

Carl Sagan is Right Again: A Review of The Millennium Man

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The novel, *The Millennium Man*, by W. Joseph Wyatt lives up to its honest billing as “a positive look at behavior analysis” (a name connoting the *natural* science of behavior). Appearing near the close of the 1900s, the title could grab a fair amount of attention as the second millennium ends and the third millennium begins (in “common era” parlance; see Gould, 1997). The story is not only set at the turn of the millennium, but it also suggests various actions that could make the next millennium more humane than all the previous ones. Still, the title derives more from the basic story line than from such calendrical connections, that story line being the surprising and insightful reactions, to this time period, of someone who has visited several earlier time periods.

Wyatt weaves an intriguing tale of a Renaissance genius—called “Leo” in the story—whose systematic work led him to discover a formula to enable a person to engage in decades-long periods of hibernation-like sleep. Applying his discovery to himself in the early 1500s, this genius has experienced a series of glimpses of the state of humanity by awakening for a couple of months every hundred years or so. He had also made arrangements to ensure his presence in the “new” world.

During the current awakening, Leo visits our time. He marvels at what he must call *miracles*, the miracles all around him in the year 2001, including miracles in medicine, transportation, construction, and communication. He recognizes these miracles as wrought by applying advances discovered in the natural sciences using essentially the same scientific methods that led him to discover his own formula. But all these miracles had not been present on any of his earlier visits, even on his last visit only a couple of generations back. Yet all these are miracles that we today take all too much for granted, apparently not appreciating what life would be like without them, and this itself causes a certain amount of concern for Leo.

However, Leo also finds certain things that have not changed, things like the easy allegiance so many, many people give to the various pseudo explanations of their own behavior, comforting but essentially shallow, untestable and so essentially unhelpful explanations such as are available in the occult, mentalistic, or astrology sections

of bookstores. As counterpoint, Leo also quickly recognizes the development of a natural science of behavior, a science called behavior analysis in the story and behaviorology by some other current practitioners.

That natural science is clearly delineated in the book from the social science of behavior called psychology (see Fraley & Ledoux, 2002, about the history and differentiation of these two disciplines). In the perspectives, advances, and applications of the natural science of behavior, Leo finds not only the relevant actions but also the wisdom about ourselves that is needed to help solve so many of the continuing problems of society that he still observes.

If you combine (a) the twentieth century’s scientific miracles, (b) the continued clinging to pre-scientific notions about human behavior and its causes, and (c) the value of the discoveries and applications of the natural science of behavior, then you have the mix that I think Carl Sagan was correctly addressing when he described this story as “an excellent device to view our time.” (His comment is inscribed on the book’s cover.)

Joe Wyatt is himself a natural scientist of behavior. Although also trained in psychology—as were so many of today’s behavior analysts and behaviorologists—Wyatt had to fight a court battle with psychologists to retain his university teaching position as a natural scientist of behavior. (He won that battle, but he should not have had to fight it, and the energy spent by both sides was not available to help society in more beneficial ways; see Chapter 3 of Fraley & Ledoux, 2002.) While not used in the book, this experience could be a typical example of the contradiction between science and pseudo science that Leo puzzled over so often in the story.

A reader already familiar with the natural science of behavior might be concerned with Leo’s occasionally extreme or incomplete handling of some of the puzzles that he encounters (though most readers may not take any notice). For example, while Leo castigates the mentalism of Freud, he ignores Freud’s historical contribution of looking at behavior deterministically. Based on information from his patients, Freud grasped some of the forces that determine behavior, such as primary reinforcers like food and sex. However, the variables shaping Freud’s behavior led him to locate these forces inside the person as psychic entities, like the id, rather than acknowledge them as independent variables of behavior in the person’s environment, both internal and external.

While the professional reader may be concerned with such cases, the lack of that level of detail cannot be considered a problem for the book. Including all such details in a novel risks making the story read like an imitation of Jack London’s *The Iron Heel* (London, 1971) in which the polemics were the point.

On the other hand, the occasional inclusion of a little more detail could have been beneficial. For example,

while stating with authority the origins of verbal behavior (language), Leo understated the complexity of those origins, leaving too much room for the continuation of many modern misunderstandings about those origins. Leo touched on partial differential reinforcement of babbling leading to words leading to sentences. However, stopping at that point too easily implies to readers that that is all that is considered necessary to account for language from a scientific perspective. Yet, in Leo's speaking style, only a few more sentences may be needed to interest the reader in a more complete range of the variables involved in language development, variables such as parental repetition—and thus modeling—of correct forms, plus generalization, creative-looking recombinations of already separately learned responses, and perhaps even the phenomenon described as stimulus equivalence.

Leo's short discourse on "praise" and "blame" is another example of stopping short. He describes how praise and blame are not actually earned—in the sense of the behavior that precedes them being initiated by the person as an initiating agent. But by stopping there, readers are too easily left with the misimpression that behavior science says praise and blame should be ignored, or even banned. Yet a little elaboration by Leo could simply point out how praise and blame are still culturally and scientifically needed as reinforcing and punishing consequences of the behavior that produces them.

Those musings could even lead to an interesting digression about the misconstrual of reinforcers as bribes. Is praising a child when she or he does something well a bribe? What about giving cookies or stars or points (or grades, for college students) or allowances (or salaries, for adults)? None of these are bribes! Dictionaries are quite reliable on this point: bribes are anything given to someone to induce him or her to act immorally or illegally (e.g., Webster [1979, p. 226] defines a bribe as "a price, reward, gift, or favor bestowed or promised to induce one to commit a wrong or illegal act").

At one point the author skillfully leads the reader to feel that Leo is misusing science of behavior principles to manipulate others for personal gain. This provides the opening to make an important point. One of the other characters then notes that Leo was not engaging in that kind of abuse, that knowing about the laws of behavior does not automatically make the knower misuse those laws. Indeed, one of the best ways to reduce and avoid such abuse is to enable everyone to be familiar with the laws of behavior. This is surely part of the very purpose of this book. Everyone should be as familiar with the basic principles and practices of the natural science of behavior as they are with physics or biology from high school.

At another point, the author has Leo giving an unusually and uncritically oversimplified description of communism. Given the difficulty—or controversy—inherent in fixing

this passage, one which seemed to be distracting anyway, perhaps it would have been better to omit this small part.

Actually, in all of the concerns I have discussed, the level of detail the author provides can certainly be construed as adequate for a novel of this type. Still, I think a novel that included the kind of details that I have suggested would be appreciated for the increase in its educational value. (And novels *can* be revised.) Meanwhile, given the general thrust of this work, I find the author's effort quite compelling. The author may not yet be a fully developed "Jack London," but efforts such as his have long been needed to help bring the natural science of behavior to a public inadequately versed in the workings and values of science (e.g., see Sagan, 1996, 1997).

I would not be surprised if *Millennium Man* turned out to be a sleeper in the way *Walden Two* was (Skinner, 1948). But I rather think it deserves to take off like a rocket. I have adopted it as a text in behavior science courses (and recommend others do so as well). For starters, I suggest to the students that they imagine themselves in the shoes of Holly and David, the younger characters in the story. I then ask the students to describe the things they would hope to be able to show Leo at his next awakening, especially in terms of the science of behavior. Finally, I ask them to describe the things they might do in their own lifetimes to help make into realities the things they would hope to show Leo.

In a similar vein, as I neared the end of the novel, the possibility, then probability, that we had not seen the last of Leo continued to rise. Wyatt handled this notion with deliberate delicacy. I enjoyed "falling for it." I found myself compelled to consider what concerns I would be pleased to find Leo observing and addressing. Of course, I would like to see Leo again meeting Holly and David and Beth and even Jim (through medical science advances) as well as Rose and her children. Who *are* all these folks? Well, read the story!

The sheer human interest of such reunions would be gratifying, whether expected or not, as would be seeing which of the many potential directions the author ends up being compelled to develop. Yet, regarding concerns, I would hope Leo gets to observe the meaningful and valuable reality of our behavior science being more accepted by those who currently see science *per se* as the principal if not sole cause of society's ills. I would hope Leo gets to observe that by his next visit, the natural science of behavior is at least as accepted then as Darwinian evolutionary biology is accepted now. And I would hope Leo gets to observe the extensive benefits our science can deliver even now—if allowed to—in areas that currently have such great needs including both child rearing and, especially, the educational arena.

Perhaps excessively critical readers will readily find tidbits about which to nit pick (e.g., the probable, unad-

dressed problems of muscle atrophy during a 100-year-long sleep). But I would have to wonder whether they were missing or avoiding the well-developed point of the story: the wisdom-bringing value—for the present and the future of humanity—that is readily available now through behavior analysis/behaviorology.

In the final analysis, this is an inspirational book, inspirational in several—and the best—senses of the word. Of course, it inspires readers to learn about, and apply, behavior analysis/behaviorology. But it also inspires readers to a greater appreciation of *all* the other wonders that the other natural sciences have brought us, wonders that we have come to take far too much for granted. More importantly, it inspires us realistically to work to know ourselves better through the natural science of behavior and thereby be better able to use the rest of our knowledge to benefit the world and the future.✻

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