H. G. Wells and B. F. Skinner on the Superorganism

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In Skinner's *Walden Two*, the central character Frazier refers to the superorganism and how to build it, but without elaboration. An examination of some parallels between the work of H. G. Wells and B. F. Skinner, however, casts light on that reference and other aspects of Skinner's views, such as multiple selves. Both Wells and Skinner wrote in similar ways about what the composition of such a superorganism would be and the conditions for its development. In particular, attention is directed to the ways in which their forecasts of the conditions for producing the superorganism changed over time, from determinism-based conditions to more evolutionary or selection-based conditions.

Key words: determinism, evolution, natural selection, pragmatism, predestination, selectionism, utopia, B. F. Skinner, H. G. Wells

Both H. G. Wells and B. F. Skinner appear to have been influenced by similar cultural contingencies, although it is impossible to say to what extent these cultural influences may have been passed on to Skinner through Wells. Nevertheless, the ways in which the views of Wells and Skinner are similar provide a clarifying background for understanding some important features of Skinner's work. In Skinner's *Walden Two* (1948), for example, the central character Frazier makes a cryptic reference to the superorganism that becomes more understandable when compared with a similar conception by Wells.

The best known connection between Wells and Skinner is an article by Wells that was credited by Skinner (1976, pp. 300–301) with confirming Skinner's decision to enter psychology. In that article, Wells compared the value of a life spent on the scientific study of behavior (Pavlov) with the value of a life spent on literary pursuits (Shaw). Wells came down decisively in favor of Pavlov. This article was one of a series of articles by Wells published in the *New York Times Magazine* in fortnightly installments during 1927 under

the general heading, "The Way the World is Going" (see Wells, 1929, for the November 13, 1927, article and a collection of other articles in that series). In addition, Wiklander (1996, p. 87) says Skinner read *The World of William Clissold* (1926), a lengthy multivolume work of fiction in which Wells explored ideas he also pursued in his nonfiction.

Wells studied under and was strongly influenced by Thomas Huxley, who wrote on many of the ethical and evolutionary issues that Wells would write about (e.g., Huxley, 1886/1929); Wells briefly pursued a career teaching biology and wrote the two-volume *A Textbook of Biology* (1893), which he illustrated with drawings from his own laboratory dissections (Stover, 1986, p. 45). Wells was prepared for a lifelong career in science. That prospect changed when Wells encountered difficulties with his health and when he discovered he could have an extraordinarily successful career as a writer, most memorably of science fiction. From that start, Wells went on to affirm several values that would later be shared with Skinner. Wells was a lifelong proponent of science (e.g., 1935/1975, p. 122), pursued the implications of natural selection in his work, supported pragmatism (Wells, 1904, p. 381; 1908, pp. 56–58; 1925/1985, pp. 292–293) as well as scientific deter-

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minism (Wells, 1908, pp. 71–72; 1913, pp. 22–23; 1942/1995, p. 99), disparaged old or traditional history as “a mass of pretentious narrative, almost entirely useless for any practical purpose at all” (Wells, 1939b, p. 96), supported behaviorism as advanced by Pavlov and Watson (e.g., Wells, 1940a, p. 304), distinguished between selves favorably and personality unfavorably (Wells, 1940a, pp. 304–305), believing that a unified personality was an illusion and that it was more accurate to regard the individual as “a collection of mutually replaceable individual systems [of behavior] held together in a common habitation” (Wells, 1944, p. 395), wrote utopian novels (Wells, 1905/1967, 1923, 1933), used Bacon’s *The New Atlantis* and Solomon House (Wells, 1905/1967, p. 60) as a model for utopia, and advocated the English country house (Wells, 1926, pp. 595–596; 1934, p. 105) as an ideal model for social interaction. All of these views, and more, have parallels in Skinner’s work. For example, Skinner (1983/1984) also used Bacon’s *The New Atlantis* and Solomon House as a model for *Walden Two*, and Skinner said of *Walden Two*, “It’s a simple life, rather reminiscent of an English country house in the nineteenth century” (1973/1978, p. 191).

Wells and Skinner also shared a basic conflict. Although both men accepted determinism, at least for a time in their careers, they shared similar pragmatic views of science. Whereas determinism explains events in terms of a preexisting state of affairs, pragmatism explains events in terms of consequences. There is an inherent conflict here that Wells and Skinner had to deal with, whether or not they were aware of it. Their determinism will be noted later on, but their pragmatism is noted in the following. For Wells, pragmatic workability exemplified the scientific approach. Speaking of science, Wells (1931b) said, “The test of all her theories is that they work.” (Vol. 1, p. 86). As one of Wells’s characters said, “We make our

truth for our visible purposes as we go along, and if it does not work we make it afresh” (1915, p. 202). For Skinner,

The ultimate criterion for the goodness of a concept is not whether two people are brought into agreement but whether the scientist who uses the concept can operate successfully upon his material—all by himself if need be. . . . This does not make agreement the key to workability. On the contrary, it is the other way around. (1945/1972, p. 383)

For both Wells and Skinner, the central criterion for scientific investigation is workability, an issue of successful consequences, particularly successful consequences in the long run.

Perhaps the most bizarre parallel between Wells and Skinner occurred in *The Food of the Gods*, in which Wells referred to a laboratory investigation that yielded frequency “curves of an abnormal and perplexing sort” (1904/1967, p. 21). The results of these and other laboratory experiments were then applied to animals on an experimental farm: “There was trouble with the rats [chickens were the intended subjects] of the Experimental Farm. . . . But at last success dawned. And its herald was a letter in the long slender handwriting of Mr. Skinner” (p. 27), who was managing the farm. The letter was signed “Alfred Newton Skinner” (p. 27). If a young Skinner had read these passages, I’ll leave it to the reader to imagine what effects they may have had.

In the following, Wells and Skinner will be examined for their contribution to understanding the superorganism, its composition, and the conditions for its development. As would be expected, similarities between the views of Wells and Skinner show up in *Walden Two* (1948), Skinner’s utopian novel, and the views of Wells will be compared with those of Frazier, the central protagonist in *Walden Two*, as well as with those of Skinner after *Walden Two*. The views of Wells and Skinner also changed over time to become increasingly selectionist in the sense of selection by consequences, as in Darwinian natural selection. The implica-

tions for the conditions that gave rise to the superorganism will then be addressed.

THE COMPOSITION OF THE SUPERORGANISM

Wells and Skinner both advanced a similar position on the composition of a superorganism in terms of social groups, individuals, and multiple selves. In general, the superorganism embraces species-cultural relations and suggests significant relations between the behaviors of a culture's members and the behaviors of the culture as a whole. It also suggests a future species-culture that is more advanced in some sense. The prefix *super* has reference, then, to a sense of extended inclusion and a sense of improvement. Some uses of the term may imply one sense without implying the other.

Wells

Wells saw a world trend, which he approved of, that moved away from valuing rampant, competitive individualism and toward valuing cooperative societies. Wells disliked singling out individuals for honors in competition with others, opposed the age-old Master-Man social order (Wells, 1942, pp. 148–149), and had “an inherent dislike of leadership and a still profounder objection to the subsequent deification of leaders. Leaders I feel should guide as far as they can—and then vanish. Their ashes should not choke the fire they have lit” (Wells, 1934, p. 562). In place of seeing life as *laissez faire* individualism, Wells saw a collective collaboration that participated in an organic existence and a greater life:

A few score generations ago all living things were in our ancestry. A few score generations ahead, and all mankind will be in sober fact descendants from our blood. In physical as in mental fact we separate persons, with all our difference and individuality, are but fragments, set apart for a little while in order that we may return to the general life again with fresh experiences and fresh acquisitions, as bees return with pollen and nourishment to the fellowship of the hive. . . . Already some of us feel our

merger with that greater life. (1914, pp. 356–357)

Wells also considered this greater life as composed of multiple behaviors. One of his characters spoke of it as a vast collection of verbal behavior:

Who taught you to talk? Your mother, you say. But whence the language? Who made the language that gives a bias to all your thoughts? And who taught you to think . . . ? Whence came your habits of conduct? Your mother, your schoolmaster were but mouthpieces, the books you read the mere forefront of that great being of Voices! (1915, pp. 44–45)

These voices were embodied in literature and encyclopedias, but they were not limited to them.

For Wells, these views were more than fanciful speculations, and he sought to place them on a scientific footing as much as he could. Wells (1896/1975) is credited with “probably the first published paper” (Haynes, 1980, p. 30) to outline the basic differences between cultural and somatic evolution, and he presented the movement toward organizational structures beyond the individual in both social and biological strands. Speaking of human society and our social reactions, Wells emphasized the extent to which the social environment determined behavior:

We talk of our “selves” and of being freemen, but much of the greater part of our activities today we perform as parts *not* of one simple, greater organism, human society, *but*, what is more complex, as parts of a number of greater organisms—profession, township, nation, religion, club, class, and so forth, which are all woven together into what we call human society and our social reactions. What we do as purely spontaneous individuals is hardly more than a narrow choice between prescribed things. The home we live in, the clothes we wear, the food we eat, the way we go about the world, are all substantially imposed upon us by forces exterior to our personalities. They are social products and more and more do they become social products. (1939a, pp. 34–35)

Wells is suggesting that the social environment, or culture, has come to play an increasing role in determining individual behavior.

This does not mean the individual did not matter. Speaking for biology

and the value of the individual in the species, Wells said,

If a species survives, then it survives only by and through its individuals. It is a great mass of individuals rolling towards that maw of time, and every one of these individuals is contributing to the movement. The species may or may not survive; it will struggle to survive as stoutly as its collective will—or, if you prefer it, the algebraic sum of its wills—to survive determines. So long as it holds out, the life of every individual must contribute some consequence to the struggle. Every individual without exception changes the species, and its contribution is permanent so long as the species endures. (1942/1995, p. 53)

Wells generally argued the case that society should or would advance the improving development of the human species, although he did not always believe a beneficial progress was inevitable. An optimistic development was commonly thwarted in his science fiction novels.

Wells indicated some historical precedents for identifying an improved human species, such as one with an increased likelihood of survival. Wells (1926) had the fictional William Clissold say,

Jung [whom Wells had met] laid great stress on the readiness of people to misconceive these ideas about a greater human being. They did not grasp how that being was supposed to be synthetic and comprehensive. . . . Neither Nietzsche's Overman nor Shaw's Superman was really to be thought of as an individual person. Both were plainly the race development, the whole race in progress. But writers with the journalistic instinct to caricature got hold of these ideas and cheapened them irremediably, and the popular interpretation of these phrases, the Overman and the Superman, had come to be not a communion of saints but an entirely ridiculous individual figure. . . . [Jung] then remarked that by his "Superior Person" Confucius must have intended the same generalised comprehensive man as this we had in mind, the racial and not the individual man. (Wells, 1926, pp. 86–89)

Although the Overman, the Superman, and the Superior Person are grammatically singular, they are group concepts that refer to the human species as a whole, a world organism. The origin of the concept of the superman is commonly credited to Nietzsche and soon became widely used, if not in Nietz-

sche's sense. It has been caricatured, as Wells pointed out. Today the term is readily identified with the comic strip, television, and movie hero of that name.

In a similar fashion, Wells considered individual personalities to be another group concept composed of smaller units. In "The Illusion of Personality," published in *Nature*, Wells (1944) said, "The reactions of the human machine are loosely linked behaviour systems, participating in a common delusion of being the self" (p. 395). Wells concluded it was more accurate to speak of multiple selves than to speak of a perpetually unified personality:

There are endless variants of "John Smith." . . . All the Smiths, from No. 1 to No. 5,000 or No. 5,000,000, have a common belief that John Smith is really one person, because they are not only all aboard the same body, but also built round a similar conception of himself, his persona as Jung has it. In fact, they are a collection of mutually replaceable individual systems held together in a common habitation. . . . If the systems vary widely, John Smith is a moody man. If still more widely, you have at last a "double personality." Whatever system dominates at the time owns John Smith and believes itself to be wholly and solely John Smith. (p. 395; also see Wells, 1912/1914, pp. 110–111, for an illustration of a few selves within the same person in his novel *Marriage*)

The article in *Nature*, from which this selection was taken, was a shorter version of the thesis that Wells had submitted in partial fulfillment of the requirements for a doctorate at London University. Obtaining that doctorate also partially fulfilled Wells's quest for "the recognition he had always wanted as a serious man of science" (MacKenzie & MacKenzie, 1987, p. 438).

For Wells, a person was a collection of mutually replaceable individual systems of behavior sharing a common body, and the unit of behavior of primary interest was the conditioned reflex (1940a, p. 215; 1942, p. 42; 1942/1995, p. 99). In addition, he (1940a, pp. 304–305; 1941, p. 78; 1942/1995, pp. 28–29) believed the behaviorist conception implied that selves were acquired and put together and not simply

split off as in the psychoanalytic conception. In sum, the world organism was composed of the members of the species, and a member of the species was composed of individual systems of behavior. More directly, the world organism was an enormous collection of behaviors, some unique but many shared across members of the species.

Skinner

Parallels between Wells and Skinner on the development of a superorganism are most apparent in Skinner's *Walden Two* (1948). In addressing social values, Skinner, through Frazier, was opposed to any enhancement of one individual in competition with, and at the expense of, other individuals:

We are opposed to personal competition. . . . We never mark any member for special approbation. . . . A triumph over another man is never a laudable act. Our decision to eliminate personal aggrandizement arose quite naturally from the fact that we were thinking about the whole group. We could not see how the group could gain from individual glory. (Skinner, 1948, p. 169)

Instead of personal gratitude, "We are grateful to all and to none. We feel a sort of generalized gratitude toward the whole community. . . . We're ready to do something for all in return for what we've received from all" (Skinner, 1948, p. 170).

Although a framework for cooperative social relations was in place for advancing the group as a whole, Frazier did not regard the details of social structure in *Walden Two* as final until there were members of *Walden Two* who had been raised in *Walden Two*: "The final social structure we're working toward must wait for those who have had a full *Walden Two* heritage" (1948, p. 250). What remained included understanding and building the superorganism:

We know almost nothing about the special capacities of the *group*. We all recognize that there are problems which can't be solved by an individual—not only because of limitations of time and energy but because the individual, no matter how extraordinary, can't master all the aspects, can't think thoughts big enough. . . . The prob-

lem of efficient group structure alone is enough to absorb anyone's interest. . . . But we lack control in the world at large to investigate more efficient structures. Here, on the contrary—here we can begin to understand and build the Superorganism. (Skinner, 1948, pp. 292–293)

In this context, Frazier is talking about groups, and his reference to the superorganism should be considered as a reference to an improved human species or culture rather than to an individual.

Skinner provided more detail on what the components of a superorganism would be after *Walden Two*. Skinner (1971, p. 8), like Wells, objected to the term *personality* (or *personalities*) for suggesting a fictitious unity. Although he did not always observe a distinction between self and personality, Skinner (1971) found that the term *self* (or *selves*) was free of such a conceptual scheme and used the term approvingly to mean "a repertoire of behavior appropriate to a given set of contingencies" (p. 199):

A self or personality is at best a repertoire of behavior imparted by an organized set of contingencies. The behavior a young person acquires in the bosom of his family composes one self; the behavior he acquires in, say, the armed services composes another. The two selves may exist in the same skin without conflict until the contingencies conflict—as they may, for example, if his friends from the services visit him in his home. . . . Conflicting contingencies lead to conflicting repertoires of behavior, but they are all exhibited by one body, by one member of the human species. (Skinner, 1974, pp. 149–150)

Skinner (1967/1982) even acknowledged, "[*Walden Two*] is pretty obviously a venture in self-therapy, in which I was struggling to reconcile two aspects of my own behavior represented by Burriss and Frazier" (p. 26; also see Skinner, 1979/1984, p. 296).

These contingencies might be complex and produce complex selves: "Complex contingencies of reinforcement create complex repertoires, and, as we have seen, different contingencies create different persons in the same skin, of which so-called multiple personalities are only an extreme manifestation" (1974, pp. 167–168; also see 1989, p. 28). Selves may vary in

complexity and contrast, but multiple selves are the rule. Skinner (1986) held that an analysis of behavior “defines self as a behavioral repertoire that results from a particular set of contingencies of reinforcement. Most people have a great many selves in that sense” (p. 716). As a behavioral repertoire, a self then may be regarded as a related system of operants.

On this account, different selves may be built slowly over time, but they may also be acquired more rapidly. Skinner indicated how readily selves might be acquired from other people:

The listener who understands “says it along with” the speaker, and biographers come to respond along with the people whose lives they are recounting. They know how and why their subjects respond because they have become disposed to respond in the same way themselves. For the same reason, they are not surprised by what their subjects do. Eventually, they are their subjects, in the sense of possessing the same repertoires. (1980, p. 93)

This illustrates how similar selves may be created across individuals.

Behaviors, selves, and individuals work for or against or work indifferently for the survival of the species and a culture. These more embracing levels of the species and a culture, not the level of the individual, have the best chance of survival. In the last line of his three-volume autobiography, Skinner addressed both social and biological strands in the development of a culture and a species, “If I am right about human behavior, an individual is only the way in which a species and a culture produce more of species and culture” (1983/1984, p. 413).

THE ENVIRONMENT AND METHOD FOR DEVELOPING THE SUPERORGANISM

In the same year that Skinner’s *Walden Two* was published, the philosopher E. A. Singer, Jr. (1948) argued that the central goal or desire for all conscious members of the human species always has been and always will be an increase in power:

Is there anything that anyone could wish to have, but that he must, at the very same time, wish he had more power than he has to achieve that thing? Surely, all desirous beings, conscious enough to reflect upon their state, must recognize in themselves the eternal desire for greater power, greater control over events, greater emancipation from fate, heightened probability of achievement, lessened probability of defeat. (p. 12)

According to Singer, all desires—by the very concept of desire—entail a desire for the power to attain them. The issue then becomes the nature of this power and how to advance it.

With an increase in power as a goal for the human species, Singer (1948, p. 77; also cf. Habermas, 1981, p. 8) presented a development along three dimensions or conditions for advancing this power: science, morals, and art. Singer interpreted science in terms of the “knowledge which is power” (p. 21); he interpreted morality in terms of cooperative relations and good will, which implied the power to help one another and power for the species as a whole; and he interpreted art in terms of “the collective work of Art” (p. 57) by humanity as a whole, which served to recapitulate the history of the species and unify its members in heroic endeavor toward idealized ends. Inspired by Singer, Ackoff and Emory (1972) have pointed out that the commonly proposed conditions for an utopian environment have precedents in the longstanding classical concepts of truth (information or knowledge), goodness (cooperative relations), and beauty (creativity), which are similar to Singer’s three dimensions. They also added a condition of plenty (access to resources or prosperity) as a fourth dimension. These conditions were presented as dimensions along which progress would be made in continually approximating an ideal environment for an ideal end.

Features of all these conditions can be found in both Wells (e.g., 1931a; 1931b; 1938; 1939a, p. 49; 1940b, pp. 89, 124) and Skinner (e.g., 1948, pp. 27, 64–65, 88–94, 161–163, 227). The controversy, and originality, in advanc-

ing these conditions comes in the degree to which they are sought and the means for achieving them. Neither Wells nor Skinner put much emphasis on conditions of plenty (other than advances in technology). They both recommended somewhat austere lifestyles. Both emphasized knowledge propagated by experimentation and science. Both emphasized cooperation and included creativity, although creativity was not emphasized as strongly as scientific knowledge and cooperation.

Another feature of the environment was assumed by Wells and Skinner that has not usually been considered as characteristic of utopian conditions. This was a belief in determinism, which provided a background for their utopias and some limitations on the creativity that would be allowed to occur. At the end of the 19th century and into the early 20th century, most scientists believed in determinism (Carnap, 1966, p. 218; Popper, 1982, p. 2). In addition, there was a substantial belief that science had determined the main characteristics of the universe as a whole, leaving only the details to be filled in (Barrow, 1998, p. 54; Wells, 1914/1988, p. 19; 1939a, p. 83) and a widespread belief in an inevitable, single-direction, onward-and-upward progress (Nisbet, 1980; Toulmin & Goodfield, 1965/1982, pp. 121–123, 233–235). One result of these beliefs was confidence in making forecasts and a confidence in forecasting utopias.

Wells

An idea about determinism helped to launch Wells's career as a science fiction writer. As Wells (1934) recounts this idea in his autobiography,

In the students' Debating Society . . . I heard about and laid hold of the idea of a four dimensional frame for a fresh apprehension of physical phenomena, which afterwards led me to send a paper, "The Universe Rigid," to the *Fortnightly Review* (a paper which was rejected by Frank Harris as incomprehensible), and gave me a frame for my first scientific fantasia, the *Time*

Machine, and there was moreover a rather elaborate joke going on with Jennings and the others, about a certain "Universal Diagram" I proposed to make, from which all phenomena would be derived by a process of deduction. (p. 172)

In the version of the *Time Machine*, published in the *New Review*, Wells (1895/1975) shows an interpretation of determinism that reflected Laplacean assumptions (cf. Laplace, 1814/1951):

Suppose you knew fully the position and the properties of every particle of matter, of everything existing in the universe at any particular moment of time: suppose, that is, that you were omniscient. Well, that knowledge would involve the knowledge of the condition of things at the previous moment, and at the moment before that, and so on. . . . To an omniscient observer there would be no forgotten past—no piece of time as it were that had dropped out of existence—and no blank future of things yet to be revealed. . . . He would see, as it were, a Rigid Universe filling space and time—a Universe in which things were always the same. He would see one sole unchanging series of cause and effect to-day and to-morrow and always. If "past" meant anything, it would mean looking in a certain direction; while "future" meant looking the opposite way. . . . From the absolute point of view the universe is a perfectly rigid unalterable apparatus, entirely predestinate, entirely complete and finished. (pp. 93–94)

Such a view appears to have provided Wells with some confidence that the future could be foretold.

A simple way of doing this was to extend trends in the present into the future, and this was a common practice in Wells's science fiction:

The future depicted in the *Time Machine* (1894) was a mere fantasy based on the idea of the human species developing about divergent lines, but the future in *When the Sleeper Awakes* (1898) was essentially an exaggeration of contemporary tendencies: higher buildings, bigger towns, wickeder capitalists and labour more downtrodden than ever and more desperate. Everything was bigger, quicker and more crowded; there was more and more flying and the wildest financial speculation. It was our contemporary world in a state of highly inflamed distension. (1934, p. 551)

Wells (cited in Parrinder, 1977) wrote a series of books in this vein and said that "they are all 'fantasies of possibility'; each one takes some great creative tendency or group of tendencies,

and develops its possible consequences in the future. . . . 'Suppose these forces to go on,' that is the fundamental hypothesis of the story" (p. 42). In his screenplay *Things to Come*, Wells (1935/1975) presented a futuristic World State that pursued "endless exploration and experimenting" (p. 123):

A very great scientific laboratory in the year 2055. It is in tier above tier in a huge space, so that there are hundreds of workers, men and women, mostly clad in white overalls, visible. Scientific work has become multitudinous. They work at benches and tables. (p. 125)

Wells's science laboratory of the future is simply an enlargement in size and population of a laboratory that Wells may have worked in, or visited, during his biological studies. To suppose such forces, or trends, to simply go on in a linear fashion from the present to the future meant to logically extend a generalization from past experiences to an overgeneralization for future experiences. Such a procedure may be unproblematic in fiction, but it is far more chancy in the real world.

In addition to the plausible worlds of science fiction, Wells (1939a, pp. 84–85) also made forecasts that applied more directly to the real world. In *The Discovery of the Future*, Wells (1913) posited a modern mind that "thinks constantly and by preference of things to come, and of present things mainly in relation to the results that must arise from them" (p. 6). The "results that must arise" are necessary deductions, and Wells (1913) called upon determinism as support for them.

In absolute fact the future is just as fixed and determinate, just as settled and inevitable, just as possible a matter of knowledge as the past. . . . And I am venturing to suggest to you that along certain lines and with certain qualifications and limitations a working knowledge of things in the future is a possible and practicable thing. (pp. 22–24; also see 1907, p. 21)

Previously, Laplace (1814/1951) had restricted accurate predictability to a supernatural being, but Wells did not believe that all predictions were so restricted:

Prophecy may vary between being an intellectual amusement and a serious occupation; serious not only in its intentions, but in its consequences. . . . For some of us moderns, who have been touched with the spirit of science, prophesying is almost a habit of mind. . . . The scientific training develops the idea that whatever is going to happen is really here now—if only one could see it. . . . Everything that has ever existed or that will ever exist is here—for any one who has eyes to see. But some of it demands eyes of superhuman penetration. (1916, pp. 1–2)

Superhuman penetration rendered opaque human experiences transparent. Such an emphasis on transparency, to see the essence of things at a glance, has been identified as one of the defining characteristics of modernism (cf. Galison, 1990, p. 710; Prigogine & Stengers, 1984, p. 311). Such an emphasis on transparency also supported a predilection for seeing clear and simple sources of certainty. Postmodern complex contexts, probabilistic relations, and evolutionary selection by consequences were opaque and undesirable by comparison (cf. Moxley, in press).

Forecasts of the future, however, involved more than a clear vision. A forecast could provoke behavior in support of, or in reaction to, the forecast. Forecasts then become a means of changing behavior. Among the consequences of forecasting, Wells (1916) identified a tendency toward exhortation on the part of the forecaster: "To foretell the future is to modify the future. It is hard for any prophet not to break into exhortation after the fashion of the prophets of Israel" (p. 11). It may then be a short step to some intolerance toward those who appear to frustrate the forecast.

Among his early forecasts, Wells (1913) saw continuing progress and improvement: "Everything seems pointing to the belief that we are entering upon a progress that will go on, with an ever-widening and ever more confident stride, for ever" (p. 58). It was simply a matter of observing and extending present trends, "If we care to look, we can foresee growing knowledge, growing order, and pres-

ently a deliberate improvement of the blood and character of the race" (p. 59). Wells (1902) believed such trends would inevitably produce a workable version of Plato's *Republic*:

I have sought to show that in peace and war alike a process has been and is at work, a process with all the inevitableness and all the patience of a natural force, whereby the great swollen, shapeless, hypertrophied social mass of today must give birth at last to a naturally and informally organized, educated class, an unprecedented sort of people, a New Republic dominating the world. (p. 262)

Wells was proclaiming an inevitable improvement in part, if not all, of the world organism.

At first, Wells thought this utopian New Republic would arise of its own accord without additional human assistance. But when Wells became convinced this would not happen by itself and that the world was headed toward catastrophe, he turned to predicting and exhorting a dedicated elite, a Samurai Order, as an essential condition for creating the utopian World State. Although Wells (1908, pp. 184–188) had previously expressed doubts about the feasibility and desirability of his Samurai Order, he said, "A Samurai Order educated in such an ideology as I have since tried to shape out, is inevitable if the modern world-state is ever to be fully realized" (1934, p. 563). This dedicated elite with shared characteristics, shared practices, and shared goals was Wells's central condition for achieving utopia in fiction and in fact. This elite was to be responsible for changing conditions as a whole: "The new Revolution cannot tolerate all this fragmentation of progress, and so it will have to be developing activities and forming a network of association to carry them on in harmony with one another" (Wells, 1942, p. 52). Such an elite was exemplified by the Samurai in *A Modern Utopia* (Wells, 1905/1967): "Practically all political power vests in the *samurai*. Not only are they the only administrators, lawyers, practicing doctors, and public officials of almost all kinds, but they are the only

voters" (pp. 310–311). Membership in "this order is open to every physically and mentally healthy adult in the utopian State who will observe its prescribed austere rule of living" (p. 259). Members could then "take a hand in the universal control" (p. 278).

Nonmembers of the elite would also benefit. Wells (1921) suggested benefits to all members of a community living in the plan even though the plan (i.e., a *Book of Forecasts*) was provided by others: "Our lives will be shaped to certain defined ends. We shall fall into place in a great scheme of activities. We shall recover again some or all of the steadfastness and dignity of the old religious life" (p. 137). Life in the community would be like the old religious life, but it would be a new religion.

With the Samurai, Wells (1929) thought he had anticipated a pattern of dedicated elite that was to become conspicuous in world affairs: "If the 'Modern Utopia' were published now, everybody would say I had taken a leaf from the book of the Communist Party or the Kuomintang, or even (though this is rather a different animal) the Fascisti" (p. 18). Although often severely critical of these other groups, Wells admired their organization and dedication: "The contents of the vehicle differ, but the form of the vehicle is similar" (1929, p. 30). However, it was not always easy to see how the contents of Wells's elite would be different from other elites. Wells (1931a), for example, presented two characteristics of the elite in his *Open Conspiracy*: "Their directive force will be (1) an effective criticism having the quality of science, and (2) the growing will in men to have things right" (p. 44). Such conditions could be interpreted in different ways. Was the criticism to be directed against selected members within the group or members of other groups, and would the criticism be directed against the usefulness of advancing a dedicated elite? Further, how is a growing will in men to have things right to be distinguished from a growing will in men

to have things their way? And where does tolerance of the views of others leave off and intolerance begin?

To Wells's surprise and consternation, he was criticized by a friend for contributing to a climate that supported totalitarian Nazi Germany. Orwell (1941/1968) said,

Much of what Wells has imagined and worked for is physically there in Nazi Germany. The order, the planning, the State encouragement of science, the steel, the concrete, the aeroplanes, are all there, but all in the service of ideas appropriate to the Stone Age. Science is fighting on the side of superstition. (p. 143)

It is not difficult to see what may have led Orwell to make this accusation. Wells wanted an elite dedicated to making certain things happen even if this meant using repressive means.

In *The Shape of Things to Come*, Wells (1933, pp. 361–371) justified the repressive measures of a dedicated elite, a “Puritan Tyranny,” as a means to achieving the ideal World State. This was a self-effacing elite, a rule of the saints:

Devotion and the sacrifice of the individual they carried to such a pitch that, for instance, it was considered unseemly for them to have portraits made, and there was no record kept of the names of the chairmen and of the movers of motions in the central committee during their ascendancy. (1933, p. 363)

This absence of a history for the Puritan elite reflected Wells's distrust of traditional history. For Wells (1939b), “Common history remains still national or regional propaganda lightened by gossip, and at most paying lip service to humanitarian ideals” (p. 98), and he wanted to replace traditional history with a new scientific history (and perhaps even a new term for it) that was “*full of intimations* of what is likely to happen to us in the years before us, and of what has to be done if certain consequences have to be escaped or attained” (p. 95).

Wells accepted extraordinary means to escape or attain certain consequences; and, saintly as Wells's Puritan elite might be, this elite used repressive means to further what they saw as wor-

thy goals. Wells was no stranger to recommending repressive measures for what he saw as a just cause. For example, he had recommended a rather liberal use of capital punishment and euthanasia to reduce overpopulation and ultimately improve the race: “The men of the New Republic . . . will have an ideal that will make killing worth the while; like Abraham, they will have the faith to kill, and they will have no superstitions about death” (1902, p. 300; also see 1942, p. 124).

The persistence and strength of Wells's exhortations for an elite—as part of the comprehensive conditions and methods for developing his utopian New Republic—were supported not only by his belief in determinism but also by his success with predictions: “H. G. Wells foretold all the most significant historical events of the first half of this century and all of them occurred during his lifetime” (Kagarlitsky, 1990, p. 252). But it should also be noted that “his predictions often missed their mark” (Wagar, 1964, p. xxv). Wells had made a remarkable number of predictions.

Eventually, Wells (1939b, p. 17; 1946, pp. 5–6) found that it had become difficult to make predictions. Speaking of the pattern of things to come, Wells (1946) said of himself,

The limit to the orderly secular development of life had seemed to be a definitely fixed one, so that it was possible to sketch out the pattern of things to come. But that limit was reached and passed into a hitherto incredible chaos. The more he scrutinized the realities around us, the more difficult it became to sketch out any Pattern of Things to Come. (pp. 5–6)

Wells no longer found the support, which he previously thought he had, for thinking he could accurately forecast future patterns.

Instead of focusing on broad patterns of things to come and utopias as a whole, Wells came to give relatively more prominence to smaller aspects of the environment in evolutionary change. In *The New World Order* (1940b), Wells spoke in favor of step-by-step development, “There will be

no day of days, then, when a new world order comes into being. Step by step and here and there it will arrive" (p. 122) and against the possibility of utopian description: "The new order will be incessant; things will never stop happening, and so it defies any utopian description" (p. 124). In illustrating this step-by-step, here-and-there process, Wells (1940b) used the history of flying:

Less than a third of a century ago ninety-nine people out of a hundred would have told you that flying was impossible. . . . A heavier-than-air machine, flying in defiance of wind and gravity! that they *knew* was nonsense. The would-be aviator was the typical comic inventor. . . . Now consider how completely the air is conquered.

And who did it? Nobody and everybody. Twenty thousand brains or so, each contributing a notion, a device, an amplification. . . . You can write down perhaps a hundred people or so who have figured conspicuously in the air, and when you examine the role they have played, you will find for the most part that they are mere notoriety of the Lindbergh type who have put themselves modestly but firmly in the limelight and can lay no valid claim to any effective contribution whatever. You will find many disputes about records and priority in making this or that particular step, but the lines of suggestion, the growth and elaboration of the idea, have been an altogether untraceable process. It has been going on for not more than a third of a century, under our very eyes, and no one can precisely say how it came about. One man said: "Why not this?" and tried it, and another said: "Why not that?" A vast miscellany of people had one idea in common, an idea as old as Daedalus, the idea that "man can fly." Suddenly, swiftly, it got about—that is the only phrase you can use—that flying was attainable. And man, man as a social being, turned his mind to it seriously, and flew. (pp. 122–123)

Wells uses *man* as a class concept for the cumulative effect of many cultural contributions from many individuals.

Wells (1946) also pointed out the potential effects of small stimuli, simple verbal behaviors, on cultural change.

Certain phrases—parroted phrases empty of belief—are already to be found in the newspapers and speeches—the abolition of war, the abolition of distance, the abolition of competition and social inequality. But after people have repeated a phrase a great number of times, they begin to realize it has meaning and may even be true. And then it comes true. (pp. 3–4)

Specific instances, specific acts of verbal behavior may support and increase the likelihood of a similar act, functioning like a model for increasing emulation or as a point of initiation for a growing resonance and reverberation. Eventually, such speech acts may help to realize great changes.

In spite of losing his confidence in predicting the future, Wells (1946) still looked forward to a grand unification: "So it is at any rate in the Dreamland to which my particular Happy Turning takes me. There shines a world 'beyond good and evil,' and there in a universe completely conscious of itself, Being achieves its end" (p. 50). These values resemble universal Platonic ones in which the universe is ordered in an increasing generality of logical classes with the highest, most embracing concept being the most real and unifying of all. As Randall (1926/1976) characterized such Platonism, "It made the end of life the release from the bond of individuality and the return to true reality or the great all that is God. It was aristocratic, contemplative, mystic" (p. 101). Wells's completely conscious universe was like that. Although his prediction of it may be regarded as another idealized over-generalization, the method in which it would be developed now emphasized smaller, more feasible means to evolutionary change.

Skinner

Like Wells's utopian science fiction and his prophecies of the conditions for a World State, the design of *Walden Two* was influenced, as least in part, by a belief in determinism. Such a belief appears as a strong foundation in Skinner's (1979) religious upbringing: "I have always believed in some kind of determinism. I was very much a Presbyterian until late puberty, when I became an agnostic, and Presbyterians believe in predestination" (p. 47). Skinner (1983/1984) suggested this religious foundation in predestination carried over to his scientific career:

"Much of my scientific position seems to have begun as Presbyterian theology, not too far removed from the Congregational of Jonathan Edwards" (p. 403). Interestingly, Huxley (1886/1929, p. 144) also referred to Jonathan Edwards in making his point that support for determinism existed in philosophy and theology before it existed in science. Given such an extended base of support for determinism, it may not be surprising that Skinner (1948) would explore the consequences of this belief in *Walden Two*.

Determinism had practical consequences for Frazier in the way that Walden Two was designed. In contrast to the unplanned universe of evolutionary theory, that side (or self) of Frazier which advanced determinism-based views characterized the design of Walden Two as having more to do with the Christian cosmogony of an omniscient God who designed the universe as a whole:

But there's no doubt whatever that Walden Two was planned in advance pretty much as it turned out to be. In many ways the actual creation of Walden Two was closer to the spirit of Christian cosmogony than the evolution of the world according to modern science (Skinner, 1948, p. 299)

In other words, the origin of Walden Two was like a creationist explanation that posited a fixed design for the whole. Further, as the designer of Walden Two, Frazier's role was like that of a God, a role that Frazier deliberately cultivated on occasions when he imagined and behaved as though he were in the role of Jesus Christ (pp. 295–299). Another parallel between Frazier's design and the deterministic design of a divinity existed in the belief, supported by the mechanistic world view, that God's active involvement in running the universe was not needed inasmuch as the originating design ran the universe by itself. Emulating a deity in this respect, Frazier said in reference to Walden Two, "Set it up right, and it will run by itself" (p. 234). The design of Walden Two having been set up, the active involvement of Frazier was no

longer needed to run it, and he stood aside. The design sufficed.

To insure that his design would not be seriously altered, Frazier made it resistant to change. The constitution could only be changed by a unanimous vote of the Planners, the Walden Two elite, and a two-thirds vote of the Managers (p. 270). In addition, public argument against the regulations of Walden Two was prohibited. Frazier also insured that his design was more resistant to serious change than Christian cosmogony: "The original design took deviations into account and provided automatic corrections. It's rather an improvement upon Genesis" (p. 297). Any deviation that might lead to substantial change in the basic framework was corrected so that change did not occur. In a further assurance that deviations from Frazier's design would be unlikely, the members of Walden Two were presented as rather docile and compliant with little interest in variety (p. 182) or in planning for the future (pp. 164, 270). According to Frazier's unqualified comment, "The majority of people don't want to plan. They want to be free of the responsibility of planning. What they ask is merely some assurance that they will be decently provided for. The rest is a day-to-day enjoyment of life" (p. 167).

Instilling further resistance to change, the Walden Code, like the codes of many religious communities, had more rules for restricting speech than for protecting speech (see pp. 163–171). For example,

As to disagreement, anyone may examine the evidence upon which a rule was introduced into the Code. He may argue against its inclusion and may present his own evidence. If the Managers refuse to change the rule, he may appeal to the Planners. But in no case must he argue about the Code with the members at large. There's a rule against that. (Skinner, 1948, p. 164)

Much as in the Puritan Tyranny of Wells's *The Shape of Things to Come* (1933), Walden Two also restricted access to information about its political workings and personal histories: "We deliberately conceal the planning and

managerial machinery [and] we discourage any sense of history" (pp. 235–236; also see pp. 115 and 237–238 on Frazier's denigration of history).

Frazier the designer of utopia as a whole was following a tradition from Plato to Descartes and the rationalists, which found that timeless patterns were far more important than descriptions of changing events (cf. Toulmin & Goodfield, 1965/1982, pp. 244–245). Once fixed patterns were determined (e.g., as the framework of *Walden Two* was intended to be), the future was largely predictable within the outlines of that pattern. Frazier forecast *Walden Two* as a whole, with supernatural eyes so to speak, in the manner of a supernatural being to whom the future (and past) was transparent. Although details of that vision may not have been transparent to Frazier's human eyes, it is noteworthy that at this period of time, 1947–1948, Skinner was making his most extreme statements for predicting behavior. Skinner (1947) said that he looked forward to a time when theory would account for "the behavior of an individual in such a way that measurement would be feasible if he were the only individual on earth. This would be done by determining the values of certain constants in equations describing his behavior" (p. 39).

In contrast to that side of Frazier which designed a relatively fixed and permanent framework for *Walden Two*, another side of Frazier spoke in support of active, ongoing experimentation and change. At the local level of daily practice, this Frazier advanced selection by consequences—an evolutionary selectionist principle that was in conflict with necessary fixed designs. At local levels in *Walden Two*, consequences played a role in experiments and in reinforcement (albeit largely limited to natural reinforcers); Frazier presented *Walden Two* as a community in which experiment was a pervasive characteristic: "We encourage our people to view every habit and

custom with an eye to possible improvement. A constantly experimental attitude toward everything—that's all we need. Solutions to problems of every sort follow almost miraculously" (1947, pp. 29–30). The Frazier who wanted to maintain the design of a fixed framework for utopia and the Frazier who advocated a "constantly experimental attitude toward everything" were in conflict.

After *Walden Two*, Skinner occasionally referred to his role as a prophet. Skinner (1975/1978) maintained that "nothing less than a vast improvement in our understanding of human behavior will prevent the destruction of our way of life or of mankind" (p. 68); furthermore,

And so I return to the role that has been assigned to me as a kind of twentieth-century Calvin, calling on you to forsake the primrose path of total individualism, of self-actualization, self-adoration, and self-love, and to turn instead to the construction of that heaven on earth which is, I believe, within reach of the methods of science. (p. 82)

Skinner, like Wells, was concerned that his forecasts and advice were not being acted on.

Eventually, Skinner expressed skepticism about a planned world and forecasts of the future:

A planned world was one of the casualties of evolutionary theory, and the belief that a life or a culture has evolved according to a plan is suffering the same fate. Too much of what will happen depends upon unforeseen variations and adventitious contingencies of selection. The future is largely a matter of chance. (1990, p. 104)

If a belief in determinism had previously supported Skinner's planned utopia as a whole and his confident forecasts, that belief was now insufficient if it had not already disappeared.

After the *Walden Two* design for a community as a whole, Skinner offered more gradual, evolutionary approaches. He said, "Perhaps we cannot now design a successful culture as a whole, but we can design better practices in a piecemeal fashion" (1971, p. 156). He made some suggestions along an evolutionary line:

A nonpolitical evolutionary approach might begin with a small core of people who are highly informed with respect to both existing social problems and behavioral principles. The small core would organize not to achieve political power, but to make changes bit by bit in the social units to which they have access. (1979, p. 51)

Instead of making changes as a whole, this small core of people would address issues bit by bit, perhaps in one setting, perhaps with one behavior. Skinner continued,

Walden Two was based on the utopian method of changing the entire system at once rather than bit by bit, but with improvements in educational and counseling techniques, we should be able to produce people who will be increasingly more effective in designing and managing their lives. As this sort of nonpolitical reform at the personal and interpersonal levels becomes more and more widespread, it may eventually affect the nation's economic and governmental practices. In this way, better methods of producing and governing may gradually be evolved. (1979, p. 51)

Skinner identifies the "utopian method" of change as a "method of changing the entire system at once." In this respect, the utopian method is like a creationist design for nature: Nature, or whatever is contained in nature, is created all at once from an all-at-once design, and Darwinism is rejected precisely because it does not support all-at-once creation.

Skinner's goal for a cooperative society may not have changed, but the means he offered for achieving that goal shifted from an utopian emphasis on a change in the entire social system as a whole to an emphasis on more piecemeal evolutionary changes over time. Skinner's final pessimistic forecast for the future (see Bjork, 1993, pp. 229–230) was not so much a rejection of these means as a belief that beneficial evolutionary changes would be overtaken by deleterious changes leading to disaster. Of course, that forecast itself may be said to exert some beneficial influence over the future if people react to frustrate it.

PROSPECTS FOR THE DEVELOPMENT OF THE SUPERORGANISM

At first glance, a bit-by-bit evolutionary process may seem too slow for developing a superorganism that is a significant advance over the present species. It is easy enough to see how repertoires of selves could be reproduced once they had been established, but what about the origin of new repertoire selves? How might new repertoires of lasting value originate? One of the more detailed examinations of novel occurrences of repertoires that survive for indefinite periods of time has occurred in the examination of multiple scientific discoveries:

The pages of the history of science record thousands of instances of similar discoveries having been made by scientists working independently of one another. Sometimes the discoveries are simultaneous or almost so; sometimes a scientist will make anew a discovery which, unknown to him, somebody else had made years before. Such occurrences suggest that discoveries become virtually inevitable when prerequisite kinds of knowledge and tools accumulate in man's cultural store and when the attention of an appreciable number of investigators becomes focused on a problem, by emerging social needs, by developments internal to the science, or by both. (Merton, 1963/1973, p. 371)

The reader may think of other kinds of independent discoveries. The scientific discoveries are so numerous that Merton (1961/1973) advanced the hypothesis that "once science has become institutionalized, and significant numbers are at work on scientific investigation, the same discoveries will be made independently more than once and . . . singletons [a lone discovery] can be conceived of as forestalled multiples" (p. 364). In a close examination of 264 instances of independent scientific discoveries, Merton reported the following tally:

Twenty percent of the multiples under review occurred with an interval of one year; some of them on the same day or within the same week. Another 18 percent occurred within a two-year span and, to turn to the other end of the scale, 34 percent of them involved an interval of ten years or more. (p. 365)

It should be stressed perhaps that this is only a partial count of multiple independent discoveries.

One interesting feature of such discoveries is their dispersion, which shows that common influences are not restricted to a local culture:

For we find that *the* community of scientists is a dispersed rather than a geographically compact collectivity. The structure of this community cannot, therefore, be adequately understood by focusing only on the small local groups of which scientists are a part. The sheer fact that multiple discoveries are made by scientists working independently of one another testifies to the further crucial fact that, though remote in space, they are responding to much the same social and intellectual forces that impinge upon them all. (Merton, 1963/1973, p. 375)

Another interesting feature is the endurance of these scientific communities in their extension across time and space:

The study of [multiple discoveries] shows how scientists are bound to the past by building upon a deposit of accumulated knowledge, how they are bound to the present by interacting with others in the course of their work and having their attention drawn to particular problems and ideas by socially and intellectually accentuated interests, and how they are bound to the future by the obligation inherent in their social role to pass on an augmented knowledge and a more fully specified ignorance. The community of scientists extends both in time and in space. (Merton, 1963/1973, p. 376)

Further interesting features of multiple discoveries, which Merton points out, include the advantages bestowed by their redundancy that make for "safety from error" (p. 380) and "a greater chance of being heard in the social system of science" (p. 380). Thus, scientific communities illustrate a continuing process in which new repertoire-selves originate and propagate into an extended future with improvements in and among those selves along with the decline, if not extinction, of those repertoire-selves that prove to be unproductive.

Such scientific discoveries are fairly complex repertoires. Simpler behaviors may originate and propagate much more readily. Metaphorically, they may be said to resonate. Whether such

resonance has any further basis in physical reality has yet to be determined (cf. Sheldrake, 1988, 1995).

These selves of shared repertoires argue the case for the ongoing development of the human species (the superorganism to come) with at least some control or influence on this development by social communities. As a forecast of things to come, of the communities and shared repertoire-selves that may develop, we may contemplate the effects that Internet communications will have. Consider Internet communications as providing the opportunity for a significant acceleration in the development of repertoire-selves and the superorganism of a world culture.

In one sense, the superorganism already exists in the concept of the species as the total collection of selves or repertoires of behavior that may be rare or common among members of the species. In another sense—what the superorganism may eventually become—that superorganism is currently being built, piece by piece, through evolutionary selection of individual acts of the members of the species. It is not a question of whether or not to build the superorganism but what it is to become. It is being built. It is evolving. Will it be an improvement in the long run?

CONCLUSION

H. G. Wells and B. F. Skinner both shared selves of common behavioral repertoires to a noticeable degree, both in terms of their beliefs and their behavior, and their changes of belief and behavior. These shared beliefs included determinism, pragmatism, the importance of science, a conception of multiple selves, and an interest in the superorganism. Their shared behaviors included writing utopian novels and making forecasts. Their shared changes included a shift from a view that accepted determinism and its implications to a view more consistent with selectionism.

From a selectionist perspective, predictions of the future are far more challenging in principle than they are from a deterministic perspective that claims all events past and future are forever fixed and determined. From a Darwinian selectionist perspective, Toulmin and Goodfield (1965/1982) reject the idea that history has a demonstrable direction that can be reliably forecast:

The most profound lesson of Darwin's work is that new creations of great functional significance often come into existence as by-products of processes, all of whose manifest goals lie in quite other directions; and the merits of these novelties depend, not on their conformity to any long-term historical tendency, but on their immediate appropriateness to the particular situation in hand. This is equally true for both organisms and institutions. (p. 235)

Given such inherent limitations on predictions, the task of building an improved superorganism as a whole appears to be all but impossible. However, building the superorganism as a whole is not the only approach to take. Within a selectionist, experimental orientation, the task of building (or advancing the evolutionary development of) the superorganism bit by bit is similar to the task of building any new behavior, which is commonly an issue of reinforcement of successive approximations. We may not know beforehand what the approximations will lead to, but we can make the judgment that a behavior should be reinforced, and much, if not most, of this reinforcement may occur quite naturally. Accordingly, Skinner's shift toward an increasingly consistent selectionism may be viewed as making the building of an improved superorganism less of a fantasy and more of a reality.

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