”Beam me up, Scotty! - Teleportation, and Personal Identity

Charles W. Johnson, Utah

Near the end of the Nineteenth Century a Prussian woman arrived at her local telegraph office with a bowl of sauerkraut she wanted sent to her son. She insisted that, if soldiers could be sent to the front by telegraph, certainly her sauerkraut could be sent the same way. (Standage, 1998)

The Prussian woman thought that communication and transportation could coincide. She may have been correct. In 1993 an IBM scientist, Charles H. Bennett, predicted that quantum teleportation is possible, but only if the original object is destroyed. More recently, in October, 1998, Caltech scientist H. Jeff Kimble succeeded in instantaneously transporting information contained in the quantum state of a photon one meter across a lab bench without it traversing any physical medium in between. Kimble and his colleagues used an extremely delicate quantum mechanical phenomenon, ”quantum entanglement.” Kimble’s findings suggest that teleportation of the sort depicted in the Star Trek television series and movies is theoretically possible.

In science fiction and science fact teleportation of a human being would involve a person stepping into a send-booth and having every single atom in his body and its location encoded. His compete physical structure would be stored in a memory buffer. The code of his structure would be sent, presumably by quantum mechanical means, to a remote receive-booth. At the reception end, the person’s body would be reconstructed according to the encoded information. A very slow way of doing this would be to also convey the matter from his prototype body to the receive-booth by snail mail. However, since he was completely disassembled back in the send-booth, we need not be fussy about what matter is used for the reconstitution. To optimize speed, local matter could be recruited for the purpose of reconstructing his body at the reception site. Initially this seems to be an extremely rapid means of transportation. However, teleportation amounts to transportation only in the event that personal identity is preserved. Whether the person who emerges from the receive-booth is the numerically same individual who entered the send-booth depends on the concept of ”person” we employ.

Cyberneticist Norbert Wiener claimed that matter does not matter. He suggested that a person is not a static entity, but a pattern whose instantiation is constantly changing. Wiener said, ”The individuality of the body is that of a flame rather than that of a stone, of a form rather than of a bit of substance.” Regarding the prospect of teleportation, he added:

> The pattern of the body can be regarded as a message that is in principle capable of being coded, transmitted, and then translated back into its original form, as sight and sound patterns may be transmitted by radio and translated back into sound and picture. Hence there is no absolute distinction between the types of transmission which we can use for sending a telegram from country to country and the types of transmission which at least are theoretically possible for transmitting a living organism such as a human being. (Wiener 1954, 91.)

If a person is simply a pattern, then it looks as though teleportation could be a viable form of transportation. Some practical difficulties exist. For example, information theory dictates that, whenever large amounts of information are transferred from one location to another, some bits of information are inevitably changed or distorted. This makes it unlikely (or impossible) that the individual decoded and reconstituted in the receive-booth is exactly the same in all respects as the one who entered the send-booth. Even if we disregard the change in location and the discontinuity, if the received person differs from the sent person in any respect, no matter how minute, then Leibniz’s principle of identity of indiscernibles indicates they are not the same.

A second practical difficulty concerns the information stored in the memory buffer. Physicist Lawrence M. Kraus contends that transporters are the least plausible technological devices depicted on Star Trek, because of the daunting amount of memory that would be required to store all the information regarding the atomic structure of a human body. About 10^{28} kilobytes would be needed to store a human pattern in a memory buffer. It is difficult to imagine how this much information could be stored. Moreover,

> The fastest digital information transfer mechanisms at present can move somewhat less than about 100 megabytes per second. At this rate, it would take about 2000 times the present age of the universe (assuming an approximate age of 10 billion years) to write the data describing a human pattern to tape! (Krause, 1996, 76-77)

Even if these practical difficulties could be overcome, personal identity problems remain. Recent philosophical accounts of personal identity have become increasingly sophisticated compared to the treatment by John Locke. For example, Robert Nozick’s closest-continuer schema for numerical identity is a means for keeping track of an individual’s identity over time. According to Nozick’s schema an object can be thought of as chopped up into time-slices; each slice is an object-at-a-time. Time-slices of objects have causal descendants, or continuers, as they undergo changes. Nozick suggests that we are willing to call the closest-continuer the same object as its ancestor based upon its qualitative similarities. If I replace a part in my watch, I consider my repaired watch as the same one I had before, because of similarities and because it is the closest continuer of my old one. Even if I have my watch completely disassembled for cleaning and then reassembled afterward, I regard my cleaned, reassembled watch as being the same as my old, dirty one. Nozick supposes that his schema works as well for people as it does with watches. Since the human body replaces most of its cells, and presumably most of its matter every five to seven years or so, Nozick’s closest-continuer schema provides a justification for saying that I am the same person who was born in Chicago fifty-seven years ago even if none of the cells now present in my body, or none of the matter that now comprises my body, was there when I was an infant.

Richard Hanley uses Nozick’s schema to defend the claim that personal identity is retained when a person goes through a Star Trek transporter. (Hanley 1997, 123-

162) However, a watch is different from a person. A disassembled watch can be reassembled with no significant differences being imposed on it. A disassembled person dies. Moreover, the generation of duplicates by a transporter presents no great difficulties with respect to a watch. Transporter duplication of objects could be a benefit; it might be an efficient means of mass production. While transporter duplication of persons could be an alternative to cloning, the possibility of duplication of human bodies precludes the possibility of retaining personal identity. A watch cannot socially ”meet” its duplicate. A person can meet his *doppelgänger* in a transporter scenario.

Transporters provide the illusion of transportation. A working transporter would not be a means of extremely rapid conveyance; it would be a killing and duplicating machine, comparable to a FAX machine in which in original document is automatically destroyed. Consider a scenario:

Transporter Scenario 1:

- Chuck steps into the send-booth of a teletransporter in Kirchberg.
- Chuck is encoded and disintegrated in the send-booth.
- An exact replica of Chuck, Dopple-Chuck, steps out of the receive-booth on Altair-4.
- Dopple-Chuck is completely similar to the individual who entered the send-booth regarding both physical and psychological characteristics (for instance, he has the same fingerprints, DNA structure, and stomach contents; he also has the same memories and personality).
- It seems to Dopple-Chuck as though he is the same person who entered the send-booth.
- A deputation of colleagues is sent to Altair-4 by conventional means. They find that Dopple-Chuck is exactly as though he had traveled from Kirchberg to Altair-4 by conventional means.

Notice that you could use a functional transporter to commit suicide by turning off everything except the disintegrate feature. To demonstrate that a working transporter would not retain numerical identity of a person, activate all the features except disintegration so the prototype individual is not destroyed. After the transporter completes its work, you have two, numerically distinct individuals, one in Kirchberg and the other on Altair-4.

Transporter Scenario 2:

- Chuck steps into the send-booth of a teletransporter in Kirchberg.
- Chuck is encoded, but not disintegrated, in the send-booth.
- Chuck steps back out of the send-booth.
- An exact replica of Chuck, Dopple-Chuck, steps out of the receive-booth on Altair-4.
- Dopple-Chuck is completely similar to the individual who entered the send-booth regarding both physical and psychological characteristics (for instance, he has the same fingerprints, DNA structure, and stomach contents; he also has the same memories and personality).
- It seems to Dopple-Chuck as though he is the same person who entered the send-booth.
- A deputation of colleagues is sent to Altair-4 by conventional means. They find that Dopple-Chuck is exactly as though he had traveled from Kirchberg to Altair-4 by conventional means.

We can remove the illusion that any traveling is accomplished with a transporter by drastically reducing the distance between the send and receive-booths. Place them both right here, within the same room, just a meter apart. Now we have a device that is analogous to a copy machine instead of a FAX machine.

Transporter Scenario 3:

- Chuck steps into the send-booth of a teletransporter in Kirchberg with a stout rope tied around his waist. The rope is firmly held by a delegation of his colleagues and friends.
- The receive-booth is located one meter from the send-booth
- Chuck is encoded, but not disintegrated, in the send-booth.
- Chuck steps back out of the send-booth, with the rope still tied around his waist and firmly held by his colleagues and friends.
- An exact replica of Chuck, Dopple-Chuck, steps out of the receive-booth one meter away.
- Dopple-Chuck is completely similar to the individual who entered the send-booth regarding both physical and psychological characteristics (for instance, he has the same fingerprints, DNA structure, and stomach contents; he also has the same memories and personality).
- It seems to Dopple-Chuck as though he is the same person who entered the send-booth.
- A delegation of Chuck’s colleagues, still holding the rope, which remains tied to Chuck’s waist, sees Chuck to their left and Dopple-Chuck to their right. The delegation counts two numerically distinct individuals.
- Chuck meets Dopple-Chuck.

Both objective and subjective criteria show that the prototype person is not the same person as the duplicate. The objective case is easiest. Witnesses keep track of which one is the original by means of the stout rope. Moreover, they can readily observe that the original is to the left of the duplicate. Leibniz knew that locational properties were among the characteristics we use to distinguish between distinct individuals. It is insightful that, in transporter scenarios, the locational differences are more obvious when the two individuals are in the same room than when they are on difference planets.

Subjective criteria are more intriguing. First, the fact that it *seems* to the duplicate that he is the same person who entered the send-booth proves nothing. *Seeming* is not a viable criterion for correctness. ”It *seemed* to me at the time that I was correct,” usually implies that I was not correct. If my ”seeming” impression gains its force from comparing me with myself itself, then it is not trustworthy, no matter how psychologically compelling it is. The standard meter rod cannot be used to measure its own length. (*PI*, 50) Lewis Carroll’s Alice cannot figure out whether she is shrinking or growing by placing her hand on top of her own head. An independent standard is needed to determine sameness.

Wittgenstein’s remarks concerning the ”metaphysical I” from the *Tractatus* are helpful at this point.

Similar observations were made by Leibniz and Gershon Weiler. A person can be identified by his physical characteristics including his memories, personality, and his relationships with other persons. However, a person can also be identified in terms of his point of view. Points of view are unique. Only I can have my perspective on my world of experience (that is what makes it mine). Just as a camera can take photographs of other cameras, but it cannot take a picture of itself, so too, I can meet other persons, but I cannot meet myself. If I meet another person at all, that suffices to show that the other person is not me. ”I am my world.” (*Tractatus*, 5.63) ”. . . the metaphysical subject [is] the limit of the world – not a part of it.” (*Tractatus*, 5.641) Dopple-Chuck is a part of my world. My world would come to an end, if I were disintegrated back in the send-booth. (*Tractatus*, 6.431) Since I can meet my duplicate in the third transporter scenario, he is not me. The moment Dopple-Chuck steps out of the receive-booth, his experiences, history, and viewpoint differ from mine. He becomes an external fact in my world, and I become one in his.

No one I have asked would be willing to use a functioning, reliable transporter as a means of transportation. They feared that using a transporter involves death and duplication. If you were the prototype in Transporter Scenario 3, when you stepped back out of the send-booth, would you be willing to have yourself killed and permit your duplicate to carry on with the rest of your life? Would you cheerfully let him share love with your partner, possess your belongings, interact with your friends, and enjoy the loyalty of your dog? Would it matter to you? If so, then the transported duplicate is not you.

References

Hanley, R. 1997 *The Metaphysics of Star Trek*, New York: Basic Books.

Hick, J. 1976 *Death and Eternal Life*, New York: Harper Collins, 278-285, 287-296.

Hick, J. 1960 ”Theology and Verification”, *Theology Today*, XVII, 1.

Krauss, L. 1995 *The Physics of Star Trek*, New York: Basic Books.

Nozick, R. 1981 *Philosophical Explanations*, Cambridge, MA: Harvard University Press.

Standage, T. 1998 *The Victorian Internet*, New York: Walker.

Weiler, G. 1976 ”Points of View”, in A. Kasher (ed.) *Language in Focus*, Dordrecht, Holland: D. Reidel Publishing Company, 661-674.

Wiener, N. 1954 *The Human Use of Human Beings: Cybernetics and Society*, Garden City, New York: Doubleday.

Wisdom, J. 1967 ”Ludwig Wittgenstein, 1934-1937” in: K.T. Fann, *Ludwig Wittgenstein: The Man and His Philosophy*, New York: Dell, 46-48.

Wittgenstein, L. 1998 *Wittgenstein’s Tractatus*. Daniel Kolak (trans.), Mountain View, CA: Mayfield Publishing Company.

Wittgenstein, L. 1953 *Philosophical Investigations*, New York: Macmillan.