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**Life Before Life: A Scientific Investigation of Children's Memories of Previous Lives** by Jim Tucker. St. Martin's Press, 2005. 256 pp. \$23.95 (hardcover). ISBN 0-312-321-376.

*Life Before Life* is a highly readable account of the ongoing research at the University of Virginia division of Personality Studies into the fascinating phenomena surrounding past-life recall by children. The basic phenomenon usually involves a young child who talks about the memories of another (adult) person in first-person perspective. In some cases there are predictions or announcing dreams made, respectively by the older person before death and the mother of the child, predicting the transfer of personal identity. Also involved may be unusual play, behavior patterns, specific phobias, and birthmarks/birth defects specifically related to the life and death of the previous personality. Such cases have been found in many parts of the world; the most striking cases involve memories that can be (and in many cases were) checked against independent sources and shown to correspond to an actual deceased person. The far majority of these cases describe ordinary lives (not famous individuals, as often occurs through "past life recall therapy"), as well as violent deaths resulting from accidents or various crimes.

The investigation of such cases, as described in this book, is carried out in a methodical and impartial manner. The only view that the book assumes is that there is a phenomenon here worthy of study, and that seems amply proven. The text is fairly neutral about the interpretation of the data and indeed goes into considerable detail about the methodology (interviews and fact-checking) as well as possible pitfalls of individual cases. The author is very good about suggesting possible conclusions that might be drawn and discussing their relative merits. Clearly the most immediate thing that comes to mind is a classical notion of reincarnation, but the book discusses a number of possible alternatives that must also be considered. Accepting that, one is left with a variety of further questions, such as why only some people seem to have such recall, why the recall generally ceases at 5–6 years of age, why the birthmark cases almost always involve the skin, why the deaths almost always involve violence, etc.

Chapter 3 focuses on "explanations to consider", including super-PSI, possession, etc., which while hardly being more palatable explanations for conventional scientists, need to be evaluated. Interestingly, while these alternatives are discussed in detail, along with both scientific and religious objections to reincarnation, the book does not spend time unpacking the notion of reincarnation, or exactly what it means for a "person" to be identified with another person. The philosophical (ontological as well as epistemological) issues surrounding personal identity are complex (see the works of Anthony Flew), and quite germane to this discussion (Glover, 1976; Morick, 1970; Perry, 1975; Perry, 1978). While the data will be convincing to many readers, it would be a mistake to think that accepting reincarnation as the most likely explanation for these observations gets us past many of the difficulties with personal identity and the meaning of "memory" which have plagued philosophy of mind for millennia.

As an example, consider the fact that the concept of "person" has undergone a radical deconstruction by recent advances in cognitive science. Evidence from a number of areas of psychology, biology, and artificial intelligence suggests that there is no unified "I" even in living individuals! The author asks (p. 215), "what is it that reincarnates?". A first question might be, "what is it that is incarnated now?". The currently most-popular notion of human cognition treats the self as a fiction, or a "center of narrative gravity", while the behavior and perceptions of a human being are the result of a number of information processing modules that vie for control (Braude, 1995; Dennett, 1980; Dennett, 1991; Marks, 1981; Marks, 1978; White, 1991). These modules are made up nested hierarchies of increasingly "dumb" information-processing systems, ultimately merging with specific neuronal pathways in the brain. It is clear that we are moving away from the notion of a centralized Ghost in the Machine who supervises the whole operation; if this view is even partially correct, it challenges us to develop more sophisticated notions of what might reincarnate and how, assuming we believe that something related to human cognition might survive the death of the body.

The author proposes the analogy of TV signal to TV set, to explicate the relationship between mind and body. As the television apparatus is needed for the signal to be expressed, the mind is not originated by the brain but rather is "transmitted" through it. This offers dualists a way to explain why the brain is necessary but not sufficient. Pull out the right wires, and there's no TV program on, but not because the program has disappeared. On this view, the information content of the show is not in the wires of the TV set. The analogy is appealing, but dangerous. The main problem is that it only explains the simplest cases—a bullet through the brain = no human behavior. However, neuroscience now has a huge amount of data showing how very subtle and primary aspects of our personality do indeed depend upon the structure and function of the brain. Through work with psychotropic compounds, accidents or disease which causes specific kinds of damage, and genetic mutation in animal systems, it seems that this simple analogy must be fleshed out much more before it can do useful work. Many wonderful examples have now been reported (Sacks, 1998). A particular kind of

damage can cause a man not to be able to name red vegetables, or to cause him to believe and claim vehemently that his left arm does not belong to him. Does that really jibe with the brain being just a transmitter? Not in any simple fashion. If, when one pulls out a certain transistor, the TV show does not stop but rather shows the protagonist start to walk on his hands for the rest of the program, one starts to suspect that some important aspect of the fundamental information content was indeed directly related to the hardware that was removed.

These issues directly point to the reason why this work is so important. While many people are personally excited at the prospect of reincarnation, it is unclear that this possesses that kind of general import for most of us. First, the data do not show that everyone reincarnates; at face value, it suggests that perhaps only those with particular kinds of deaths may do so. Even if all of us do, the far majority will have no recollection of it, dampening the excitement about the prospect (shades of Philosophy-101 again: is the situation where you are reborn but do not know about it, really any different from one where you simply die and another person is born, and does it matter to "you" now?). In any case, it would seem that one's focus ought to be in the current life, and not on the past lives (as suggested in the book section dealing with how to ease the psychological issues confronting children with these kinds of memories). If we don't remember our past lives, there's probably a good reason for it. Nor do there appear to be any societal benefits stemming from an acceptance of rebirth and even karma; as pointed out in the book, there are just as many villains in countries where this is commonly-accepted fact as there are in the Western world.

The biggest import of this work is for basic science and the understanding of the universe as a whole. More profoundly than most of the work on psychokinesis, telepathy, and so on, which at least can be approached with physicalist theories (White and Krippner, 1977), the prospect of personal survival of bodily death speaks against the doctrine of materialism (Beloff, 1985; Beloff, 1990). The author discusses a couple of related phenomena that do the same (veridical out-of-body experiences) and touches on relevant aspects of parapsychology, such as the mind-machine interaction work (Jahn and Dunne, 1987). It is clear that if the human personality is not simply a by-product of the biology of the body, a drastic revision in our basic sciences will be required. A brief discussion of the issues (problems with conservation of mass/energy, quantum approaches by people like Stapp, etc.) is appropriately included. Interested readers can learn more about these issues from (Popper and Eccles, 1983).

Indeed, the intersection of this body of work with mainstream science provides some important puzzles. The author rightly points out that it is entirely unclear how (in the case of birthmarks, if they were caused by the beliefs and wishes of the mother instead of by reincarnation) information acquired by the mother might affect the genetics of embryonic development. This is true, although it is of course equally unclear how the information content of a discarnate spirit can affect the embryogenesis of a human fetus. A couple of the most interesting cases revealed information from the children about how they "chose" their prospective parents.

This immediately presents a thought experiment. Suppose one takes a human egg, fertilizes it *in vitro*, and waits until it makes its first division into a 2-celled embryo. This is done today routinely in IVF clinics around the world. One then tosses a coin (or if you prefer, uses a quantum random number generator). If it comes up heads, one implants the embryo as is, and one child results. If it comes up tails, one separates the 2 cells and implants them individually, which will result in the birth of twins – two different individuals. The procedure from coin toss to splitting can be done on the time-scale of a minute. Assuming the "decisions" about picking one's parents are performed in a world where time is relevant (and it would seem that a "decision" process assumes a linear flow of time), when in such a case does a spirit get assigned to the twin which would not exist if the coin comes up heads?

As long as we're talking about biology (and certainly this work, and the works of Stevenson, contribute to biology in an important way), I am tempted to add to the "Future Research" section (p. 231) and describe a potential area of experimental research that at least begins to address these questions in a rigorous manner. It turns out that there is a type of worm that can regenerate (re-grow) its head (including brain etc.) if it is cut off. These worms can also be trained to perform simple tasks – they have memories and remember. Some truly astounding work in the 1970s (which is now being pursued in our lab) has shown that if trained worms are cut up, and the tails are allowed to form a new worm (with a new brain), the resulting worm remembers the original training (McConnell, 1965). This work demonstrates that (assuming the memory is in the body at all) knowledge and information can be stored outside of the brain. While this example doesn't take us all the way to a discarnate entity, and may or may not apply to higher vertebrates, it provides a foot-hold to begin, giving biologists an experimentally tractable entry-point into the process of how information could be imposed on a forming brain from outside the brain.

The book does not describe any cases not supportive of 1:1 relationships between deceased personalities and children (for example, cases where the original personality was still alive while the child was born, or two children who remember the same previous life). Such were (as a minority) described in the larger Stevenson books, and represent interesting cases which might also teach us much. Clearly, lots of work remains to be done. Besides continued collection of cases, one wishes for more experimental approaches, such as the described marks purposefully made at the time of death that can help identify possible rebirths if they occur in the same family. A number of children apparently also made statements about their conditions between lives, and it is hoped that continued questioning of such children might reveal interesting details about the process.

The author has not only produced a first-rate piece of research, but also has shown the necessary very wide-ranging knowledge to help the reader make sense of it. This work is incredibly important, and the author is clearly doing it the right way. The coding of all cases into a searchable computer database is an important advance, as it will allow a significant amount of data-mining—a technique which allows, given large data sets, to automatically find and derive relationships and

hypotheses which were not specifically anticipated. For example the author describes the test for a correlation between "saintliness" in the previous life and the societal position of the next personality. For those who have never heard of this fascinating work, this is a good introduction and describes a number of informative cases. For those who have, the book includes plenty of discussions of related topics and will surely cause the reader to ponder important issues. I recommend this book. Interested readers will also want to read a number of the works of Ian Stevenson, the originator of this field (Stevenson, 1997a; Stevenson, 1997b).

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**The Scientific Legacy of Fred Hoyle** edited by Douglas Gough. Cambridge University Press, 2005. 266 pp. \$75.00 (hardcover). ISBN 0-521-824-486.

It is a measure of Fred Hoyle's standing that three biographies have appeared, and two international meetings have been held in his honour, since his death on