articulate through the process of our acquired habits applying themselves. The richness of the world then gradually unfolds itself before our eyes. We experience this, for example, when, after having cast a quick glance at a painting, we start paying more and more attention to it. Then “I become aware that each perception, and not merely that of sights which I am discovering for the first time, re-enacts on its own account the birth of intelligence and has some element of creative genius about it” (Merleau-Ponty 1962, p.43). In familiar situations, this re-enactment of the creative, primary act happens so automatically, that we do not really notice our active part in the constitution of the world anymore. It is as if the world is simply “given”. However, on occasion, we find that some aspect of the situation requires further determination. In that case we have to be creative again: we have once again to discover a new, promising way of going about.

Both Dewey and Merleau-Ponty think of agents as collections of habits, or abilities, which all have this property of being “wholly active and wholly passive”. Dewey sometimes calls us “agent-patients”. For both men, this feature is captured in the notions of mind and body themselves. In the notion of mind-body (or “body-mind” for Dewey), the “body” aspect refers to the “habit body” which consists of sedimentations, and hence is to be associated with passivity. Merleau-Ponty also speaks of “pure being”, which signifies thinghood or the body as continuous with the rest of nature. The “mind” aspect captures the features of activity, creativity, spontaneity, and openness. This is the mind that is emergent upon the situated activity of the body (cf. Dewey 1925, p.232). For Merleau-Ponty, this is not being, but existence, because to him that has the connotation of emerging (ex-isting; cf. Spurling 1977, p.16; Cooper 1990, p.4). It is the mind in *this* sense which creates and establishes meanings, which are then sedimented, and “become body”.

Insofar as we are mind, our world is always open, is always indeterminate to some extent. That is to say, situations can always be made more specific (Merleau-Ponty), inquiry can always go on (Dewey). Hence, it is the active, creative aspect of habits which accounts for our flexibility, our mindfulness. Without it, we would be mere mechanisms.

5 Embodiment and Abstract Thought

The main argument in favour of a Cartesian cut between mere body and pure mind derives from the fact that we often think without behaving. It seems, therefore, quite possible that there is mind where there is no behaviour at all. Even though our thoughts have developed out of bodily activity, *now* they appear to be purely mental. If they are, mind and body, consciousness and behaviour,

would have to be considered as only contingently related to each other, as Searle's principle states. How can we, in the face of there being abstract thought, imagination and even paralysed thinkers, argue for the thesis that mind is essentially embodied? There is not much space available, so I will restrict myself to sketching several parts of an answer.

The Lived World

One part of the answer is that we only have a world to think about thanks to our embodiment. We saw that this is related to embodiment not being simply a matter of physicality, but one of innate and acquired habits (sedimentations). Or, as Sheets-Johnstone (1990) puts it, the body is an animate form, not a corpse. We then also saw that the habit body *brings forth* the world in its ongoing interaction with "otherness", pretty much in the way that the lower activity-producing layers in Mataric's navigational robot bring forth a walled environment for the robot to do its navigating in. The body and the world are each other's complements.⁶

The idea of the living body and the lived world being two poles of one and the same primordial movement, or dialectic, can be understood in two ways. First, in a way that is more or less the way in which ethologists conceive of the relation between animal and *Umwelt*: the *Umwelt* is determined by the animal's behavioural and perceptual abilities.⁷

The second way impinges more directly on the question whether a disembodied mind could have a world. The world as it is perceived momentarily is a matter of the habits that are being activated at that time. To perceive something as graspable, for example, involves the activation of the grasping habit. Initially, this activation implies an actual grasping (in infants, grasping and graspability are not yet separated), but later it becomes possible to simply perceive the graspability. It is still, however, the grasping-habit which imposes its structure on the world, and it still does so in a dialectic with it. Notice that habits are not mechanised routines. Thus it is that the precise *way in which* we use our body, has as its "other side" the qualitative, rather than the structural, aspects of the world. Walking tall is quite directly correlated with experiencing the world as full of possibilities. Also, if we are performing a skill that we have fully acquired, to the extent that it does not require any attention at all anymore, we experience the world as rather dreary. On the other hand, if we are stretching ourselves, if we are engaged in an activity that requires our full involvement (they are not fully habitual, we might fail), the world is exciting. Thus, affective aspects of experience are bodily as well and not "purely subjective".

Constitution and Sustenance

The argument so far only establishes that if there is to be a world for abstract or imaginary thought to be *about*, it needs a body. But what about purely conceptual thought, i.e., thought that is not intended to be about the real world at all, but only about a conceptual world, a Platonic realm, for

⁶Note that this leaves open the possibility of real cognizers in virtual reality. The body of a cognizer has to be of the same substantiality as its world. The body is not only in the world, it is also *of* the world.

⁷The phenomenological counterpart is that the world is the ultimate background of all our activities, the "setting of settings", or the "horizon of horizons". One can only have a world in this sense, if one is able to step back from one's immediate involvement with the here and now. My world includes the dark side of the moon, because I can *think* about the dark side of the moon, and have some understanding of what it would involve if I wanted to actually see it. In general animals do not have this kind of ability (the ability which Brenda Judge (1985) calls representational thinking), which is why, strictly speaking, they don't have a world, but only an environment (cf. Merleau-Ponty, 1962, p.87).

example. First of all, it is to be pointed out that such thoughts are still *acts*. We should not be fooled by the use of nouns like “thought”, “consciousness” and “mind” into thinking that we are dealing with objects. We would do better thinking of them adverbially, as *ways* of interacting with the world. The acts involved in abstract thought do not come out of nowhere. In fact, they are rooted in the more concrete, i.e. bodily, acts. This is why so much of thought and language consists of bodily metaphors and metonymies (Lakoff & Johnson, 1980). A very strong case for embodiment could be made if it could be shown that particular bodily acts are *constitutive* of certain abstract acts.⁸ An almost equally strong argument would follow if it could be shown that the high-level, abstract acts *need to remain* rooted in their more concrete precursors. We know (e.g., Smith, 1989; Cussins, 1990; Karmiloff-Smith, 1992) that the earlier abilities are not lost with development, they are not replaced. But that does not by itself show that they are still playing a part in the abstract acts.

What we need is evidence that the higher levels of the mind-body need to be *sustained* by the lower ones. Such a claim is implicit in Merleau-Ponty’s idea that human experience consists of a dialectic between sedimentation and innovation, or creativity within the structure that is provided by acquired habits (Spurling 1977). If the dialectic disappears, the higher level thoughts go as well. Merleau-Ponty explains it like this, “But the word ‘sediment’ should not lead us astray: this acquired knowledge is not an inert mass in the depths of our consciousness . . . Similarly my acquired thoughts are not a final gain, they continually draw their sustenance from my present thought, they offer me a meaning, but I give it back to them . . . Thus what is acquired is truly acquired only if it is taken up again in a fresh momentum of thought, and a thought is assigned to its place only if it takes up its place itself.” (1962, p.130) Thoughts, or meanings or habits, that do *not* continue to draw sustenance from concrete interactions simply wither away. They are pushed aside by other habits with which they are in continuous competition. We witness this phenomenon on a more physiological level when, for example, we cannot use a leg for an extended period. Afterwards, the habit of walking has to be learned all over again, because it was pushed out (its underlying resources have been usurped) by competing habits.

So far for individual thoughts and meanings. But things can get worse. “If consciousness would be *totally* loosened from its anchorage in the body, it would have no means of expression, of actualising itself, and so would literally cease to be” (Spurling 1977, p.23; emphasis added). This point is closely related to the Kantian insight that thought without perception is empty: if it is indeed true that thought-acts, like other acts, have to be understood as *interactions* with “otherness”, then, in the absence of an anchorage in a body, it would be a mere “frictionless spinning in a void” (McDowell, 1994, p.11). Merleau-Ponty extensively discusses the case of a brain-damaged soldier, Schneider, whose “intentional arc has gone limp” such that all of his abstract acts of thought lose their sustenance. Now there is no withering away of the habits involved, because competing habits suffer the same fate. The effect is that the higher level habits become completely fixed. Meanings are fossilised and thought mechanised. Schneider is still able to use language, but his language is not properly linked in with his bodily situatedness anymore. For example, “Schneider does not recognize any object by merely looking at it. His visual data are almost-amorphous patches” (Merleau-Ponty 1962, p.113). He has to engage in an explicit reasoning process to figure out what he is looking at. “In the patient’s case, . . ., the field of actuality is limited to what is met with in the shape of a real contact or is related to these data by some explicit process of deduction” (ibid,

⁸Unfortunately I do not know of any clear examples, although the work of Lakoff and Johnson may be suggestive. Cases to be looked for are similar to those of blind people who cannot even *think* about colour anymore.

p.109).⁹ Also, he cannot make sense of anything imaginary or even prospective. His behaviour is so tightly coupled to his situation that we might call him a “reactive system”. And his language is so mechanical as to border on the meaningless. He is, in fact, strikingly like a traditional AI program. Interestingly, this was foreseen by Dewey, who wrote in 1925: “A fixed idea is no idea at all. ... ‘Pure reason’ would thus not be rational at all, but an automatic habit; a substance so stable and pervading as to have no limits and vicissitudes, and hence no perceptibility. ‘Pure’ reason is best carried on by fixed symbols, automatically manipulated; its ideal is something approaching the well-devised mechanically operative calculating machine.” (pp.284-5).

For our mental activities to be meaningful, it is necessary that they keep being put to the test through concrete interaction with the world. If not, they become sterile, purely habitual, mechanical and, ultimately, meaningless. A mind that is not properly anchored in its body loses itself.

Imagination as Forming

Finally, I want to say a few words about our ability to think about things that are not actually present. How does that have to do with embodiment and habits?

Merleau-Ponty argues that all movements (actions) have a background, a background which is not linked externally to the movement but which is “immanent in the movement inspiring and sustaining it at every moment” (ibid, p.110). He then makes a distinction between concrete movement and abstract movement. The former has the actual world as the background; concrete movements flow from the situation. But the latter have to “throw out their own background”, because they occur in the realm of the virtual. Good examples of abstract movement are to be found in mime or dance. The artist “keeps in front of him an area of free space in which what does not naturally exist may take on a semblance of existence” (ibid, p.111). In other words, in the case of a normal human being, her body can “turn aside from the world” and through abstract movement produce a virtual space around her in which things take on a pseudo-presence. Good mime artists really make their audience *see* the virtual objects. Bringing about the pseudo-presence of objects or events thus is a matter of an *enactment*. However hard to understand the ability to produce abstract movement is (the body has to be de-situated and “I must reverse the natural relationship in which the body stands to its environment”, ibid., p.112), it is clear that abstract movements depend on concrete abilities, i.e., on habits.

But clearly we can imagine things without enacting them. So we need to take yet another step: it is possible to “virtually enact”, i.e., without making overt movements. Shapiro (1985) calls this “forming”. At first this may seem to overstretch things, but we are in fact quite familiar with the phenomenon. Think, for example, of athletes, sprinters say, who are able to run a race “in their minds”. There is a genuine sense in which they are going through the motions: it usually takes them

⁹This stands in marked contrast to normal subjects whose experiences are what Sartre calls “impure”; they are not limited to the absolute here and now, but they draw in past experiences such that a *cube* is perceived rather than three surfaces. The other sides of the cube, as well as the bit of the table behind and under it are *present* to the normal subject. This is what the “horizontal” structure of perception is all about. The living body of normal subjects is thus not fully dependent upon actual situations (ibid, p.109). All this is impossible to see as long as one is in the grips of the atomistic dogma that perception starts with elementary, sensory givens. “We must then discard this postulate which obscures the whole question. The cleavage between the given and remembered, arrived at by way of objective causes, is arbitrary. When we come back to phenomena we find, *as a basic layer* of experience, a whole already pregnant with an irreducible meaning: not sensations with gaps between them ...” (ibid, pp.21-2; emphasis added). Very similar views can be found in the work of Gibson (1979). For example, he also warns against the mistake of confusing the hidden with the invisible.

exactly the right amount of time and this virtual practicing also *improves* their actual performance. An even more familiar example is that of thought. Thought, in its central meaning, is a matter of internalised speech. We all do it, we all talk to ourselves silently. It does not seem too crazy to claim that what we do when we perform the virtual acts is, in a crucial sense, the *same* thing as what we do when we perform them for real. Thus, they are occurrences of the very same habits of which we have claimed that they constitute embodiment.

As Shapiro points out, the notion of forming as a virtual rather than an actual behaviour is very close to Piaget's internalised action. The latter's step of deferred imitation, which occurs quite early in development, already makes possible a separation of the cognizer from her immediate situatedness. She is no longer at the beck and call of her situation but can now create situations through her own action. Then, when the act of imitation is internalised (or abbreviated), it is transformed into thought. At this point, Piaget unfortunately abandons the emphasis on action and moves on to talk of internal representations. "Having taken action to the doorstep of a mental life which it originates, Piaget then leaves it outside." (Shapiro, 1985, p.105) The problem is that we are offered no account of how an action can become an object (an image or other kind of mental representation). Shapiro shows how it makes much more sense to take it that what is produced by forming is like what is produced by mime: a pseudo-presence. If I imagine an object or an event, I am indeed representing, but the representation is not in my head, it is somewhere out there.¹⁰ Representation is an act, rooted in the body, not a mental object.

6 Conclusion

If we reject the Cartesian cut between mind and body, we are not only able to arrive at a notion of the mind as essentially embodied, but we can also take experience seriously: the phenomenal body is an experiencing body. Thus, it is by rediscovering the body that we rediscover the mind. Note that this goes hand in hand with a rejection of representationalism and computationalism.

To arrive at our notion of embodiment we had to abandon the Cartesian pre-occupation with knowledge and truth and see cognition instead as a "life process". Cognizers are participants in their own existence. It is not abstract knowledge that primarily needs explanation in cognitive science, but behaviour. We are agents before we are knowers, we live our world before we conceive it. Traditional Cartesian approaches treat us detached observers, but we are thoroughly involved with the world. Knowledge itself is nothing but an extra means in the maintenance of our existence. Or, as Dewey puts it, "mind is a further process in life, a further process of registration, conservation and use of what is conserved" (1925, p.230).

This paper has not so much been concerned with showing that "all possible minds" are essentially embodied, as with showing that there is at least a notion of embodiment which would make sense of such a claim. It involves not the objective body, but the habitual body. *That* is the "stabilized structure of my existence". Importantly, although the habitual body is made up of the sedimentations of (inter)actions, it is not a passive mechanism, but it is of the "third genus". It is a *living* body which brings forth a world through its *activity*. I have tried to explain this concept by making use of the notion of activity-producing layers as found in the work of Rodney Brooks.

Rather than take the mental and the physical, or the objective and the subjective, as starting

¹⁰"Forming is a movement through space which carves it up and organizes it without yet filling that space" (Shapiro, 1985, p.144).

points, Merleau-Ponty and Dewey start with the interactions between the living body and the lived world. This interaction is unreflective and pre-objective, which means that the traditional mind-body problem can be avoided. Every interaction has two sides. Thus, as a cognizer learns to make a self-world distinction, it is possible for her to reify the two sides of her interactions with the world, thus creating the ideas of “pure subject” and “pure object”. If she also is oblivious to the way her abstract thinking is sustained by her concrete, embodied existence, she will be on her way to mistakenly accepting the claim that consciousness and behaviour are independent.

Because of the same reason that being-in-the-world is pre-objective, it is also pre-subjective. The body does its work “beneath personal life” (Merleau-Ponty 1962, p.84), which is why we can also speak of the “anonymous life” of the body. Despite being anonymous, the body has its own intentionality,¹¹ which is not the one of judgement, but an *operative intentionality* which, pre-objectively and ante-predicatively, lays down the structures of our existence (ibid, p.xviii). We spoke of the intentional arc in this context. Because of the work of the body, the reflective subject finds itself in already meaningful situations.

In the previous section I attempted to show that even those of our acts that might appear to be purely mental are possible only thanks to embodiment. The distance that is experienced between the thinker and the world is not evidence for the possibility of disembodiment, but it is something which can only be achieved by being embodied. The capacity to think is a gift of the body. “Thus it is by giving up part of his spontaneity, by becoming involved in the world through stable organs and pre-established circuits that man can acquire the mental and practical space which will theoretically free him from his environment and allow him to *see* it. ... it is an inner necessity for the most integrated existence to provide itself with an habitual body” (ibid, p.87)

¹¹“These elucidations enable us clearly to understand motility as basic intentionality. Consciousness is in the first place not a matter of ‘I think that’ but of ‘I can’.” (ibid, p.137)

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