

**Persons and the Extended-Mind Thesis**

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Cognitive scientists have become increasingly enamored of the idea of extended minds. The extended-mind thesis (EM) is the claim that mentality need not be situated just in the brain, or even within the boundaries of the skin. EM is the modal claim that it is possible that the mind is not bound by skull or skin. EM is quite radical: A mind is a collection of processes that easily extends to tools, programs, other minds, language. Cognitive states may have all sorts of components—neural, bodily, environmental. The heart of the extended-mind thesis is that we biological creatures can “couple” with nonbiological entities or features of our environment and thereby expand the entities that we are. Some versions do away with enduring agents altogether: “Extended selves” are relatively transitory couplings of biological organisms and external resources. (Clark and Chalmers, 1998, p. 18) Although there is a huge and complex literature on the idea of an extended mind—both pro and con—I’ll focus on some of Andy Clark’s work, especially the article he wrote with David Chalmers in 1998, “The Extended Mind.”<sup>1</sup>

Here’s my plan for the paper: First, I want to show how EM can be seen as an extension of traditional views of mind. Then, after voicing a couple of qualms about EM, I shall reject EM in favor of a more modest hypothesis that recognizes enduring subjects of experience and agents with integrated bodies. Nonetheless, my modest hypothesis allows subpersonal states to have nonbiological parts that play essential roles in cognitive processing. I’ll present empirical warrant for this modest hypothesis, and show how it leaves room for science and religion to co-exist.

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<sup>1</sup> For a book-length treatment of difficulties with EM, see Adams & Aizawa 2008. Adams and Aizawa emphasize the need for a theory of cognition adequate to the needs of cognitive psychology.

## From Traditional Views to the Extended Mind

One way to understand EM is to start with a traditional picture of mental states and to see how EM revises it. Here is one traditional picture: Many mental states have content—states of desire, for example, are satisfied or not, intentions are fulfilled or not, beliefs are true or false. Typically, contents are given by the ‘that’-clauses that follow psychological and linguistic verbs like ‘thinks’, ‘believes’, ‘desires’, ‘intends’, ‘says’. Thoughts and other contentful states are said to have two kinds of properties: properties determined by the content and properties of the “vehicles” that carry content. (The distinction brings to mind Descartes’ distinction between representative (or objective) reality and formal reality.)

What makes a thought the very thought that it is is its content. That is, states that have content are individuated by their contents. The thought that snow is white differs from the thought that grass is green in virtue of the difference between snow’s being white and grass’s being green. The contents of thoughts (and other mental states)—that snow is white or that grass is green are carried by vehicles—traditionally thought of as neural states. Neural states are internal states, “in the head.” Call this view ‘*vehicle-internalism*’.

Even if, as traditionally supposed, vehicles are internal to the thinker, the contents of thoughts may be determined by phenomena outside the thinker (or so many think). The view that the contents of our thoughts—and hence, the identity of which thoughts we can have—are determined by features of the environment is called *content-externalism*.<sup>2</sup> To take a well-worn example, Pam, who lives on earth where there is H<sub>2</sub>O (=water) may have the thought that water is wet. Now suppose that there is another world in which there is an abundant liquid that looks like water but is not water since it has a different chemical composition. Suppose also that people in that waterless world brush their teeth with, swim in, etc. in the water-look-alike. In the other world, the inhabitants speak a

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<sup>2</sup> See Burge 1979 and Putnam 1975. I have been pursuing similar externalist lines for more than twenty years. See Baker 1987 and Baker 1995.

language similar to English, but when they utter what sounds like ‘water’ in English, they are not speaking of water but of the other stuff (the water-look-alike). In that other world, where there is no water (no H<sub>2</sub>O), a molecular duplicate of Pam—call her ‘Cam’—could not have the thought that water is wet. The duplicate’s thought can be reported in English as the thought that twater (the stuff in the other world) is wet, but it cannot be reported as the thought that water is wet. Cam’s thoughts that correspond to Pam’s water-thoughts are twater-thoughts. Cam cannot have any water-thoughts. Since Pam and Cam are molecular duplicates, their brain states are of identical types. But if content-externalism is true, their thoughts are not of identical types.<sup>3</sup>

Although content-externalism is not altogether uncontroversial, it is well-entrenched enough to say that a version of the traditional view combines vehicle-internalism and content-externalism.<sup>4</sup> We may see EM as an extension of the externalism of contents to an externalism of vehicles.<sup>5</sup> With the combination of vehicle-internalism and content-externalism in the background, EM treats vehicles in a way analogous to the way that the (externalist) traditional view treats content. EM is a kind of extreme externalism: Not only the determinants of content, but also the vehicles, may be located outside the organism. Andy Clark, an early proponent of EM, characterizes EM as “the view that the material vehicles of cognition can be spread out across brain, body and certain aspects of the physical environment itself.” (Clark 2005, p.1)

In short, EM in effect extends content-externalism to vehicle-externalism. (Hurley 1998) Until recently, vehicles were thought to be only brain states (vehicle-internalism). But according to vehicle-externalism, not only is the content determinable by features of the environment, but the vehicle may also be spread out into the

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<sup>3</sup> I believe that content-externalism is true, and I’ve argued for it in many places. E.g., see Baker 2007b.

<sup>4</sup> This is not how I formulate my own view of belief. I take the material carrier of content to be almost irrelevant to understanding belief. Suppose that a German and a Saudi both believe that the US has pursued dangerous policies in the Middle East. Their brains may be in quite dissimilar states. See Baker 1995.

<sup>5</sup> One could endorse wide vehicles but be an internalist about content; but since content externalism already has breached the boundary of the skin for determining content, it seems to me natural to see EM as an extension of the breach of the boundary of the skin.

environment. Vehicle-externalism supposes that cognitive processes may have vehicles that include aspects of the environment.

For example, beliefs are normally embedded in memory, but need not be. Consider Otto who is impaired in a way that he cannot form new memories. He may write down what he wants to remember in a notebook, which he always carries. Suppose that Otto is on Fifth Avenue in New York City and is looking for MOMA. He knows that he cannot simply “search his memory” to recall the location of MOMA, but he automatically reaches for his trusty notebook and looks up the address: 53<sup>rd</sup> Street. The information in the notebook—just like the information stored in brain-based memory—“is reliably there when needed, available to consciousness and available to guide action, in just the way that we expect a belief to be.” (Clark and Chalmers 1998, p. 13) Viewed from the lens of EM, the skin is seen as an artificial boundary.

In one of the most important early articles on EM, Andy Clark and David J. Chalmers say, “[W]hen it comes to belief, there is nothing sacred about skull and skin. What makes some information count as a belief is the role it plays, and there is no reason why the relevant role can be played only from inside the body.” For some of Otto’s mental states—his extended beliefs—Otto and his notebook are coupled; they form a cognitive system, all of the components of which are causally active.<sup>6</sup> The “relevant parts of the world are *in the loop*, not dangling at the other end of a long causal chain.” (Clark and Chalmers 1998, p. 9) Hence, extended cognition is sometimes called “active externalism.” (Clark and Chalmers, 1998, p. 8.)

As Clark puts it later, “[T]aken as a single, integrated system, Otto-and-the-notebook exhibit enough of the central features and dynamics of a normal agent having (amongst others) the dispositional belief that MOMA is on 53<sup>rd</sup> St. to warrant treating him as such.” (Clark 2005, p. 7) He asks rhetorically, “[I]f an inner mechanism with this functionality [passive aspects of memory] would intuitively count as cognitive, then

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<sup>6</sup> Adams and Aizawa 2008 argue that “coupling” is the wrong way to approach extended cognition altogether. The notion of coupling conflates ways that cognition causally depends on the environment with ways that cognition constitutively depends on the environment.

(skin-based prejudices aside) why not an external one?” (Clark, 2005, p. 7) The point of EM is that neither the organic brain nor the skin sets a boundary on the vehicles of cognition. Features of the environment may or may not be components of the vehicle.

In general, tools extend cognition. A tool, “even when temporarily in use, is rapidly assimilated into the brains’ body maps and is treated (temporarily) just like a somewhat less sensitive part of the body.” For example, the receptive visual field of a macaque using a rake for as little as 30 seconds becomes elongated as if the rake were part of the arm. (Clark 2005, p. 8) So, use of a tool, even temporarily, changes neural maps. Neural plasticity “makes it possible for new equipment to be factored deep into both our cognitive and physical problem-solving routines.” (Clark 2005, p. 9) So, we become physical and cognitive hybrids—part biological and part artifactual.

Not only is there physically extended cognition, there is socially extended cognition as well. As many have observed, their spouses are their external memory devices. The vehicle for many of my beliefs includes states of my husband as a component. For such beliefs (as well as in other ways), a proponent of EM may say, my husband and I are coupled. Coupling between agents is effected by language, among other things.<sup>7</sup> Language “is not a mirror of our inner states but a complement to them. It serves as a tool whose role is to extend cognition in ways that on-board devices cannot.”

Clark emphasizes that hybridization (Otto-and-his-notebook) is quite normal. We routinely use “transparent technologies” such as pencils for calculating sums. We are just shifting combinations of biological and non-biological elements.

### **A Step Too Far**

A precursor to EM was encapsulated in a slogan “embodied and embedded.” This slogan is quite congenial to me. Many of our mental states (all the interesting ones) are made possible by our being embodied as we are and embedded in the environments that we are. Some of our mental states, e.g., memory of how to ride a bicycle, may be constituted by states of our bodies beyond the brain. And the electrical stimulation

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<sup>7</sup> Coupling can also be effected by gestures, artifacts, or shared practices.

provided by cochlear implants is clearly part of the cognitive process of hearing among certain deaf people.

So far so good. But some proponents of EM take another step: The extended mind seems to imply an extended self. In that case, one's boundaries may fall outside one's skin. "Otto [who couldn't retain information without his notebook] *himself* is best regarded as an extended system, a coupling of biological organism and external resources. To consistently resist this conclusion, we would have to shrink the self into a mere bundle of occurrent states, severely threatening its deep psychological continuity. Far better to take the broader view, and see agents themselves as spread into the world." (Clark and Chalmers 1998, p. 18.)

I think that Clark and Chalmers here set out a false dichotomy. We can reject both the option to "shrink the self" and the option to see ourselves "as spread into the world." On the one hand, we can think of ourselves as subjects of experience and as agents without supposing that there is any mysterious inner entity, the "self". As Hurley wisely put it, "It is a mistake to think that the processes in brains that make subjecthood and agenthood possible relocate subjecthood and agenthood internally. These processes make it possible for us familiar persons to be selves, embedded in the world, here where we seem to be. They don't replace us with other, hidden selves." (Hurley 1998, p. 36) (So, I try to avoid the term 'self' altogether.) On the other hand, as I shall argue, we are not stretched out across the environment.

As a traditional externalist, I do take the social, linguistic and physical environments to play essential roles in determining what we are able to think and do. However, I do not believe that that role "spreads [us—cognizing agents] into the world." We are still agents and subjects of experience, not mere systems or components of systems. Cognitive processing does loop out into the world; but processing does not stand on its own. It requires an entity that is doing the processing: Processing does not perceive or act on the world; we do. Brains do the processing that enables us to perceive and act on the world; but the entities who act on the world are not brains, but agents.

If I am right, then we are enduring persons—agents and reflective subjects of

experience. For the remainder of this paper, I'll explain my view of persons and the extent to which it can accommodate a small (but empirically warranted) step in the direction of EM.

## Two Qualms

Although many philosophers and cognitive scientists have responded to Clark—especially to his book, *Natural-Born Cyborgs*<sup>8</sup>—I would like to raise two qualms of my own. Both concern the nature of human persons. Since I have argued for my views elsewhere (Baker, 2007a), I shall only mention my qualms and not argue for them here.

First, I can agree that there is a cognitive system that has as parts Otto and his notebook; but Otto does not expand to become an extended entity that includes his notebook. Otto, the human being, does not dissolve or disappear into a cognitive system. Elsewhere, I have argued that the only coherent way we can understand ourselves is as entities with first-person perspectives (Baker 2000, 2007). So, on my view, Otto is a concrete particular, and there is no concrete particular denoted by 'Otto and his notebook.' A cognitive system is not a concrete particular. So, even if one supposes that Otto is a part of a cognitive system that has a nonbiological part (Otto's notebook), Otto himself does not become an extended being (Otto-cum-notebook). A person who is part of a cognitive system does not expand to include the other parts of the system; nor does the system take ontological precedence over Otto, the human being. Similarly, when several people are brainstorming, they may compose a cognitive system, but there is no reason to reify the system as if it were an individual in the same sense that the participants are individual persons. The system (Otto-cum-notebook)—like the brainstorming group (Tom, Dick and Harry)—does not take ontological precedence over the persons who are parts of it. Otherwise, persons as we know them would disappear.

As I understand Dennett, persons do disappear. Ontologically speaking, there is tool use, but no tool user; there is thinking, but no thinker; acting, but no agent; experiencing, but no subject of experience. There are just temporary couplings of various

<sup>8</sup> See the Review Symposium on Andy Clark, *Natural-Born Cyborgs* - reviews by Terry Dartnall, Adrian Mackenzie, Alicia Juarrero, and Steven Mithen, in *Metascience* 13, 2004: 139-181. Also see criticisms by Adams and Aizawa 2008.

components of various processes.<sup>9</sup> So, persons disappear into temporary hybrids. Persons become scattered objects, different hybrids at different times. It is unclear what holds persons together over time. (Perhaps person x considered at time t = person y considered at time t' iff there is a human body that is part of person x at t and is also part of person y at t'?) Clark expresses agreement with Dennett's interpretationism regarding "selves." (Clark, 2005, p. 10) Since I have written on Dennett and extensively on persons, I'll simply say that for me an anti-realist view of persons is a nonstarter.<sup>10</sup> There's no tool use without a tool user.

My second qualm concerns the distinction between personal and subpersonal levels—a distinction that I take to be ontological. (Baker 2007a, Ch. 11) (Clark mentions the importance of the distinction several times, but I suspect that he takes the levels to be levels of description. Clark 2005, p. 1, n. 1) It seems to me that, on EM, the distinction between personal and subpersonal levels (whether descriptive or ontological) becomes blurred, especially when we consider tools. Clark suggests that a gardener-together-with-his-spade is an extended agent (Clark, 2005, p. 8) Here the tool (the spade) is on the personal level—it is something that the agent, the whole person, manipulates. But Clark also says that a neural implant extends cognition, and I infer, is likewise a tool. (Clark and Chalmers, 1998, p. 10) A neural implant is clearly a subpersonal device. Tools seem to be ubiquitous, crossing over between personal and subpersonal levels.

Keeping personal and subpersonal levels distinct is important to me because I do not believe that there are extended agents or extended persons; however, I shall propose a modest hypothesis that recognizes us as enduring persons, whose subpersonal states may have nonbiological parts that play essential roles in cognitive processing.

Since 'cognitive process' and 'cognition' are sometimes used equivocally for phenomena at both personal and subpersonal levels, let me try to avoid confusion by stipulating how I shall use terms. I use 'mental state' and 'mental process' to refer to person-level states and processes that are constituted by subpersonal states and processes;

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<sup>9</sup> An early article along the way is Dennett 1978.

<sup>10</sup> For my response to Dennett, see Baker 1989 and Baker 1994. For my detailed work on persons, see Baker 2000 and Baker 2007a.



and I use ‘cognitive state’ and “cognitive process’ to refer to subpersonal states and processes. On my modest hypothesis, subpersonal states and processes may have bionic components. Since I take minds to be at the personal level, constituted by brains or by brains-with-bionic parts (or someday, perhaps wholly by bionic mechanisms), and my modest proposal pertains only to subpersonal states and processes, it would be more accurate to call the proposal a modest version of extended cognition.

### **A Modest Proposal**

I share two beliefs with proponents of EM: persons are not essentially biological and there are no immaterial minds. But I disagree with proponents of EM about the existence of extended persons. On my view, there are no extended persons—persons who extend beyond their bodies.<sup>11</sup> However, there are enduring persons—subjects of experience, agents, who can think reflectively of themselves throughout much of their existence. (They have robust first-person perspectives.) So, I take issue with Clark when he says that “(what we ordinarily think of as) the self [I’d say ‘person’] is a hastily cobbled together coalition of biological and non-biological elements, whose membership shifts and alters over time and between contexts.” (Clark, 2004, p. 177)

Although I believe that there will be increasing integration of parts of human organisms and machines, I do not believe that such “couplings” will threaten to replace enduring persons such as ourselves with fluctuating systems. The reason that I think that persons (or “selves”) do not fluctuate with various couplings is that the integration of parts of human organisms and machines takes place at subpersonal levels. At subpersonal levels, mechanisms and functions are explained in computational or neurophysiological or physical terms. At the personal level, we are focusing on intentional agents and “what they perceive and intend, what they believe and desire, and [we are] try[ing] to make sense of them as acting for reasons, though of course allowing for irrationality and mistakes.” (Hurley 1998, pp. 2-3)

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<sup>11</sup> At least one proponent of EM agrees on this point. Wilson 2004 (p. 141-2) holds that mental states may be locationally wide, extending into the world, but the subject of those states remains the individual organism. I take the nonderivative subject of such mental states not to be the organism, but rather the person. The organism is the subject derivatively.

The personal and subpersonal levels are distinct: A state is at the personal level if the person can come to acknowledge the state as her own. An unconscious desire that a person can bring to consciousness as her own (perhaps after therapy or reflection) is at the personal level. There are no doubt neural mechanisms, discovered by experimentation, that underlie the desire; but the desire is still at the personal level, and the neural mechanisms are at a subpersonal level.<sup>12</sup> Any states (e.g., digesting food, or even having a stomach) that do not presuppose consciousness are at a subpersonal level.

The sum of all Otto's organic parts constitute his body<sup>13</sup>. Otto's body constitutes Otto. Neither the sum of Otto and his notebook nor the sum of Otto's body and his notebook constitutes anything at all. The only cognizer here is Otto. Nevertheless, there is a sense in which a person may have extended cognition—i.e., cognition that has bionic components. In that case, the person would have mental states constituted by (subpersonal) vehicles that have nonbiological parts. What seems to me significant about EM is that it provides a way to understand cognitive processes (that constitute a person's mental life) in a way that does not depend altogether on biology. That bionic components (e.g., cochlear implants) may seamlessly interact with organic components is an empirical fact. So, auditory cognitive processing of someone with a cochlear implant is partly nonbiological.

My modest proposal has two clauses: (i) The (subpersonal) vehicles of a person's (person-level) mental states are causally integrated with the person's other subpersonal parts. (ii) Some people have mental states and processes that have (subpersonal) vehicles with nonbiological parts. The first clause is the "modest" part, and the second clause takes a step toward extended cognition.

It is noteworthy that my modest proposal is not science fiction. The cochlear implant that restores hearing and speech understanding to people who have been profoundly deaf, from birth or later, has received regulatory approval and is now in use. (Clark, G., 2007, p. 78) Because of the plasticity of the brain, babies born deaf may learn

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<sup>12</sup> This is a view of Gareth B. Matthews that I also endorse.

<sup>13</sup> I am using 'constitution' according to my technical definition here. See next section. For details, see Baker 2007a, Ch. 8.

to speak and hear almost normally if the device is implanted early enough (as young as six months old). After the success of cochlear implants, scientists working with engineers now aim at “making machines and technology behave like living systems with particular reference to the sense organs and nervous systems,” according to Graeme Clark, the inventor of the cochlear implant. With the advent of nanotechnology and with the increasing understanding of the plasticity of the brain, Clark continues, a new field of “Medical Bionics” offers hope

of producing a bionic ear that gives high fidelity sound, bionic nerve and spinal cord repair for paraplegia and quadriplegia, a bionic eye for blindness, bionic epilepsy control, bionic delivery of drugs for the treatment of cancer and Parkinson’s disease, bionic stents for coronary and other arterial disease, a bionic bladder neck for the control of incontinence, bionic tissue repair, bionic muscles, and implantable bionic sensors. (Clark, G. 2007, p. 78)

Another example of ongoing research is on brain-machine interfaces. John Donoghue, a neuroscientist at Brown University, has developed a computer chip to implant in brains of people who are unable to move their limbs. A “neuromotor prosthesis” takes signals from brains and decodes them and connects them to a device like a computer or a robot or even to that person’s own muscles. “We’re effectively rewiring the nervous system—not biologically but with real wires,” says Donoghue. (Sender 2004)

With these advances underway, it is not too much of a stretch to suppose that some day scientists will be able to replace whatever neural structure that is taken to be the vehicle of mental state X with a functionally-equivalent silicon part. Andy Clark points out that this has been done with an artificial neuron in a Californian spiny lobster; the artificial neuron functioned successfully in a group of fourteen natural neurons. (Clark 2005, p. 4) Empirically speaking, the boundary between human organisms and machines is getting fainter.

On my view, enduring persons may be subjects of mental processes constituted by extended cognitive processes (i.e., subpersonal processes that have bionic components).

Proponents of EM have mostly been concerned with cognitive science, not with metaphysics. My concern is with metaphysics, and I want to show that my own metaphysical view can accommodate my modest proposal of extended cognition without threatening to eliminate the person, the subject of experience.

### **The Constitution View of Persons**

On the Constitution View, persons are material beings, wholly constituted by bodies—typically human organisms—but not identical to the bodies that constitute them. The relation between a person and the organism whose brain makes possible the person’s thoughts is *constitution*, not identity. Since the person and organism take up exactly the same space, how can they be not identical? Well, the person and organism differ in persistence conditions. The person endures as long as she has a first-person perspective; the organism endures as long as it maintains certain biological functions. The person’s persistence conditions are first-personal, and the organism’s are third-personal. Hence, it is possible for one to exist without the other. So, the person is not essentially biological; the organism is.

I am constituted by my body; the body that I currently have is an organism. But with enough prosthetic devices (like an artificial heart, cochlear implants, bionic replacements of neural structures), I may come to be constituted by a body that is not so clearly an organism. (I am essentially embodied, but I do not essentially have the body that I currently have.) Some philosophers think that there is something amiss, even nonsensical, about talk of someone’s body (Olson 2007, van Inwagen 1980). But here is a formula that gives conditions for being someone’s body: “Necessarily, x is y’s body at t if and only if y is a person and x constitutes y at t.” This formula allows that a person may have different bodies at different times, and that a person’s body may be partly bionic and partly organic.

Constitution is ubiquitous: genes are constituted by sums of DNA molecules; fireplaces are constituted by sums of bricks; credit cards are constituted by pieces of plastic. When a thing (or property) of one primary kind is in certain circumstances, a distinct thing (or property) comes into existence (or is exemplified). When a fetal human

organism develops to the point where it can support a rudimentary first-person perspective, a new entity—a person—comes into existence.<sup>14</sup> (Baker, 2007a) The organism (who has a first-person perspective contingently) then constitutes the person (who has a first-person perspective essentially).<sup>15</sup> Constitution (unlike identity) is a temporal and contingent relation.

One may wonder what motivates a distinction between persons and human organisms at all? Why take the relation between persons and bodies to be constitution rather than identity? There are two reasons: First, the Constitution View preserves the unity of the animal kingdom while recognizing the ontological uniqueness of persons. (Only persons can intentionally change the course of natural selection.)<sup>16</sup> Second, a person may be constituted by different bodies at different times. A person who begins existence with an organic body may end up with a nonorganic body after enough artificial organs and prostheses.

One may further wonder: Even if the distinction between persons and bodies is well motivated, is there any naturalistic way to understand how persons could have come to be nonidentical with human organisms? I think that the answer is yes. An evolutionary just-so story shows one way that persons could have evolved from human organisms.

Suppose that: Eons ago, there evolved a species of hominids whose mentality was determined by their brains in interaction with their environments. They were social beings who had (perhaps) routinized social interactions of grooming, feeding the young and so on. The range of their cognitive states was limited to those concerning their local

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<sup>14</sup> Nonhuman animals also have rudimentary first-person perspectives, but they are not persons. An entity with a rudimentary first-person perspective is a person only if it is of a kind that typically develops a robust first-person perspective (i.e., the conceptual ability to think of oneself as oneself).

<sup>15</sup> The human organism has a first-person perspective derivatively—in virtue of constituting an entity that has it nonderivatively. This is spelled out in great detail in Baker 2007a.

<sup>16</sup> Although the ability knowingly to interfere with natural selection has been only recently acquired, persons have always had the ability to acquire such an ability when knowledge and technology became available. The fact that this ability is contingent is irrelevant to my point.

present environments and survival and reproduction. At some later time—perhaps about 30,000-60,000 years ago, at the time of rapid cultural development during the Upper Paleolithic revolution (Mithen 2004, p. 164)—beings of this species experienced a “cognitive inflation”, similar to the expansion of the physical universe after the Big Bang. Cognitive inflation was a period of remarkable cognitive innovation. At the end of this period of cognitive inflation, beings of this species had acquired spoken and written language, art, and government. Their lives and thoughts were products, not just of biology, but also of learning, culture and technology. We are their descendants.

There is only speculation about when cognitive inflation began. It probably did not start with the development of spoken language about 500,000 years ago with the development of vocal cords (Mithen 2004, p. 165). Although spoken language allowed sharing of acquired knowledge and co-ordination, it did not make the radical transformations required for modern life. Not only is the development of spoken language too early to mark the onset of cognitive inflation, but the development of written language (about 5,000 years ago) is too late. Mithen (2004) speculates that what started the cognitive snowball rolling was the emergence of art (about 100,000 years ago). Cave wall drawings are evidence of practices of inscribing persisting marks on the environment. This is a sign of “cognition-enhancing technology” that, when coupled with the later invention of written language, blurred the boundaries between the material (art) and the informational (language). These cognitive innovations were a powerful driver of extended cognition.

With my own philosophical preoccupations, here is what I take from this just-so story. No matter how the period of cognitive inflation got started, at the beginning were human organisms (members of the genus *Homo*), but no human persons (no entities with reflective first-person perspectives). By the end, there were human persons, constituted by human organisms. (That there is no precise moment when human persons came into existence is no surprise; every process in nature is gradual.)<sup>17</sup> When human organisms developed first-person perspectives (along with grammatically complex first-person

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<sup>17</sup> Indeterminacy of temporal boundaries (and of constitution) does not entail “vague identity.” See Baker 2007a, Ch. 11.

sentences), entities of a new kind—persons—came into being.<sup>18</sup> My speculation is that grammatically complex first-person language and human persons came into existence together—both in the course of cognitive inflation of human organisms.

With the development of language came an explosion of the kinds of thoughts that could be entertained—modal thoughts about necessity and possibility, normative thoughts about what makes a good person, counterfactual thoughts about what might have been, abstract thoughts about numbers and properties, and first-person thoughts about oneself and one’s desires, intentions, and beliefs. The development of the complex linguistic first-person and the first-person perspective also made possible law-governed societies, institutions of all sorts, the sciences and advanced technology.

From an evolutionary point of view, our minds evolved to guide behavior. With the advent of persons—beings with first-person perspectives and first-person language—there was an explosion of kinds of behavior that are possible. Language is an amazing enhancement of cognitive powers.<sup>19</sup> Our minds are now linguistic minds. Language is a tool of cognition, not just an expression in natural language of pre-existing thoughts that are encoded in some innate language, like “Mentalese.” Many, if not most of our everyday thoughts—thoughts about scheduling a meeting, about finding a new doctor, about getting the car repaired, paying the heating bill—would be impossible to have without our physical, social and linguistic environment. But this traditional externalist point is far short of EM.

Human brains make human persons possible by constituting our thoughts and experiences. But recall that what makes the thought or experience the very one it is its content, not what constitutes it. And the content of a thought or experience (e.g., the experience of missing a crucial free-throw in a basketball game) may depend on all manner of features outside the brain and outside the skin. Here’s an analogy: A quantity of paint on a canvas may constitute a (painted) dagger, but since a dagger is an artifact,

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<sup>18</sup> E.g., “I wish that I had more food” or “I believe that I am getting sick” are grammatically complex sentences that indicate a robust first-person perspective.

<sup>19</sup> I wouldn’t formulate this point as Clark and Chalmers do: “Language appears to be a central means by which cognitive processes are extended into the world.” Clark and Chalmers 1998, p. 11.

nothing could be a painted dagger without multiple conventional and nonconventional relations to the social and physical environment. Just as the quantity of paint is on the canvas, one's neural state is in one's brain. But what the quantity of paint constitutes (a painted dagger)—like what the brain state constitutes—could not exist in the absence of complex relations to the environment.

Being a subject of experience with a first-person perspective is at a different ontological level—the personal level—from the level of neural circuitry. (And the level of a person is different from the levels both of neural circuitry and an organism, as I explained earlier.) Traditionally, the vehicles of thoughts are brain states. With my modest proposal, we extend the vehicles to include not only brain states but also bionic tools that are integrated with the brains (or with other bodily parts). So, a person's mental processes may be constituted not wholly by brain states, but by fusions of brain and bionic states. With enough implants and prostheses, a (formerly?) human person may be constituted by a (wholly?) bionic body.<sup>20</sup>

The intentional agent, the subject of thought, is the person *however* she is constituted. Thoughts and deeds are the person's thoughts and deeds, no matter what constitutes them—i.e., whatever material vehicles they have. We are familiar with the fact that there is no isomorphism between vehicles and contents of traditionally-conceived mental states. There may be general constraints on the kinds of brain states that can be vehicles for various kinds of mental states. But the identity of a contentful mental state is, as I said, determined by the content, and—according to content-externalism—the content is not determined by the vehicle (the hopes of narrow functionalism to the contrary). To understand contentful mental states, vehicles matter little.

Here's another analogy: Consider a sign on a highway—curve ahead. The vehicle of that sign must be strong enough to withstand wind, rain, etc. So there are certain constraints on the kinds of things that can be road signs. But within these rather broad constraints, all manner of things can serve as vehicles for the sign: different kinds

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<sup>20</sup> I do not know whether it is physically possible to create an all-bionic body from start that would come to constitute a person.



of metal, different color paint, different letters (English or Farsi), icons without letters. There is no relation between the vehicle (within the broad constraints) and the content of the sign. Similarly, for most of our thoughts, it seems that there is no systematic relation between the vehicle (within broad constraints) and the content of our thoughts. And what effects our thoughts have is usually determined by content, not by vehicle.

Although I think that this is correct, there are (note: highly unusual) circumstances in which the vehicle does causal work that is determined by the thought. In these cases, the connection of the vehicle to the content of the thought becomes important.<sup>21</sup> Quadriplegics have been taught to control cursors on computer monitors by their thoughts. They think, “Move left,” and the cursor on the screen moves left. The vehicle of their thinking “Move left” is hooked up to electrodes that send radio signals to devices that move the cursor. (Sender, 2004) However, it still does not matter what the vehicle is. Scientists monitor patients’ brains and ask their patients to think certain thoughts and see where neural activity increases. Sometimes, it increases in unexpected places—e.g., parts of the brain associated with moving a leg, say. The electrodes hooked up to the computer are placed *wherever* in the brain the activity is discovered to be.<sup>22</sup>

The material vehicles of our thoughts are either parts of the brain, or parts of the brain integrated with bionic devices. The bionic parts may protrude outside the skin (e.g., some neuroprostheses may require something akin to a morphine pump). And the bionic devices may themselves have parts that are not attached to the body; a neural implant

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<sup>21</sup> I am confident that there will never be a science of vehicles, whether vehicles are taken to include things in the environment like Otto’s notebook or not. Even if vehicles are confined to neural states, vehicles are too idiosyncratic to be systematized and treated scientifically. I’m not doubting that neurophysiology is a science; what I doubt is that there will be a science that connects things like dopamine, serotonin, electrical spiking activity, etc., to entertaining thoughts with particular content—e.g., that Brazil’s deforestation increases global warming.

<sup>22</sup> “Most systems based on EEG biofeedback fall into the ‘subject learns computer’ category; subjects are required to learn to control their own neural signals in the form that the computer presents them. While these systems do perform signal processing on the EEG signal, they do not attempt to link into specific motor commands a priori to biofeedback training. The reason for this is self-evident — they are based on signals that are not the natural movement signal, but are rather a surrogate for it.” <http://donoghue.neuro.brown.edu/pubs/2003-SerruyaDonoghue-Chap3-preprint.pdf> (accessed March 14, 2008)

may communicate with an external computer wirelessly. As I said earlier, I am open to vehicle externalism. Just as Otto's notebook can be part of a vehicle of Otto's cognitive processing (without being part of Otto's body), so too can an external computer accessed by the working of a neural implant.

Although the skin is not a boundary for vehicles of cognition, the skin (enlarged by what is permanently attached to it) is still a boundary for persons and their bodies. A person is constituted by a body that may have nonbiological parts causally integrated into its operation. Although an in-place neural implant is part of a person's body, a computer across the room that the person controls via thought is not part of a person's body. (But the computer across the room, like Otto's notebook, may be part of a vehicle of a person's cognitive activity.) Similarly, although an artificial heart is part of a person's body, a ventilator is not part of a person's body. (But the ventilator may be part of a vehicle of vital respiratory activity.)

Here is a rule of thumb for whether a bionic device is part of a person's body: The bionic device is part of a person's body only if (a) it is causally integrated with the other parts that maintain the functioning of the body, and (b) it is permanently in place either inside the skin or attached to the skin on the outside—it is not merely hooked up intermittently; nor can it be taken off at night or disconnected from the rest of the body. And, of course, vehicle externalism allows that bionic devices can be parts of vehicles of a person's cognitive processing without being parts of her body. (I take this to be the lesson of Otto and his notebook.)

To sum up where I stand: A person can have subpersonal parts that are not organic and these can be material vehicles (or components of vehicles) of a person's mental states. In this way, the person can have extended cognition: the material vehicles of her contentful mental states may be nonorganic. But the person is constituted by a body (perhaps partly bionic), and the person spatially coincides with the body that constitutes her and does not extend beyond it.

The boundary between human organism and machine may someday be largely erased; yet persons may remain intact—constituted by integrated systems that have as

components parts of a human organism and a machine, or perhaps in the distant future, by only a (nonorganic) machine. What constitutes the person may change while the person remains the same. This does not require any kind of immaterial substance or property to persist through the changes of the constituter. As long as the first-person perspective continues, so does the person—whatever constitutes her.

### **Science and Religion**

My Constitution View of persons provided the background for the modest proposal that we can have subpersonal bionic parts that play an essential role in cognitive processing. The Constitution View is neutral with respect to religion. In 2007a, Ch. 4, I argue for what I call ‘quasi-naturalism,’ an epistemological view about the natural world that makes no ontological claims. Quasi-naturalism concerns only the natural world. Perhaps the natural world exhausts reality and perhaps not; quasi-naturalism does not say.

So, my modest proposal is neutral with respect to religion too. As long as science does not rule out there being intentional agents or subjects of experience, I believe that science and religion are compatible. (Of course, whether any particular religion is true or not is another matter.)

Someone may object: If EM, rather than your modest proposal, is correct, then science does rule out there being agents or subjects of experience. What we have thought of as agents or subjects of experience are just shifting combinations of organic and inorganic entities or processes—tool use with no users, thinking with no thinkers.

To this, I reply: Where’s the science? Transitory hybrids don’t form any kind, for which there could be laws. Moreover, if there are just processes, as EM suggests—e.g., thinking with no thinkers—then there are no scientists either. The idea of science without scientists is barely intelligible. So it is difficult to see how EM could have the imprimatur of science. Even if EM rules out there being agents or subjects of experience, it does not follow that science does.

There is another objection to the claim of compatibility of science and religion: “The sciences traffic in naturalistic explanations. Over the centuries, the sciences have

brought more and more phenomena into their domains. There is no stopping place. So, they will not stop until they have brought all phenomena into their domains. And at the end of inquiry, we'll see that everything is naturalistic and there is no place for a deity or any immaterial entity.”

Well, how should we respond to such an argument? Perhaps, in some way that we cannot envisage now, everything will be explained in some naturalistic way that we will then count as scientific. Maybe, maybe not. But the prudent thing is to wait and see. To accept the claim that all phenomena can be described and explained by science is to accept a closure principle—“...and that’s all there is, folks!” The inductive argument from history seems to me awfully weak to support such a closure principle. At best, we should just wait and see whether anything resists integration into science.

In any case, all that I am claiming is that my modest proposal, which entails that we are not essentially biological, does not render science and religion incompatible.

### **Conclusion**

Persons cannot have extended minds in the sense of EM; shifting and transitory hybrids can hardly be persons. However, persons can have partly (or perhaps wholly) nonorganic, bionic bodies—and some persons currently do have bodies with bionic parts that play essential roles in cognitive and motor activity. So my modest proposal that persons may have subpersonal bionic parts is empirically true. What makes this modest proposal a step toward extended cognition is that it allows bionic devices—in particular, prostheses—to be parts of a person’s body. What makes this modest proposal *modest* is that the person coincides with her body, and is not a transitory hybrid of her body and various items in her environment.<sup>23</sup>

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