

*Our brains, our selves*

There are cases in which parts of a person's own body, even portions of his mental life – his perceptions, thoughts and feelings – appear alien to him and as not belonging to his ego; there are other cases in which he ascribes to the external world things that clearly originate in his own ego and that ought to be acknowledged by it. Thus even the feeling of our own ego is subject to disturbances and the boundaries of the ego are not constant.<sup>1</sup>

For the past twenty years, my colleagues and I have studied patients with acquired brain damage who have undergone a transformation in the most intimate aspects of their personal identities. I call these conditions *neurological perturbations of the self*.<sup>2</sup>

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We study these cases to discover, among other things, the neurological structures necessary for a self, and the manner in which these structures are wired together to create a unified human mind. To that end, our analysis of these patients focuses on how the self, the ego, one's personal identity, adapts in response to damage to critical neurological structures.

In these cases, I rely in large measure upon the patients' verbal descriptions of how they view themselves after a neurological injury. Although these narratives are acquired within a medical context, and the patients are expressing what they believe to be the truth in the context of a medical or neurological exam, my analysis of their reports more closely resembles a psychoanalyst's reading of a patient's dream, or a read-

1 Sigmund Freud, *Civilization and Its Discontents*, 1st American ed. (London: Hogarth Press, 1930; repr. New York: W. W. Norton, 1961), 66.

2 For reviews of this work, see Todd E. Feinberg, *Altered Egos: How the Brain Creates the Self* (New York: Oxford University Press, 2001); and T. E. Feinberg et al., "Right Hemisphere Pathology and the Self: Delusional Misidentification and Reduplication," in *The Lost Self: Pathologies of the Brain and Identity*, ed. Todd E. Feinberg and Julian P. Keenan (New York: Oxford University Press, 2005), 100–130.

er's interpretation of a movie or novel. I take this approach because, while these patients are communicating what they believe are the actual facts of their circumstances, I actually find most intriguing what the patients reveal about those aspects of their self-concepts and motivations of which they are unaware.

Perhaps the best known, and certainly one of the most fascinating, neurological perturbations of the self is *asomatognosia*, a disorder in which a patient denies ownership of a part of his or her body. A patient with *asomatognosia* typically has damage to the nondominant, usually right, hemisphere of the brain; and the side of the body opposite the brain lesion, in this case the left, is paralyzed and has impaired sensation.

These patients also demonstrate a condition called *hemispacial neglect*, in which they ignore, as if nonexistent, the half of space opposite the brain lesion. Patients with large right-hemisphere strokes might not clothe their left sides, shave the left side of the face, eat food placed on the left side of the plate, or speak to people who address them from the left side of their hospital beds.

In order to demonstrate *asomatognosia*, the examiner grasps the patient's paralyzed left arm and brings it into the patient's right, non-neglected side. The patient is then asked a series of questions, such as "What is this?" "Who does this belong to?" "Do you have a name for this?" etc. Some patients with *asomatognosia* appear simply confused as to whose arm it is and respond that they are not sure, perhaps it belongs to the doctor. This confusion is understandable, and not terribly interesting from a neuropsychological point of view, given that the patient has profound *hemispacial neglect*, cannot move or feel the arm, and may have some degree of

generalized confusion common after an acute stroke. Many of these patients will readily admit their error if it is pointed out to them.

But there are also those patients who exhibit a more profound disturbance in their sense of ownership of or personal relatedness to the limb. Such a patient adamantly denies the limb belongs to him even when he traces its attachment to his shoulder. He treats the arm as if it is dissociated from his self – as if it belonged to someone else or as if it were an inanimate object.

The British neurologist Macdonald Critchley pointed out the remarkable tendency of some of these patients to *personify* their paralyzed limbs as if they possessed completely independent identities. He observed that these patients would make up nicknames for their arms such as "George," "Toby," or "Silly Billy." Critchley described the striking behavior of one of his patients toward his paralyzed left arm:

Asked to open his fist, he held it up before him, still clenched, and then began to cuddle and caress it, patting it and rubbing it, talking to it and encouraging it, e.g., "Come on, you little monkey, don't let us down. Come on, 'Monkey.' I used to call him 'Lucky.' We're doing nicely now, so we'll call him 'Lucky.' Come on, 'Lucky'" . . . . The nursing staff observed that at meal-times he would 'feed' the 'little monkey' with a spoon, saying, "Come on, have a bit."<sup>3</sup>

The first patient with *asomatognosia* I interviewed was Mirna, a woman in her seventies who was admitted to the Mount Sinai Hospital neurology service

3 Macdonald Critchley, "Personification of Paralyzed Limbs in Hemiplegics," *British Medical Journal* 30 (1955): 284.

with an acute stroke that destroyed large portions of the right hemisphere of her brain. Although her husband had been dead for many years, she believed that her left arm actually belonged to him:

Q: What is this about your husband's hands? Did you have your husband's hands?

A: I did.

Q: Tell me about that. What happened?

A: He left them.

Q: He left them to you?

A: He didn't want them.

Q: O.K. Well, did he leave them to you in his will?

A: He just left them like he left his clothes [tearfully].

Q: So they were in the house? Tell me about them.

A: Up until the other day. They used to fall on my chest. I said, "I got to get rid of them!"

Q: Yeah.

A: So I did.

Q: So what did you do?

A: Put them in the garbage.

Q: You put them in the garbage?

A: Yes...two days ago.

Q: Where are they now?

A: Still in the garbage...a black hand, with a plastic cover...you'll find them there. Be careful, though...the nails are very long...and very sharp. How come nails grew on dead hands?

Q: I don't know....How do you figure that?

A: I don't understand; if it's dead, it's dead. I don't know.

Q: How do you account for that?

A: I can't....Maybe they're not completely dead.

Q: What would that mean?

A: Nothing at all.

Q: Why did you get rid of them?

A: They were bothering me. They used to fall on my chest when I slept...and they're very heavy. And the nails used to scratch me.

Q: Sounds like they were alive!

A: No...they were dead, dead, dead! I tell you, you can take my word for it.

Q: How many years did you have them?

A: Maybe two. Since I was sick.

Q: Since you were sick you had them? Why did you throw them out?

A: Because I thought they were hard luck.

Q: Why did you get rid of them after all those years?

A: Because I got the stroke...and I thought maybe I'd die here like he did! [At this point she begins to cry.]

This pattern of misidentification and confabulation is common in asomatognosic patients. Nearly fifty years ago, Montague Ullman and his colleagues described a case that resembles Mirna's in many respects.<sup>4</sup> Their patient was a fifty-year-old Italian woman who was hospitalized at Bellevue Hospital in New York City in 1957. She had suffered a stroke in her right hemisphere that had resulted in complete paralysis of her entire left side. Her husband had died one year previously, yet she claimed that her left hand was actually her dead husband's and that he stroked her breast with it. They reported the following interviews:

4 M. Ullman et al., "Motivational and Structural Factors in Denial of Hemiplegia," *Archives of Neurology* 3 (1960): 306-318.

Q: Do you remember what you said when you first told us about your arm?

A: Yes, I imagined that it was my husband's arm because I wished so very much he could be with me.

Several weeks later, she tried to make sense of her prior confusion:

Maybe because I was wishing so much that he would come. Someone had cut my nails short like my husband's. I keep mine long and pointed, so it looked to me like my husband's hand.

Both Mirna and Ullman's patient claimed their arms had belonged to their dead husbands. In fact, the idea that the arm is 'dead' in some sense, literally or figuratively, is common in asomatognosic patients. Shirley, a woman in her fifties who suffered from a right-hemisphere stroke and left hemiplegia, also associated death with her left arm:

A: It took a vacation without telling me it was going. It didn't ask; it just went.

Q: What did?

A: My pet rock. [She lifts her lifeless left arm with her right arm to indicate what she is talking about.]

Q: You call that your pet rock?

A: Yeah.

Q: Why do you call it your pet rock?

A: Because it doesn't do anything. It just sits there.

Q: When did you come up with that name?

A: Right after it went plop. I thought I'd give it a nice name even though it was something terrible.

Q: Do you have any other names for it?

A: Her. She belongs to me so she's a 'her.' She's mine, but I don't like her very well. She let me down.

Q: In what way?

A: Plop, plop, rock, rock, nothing. I was on my way home out the door, and then she went and did this [pointing to her left arm]. She didn't ask if she could [shaking her head back and forth]. I have to be the boss, not her.

Q: So why do you refer to it as a pet rock? What do you mean by that?

A: It lays there like a lump. It doesn't do anything. It just lays there. It's like when you're Jewish, and you go to a Jewish cemetery and put a rock on the tomb, and it just lays there. It is supposed to say, 'I was here.' It's saying I'm here. But I'm not. I'm only sort of here. I'm not really here.

Shirley, in addition to referring to her arm as a pet rock and 'her,' personified the limb in other ways. During one interview, she grasped her left hand with her right, shook it, and began to sing:

A: Wake up! Time to go home. What are we gonna to tell your mama? What are we gonna tell your papa? What are we gonna tell your friends when they say, "Ooh la la, wake up little Susie, it's time to go home"? [She holds her left hand to her cheek, hugs it, kisses it, fondles it, and pets it.] She's a good girl.

Q: What was that?

A: "Wake Up Little Susie." Remember the Everly Brothers? [She points to her left arm.] That's her; that's little Susie. She been out all night long – she has to go home. That's it; she's done. She's gotta go home, or they're gonna think she's the town whore [laughing].

Q: Why would you say that?

A: Because she's not behaving. [She wiggles her arm again, pulling on her fingers as if to rouse it.] Wake up little Susie! [She goes on to explain why she developed this idea about her left arm being

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little Susie.] It's a coping mechanism. It's like laughter is the best medicine. If you can't laugh, what have you got? I thought I could bring her back with some loving-kindness. So I sang "Wake Up Little Susie," which is one of my favorite songs from the Everly Brothers.

Q: What's the theme of that song?

A: A girl and her boyfriend were out too late at night. And the entire town is gonna be talking about them, that she's being a slut. So it's a way of avoiding getting in trouble. And then he says, "What are you gonna tell your mama? What are you gonna tell your papa? What are you gonna tell your friends when then they say, 'Ooh la la, wake up little Susie. It's time to go home?'" [She lifts her left arm.] I wanna go home.

"Dead husband's arm," "pet rock," "Little Susie" – these are only a few of the terms my patients have used to describe their arms. Other patients I have examined have called their paralyzed arms "a breast," "deodorant," "nothing but a bag of bones," "stock option," "dummy," and "useless piece of machinery."

The neurologist and psychoanalyst Edwin Weinstein reasoned that the manner in which asomatognosic patients referred to their arms could be interpreted as metaphorical expressions of their feelings about the arm and themselves. He pointed out that his patients actually employed a variety of tropes, including personification, when speaking of the affected arm.

Another variety of metaphorical self-expression displayed by brain-damaged patients is the 'phantom-child delusion.' In 1956, Weinstein and his colleagues described patients with this disorder. The most common delusion was the mistaken belief that the patient was a parent of

a fictitious child.<sup>5</sup> These astute clinicians observed a unique feature of this particular variety of delusion: patients often attributed to the 'phantom child' the same illness or disability that they themselves had.

For instance, a woman with a brain tumor that resulted in blindness claimed that she had a child who was "sick and blind." Another patient, a twenty-one-year-old soldier with a traumatic brain injury and weakness in both legs, maintained that he had a three-year-old 'daughter' who had leg paralysis as a result of polio. In other cases, the 'phantom child' embodied significant personal issues besides, or in addition to, personal illness. For example, one woman who felt that the nursing staff was mistreating her asserted that she had a "baby" that the nurses had "harmed and even killed."

These self-referential delusions and confabulations occur in a variety of clinical settings yet demonstrate particular patterns. As in asomatognosia, in which the patient may claim the affected limb is dead or belongs to a dead person, the phantom child is often said to be dead or ill. The fate of the phantom child often parallels the patient's personal medical condition.

Alan Baddeley and Barbara Wilson provided one illustrative example of this pattern. A patient 'RJ' was an Englishman who at the age of forty-two was involved in a serious car accident that resulted in intracranial hemorrhages involving both frontal lobes.<sup>6</sup> Despite

5 E. A. Weinstein et al., "Delusions about Children Following Brain Injury," *Journal of Hillside Hospital* 5 (1956): 290–298.

6 Alan Baddeley and Barbara Wilson, "Amnesia, Autobiographical Memory and Confabulation," in *Autobiographical Memory*, ed. David C.

the seriousness of his condition and the fact that he was in the hospital and in rehabilitation for many months, he repeatedly denied the seriousness of his injuries. RJ had a real brother, Martin, an adult who was still in communication with the patient. Nonetheless, RJ confabulated that he had had two brothers, both named Martin, but that one Martin had died in a car accident. RJ described a letter he had supposedly written: "I sent a letter to my great-aunt in South Wales when my younger brother was killed, saying just that."

He was able to provide detailed answers to a range of questions, including the date of his brother's death (eight years ago); how he had heard (by telephone); how his brother had been killed; and what time of day and what time of year the accident had occurred. When asked about the wording of the letter, he replied: "Dear Auntie Bertha, I am sorry to tell you that Martin has been killed in a car accident; it's all very sad and we're all terribly sorry, what can I say sort of thing, really."

Q: It must have been very painful.

A: It was, yes.

Q: Have you just got one brother?

A: I've got three now; I've got two now actually, one older and one younger.

Q: What are they called?

A: Martin and John.

Q: Which one was killed then?

A: Martin.

Q: So did you have two Martins?

A: We had actually in those days one Martin; then Mother had another one, and we called it Martin as well. I think she felt a bit ... sort of morbid about it

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Rubin (Cambridge: Cambridge University Press, 1986), 225–252.

so she called it Martin. So we had two, I suppose, yes, or what would have been two.

Weinstein, Robert Kahn, and Sidney Malitz described another case, a twenty-year-old hospital corpsman who was hospitalized at Walter Reed Hospital in June 1952 after being in an automobile accident that resulted in a severe head injury.<sup>7</sup> According to them, the patient

expressed the idea that he had been killed in Korea and that his body had been returned that morning. Later he stated that his brother had been killed and that his body was in a casket under the bed, subsequently saying that it had been "moved to the morgue down the hall."

Following a visit from his mother, he announced that she had told him he had been in a car wreck and that the scars over his face, chest, and hands had been caused by penicillin injections. Subsequently, he ceased to confabulate about his own accident but fabricated a story that his brother had been injured in a car accident while coming to visit him in the hospital.

I have had the opportunity to examine several patients engaging in this fascinating form of confabulation. One of the most interesting and complex was a sixty-three-year-old man I call 'Sam.' Sam had bilateral damage to his frontal lobes, the result of a ruptured anterior cerebral-artery aneurysm. He had an array of neuropsychological impairments, including problems with attention, memory, and executive functioning (i.e., the ability to plan ahead, regulate his actions, judge, and reason). In spite of the seriousness and incapacitating nature of his cognitive difficulties, Sam denied

7 E. A. Weinstein, R. L. Kahn, and S. Malitz, "Confabulation as a Social Process," *Psychiatry* 19 (1956): 383–396.

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that he had any cognitive impairment. Indeed, when asked why he was in the rehabilitation facility, he claimed he was “a guest” with the “Optimists Club” to “help out.”

Sam was the biological father of three children, but the severe nature of his intellectual difficulties led to the breakup of his marriage. In spite of his separation from his wife, he claimed they were planning to adopt a child. During the course of an interview with his neuropsychologist, who was rating his performance, Sam asserted that the adopted child “has problems” and complained about the way the doctors were treating the child:

I don't think a kid who is six or seven years old is capable of giving you the right answer . . . I know this kid has been in the hospital off and on for a couple of years, and they kind of rate them as far as progress goes, or things like that . . . I guess they must rate them when they don't hear the things they want to hear . . . like the kid is not accomplishing anything, which I think is very unfair to basically analyze a kid that way.

In Sam's case, ‘child’ served as an alter ego for ‘patient.’ Another one of my patients with phantom-child delusions was a sixty-five-year-old female, ‘Linda.’ She had a medical history similar to Sam's: a brain aneurysm had damaged her frontal lobes bilaterally, which resulted in significant memory and cognitive impairments. Also, like Sam, she tended to deny or minimize her neuropsychological deficits. She was divorced and had no children. When I inquired why she was in the hospital, she said she was there to visit her “niece” whom she described as a “child” and “a little girl.” She claimed that the niece had an aneurysm, and also insisted that she had an

aunt and six cousins, all with “aneurysms on top of their heads.”

How do we explain these patients' behaviors? And what can they teach us about the nature of the self and identity? As John Hughlings Jackson, the father of modern neurology, pointed out many years ago, a brain lesion can have both negative and positive effects on behavior.<sup>8</sup> The negative effects are those things that the patient can no longer experience or do after brain injury. In the asomatognosia cases, these behavioral losses include paralysis, sensory deficits, and hemispatial neglect. They create the confusing and disorienting circumstances that make it difficult for the patient to comprehend that the arm is his or her own. The arm no longer ‘feels’ like it is part of the patient's self.

In the case of phantom-child syndrome, as a result of memory impairment, these patients cannot recall many of the actual circumstances of their illness and hospitalization. Although their family and physicians may repeatedly tell them what has happened to them, the immediacy and intimacy of personal recollection is lost. In addition, the presence of executive dysfunction, especially problems in judgment and abstraction, makes it difficult for these patients to understand that just because they cannot actually remember a personal experience does not mean it hasn't happened to them.

In contrast to the negative effects of a brain injury, the positive effects are new behaviors that emerge after the damage has occurred. These include delusions or behaviors that may represent an exaggeration of premorbid tendencies, such as the use of metaphorical language.

8 James Taylor, *Selected Writings of John Hughlings Jackson* (New York: Basic Books, 1958).

Weinstein suggested an explanation for the prominent use of metaphorical language in these cases. He posited that, under the conditions of brain damage, metaphorical language may seem more 'real' to these patients than more conventional forms of expression. Faced with the life-threatening and chaotic circumstances posed by neurological illness, the patients see metaphor, more than everyday language, as capturing the way they see themselves and their disabilities:

The fiction imparts more of a *feeling* of truth than does the more referential account because it is an expression of relatedness and identity – because the theme provides unity and order to events that might otherwise be unpredictable, unconnected, and incompatible with expectations based on past experience.<sup>9</sup>

According to this account, the metaphor may make more sense and feel more true to the patient than the actual facts of their illness or altered life circumstances. My patient Mirna described her arm as both "dead" and her "husband's arm." Referring to a paralyzed arm as 'dead' may make more sense to her within the context of her premorbid experience than does a more scientific explanation invoking the neurology of stroke and brain damage. Further, by saying the arm is her husband's, she replaces the peculiar and unpleasant sensation of a lifeless limb with the more conventional feeling that it could belong to her husband.

The metaphor may serve other functions in addition to rationalizing confusing circumstances. It may simultaneously provide an adaptive, motivated,

or wish-fulfilling substitute for reality. Ullman's patient explicitly depicted how her desire for the return of her husband influenced her view of her arm. For Shirley, her singing "Wake Up Little Susie" metaphorically expressed her feelings about her arm and illness and simultaneously served as an articulation of a wish. In actuality, Shirley was upset that her 'sleeping' arm would not 'wake up.' In the song, Little Susie was about to go home, reflecting my patient's wish to be discharged from the hospital. If her arm – 'Little Susie' – would just 'wake up,' Shirley would also be able to go home.

Our research into these syndromes of self and personal relatedness has indicated that the vast majority of those patients that display enduring delusions and metaphorical confabulations regarding their bodies, their relationships with loved ones, and their personal experiences has pathology of the right (non-dominant) hemisphere.<sup>10</sup> The damage in these cases is especially prominent within the right frontal regions. What special functions essential to the creation and maintenance of the self could these areas be performing?

One possibility is that the right hemisphere, particularly the right frontal regions, is essential for the incorporation of ongoing experience into premorbid memory and identity. When confronted with life-altering experiences that require a change in the feelings about and perception of the self, an individual without a normally functioning right-frontal lobe may process information in the remaining intact brain but not appropriately incorporate it into his or her

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9 Edwin A Weinstein and Olga G. Lyerly, "Confabulation Following Brain Injury," *Archives of General Psychiatry* 18 (1968): 348–354.

10 Feinberg, *Altered Egos*; Feinberg et al., "Right Hemisphere Pathology and the Self," 100–130.



identity. In other words, personally significant events may occur – of which the patient may have implicit, partial, or even full knowledge – but they are not *experienced as occurring to the self*. Under these circumstances, the relatively intact verbal left hemisphere creates the metaphor that partially reflects the patient’s inability to incorporate new personally relevant experiences into his or her identity. As Weinstein proposed, the patient, without realizing it, elaborates his or her personal experiences in terms of external – real or fictitious – persons, objects, places, or events. The metaphor serves as a symbolic representation, or externalization, of the patient’s feelings, which the patient does not realize are his or her own.

I detect an interesting relationship between the narratives of the patients I have described and the statements of neurologically intact individuals threatened with a loss of self or identity, or death. For most people, the notion of death is incomprehensible. At the very least, it is difficult to accommodate within one’s self-image. To some extent, we must deny death in order to go on with life. Hence, when faced with the prospect of one’s own death, an individual often turns to the metaphors of life beyond death provided by cultural and religious institutions. Just as the patients discussed in this essay deal with a difficult reality by creating metaphorical and wishful substitutes, we can understand our beliefs in eternal souls, angels, and deities, in part, as wish-fulfilling proxies for a reality that many of us cannot fully understand or accept.<sup>11</sup>

11 I wish to thank Dr. Joseph Giacino and Dr. Patrick Smith for allowing me to examine their patients, some of whom are discussed in this essay.