Abstract

Traditionally, what we are conscious of in self-consciousness is something non-corporeal. But anti-Cartesian philosophers argue that the self is as much corporeal as it is mental. Because we have the sense of proprioception, a kind of body awareness, we are immediately aware of ourselves as bodies in physical space. In this debate the case histories of patients who have lost their sense of proprioception are clearly relevant. These patients do retain an awareness of themselves as corporeal beings, although they hardly feel their bodies (they have normal sensation in the head, but from the neck downwards only sensations of pain and temperature, and of fatigue and deep touch). They can initiate movements, and with the help of visual feedback learn to control them.

It is shown that the traditional view of the self as immaterial is not supported by these cases. But the argument against this view has to be amended. It relies too much on bodily sensations, and misses the importance of active self-movement.
Introduction.

This article deals with self-consciousness and the body. Traditionally, self-consciousness has nothing to do with the body at all. What we are immediately conscious of is non-corporeal. Cartesian positions maintain that therefore the self is essentially non-corporeal. I will briefly discuss this position.

Next I will go into anti-Cartesian arguments of philosophers who claim that the self is corporeal, at least as corporeal as it is mental. These arguments too are based on our immediate experience. We may well ask: what precisely are these experiences that indicate that our self-consciousness is the awareness of a bodily something?

This question calls for a closer look at the senses. We should notice that we do not have five senses, as is commonly thought. We have six senses, and this sixth sense is the "inner" sense of proprioception, which gives us information about the position, posture and movement of our body in physical space. This information comes in fact from a whole range of different kinds of receptors located in different parts of the body. It is of a non-conceptual nature and helps to maintain and update, in a holistic and usually unconscious way, what is called the body schema. The body image, by contrast, is the (conceptual) way we perceive our body. In this sense it has to do, not only with how we literally see our body, but also with our emotional attitude towards and our (scientific) knowledge of our own body. Without a continually updated body schema, movement and balance would be all but impossible.¹

Proprioception is crucial to our self-consciousness. It is this sixth sense that anti-Cartesians use in their argument that the self is not an immaterial ego.

But what happens when you have not got this sense? Here the case histories of patients who have to do without proprioception become relevant. What is their self-consciousness like? I

¹ "... this distinction involves the issue of control. I can consciously decide to raise my hand, for example, and then do so with my perceptual attention focused on this action. In this case, control over this movement is achieved by means of a perceptual experience of the body, that is, by means of the body image. ... Even in intentional bodily motion, however, certain postural adjustments of the body that serve to maintain balance are not under conscious control. ... The body schema ... functions in a holistic way. A slight change in posture ... involves a global adjustment across a large number of muscle systems" Gallagher 1995, 229. Cf. also Gallagher 1986, Bermúdez 1998.
will show that, though their experience of themselves is radically different from the normal case, and their body schema deeply impaired, they do have an awareness of themselves as corporeal and their body image is intact. However, in order to maintain their bodily self-awareness, they need the sense of vision.

Finally I will argue that experience alone, be it of proprioception or of visual perception, is insufficient to account for the immediate experience of the self as corporeal. Active self-movement is needed as well.

**Self-consciousness as non-corporeal.**

Traditionally, self-consciousness has nothing to do with the body. The self is supposed to be something different from the body, something more. What is it exactly that we are conscious of when we are conscious of ourselves?

That is the question Descartes raised in his second Meditation. He tried to establish, with his method of systematical doubt, what he could know with certainty. With his *Cogito, ergo sum* he had already established his own existence. But the next question is: what kind of thing is it that thinks, and therefore exists? And the answer is of course: a thinking thing. "... to speak accurately I am not more than a thing which thinks, that is to say a mind or a soul" (Descartes 1641 [1967], vol i, 151).

Everything I think may be a mistake, a dream prompted by an evil demon. But the fact *that* I think, and that I therefore am a thinking thing, *that* cannot be a mistake. The self is a thinking thing and nothing else is needed for its existence. "Not even a body?", Descartes asks himself. One cannot see or hear, one cannot feel without a body. But here too it may all be a dream, according to Descartes.

But it will be said that these phenomena [seeing light, hearing noises, feeling heat] are false and that I am dreaming. Let it be so; still it is at least quite certain that *it seems to me that* I see light, that I hear noise, and that I feel heat. That cannot be false; properly
speaking it is what is in me called feeling; and used in this precise sense there is no other thing than thinking (ib. 153).

Descartes has transferred all perception from the body to this thinking thing - all perception, all feeling becomes thinking. What is left after this systematical doubt, the only thing we can be certain of, is that we think that certain things are the case. 'Thought is a word that covers everything that exists in us in such a way that we are immediately conscious of it' (Descartes 1641 [1967], vol ii, 52).

Thus we could ascribe to ourselves only mental properties without error, according to Descartes. The ascription of physical properties to ourselves is fallible. The assertion "Now I am thinking of Brussels sprouts" is incorrigible - how could I be mistaken in this? But the assertion "My hair is brown" might be based upon an error. And therefore the word "I" was thought by Descartes to refer to the mind and not to the body.

But what about the awareness of one's own body, or what about pain? Here too the method of doubt leads to the conclusion that pain does not give any certainty about the existence of the body. In the Cartesian view it is all "between the ears". Of course, when you have a pain in your foot it is your foot that hurts, and it seems all too clear that you do have a foot. If the pain is very bad, you might wish that you had not got one - if thy foot is offending thee, cut it off! But that would be a very bad idea - chances are that it would not help at all. Because - apart from considerations of a more practical nature - there is such a thing as phantom pain. Someone whose foot is amputated can feel terrible pains in the foot, in the foot that isn't there any more! It seems as if a person who has such pain in her foot simply cannot be mistaken, but that is exactly what is the case. The part of the body that is so intensely experienced, does not exist, it isn't there.²

Thus, in the Cartesian dualism of res cogitans and res extensa (the thinking substance and the spatially extended substance), the self is clearly a res cogitans, which implies that it is not spatially extended like the body. It is distinct from the body, and its essence is to think. In the

² For some fascinating findings on phantom pain, see Ramachandran and Blakesley 1998.
Cartesian view the body is contingently linked to the self. And though it is even intimately linked to it, it is not really part of the self and it is not necessary for the existence of the self.

**Self-consciousness as corporeal.**

Also in the Cartesian view of the self one's own body is special. My body is different from all others, for my body is the body out of whose eyes I see, whose mouth makes sounds when I speak, whose arm goes up when I raise my arm, that is pushed when I feel pressure and so on. It is mine, though it is not me. But is my body just something that I own? Isn't there a difference between "my body" and "my car"?\(^3\)

Here the anti-Cartesian philosophers take their cue. They claim that the self, though essentially a thinking thing, is *at the same time* a spatially extended, corporeal being. The body is just as much part of the self as the mind. Gareth Evans (1982), for instance, argues as follows: Descartes did not apply his method of doubt in the right way. He thought that everything you could say about yourself that was immune to error automatically belonged to the *res cogitans* and not to the body. For "thought" covers everything of which we are immediately conscious. Only ascriptions of mental properties are correctly ascribed to the self, so the self is essentially mental.

But according to Evans there are also certain self-ascriptions of physical properties that display a particular immunity to error. Not in the sense that they are absolutely incorrigible.\(^4\) It is rather that a certain special sort of error is not possible, the so-called "error through misidentification relative to the first person pronoun".\(^5\) As Evans puts it:

\[\text{None of the following utterances appears to make sense when the first component expresses knowledge gained in the appropriate way: "Someone's legs are crossed, but is}\]

\(^3\) [Descartes' Meditations](https://en.wikipedia.org/wiki/Meditations) are not as straightforward as the so-called Cartesian view. Besides talking about the self as non-corporeal (in *Meditation 2*), Descartes also says (in *Meditation 6*) that he is not lodged within his body as a pilot is within a ship.

\(^4\) But then the belief in the absolute incorrigibility of mental self-ascriptions is not as strong as it was.

it my legs that are crossed?"; "Someone is hot and sticky, but is it I who am hot and sticky?"; "Someone is being pushed but is it I who am being pushed?". There just does not appear to be a gap between the subject's having information (or appearing to have information), in the appropriate way, that the property of being F is instantiated, and his having information (or appearing to have information) that he is F; for him to have, or appear to have, the information that the property is instantiated just is for it to appear to him that he is F (Evans 1982, 220-1).

Having the information "in the appropriate way" means having gained it from a kind of internal sense or bodily awareness. Seeing someone's legs crossed, maybe in a mirror, might make me wonder whether they could be mine or someone else's; feeling (informed by receptors in the muscles, joints and skin of the legs, not with the traditional sense of touch by hand) someone's legs crossed does not leave any doubt that they are mine. So there are some self-ascriptions of physical properties, as well as mental properties, that are immune to error through misidentification. The self, the subject that makes these judgements, is at the same time the object of these self-ascriptions. It is not only a thinking thing, but the very thing that can have its legs crossed, or can be hot and sticky. The self, that to which the word "I" refers, is not a Cartesian ego but a bodily subject of both mental and physical properties.

Bill Brewer (1995) thinks this argument unconvincing. According to him the Cartesian could still maintain that there are two substances: the mental properties are ascribed to the res cogitans whereas the physical ones are ascribed to the res extensa. The Cartesian has to add that there are two different uses of the word "I" involved here. In the "proper" use of the word, "I" refers to the immaterial self, whereas in the somewhat sloppy, secondary use it refers to the body. So we are not really ascribing mental and physical properties to the very same thing. Because both substances are so intimately linked in this world, we ascribe the physical properties not just to any body, but to our own body. Normally the seemingly bodily feelings (thoughts) in the mind are caused by one's own body. So whenever we, res cogitantes, think these things, we are normally justified in concluding that there is something the matter with our bodies: the legs crossed, warm and sticky and so on.
But this Cartesian move, Brewer continues, would only work if all bodily sensations were pure sensations, not spatial or localised in themselves. For everything belonging to the *res cogitans* is essentially non-spatial, according to Descartes. We would have to feel at first a purely qualitative sensation in the mind, and then we would have to infer from that where on the body the corresponding disturbance is that gave rise to that sensation. But that is simply not how bodily sensations are experienced. We do not first feel an itch, then infer that it must be caused by something on the left calf, thereupon try to locate this left calf and finally scratch the offending mosquito bite (or do something else about it). We may go about it like that when our children complain of an itch, but not when we ourselves feel one. What we feel is an itch-in-the-left-calf. The spatial location is part of the feeling from the outset and we have an immediate inclination to act towards that particular location.

Moreover, bodily sensations are spatial in a special way. We do not feel a sensation in a particular location in objective space, but rather in a location that is primarily part of the body. Normally we *also* know the objective location of our body-parts, but *that* knowledge does not seem to be a part of the particular bodily sensation (e.g., the itch), nor can it be derived from that sensation.

So there is, over and above the sensational quale of a bodily feeling, an ineliminable presentation of some more or less specific place in egocentric space that is not a mere construct out of any purely sensational qualitative features. Thus bodily awareness is intrinsically spatial. Apparent location is an essential component of the epistemological given in bodily sensation (Brewer 1995, 299).

On the one hand we have bodily sensations that are intrinsically located in the egocentric space of the body, and on the other hand we have a continuous awareness of the location of our bodies in objective space.

This analysis of bodily sensations as localised in egocentric space offers a way out of the puzzle of phantom pain. Phantom pain is not a pure, non-spatial sensation of pain, that the patient mistakenly *thinks* is in a foot he does not have any more. That the pain is felt in the phantom foot
is not inferred from the fact that it is felt in a location in objective space that would have been occupied by the foot if it had still been there. The patient does not feel pain `in mid-air simpliciter, i.e. not even seemingly in a seeming limb' (O'Shaughnessy 1980, 161). It is an immediate experience of foot-pain. Only because we normally know where our limbs are in objective space, is it also a pain in a certain location in objective space. Sufferers from phantom pain do not just feel pains that are localised outside the boundaries of their own bodies. Neither do they feel pain in imaginary limbs that they simply do not have. There are no known cases of patients who had phantom pains in "fancy" body parts that they never had, like an imaginary tail, or in parts of someone else's body. Phantom pain is still a feeling-in-a-certain-body-part, but it is an illusion because that body part has been amputated.

According to Brewer, this further analysis of bodily awareness as intrinsically spatial and not purely sensational helps to strengthen Evans's anti-Cartesian argument. He concludes: `... the psychological subject is a spatially extended object. The ascribed [sensational] property is a property of the spatially extended body but it is also essentially a property of the subject of consciousness itself' (Brewer 1995, 303).

The nature of bodily awareness.

The next question is how these immediate experiences of ourselves as spatially extended body come about. How do we know where our bodies are localised in objective space, and how do we know our own posture? Anti-Cartesians use these experiences to argue that the self is essentially a spatially extended body. But we can say more about them.

Normally we speak of these five senses: hearing, seeing, smelling, tasting and feeling. And if we mention a sixth sense, in the common sense use of the word, we mean something like intuition. These senses give us information about the outside world. But there is another sense, a "real" biological sense, that gives us information about ourselves, about our bodies, and that is

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6 There is, however, a case described by Ramachandran of a woman with congenitally shortened arms (she had only stumps hanging from the shoulders) who had phantom pains in the parts of the arms she never had (Ramachandran and Blakesley 1998). Cf. also Martin 1995.
the sense of proprioception. Proprioception is the perception of position, posture and movement of the body in physical space. Although proprioception is crucial for self-consciousness, this sense was "discovered" only recently. It was first described by the early nineteenth-century physiologist Sir Charles Bell. He called it the sixth sense, but it was a sense, he stressed, that functions automatically, unconsciously. The information it gives comes from the nerve-endings in muscles and joints, and partly also from those in the skin. The balance organ in the ear also contributes to the information about one's posture and position in space. Nerve endings in the muscles give information about the amount and fluctuation of muscle tone and about the length and tension of the muscle - and in doing so also give information about movement and the amount of force used. Nerve endings in the joints give information about movement and position of the joints, and thus about movement and posture. Stretch receptors in the skin, especially in the face, give information about facial expression, and movements in speech and eating. And the balance organ, together with information from the neck muscles, give information about the global posture and position with respect to the horizontal plane.

But all this information is not conscious. All our movements, and also the maintenance of a posture, require a subtle coordination of countless muscles and joints. And without feedback by the sensory nerves about what the muscles and joints are doing, all our movements and even the maintenance of our posture would go totally awry. The body schema, the continually updated, non-conceptual, non-conscious information about the body, provides the necessary feedback for the execution of both our gross motor programs and their fine-tuning.

Take for example something simple like standing up straight. We have known how to do that since infancy, so we do not have to bother consciously with the motor program we have at our disposal. Also the fine-tuning of this posture is provided for by the body schema. If our arms are slightly in front of our body, we have to lean back somewhat to compensate for the extra weight in front. And if we have to carry something in front of us, we have to compensate more. This compensating just happens; we don't have to think about it. We don't even notice these

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7 C. Bell 1991. Cf. also O. Sacks 1995, x. However, starting from a philosophical point of view, the early 19th-century philosopher Maine de Biran also speaks of a sixth sense, which he calls the "sens intime". See Schmitz 1982.
small corrections, not in others and not in our own case. It is only when we see people with very
large beer-bellies or pregnant women that we notice that they are leaning backwards. All that
information from nerve endings in muscles and joints together with the information from the
balance organ is needed. The body schema has to feed it in time to the motor programs,
otherwise we would fall over. But we don't have to be bothered with it. It all happens automati-
cally, so that we have our hands literally free for other things. Of course this only goes for motor
tasks that are not too complex, or that we have mastered some time ago. New motor skills - a
new piece for the piano, a different technique for handling the reins on horseback - do cost us
conscious effort and attention. And unexpected demands to our motor tasks will always require
our conscious attention.

The majority of our everyday motor tasks are executed automatically. To take another
example: We can effortlessly hold an egg in our hand, palm down. We do not have to think
about how much force we have to use. If we use too little, the egg will drop to the floor; if we
squeeze too hard the egg will break. But it simply presents no problem. Feedback from the
feeling in our fingers, from the skin and the muscles and the joints, automatically takes care of
the right amount of force.

If we have a mosquito bite on our calf we know automatically how to scratch on the right
spot. We do not have to look first where the calf is. We know whether we can pass under a low
doorway, or how not to bump our head when we get into a car.

Diderot, the eighteenth-century French writer and philosopher wrote in *D'Alembert's
Dream*:

`What really sets a limit to the space you feel you occupy?'

`My sight and touch.'

`Yes, by day, but at night, in the dark, or even by day when your mind is preoccupied?'
(Diderot 1769 [1995], 149).

Diderot suspected that there had to exist something like proprioception, that the traditional senses
where insufficient to account for the way that we feel our bodies from the inside. Proprioception
accounts for the fact that we are not lodged within them as a pilot is within a ship, but that our bodily awareness is the consciousness we have of ourselves, not of something that we own.

The possibility of disembodiment: living without proprioception.

Anti-Cartesian philosophers have made grateful use of proprioception as an argument against the Cartesian idea that the self is non-corporeal and that disembodiment is possible in principle, although maybe not in this world. We experience our bodies just as clearly and distinctly as we experience our thoughts. It is precisely in proprioception that the absolute inseparability of the mental and the physical comes to the fore. Proprioception is an experience, and therefore subjective and "mental", and at the same time it is a bodily awareness, and therefore corporeal and physical. The Cartesian distinction between res cogitans and res extensa evaporates in the analysis of proprioception.

If proprioception is so important, we should examine what happens to a being without proprioception. Would such a being have an awareness of itself as a bodily thing? The great physiologist sir Charles Sherrington (1857-1952) experimented with cutting the sensory nerves of animals and showed the devastating effects on their motor control and their posture. He wondered how human beings would cope with a total loss of proprioception, but such cases had never been described. He assumed that what a patient would experience in such a case would be doomed to be indescribable.

Recently some cases have become known of patients with a total loss of proprioception, with so-called total proprio-blindness. Oliver Sacks was the first to describe such a case in The Man Who Mistook his Wife for a Hat (1985), in the chapter with the intriguing title "The Disembodied Lady". In England there is a case that is described in the wonderful book Pride and a Daily Marathon (1995) by Jonathan Cole and also in Canada there is a well documented case. These three patients suffer from a total and irreversible loss of proprioception (though in Sacks'

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there is intact skin sensation). In their own experience they have lost their own bodies; thus Oliver Sacks' use of the phrase "disembodied lady".\textsuperscript{10}

The British case gives by far the best insight in what it is like to be such a patient. The physician and physiologist Jonathan Cole, together with his patient Ian Waterman, have succeeded in describing the indescribable. This is their story:

Ian Waterman fell sick with a viral diarrhoea when he was 19. He felt progressively weaker, but what worried him more was that his coordination seemed to be diminishing. His speech became slurred and he could not walk or maintain an upright position. A doctor was called and Ian was sent to hospital, where initially they thought he was drunk. His condition deteriorated. Doctors did not understand what was going on. He seemed to be paralysed, but there was nothing wrong with his muscles or motor neurons. Besides, the problem was not that he was not moving; even when lying in bed his arms and legs would move in all directions, sometimes painfully hitting anyone who came close. He had no control whatever over his movements.

What had happened was that Ian Waterman had lost all sense of touch and proprioception from the neck down. All large sensory nerves that send information from the periphery to the brain had been destroyed. What was left was feelings of deep pain, of heat and cold and of fatigue. But not a single feeling of the position and posture of his body, not a single feeling of touch on the skin. He was lying on his bed and did not feel his body at all. If he was not looking he did not know where his arms and legs were. He could initiate a movement, but subsequently did not have any control over it. He could not sit up, and if someone else put him in an upright position - which was a dangerous job because of those flailing arms and legs - he could not stay upright and collapsed in a heap. At first the nurses thought he wasn't cooperating, but he just couldn't maintain the posture.

Very slowly he learned to sit up, by thinking very hard how he would go about it. At first he only used the muscles of his abdomen, as in sit-ups, but that didn't work. Then he realised that

\textsuperscript{10} Oliver Sacks makes mention of a number of reversible cases in the United States under vitamin addicts. Megadoses vitamin B6 or pyridoxine seem to be responsible for these problems. Cf. also Sterman et al. 1980.
the weight of his head was keeping him back, so that he lifted that first. When he finally succeeded, he was so triumphant that he forgot to think and fell back.

As soon as he had learnt to sit up and maintain that position, the hospital staff tried to transport him sitting up in a car. But that turned out to be very difficult. His legs had to be lifted into the car, but no sooner were they inside than they started to come out again of their own accord. He could not compensate for any disturbance in his equilibrium, so he fell over every time his centre of gravity changed. He had no idea how to move in time and sympathy with the vehicle when turning corners.

Over the months and years he learned to eat, to dress himself, and finally even to walk and to write again. Doctors and physiologists thought that meant that his neuropathy was getting better, but the destroyed nerves never recovered. It was all done by endless, never abating concentration, by conscious planning of every movement, and especially by using visual feedback.

In the dark, when he could not see himself and his surroundings, he was just as helpless as in the beginning. He didn't know what was horizontal, he didn't know his own posture, and he just fell on the floor. He always had to sleep with the lights on. In the dark he didn't know where his limbs were in the bed, and he couldn't get up. If he wanted to turn over, he had to wake up and see where he was, plan the movement, execute it and only then he could go back to sleep.

Jonathan Cole, his physician and the writer of the book, once asked him whether he slept with a torch on the bedside table - and immediately was ashamed of the question. How would he have been able to find the torch in the dark? By touch? But he didn't have any sense of touch. In the dark he did not know where his hand was; and even if he knew, he would not have been able to move it towards the bedside table without visual feedback; and even if he could do that, he would not have been able to find the torch by touch.

Ian Waterman never got better but he learned to deal with his problems. He learned how to walk, how to drive a car. He got a normal job. And though nobody could fail to notice that he moved in a rather peculiar way, most people did not know that he was severely disabled. But he can only maintain this seeming normality by constant, unflagging concentration and planning.

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11 i.e. a flashlight in American English.
Although his very proficiency in walking and other motor tasks suggests that at least some motor programs are re-established, most movements never get learned, in the sense that they need less conscious attention. Where most of our movements are executed automatically, routinely, with an easy grace, his are planned, consciously monitored. He has learned the trick of holding an egg, but he cannot walk while holding one: the act of walking requires so much concentration that nothing is left for the task of holding the egg and he either drops or crushes it.

Self-consciousness and the bodily awareness of a deafferented patient.

What can we learn from such a case about self-consciousness and the body? A deafferented patient (someone in whom the sensory nerves leading from the periphery towards the brain do not function any more) has a totally different kind of awareness of his or her body than we have - almost indescribably different. He or she hardly feels a body, is qua proprioception indeed almost disembodied. The body schema gets only very few kinds of information - of pain, temperature, fatigue and deep touch. The crucial information about position, posture and touch (skin sensation) is missing.

GL, the other deafferented subject that is being discussed in the literature, occasionally talks of her body as being a machine on which she imposes commands - she does seem to feel herself to be a pilot lodged within a ship - and a ship that is difficult to steer at that. But then her neuropathy is from the level of the mouth down, and unlike Ian Waterman, she has never been able to learn to walk again.

However, both subjects claim that, although their body schema is almost non-existent, their sense of body image, their sense of how they look and how much space they occupy, has altered little as a consequence of the deafferentation syndrome.12

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12 In this respect they have a more normal, less disturbed body image than an anorexia patient who could be defined as a person who always thinks that she occupies much more space than she actually does.
When talking of boundaries between him and the external world, IW's immediate concern was to stress his need to have a larger personal space surrounding him to avoid the danger of unexpected movements by others. He suggests that, in the absence of touch, his personal boundaries are visually maintained, that he has to keep an idea of the positions of his limbs and their relations to external objects in mind all the time and, by this visual monitoring and visual memory, keep alive both a knowledge of where he is and an awareness of body image (Cole and Paillard 1995, 262).

Both subjects can experience pain. The pain they experience is always located in a particular part of the body, even if they cannot see themselves. It is never felt outside the boundaries of their bodies. Indeed, they never have any sensations of phantom limbs at all. GL is normally able to perceive a pin prick to her skin, and tell the location of the stimulus, but if she cannot see her body, she is not able to point to that location. She can indicate the right place precisely on a schematic body picture that she can see. 'In other words, she can locate the stimulus in a perceptual representation of her body, knows where the stimulus has been delivered within the frame of her body image, but does not know how to get there in her apparently lost sensorimotor frame' (ib. 254).

These findings lend support to the idea that our bodily sensations are primarily sensations-in-particular-body-parts, in the egocentric space of our own body, and only secondarily sensations located in objective space. In normal subjects both kinds of localisation go together, but it is possible that the second kind fails.

But shouldn't we say that the Cartesians were right after all in claiming that the self is not intrinsically corporeal? Aren't these patients really somewhat disembodied, as Oliver Sacks seems to suggest?

I do not think so. As we saw, both had a correct body image. Both felt pain immediately as located within the frame of their body image, on a particular place. It is just that their body image was not proprioceptively but visually maintained. Cole and Paillard say that they have a kind of visual proprioception. That sounds prima facie just as strange as visual hearing. Lip-reading is not hearing, although you do come to know what someone is saying. Likewise visual per-
ception is not proprioception, though you do come to know the position and posture of your own body. And it does seem as if this visual perception gives IW and GL a normal body image and an awareness of themselves as corporeal.

**Visual perception, movement and the body.**

The fact that Waterman's and GL's body image is *visual* raises problems. How can it be an awareness of the self, how can it be *proprio*-ception? Why should the object of visual perception, the body, be equated with the subject of that perception, the self? Proprioception is the sense that is pre-eminently characterised by immunity to error through misidentification. When you feel a certain property of a body instantiated, you know *ipso facto* that it is instantiated in your own body. But visual perception does not carry the same guarantee. That is, when you *feel* someone's legs to be crossed, proprioceptively, you know at the same time that it is you that feels thus, *and* that it is your own legs that are crossed. But when you *see* someone's legs to be crossed, you cannot be certain whose legs they are, though of course you *are* certain that it is you who sees them. So how can visual perception help in achieving an awareness of the self as corporeal in the same way that proprioception does?

At first, when Waterman was lying on his bed, unable to move, he had no awareness of his body at all. He did not feel anything. However, in a poem he equated the living death, not with loss of touch, but with the subsequent loss of movement. Only when he had learned to move again, with the help of visual feedback, did the idea of being dead disappear - though he felt just as little as before. He never regained his sense of touch.

It is especially significant that Waterman learned to drive so well. In fact driving a car is about the most relaxing activity for him there is: it is far easier for him to drive 300 or 400 miles than to stop and refuel for petrol. With a normal steering wheel and a single stick control for accelerating and braking, he had no difficulty with driving at all. He did not have to plan each movement consciously. He did not even need to look at the speed control or at his hand on it, because he could use visual feedback from the scene outside.

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In fact this is how able-bodied people drive a car. We don't have to think: if I press my foot down this far, I will go that much faster. We just see how fast we are going and adjust the movement of our foot accordingly. And if we are used to the car, we know how wide it is without looking. We just know whether we can pass through a narrow opening; we have a correct car image based on visual feedback. We have no proprioception of the car, in the sense that we do not feel the car. And yet we move with it as if it were an extension of our own body. Thus our car image is much like our body image and unlike our body schema: it is perceptual but not proprioceptive.

This is reminiscent of the ideas of the psychologist James Gibson. According to him proprioception is not all that important for awareness of the self. It is the visual information (Gibson prefers to speak of optical information) that counts.

Visual perception only exists in moving organisms. Only organisms that are able to move relatively fast are in need of some kind of perception at a distance in order not to bump into things. Slow-moving organisms can stop on contact without incurring damage. So seeing (or, in organisms living in the dark: echolocation) is necessary in order to move.

But conversely, movement is needed in order to see. Gibson has shown in numerous experiments that a stationary perceiver misses all kinds of information that a moving perceiver picks up easily. Ambiguities that puzzle the stationary perceiver are easily resolved, indeed almost never arise, for a moving one. The difference between an opening and an obstacle - both form a closed contour with a different kind of texture inside the contour from outside of it - have presented a difficult problem for computer vision. For a moving perceiver the problem vanishes. If it is an opening: more and more texture appears within the contour on approaching; if it is an obstacle: more and more texture disappears on the outside of the contour on approaching.

But it is not just movement that is needed in order to see, it is active movement, indeed self-movement. In a famous experiment Held and Hein describe the sensorimotor skills of kittens, reared in the dark. Several hours a day they spend in a contraption which allows one kitten fairly complete freedom to explore its environment actively. The other is suspended passively in a gondola that is moved in all directions by the exploring littermate so that the gondola passenger is subjected to the same play of visual imagery as the active kitten. After some weeks,
the active kitten shows a normal visualmotor development, whereas the visualmotor skills of the passive one are seriously impaired (Held & Hein, 1963).

So in order for visual perception to develop, we do not only need movement, but self-movement. The passive kitten was in motion, just as much as its active companion. It had normally developed motor and visual neurons, but its visualmotor control was definitely sub-normal. Presumably it had never learned to experience itself in space; never developed a proper body image.

A self-moving, active organism gets information about the environment, information about where it is and where it is going to. But at the same time it gets information about where it itself is in that environment: precisely in the centre. The environment surrounds the self, and the self forms the centre of egocentric space. When you turn around your axis, you yourself are what you do not see. Gibson states:

Ask yourself what it is that you see hiding the surroundings as you look out upon the world - not darkness surely, not air, not nothing, but the ego! (Gibson 1979, 112). The optical information to specify the self, including the head, body, arms, and hands, accompanies the optical information to specify the environment ... When a man sees the world, he sees his nose at the same time ... The nose is here ... (ib. 116-7). Egoreception accompanies exteroception, like the other side of a coin. Perception has two poles, the subjective and the objective, and information is available to specify both. One perceives the environment and coperceives oneself (ib. 126).

Perhaps Gibson is a bit too easy in discarding the need for proprioception. Normally we do need that too for an awareness of ourselves. Visual perception or visual proprioception can only function when there is light. Diderot already saw that another kind of sense was necessary 'to set a limit to the space you feel you occupy ... at night, in the dark, or even by day when your mind is preoccupied' (Diderot 1769 [1995], 149). Especially the clause 'when your mind is preoccupied' is important. Ian Waterman and GL are spending a gigantic, never abating amount of concentration simply to execute their movements and to keep their posture and to maintain their
bodily awareness with just visual proprioception, without real proprioception. Proprioception, the automatic, unobtrusive sixth sense, literally frees our hands; it leaves our minds at liberty to be occupied elsewhere.

Conclusion

There is a lot we can learn from neuropathological cases. They are often more surprising, more bizarre even, than the most contrived thought experiments could be. They can sometimes serve in philosophical disputes, but they always raise further questions. In this instance, though Ian Waterman's case clearly supports certain conclusions about self-consciousness and the body, the case of GL is more ambiguous. Her awareness of herself as a corporeal being is much more tenuous. What would happen if she had not been able to move at all? Clearly she still would have some kind of self-consciousness, but the question is whether it would be a consciousness of an immaterial self. At least she might have retained the memory of a bodily awareness. On the other hand, we have cases of complete paralysis from birth. But there is no case known of a person who is afflicted with both paralysis and absence of proprioception from birth. We simply don't know what would happen in such a case - and we must hope that such a case will never occur.

Still, there are some conclusions we can draw from the cases of Ian Waterman and GL. Cartesians believed to have arguments that the self is essentially non-corporeal. Anti-Cartesians, in their turn, argued that in proprioception we immediately experience ourselves as corporeal.

But real proprioception is not strictly necessary. The case histories of Ian Waterman and of GL have revealed that people can do without it. They use visual perception to maintain their bodily awareness. Do these facts plead for the Cartesian point of view? Is it true after all that our bodies are machines that we can see and operate, as GL felt?

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14 They also have invested a large amount of their energy in re-learning gesture. Being embodied also means being emotionally embodied. Just as the body is not a machine on which one imposes one's commands, it is not a machine with which one communicates one's emotions. The body expresses one's emotions, and without the possibility of expression IW and GL said they would feel less embodied.

15 One case is beautifully described in Christie Brown's autobiographical novel My Left Foot.
I do not think so. For Gibsonian arguments indicate that in visual self-perception we do not see ourselves as objects, but as subjects, indeed as ourselves. But in order to be able to do so active self-movement is necessary. As soon as he could move, Ian Waterman no longer felt to be dead. GL however, who never managed to get out of her wheelchair, appears to describe much more of a feeling that her body is a machine than Waterman.

As long as we can move actively we experience ourselves as corporeal, or anyway as spatial. But to be able to move we need some feedback about our movements, be it in the form of proprioception or in the form of visual perception. Mother Nature has provided us with a double feedback system, as often happens in evolution: we have proprioception and visual egoreception as well. To be sure, we normally need both systems, and they cannot just stand in for one another. In view of the enormous difficulties experienced by Ian Waterman and GL, the Gibsonian notion that vision is the most important of the two, and that proprioception from specialized proprioceptors gives only one kind of propriospecific information, seems to be wrong. It underestimates the importance of somatic proprioception. But visual egoreception can take over at least some of the functions of proprioception as a feedback system for movement and locomotion.

However, both systems can only work if we can move, can actively move ourselves. Or, to ring another change on Kant’s famous dictum: movement without self-perception is blind, self-perception without movement is empty. The ecological self, the self that is perceived in visual egoreception, is a doer. Gibsonian visual perception is an active way of information pick up, and is indeed nothing without active self-movement. It is not just the information of a changing environment, but the interplay between this information and the active self-movements, that places the self firmly in the centre of the environment. Active self-movement gives a sense of agency, as the perceived environment changes as a result of the purposive action. That is why

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16 Neisser 1993, 6.
17 Gibson 1979, 115
19 Gibson 1966, 1979. Although according to Gibson visual kinesthesis is available to both a passive and an active mover (so it is not the same as visual feedback), perception is, nevertheless, an act. "The act of picking up information ... is a continuous act, an activity that is ceaseless and unbroken" (1979, 240).
the passive kittens in the Held & Hein experiment were so impaired. They had never experienced this interplay between purposive action and changing environment.

The body has a special status, not just because it is constituted by the information coming from proprioception, but also because it is the immediate respondent to the will.20 This should not be taken in the sense that the will is the pilot of the body: in action I do not move myself, but I myself move.

Cartesians are wrong: the self is indeed corporeal. But anti-Cartesians who want to argue this with reference to bodily sensations only, are wrong too: they concentrate in their argumentation on passive sensations and miss the importance of active self-movement. The self of self-awareness is neither the Cartesian thinker, nor the proprioceptive feeler. It is, at bottom, the localised actor.

Of course, we are many things, and we experience ourselves as many different things. Sometimes we indeed experience ourselves to be nothing but thinkers, sometimes nothing but feelers, sometimes nothing but a centre of narrative gravity.21 The self is many-layered. But there is evidence from various sources that the sense of self as an embodied, active being is in place, long before there is any "real" thinking, or narrating, or even perhaps before there is much differentiated experiencing. In a synthesis of developmental psychology and psychoanalysis, Daniel Stern (1985) claims that the sense of a core self emerges in an infant between the second and seventh month. This sense of a core self is characterised, among other things, by the sense of being an integrated, coherent body that is different from the rest of the world, and by a sense of agency. This is before there is any sense of a subjective self and of a verbal, and thereby objective self come into being. Carl Ginsberg (1984) argues that the self that plays such a prominent role in humanistic psychology is really a somatic self. And Ulric Neisser (1993) argues that the ecological self and the interpersonal self are developed before the conceptual, the temporally extended and the private self.22

22 Cf. also Gibson 1993, Bermúdez 1998.
Not only ontogenetically, but also phylogenetically, it seems likely that there exists a kind of awareness of a corporeal self long before there is any sign of self-consciousness in the Cartesian sense of the "I think", or any sign of the existence of a self-concept. Gallup (1977) for instance, claims that the great apes, but no other kinds of primates, can recognize themselves in a mirror, and that this self-recognition shows that the apes have a well-integrated self-concept, implying that they have an awareness of their own existence, can view themselves as they are viewed by others, and can contemplate their own death. But Heyes (1994), in a review of these mirror experiments, argues that

... it is incredible that any primate (or indeed any vertebrate) lacks the only kind of self-concept necessary to use a mirror as a source of information about its body: i.e. what might be described loosely as a 'body-concept'. All that the animal needs to know about itself is that its body is distinct from the rest of the world, including the bodies of other animals (1994, 914-915).

It is rather confusing to be talking of a body-concept in this context, for presumably the self-awareness of most vertebrates is non-conceptual. But even the simplest organism is already a kind of "selfless self", in that it, in maintaining its own organisation, distinguishes itself from what is not itself.23 And elsewhere I have argued that the most primitive kind of self-awareness emerges in organisms with locomotion, active self-movement.24 Such animals are ecological selves, active agents in their immediate environment.

To be sure, our self-consciousness is much more sophisticated, much more complex also. And at times our self-awareness can become separated from its corporeal basis. In sickness, injury or paralysis we experience ourselves as different from our disobedient body. We become more of the pilot, the one who tries to move the body-machine, instead of a self-mover. There is evidence that medieval and early modern man experienced his own body as unruly, disruptive,

and much more open to foreign influences than we do today. And in meditation one can experience the dissolving of the boundaries of body and of the self.

But all these different kinds of self-consciousness, and all these different senses of the self, are additions to, or variations of, or indeed retreats from the original sense of self. They are therefore dependent on that sense of a core self, an ecological self. Thus Lakoff and Johnson (1999) describe the metaphoric system in which people conceptualize their inner lives. People seem to experience "a fundamental distinction between what they call the Subject - the locus of consciousness, subjective experience, reason, will, and our "essence" - and one or more Selves" (1999, 268). But they stress the fact that these metaphors in which people talk and think about themselves are grounded in the earliest everyday, bodily experiences of manipulating objects, being located in space, entering into social relations and, finally, emphatic projection. Indeed, these bodily experiences form the basis of all metaphors we use, indeed of the very way we think.

These ideas about "philosophy in the flesh" have a longer tradition. Schmitz (1965), in an overview of the history of the concealment and rediscovery of the body, mentions the French philosopher Maine de Biran:

[Maine de Biran] adds, to the five external senses that were the only sources of experience, according to Condillac, a sixth sense (sens intime). This sense consists in the awareness of one's own self, through a forcefully exercised effort of the will against the sluggishness of one's own body. This fundamental experience of human consciousness, which forms the inner sense, grounds, according to Maine de Biran, both self-consciousness and the categories of substance and force [causality], that structure

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25 "The persisting symbolic representations which partly compose a body image in turn influence the preconscious continuous body schema which supports and constrains action and thought ....: both image and schema are historical. The bodies ... glimpsed through texts of English Jacobean drama, were (not only theorised as but lived as) semipermeable irrigated containers, moist sponges filled with interchangeable fluids" (Sutton 1998, 42).

26 Ginsberg 1996. But this experience of dissolving is only achieved with the utmost difficulty after years of strenuous "sitting"; it would therefore seem to be, although biologically possible, far from natural.

27 Cf. Ginsberg 1996, who distinguishes essence and (one or more) identity (identities).
external experience. ... In this way the bodily is no longer projected into something else - such as God or Nature or the transcendental ego. Rather the fundamental types of human experience are traced back to corporality as the first condition of their possibility. Thus Maine de Biran is the first thinker, who makes human corporality, in its neither mental nor purely physical character, the subject of philosophical study, straightforwardly and without reinterpretation (Schmitz 1982, 591; my translation)

So my conclusion is: that which we are immediately aware of in self-consciousness is indeed essentially a corporeal, spatial thing as much as it is a conscious thing. But such a self-awareness can only arise in an active, self-moving organism.

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28 So the self, though corporeal and spatial, is not physical. It is as much physical as it is mental, or rather, it is neither. In this sense I am not defending some kind of physicalism, but rather a double aspect theory.

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