

Disability as Lifeworld

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Shaping Action

In the interval before going to work after getting up in the morning, myriad movement and actions are included. Stretching out one's hand to the alarm clock, rising from a supine state, getting out of bed, walking to the kitchen, grabbing the kettle, turning on the gas stove, taking out a coffee mug, pouring water into the mug, washing one's face, getting dressed, putting on shoes, and more. In the kinematic viewpoint, the scene of the morning involves the performance of a huge number of articular movement and incessant muscular activity.

Although these various behavior and actions are repeated as a sequential flow in the same order on an almost daily basis, each activity and action is not performed in exactly the same way, as though copied from one day to the next. Or perhaps it is better to say that human beings are incapable of performing a task twice in precisely the same way. Behavior and actions are spontaneously chosen and tailored in keeping with the state of one's own body in terms of mood and physical condition, as well as the surrounding environment, including light and temperature, humidity, and sounds. And so, as for the movement and the act, it is done emergence without rising to the consciousness of a person carrying it out.

The formation of human action involves mechanisms utterly different from those that control the movements of robots: actions are shaped in each case in the context of a relationship between the body and the world (i.e., the surrounding environment). For example, when walking to the living room, while your center of gravity is propelled forward by the alternating movement of the right and left legs, at the same time you will perceive various sensations on the bottom of the foot in contact with the floor, such as inclination and material, friction, and shifts in pressure. When pouring water into the kettle, you will feel the weight of the kettle in your arm, and you will spontaneously adjust the amount of force exerted by your hand and arm in response to the gradual increase in the amount of water. Deliberate action is realized through the conjunction of behavior and actions with these sensations. Of course, the sensations felt in conjunction with behavior and actions also usually remain in the background, without rising to the level of conscious perception.

In the event of situations that diverge from your expectations, such as for instance when stepping on a pebble lying on the street or when someone appears suddenly around a corner, one transitions to the next behavior of becoming aware of the sensation of the pebble and adjusting one's stance so as not to fall, or of stopping short or quickly dodging so as not to collide with the other person.

Actions are shaped through the perception in the body, of the environmental world, and of the relationship between the two. Preparation for these is already underway in the mother's womb. From a relatively early stage, the fetus begins moving its limbs, head, and entire body. By a gestational age of about ten weeks, it will be able to carry out reflexive stimulation ("double touch") by touching its face and mouth with its own hands.¹⁾ Furthermore, past the twenty-second week of pregnancy, a fetus will be able to perform the movement of smoothly inserting its fingers into its mouth – as when it begins opening its mouth even before its hand comes into contacts with the lips, begins temporarily inserting its fingers into its mouth and repeating these movements over and over again²⁾ – the fetus is already able to perform movements involving the conjunction of each body part. In addition, senses other than the visual are said to already be in a functionally mature state by before birth,³⁾ and the fetus maintains posture and moves its limbs while adjusting to the amniotic fluid by making use of equilibrium function to maintain its balance.⁴⁾

In this way, the body of the fetus, as it is inextricably linked with the environment of the amniotic fluid, takes form while being developed by the experience of the bodily perception of sensations linked to movement, the experience of repeatedly exploring and perceiving the environment surrounding its body (e.g., amniotic fluid, mother's movements, sounds, and voices), and the experience of perceiving the relationship between the body and that environment. The fetus is thus thought to make physical preparations (i.e., for the environment outside the womb) that will enable it to adapt spontaneously to body weight, light, humidity, breathing, and other changes that will occur in the transition to the next phase of existence in the gravity environment.⁵⁾

The generation and development of the nervous system also progresses at a frantic pace during

¹⁾ Vauclair, Jacques. *Développement du jeune enfant. Motricité, Perception, Cognition*. Paris: Belin, 2004 (Myowa Masako, Suzuki Kotaro ed., Shinyousha, 2012.) p.49. Rochat refers to the fetus touching one part of its own body with another as a "double touch." It is thought that the fetus engages in the exploration of its own body through this dual experience of touching and being touched. See also Rochat et al, "Differential rooting response by neonates: Evidence for an early sense of self." *Development and Parenting*, 6:105–112, 1997.

²⁾ Myowa-Yamakoshi Masako & Hideko Takeshita. Do human fetuses anticipate self-oriented actions? A study by four-dimensional (4D) ultrasonography. *Infancy*, 10: 289-301, 2006.

³⁾ Vauclair, Jacques, op. cit., p. 52.

⁴⁾ Mishima, Masahide and Yukie Yamashita. Growing up: Spatial perception in infants. *To live in space: A developmental study of spatial cognition*, Kitaōji Shobō, 1995, pp. 12-39.

⁵⁾ Hitomi, Mari. What is development? Clinic and phenomenological approaches to rehabilitation, Seidosha, 2012, pp. 215-217.

the fetal stage. The number of nerve cells is at its largest during the fetal stage, with around half of these believed to cause cell death (apoptosis).⁶⁾ The myelination of nerve axons begins from around the twenty-fourth week of gestation, increasing the speed with which electrical signals are conducted. Synapse formation between neurons begins from around twenty-seven weeks, once the nerve cells have matured. This enables the transfer of information between neurons, and leads to the formation of networks of neuron (neural networks). Whereas neural networks are associated with a wide range of neural activity in response to stimuli when the brain is immature, as the brain matures they develop into mechanisms whereby they are established only as specialized networks.⁷⁾ Thus, rather than a mechanism that begins simply and then gradually becomes more sophisticated as it develops, the development of the nervous system instead begins with a high degree of connectivity from which unnecessary connections are then removed, and through a process of neural circuit refinement and specialization becomes a functional and highly productive mechanism that performs only the necessary outputs. neural circuit refinement and specialization (i.e., the self-organization of neural networks) is also thought to be carried out in an experience-dependent manner. In other words, this is to say that depending on the way things are experienced, the ways in which neural networks are organized will differ, thereby demonstrating plasticity (the possibility of change).

The nervous system and body comprise a single system. As a system, the body gives rise to action, and actions shape the body in conjunction with cognition. In this sense, we have a mechanism for self-organization.⁸⁾ Here is the mechanism of this self-organization, actions are formed in each case in the context of a relationship between the body and the environment, so as to become embedded in the self's physical body.

When the nervous system suffers damage, such as might result from a stroke, neuron die, causing networks to fail and cease to function. However, after a time, the reconfiguration of neural networks is believed to begin with the manifestation ("unmasking") of longstanding but normally suppressed synaptic contacts and regeneration ("sprouting") of neuron through the lateral bud formation.⁹⁾ However, the reconstruction of damaged neural networks and recovery from paralysis of upper and lower limb function does not necessarily occur simultaneously, owing to the specifics of how re-connections are formed between neurons.

⁶⁾ Sakakihara Yōichi. The pre-natal and perinatal periods. In Takashi Mutō and Masuo Koyasu, eds. [Developmental Psychology 1, Tōkyō Daigaku Shuppan, 2011, pp.78-87.

⁷⁾ Nabekura, Jun'ichi. Reorganization of brain functional pathways at the development stage. *Baby Science*. 8, 2009, pp. 26-32.

⁸⁾ Kawamoto, Hideo. Clinical autopoiesis: The transformation and regeneration of the lifeworld, Seidosha, 2010, pp.199-204.

⁹⁾ Matsushima, Yasuyuki. The significance of functional recovery of nerve after stroke and neuro-rehabilitation. *Molecular Cerebrovascular Medicine*, 4(1), 2005, pp. 15-19.

Transformation of the body

When Gregor Samsa woke one morning from troubled dreams, he found himself transformed right there in his bed into some sort of monstrous insect. He was lying on his back—which was hard, like a carapace—and when he raised his head a little he saw his curved brown belly segmented by rigid arches atop which the blanket, already slipping, was just barely managing to cling. His many legs, pitifully thin compared to the rest of him, waved helplessly before his eyes.

“What in the world has happened to me?” he thought. It was no dream...

“What if I just go back to sleep for a little while and forget all this foolishness,” he thought, but this proved utterly impossible, for it was his habit to sleep on his right side, and in his present state he was unable to assume this position. No matter how forcefully he thrust himself onto his side, he kept rolling back. Perhaps a hundred times he attempted it, closing his eyes so as not to have to see those struggling legs, and relented only when he began to feel a faint dull ache in his side, unlike anything he’d ever felt before.

(Kafka, *The Metamorphosis*, trans. S. Bernofsky, Norton 2014)¹⁰⁾

Here we have a passage from Franz Kafka’s *The Metamorphosis* (*Die Verwandlung*, 1915), a story in which the protagonist wakes up one morning only to find that he has been transformed into a giant insect. From the bodily metamorphosis he witnesses, the main character suspects that something preposterous has occurred, wonders whether it might be a dream, before noticing that he undeniably lying flat on his bed in his own room, and that it does not seem to be a dream. However, his thoughts turn to whether this might be a legitimate excuse for being late for work, that if he were to stay silent, things might return to normal, that this is might not in be reality, but in fact be some hallucination. Yet even though his mind wanders in such various ways, in the end he begins preparing to leave for work, and makes an effort to rise from his bed. This is when he fully glimpses his transformed body and he begins to feel a strange sensation. He also notices that his body does move the way he expects. Even so, he makes an effort to adjust his posture and attempts to move his body. By repeating these motions, what had been seemingly hallucinatory increasingly takes on the substance of reality.

When we read Kafka’s *Metamorphosis*, this depiction of the protagonist—confronting a state in which the body he encounters in the here and now is not his own, but has become something other—conjures the sense that this must be like the feeling of doubting that the body before our

¹⁰⁾ Franz Kafka, *The Metamorphosis* (Translated by Susan Bernofsky, Norton, 2014), pp. 21–22.

eyes could in fact be our own, and furthermore of a body that refuses to move as we expect that it should. It is though we are being shown the process of ultimately being forced to accept reality, the difficulty of confronting something that is actually happening.

It might be presumed that victims of stroke who have hemiplegia also confront a state similar to that of Kafka's protagonist. In fact, when asked about awake after being taken to the hospital, a hemiplegic patient who underwent rehabilitation after experiencing a stroke responded with a description as follows:

At first I was surprised. I was confused, wondering "What's happened?" In the hospital bed, my left leg [the non-paretic side] was touching my right leg [the paretic side], you see? Since it didn't feel like my leg, I wondered what they'd put there. Then, when I touched one with my left hand, I was taken aback. Though I realized after touching my thigh, feeling [with the left hand] from my knee down, right? Having thought something had been put in there, I realized it was my own leg. I was shocked.

This hemiplegic patient awoke three days after collapsing from a stroke, and this description was part of an account given while recollecting the experience of that time. For this reason, although it might be somewhat embellished, this description includes the expression of surprise and confusion felt upon realizing that something thought to be a foreign object turned out in fact to be one's body. Just as experienced by the main character of Kafka's *Metamorphosis*, it was as though one's own body had been transfigured into something another.

Another hemiplegic patient described the following about his paralyzed limbs:

You could call them objects, I suppose. They can still move, but it's difficult to make complicated movement. There is no sensation. They don't hurt, they don't itch, I don't feel them move when I want them to. But I can move them. Still, it doesn't feel like walking, and I don't feel anything when using my left hand. Just that it's moving. When I was healthy, I never thought about it [how to walk, or how to move my limbs] – it's just that they [my limbs] don't move the way I want them to, so, you know, I kind of get this sense of "What the heck is going on?" They move, but I can't put any strength into them, they just plop into place. Practicing walking with a cane feels more confusing than painful, I guess. I'm forcing myself to move them at a point when I have no sensation. They're my senses, but I don't feel like I really own them.

This report shows a sense of incongruity and distance arising in relation to the patient's own body, with feelings of confusion about not being able to move at will.

Although the symptoms to appear will differ depending on the area of the brain that is damaged,

in the event of a stroke, in most cases motor paralysis will occur in the upper and lower limbs on the side of the body opposite of the damaged side of the brain. The disease severity of the motor paralysis has various levels. The degree of paralysis can vary, and can occur at a number of levels, such as where the patient is absolutely unable to voluntarily move the affected arm, hand, and leg; where moving some part of the body other than on the paretic side such as the arm or leg on the non-paretic side results in a movement of the arm or leg on the paretic side, but where these limbs cannot be moved voluntarily; where arms, hands, and legs can be moved voluntarily if all joints are moved to the same direction; where each joint can be moved individually, but where fine adjustments are impossible; or where arms and legs can be moved voluntarily more or less similarly to those on the non-paretic side. Other symptoms that can appear include the so-called higher brain dysfunctions, such as sensory impairment and aphasia, apraxia, anosognosia, and unilateral spatial neglect, as well as dysphagia (involving difficulty in ingesting foods or liquids), and visual impairment. Such functional impairments result in states whereby a variety of behaviors and actions cannot be performed as expected, such as not being able to walk, dress, eat, or talk.

In contrast to the results of brain damage that manifest as phenomena observable by third parties, the state experienced by post-stroke hemiplegic patients such as in the case described above can be imagined to be akin to living in a world that one has not previously experienced. Your arms and legs feel heavy, and you experience an unpleasant tightening sensation. Your hands and feet feel rounded and shrunken, your arms are heavy yet seem to float. Your legs seem to disappear when you close your eyes. As suggested in such descriptions given by post-stroke hemiplegic patients, the body is experienced something other than being healthy. However, this awareness falls short of understanding how the body has changed, and post-stroke hemiplegic patients are themselves often unaware of the truths of how their bodies have been transformed. You might know that an unresponsive hand is there by looking at your own body from the outside, understand that a side of your body is hard to move, or recognize that you cannot see to the your left space based on being told by people around you, but you do not aware that it is difficult to perceive the left space in a true meaning. Even so, there will be other bodily transformations that you will not understand even as a patient: not understanding how your body has been affected, not understanding your own body, or even not understanding that you do not understand your own body. As evidenced by various descriptions about a paretic arm—that the arm does not move even when attempting to do so forcefully, that it cannot be moved even if it is left to power and moves the arm, that it does not move with the intention and simply feels more stiff or tight in the muscle, that one cannot perceive about whether the arm is moving, or that one feels as though it

the arm bends only slightly but in fact bends much more—the bodily experiences of post-stroke hemiplegia sometimes diverge from reality, a fact that they themselves often fail to notice.

Transformation of the Environment and of Environmental Engagements

If one is in a state that has caused a transformation in the body, one will not be able either to make a connection to one's own body, nor will one be able to approach the environmental world without being able to have some connection to that world in the same strategy as in times of health. In other words, one is in a state where it is difficult to sense either the body or the world. If we assume that the environmental world for post-stroke hemiplegic patients is only that which can be perceived by their own transformed bodies, we may imagine that the perceivable world will also have been transformed.

One hemiplegic patient with severe “pusher syndrome”¹¹⁾ and left-sided hemispatial neglect¹²⁾ combined with anosognosia¹³⁾, when seated, would sit with her face always oriented in a direction about thirty degrees to the right of the median position (i.e., facing forward). When the hemiplegic patient spontaneously responded “I kind of feel like I'm not facing straight forward” to a therapist who addressed her from her right side, the therapist asked “Which way do you think you are facing?” At this, the patient replied “At this point I would say be facing to the back left corner”. Then, when asked “So could you turn to face straight forward then?” the hemiplegic patient turned her neck further to the right. To the therapist's question “Is that straight forward?” the patient replied “Yes it is.” Although as a phenomenon the patient turned her head to face further to the right, from the perspective of the hemiplegic patient, since she had originally been looking far to the left, the action of turning her head further to the right in response to the direction of turning to face straight forward was the correct one. Although at first glance, from the perspective of a healthy person, it looks like a mistaken action, from the perspective of the hemiplegic patient, it

¹¹⁾ Miyamoto Masaaki, “The Pushing Phenomenon”, in *The ABC's of High Brain Dysfunction for PT/OT* (Amimoto Kazu, ed., Bunkōdō, 2015), pp. 132–135. Pusher syndrome refers to symptoms indicating that one's center of gravity when moving or maintaining posture is strongly “pushed” by the non-paretic side in the upper and the lower limbs toward the paretic side, which is then corrected with the aid of resistance. Within pusher syndrome, the pushing action seen in movement or at all positions is termed the ‘pushing phenomenon.’ When sitting or standing, the non-paretic side supports the load of the paretic side to push the whole body in the direction of the paretic side.

¹²⁾ Ishiai Sumio, *Studies in Higher Brain Dysfunction* (Ishiyaku Shuppan, 2003), p. 121. Hemispatial neglect is a condition where a person with hemiplegia fail to notice and report, response to, and localize stimuli occurring in the contralesional space or perceived by the contralesional side of body. In patients with left-hemispatial neglect, the patient's inability to notice the left side of his visual field, despite the maintenance vision, results in an inability to find things placed there. Observable symptoms may thus include failure to notice obstacles even when clearly encountered.

¹³⁾ Ishiai Sumio, *op. cit.*, p. 147. This refers to the symptomatic disregard or denial of the existence of hemiplegia, a phenomenon in which the patient denies any impairment and claims not to be experiencing any difficulties.

is a clear, self-evident action without doubt. Underlying this action is the transformation of the body, of which one remains yet unaware, and the transformation of the lived world (i.e., the lifeworld).

If, for post-stroke hemiplegic patients, the body other than what their bodies are able to perceive may not exist, there is little choice but to move by using the strategies that they are able to use for the time being, via clues from the strategies that they do in fact find easy to perceive. For example, whereas circumduction gait¹⁴⁾, the characteristic way in which post-stroke hemiplegic patients gait is an abnormal pattern of gait from the point of view of therapists, in light of the circumstances of post-stroke hemiplegic patients, it is necessary to apprehend their situation along different dimensions than terms such as normal/abnormal or healthy/unhealthy. Seen from the perspective of post-stroke hemiplegic patients, circumduction gait is the result of maximum effort, and inherent to a body system that will be no longer operated to a different way strategy.

These transformations to the body and lifeworld occur not only in the case of strokes, which are disorders of the central nervous system, but also in orthopedic diseases such as bone fractures and osteoarthritis. Yet even though the underlying pathology may differ, for persons with disability they are inherent to the organized body system that will be no longer operated any other strategy.

The disabled persons live in the environmental world that it is possible for them to understand, and if we assume that they live their lives responding to this world,¹⁵⁾ then we may say that among persons with disability, rehabilitation is a frame in which to rebuild the body and the world that is lived through that body.

Rehabilitation as Reconstruction of the Lifeworld

Interventions that seek to compensate for what is lacking compared to healthy persons—such as by the repeated dorsiflexion of the ankle so as enable heel contact with the ground when walking, or the repeated practice of swinging the leg straight forward rather than outward, or using a brace so as not to catch one's toes on the floor when taking a step—cannot lead to the development of the ability to generate spontaneously action. In such cases, although adjustments to movement can be made by concentrating attention on one's own body, in situations where this is impossible, such as walking along the street, the disabled persons will become to gait with a pattern of

¹⁴⁾ Nakamura Ryūichi and Saitō Hiroshi, *Basic Kinematics*, 4th edition (Ishiyaku Shuppan, 2003), p. 333. Circumduction gait refers to the characteristic way in which post-stroke hemiplegic patients walk in which the knee joint and foot are extended in a rigid state when taking a forward step with the lower limb on the paretic side, such that the forward step is accomplished by the elevation and outward swing of the pelvis.

¹⁵⁾ Hidaka, Toshitaka. *Sekai o, konna fūni mite goran* [Try looking at the world this way], Shūeisha, 2013.

circumduction.

Making forward progress from such a state of affairs requires that the process of rehabilitation involve the setting of some sort of challenge (i.e., exercise) designed to develop the ability to maintain involvement between one's own body and the real world. In addition, it is also necessary that the disabled person and the therapist exist in a "coupling" relationship with reference to the process of reconstructing the system currently operating within the disabled person.¹⁶⁾ In this sense, "coupling" refers to a relationship in which, although each exists as a separately operating body system, the two subjects (the disabled person and the therapist) are mutually associated in the context of the rehabilitation process. In the context of the coupling relationship, the therapist explores the specific pathology underlying the phenomena manifesting in the disabled person. The therapist observes the physical function, behavior, and expressions of the disabled person with his or her own eyes, and on the basis of this makes further observations concerning the disabled person's feelings about his or her own body and own state, about the world, and about his or her comprehension of involvement within the world. Through this, the therapist attempts to observe the lifeworld of the disabled person, and so to clarify the inner workings of the disabled person's behavior. Then, the therapist considers the pathology in terms of what has been left behind and left unestablished in the disabled person's lifeworld, namely inquiring into how the person is attempting to secure stability.¹⁷⁾

Rehabilitation exercises are set based on the pathology observed. These exercises need to be set so as to include choice and bodily perception. For the disabled person, the exercises devised by the therapist represent a point of contact with the environmental world. It is at this point of contact that the disabled person will repeatedly experience the perception of things that occur on the part of the body and on the part of the world, and in this iterative process will at the same time experience a relationship with the world. The point of contact with the environmental world is set in a frame where it seems most probable that the disabled person will be able to access both his or her own body and the environmental world (or the point closest to it).¹⁸⁾ While remaining receptive to changes in the conditions of the disabled person, the therapist is called upon to devise

¹⁶⁾ Hitomi Mari, op. cit., pp. 371–372. Kwamoto Hideo, op. cit., pp. 172–173.

¹⁷⁾ Hitomi Mari, op. cit., pp. 283–290.

¹⁸⁾ Hitomi Mari, op. cit., pp. 280–281, 373–376. The "zone of proximal contact" is based on the definition proposed by the Russian developmental psychologist Lev Vygotsky for the "zone of proximal development" (ZPD). With regard to children's intellectual development, Vygotsky defined the zone of challenges that a child could for now only solve with assistance from adults or peers, but would in time be able to solve independently – i.e., the zone of subsequent development – as the "zone of proximal development." Nakamura Kazuo, *Vigātsuki shinrigaku: Kanzen dokuhon: Saikinsetsu hattatsu no ryōiki to naigen no gainen o yomitoku* [Vygotskian psychology: Understanding the concepts of "zone of proximal development" and "Private Speech"] (Shin Dokushosha, 2004), pp. 9–16.

a frame that will enable the disabled person to make forward progress while making independent choices.

In other words, for a disabled person environmental setting by the therapist or therapist oneself becomes the environmental world itself to reconstructing the body. Accordingly, the very way that the therapist interacts with the disabled person yields the emergence of a new reality, and could be said to open a path to the next phase. This change of phase, however, will not necessarily occur only in the direction of further organization; it includes the possibility for change in many other directions: setbacks, stagnation, confusion, or stoppage. In addition, in some cases a separate pathology may appear that had not previously been visible, or a completely new pathology may be born. The pathologies glimpsed in the context of (or even caused by) the relationship between therapist and disabled person (coupling) are known as morbidities in rehabilitation.¹⁹⁾ To the extent that a coupling relationship exists, changes that occur on the part of the disabled person will also occur on the part of the therapist, and this situation cannot be avoided. When the state of the disabled person stagnates, so too does the therapist. When the state of the disabled person grows confused, so does the therapist grows confused. For this reason, the therapist must observe the changes that spring from the body of the disabled person, taking these as cues to consider over pathologies that may not be visible to the eye, and in each instance adjust the prescribed exercise regimen.

The lived world of the disabled person is transformed in manifold ways through involvement with a therapist, and may sometimes point to changes that exceed the therapist's expectations.

Interviews were carried out with three hemiplegic patients more than a year after each had suffered a stroke. At the time of initial onset, these patients had not been able to accept their paralyzed bodies; they felt anxiety over the fact that everything had changed and over how they would live, as well as insecurity and self-pity about their inability to walk. However, through the process of rehabilitation, they gained experience in these changed bodies, and despite the internal conflicts of "self-blame over becoming hemiplegic when faced with something beyond my abilities" and "nostalgia for the old [pre-paralysis] life despite awareness of the existence that this other [paralyzed] way of life" the patients reported variously that "I've grown accustomed to being paralyzed, to this being who I am now. I don't feel the inconvenience of being paralyzed"; "I get around by fully acknowledging my paralysis and asking myself how I can do something, imagining myself into the state of being able to move"; "I sometimes feel odd sensations, like my fingertips aren't moving, but don't feel any inconvenience in terms of movement"; and "I have no choice but

¹⁹⁾ Hitomi Mari, *op. cit.*, pp. 301-328.

to live with my paralyzed body.” Despite differences in the degree to which these three had recovered from their respective limb paralyses, the patients’ physical condition was such that they were all capable of walking with a cane. From these descriptions, it appears that through the process of rehabilitation, the sense of self was reshaped to include the paralyzed body, with the effect that patients gained the ability to reconstruct their bodily actions to more closely unify them with their surrounding environments.

Conclusion

The disabled Persons live in a changed world in conjunction with their own changed bodies. In the context of rehabilitation, therapists may well be external observers who draw on their own perspectives to comprehend the lived reality of their disabled patients, but they are also part of the environmental world that surrounds these same person. Through the coupling relationship between therapist and disabled person, the former suggests a point of contact (frame) that links the latter’s own body with the world. The disabled subject burrows into the frame suggested by the therapist, and through the action of confronting choices, accumulates experience perceiving the feeling of having a body (bodily awareness) and the feeling of a body that is kept in motion (kinesthesia). In this way, in the context of the rehabilitation process, persons with disability and therapists become associated, and a metamorphosis occurs.²⁰⁾

This paper was based on supplements and reorganized interviews with hemiplegic stroke patients published elsewhere in the “Environments of Persons with Disability” chapter 20 of *Eco-fantasy: Toward extending our environmental sensibilities* (Toshiaki Yamada; Hideo Kawamoto, ed., Shunpūsha, 2015, pp.313-324). These interviews were carried out with the informed consent of the patients involved. In addition, this collection of accounts by hemiplegic stroke patients benefitted from the assistance of Rumiko Nakazato, an occupational therapist, and Masako Iwasaki, a physical therapist. In preparing this paper, I would like to acknowledge my gratitude for the guidance of Prof. Hideo Kawamoto, Rumiko Nakazato, and Masako Iwasaki.

²⁰⁾ Kawamoto, Hideo. *Metamorphōze: Metamorphosis: The core of autopoiesis*, Seidosha, 2002.