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B. F. SKINNER'S OTHER POSITIVISTIC BOOK: *WALDEN TWO*

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ABSTRACT: B. F. Skinner's *The Behavior of Organisms* (1938/1966) and *Walden Two* (1948) are both positivistic. Skinner explicitly stated his approach was positivistic in *The Behavior of Organisms* although he did not make an explicit statement about *Walden Two*. Three features of positivism are elaborated—its concern with indisputable certitude, unified reality, and ever-onward progress, each of which entailed overly simplifying assumptions. These features are brought out in the positivistic sources for *Walden Two* and in the changes from the positivistic views of Frazier, the protagonist in *Walden Two*, to Skinner's later pragmatic-selectionist views.
Key words: Comte, dystopia, positivism, neopositivism, Skinner, utopia, *Walden Two*

Both of B. F. Skinner's first two books show a positivistic orientation. Skinner (1938/1966, p. 44) explicitly stated in *The Behavior of Organisms* that his "method" was "positivistic" (p. 44), and Skinner's (1948) *Walden Two*, written in 1945 (Skinner, 1983/1984, p. 77), was also positivistic. Positivism was a view of knowledge that was mainly influential in France, England, and Germany (Simon, 1963) and reached into Russia and South America (Manuel & Manuel, 1979, p. 724). In addition,

> There were stray groups of Positivists in Holland, Italy, Sweden, and the United States. When on January 1, 1881, Edward Spencer Beesly celebrated the Festival of Humanity in London, he could speak of a union of all Positivists comprised of members in Havre, Rouen, Mons, Rio de Janeiro, Dublin, New York, and Stockholm, who were at that moment turning toward Paris, where Pierre Lafitte, the successor of Comte at the head of the Positivist Society, was conducting the ceremonials in the very abode of the Master. (p. 724)

Later, positivism evolved into influential variants of neopositivism with common features in logical positivism and early behaviorism. Although a positivistic view was dominant in Skinner's first two books, his later writing largely turned away from such views and showed increasing similarities with natural selection and pragmatism. First, some background on positivism.

Positivist Background

Auguste Comte (1798–1857), who coined the term *positivism*, dated its marked progress from Bacon, Descartes, and Galileo (1830–42/1988, p. 11) and said, "the word *Positive*. . .means *organic*, *precise*, *certain*, *useful*, and *real*" (1849/1975, p. 63). Positivism advanced indisputable certainty, unified reality, and ever-onward progress—all with simplifying assumptions. In Berlin's (1954)

assessment of Comte, "Our view of the natural sciences, of the material basis of cultural evolution, of all that we call progressive, rational, enlightened. . .owes a good deal to his teaching and his fame" (pp. 3-4). "If his works are today seldom mentioned. . .that is partly due to the fact that he has done his work too well, for Comte's views have affected the categories of our thought more deeply than is commonly supposed" (p. 3); and this lack of mention may also be due to his perceived defects, including "his insane dogmatism, his authoritarianism, his philosophical fallacies, all that is bizarre and utopian in his character and writings," which "need not blind us to his merits" (p. 4). Many of Comte's ideas passed on in logical positivism, where he is *a* source rather than *the* source (Ayer, 1959, p. 4). Early behaviorism also incorporated a positivism with more acknowledgment of similarities with logical positivism than with Comte. The following focuses on three excessive features of positivism: certainty for events that warrant no more than some degree of probability; unified reality at the cost of important aspects in a more complete reality; and continuous progress without setbacks.

In the seventeenth century, the paradigms of reasoning were formal frameworks, and the certainty of mathematics was the desired model to apply:

> The application of mathematical techniques—and language—to the measurable properties of what the senses revealed, became the sole true method of discovery and of exposition. Descartes and Spinoza, Leibniz and Hobbes, all seek to give their reasoning a structure of a mathematical kind. (Berlin, 1956/1984, p. 15)

Not only was mathematical structure sought for reasoning, but "Despite the divergence of approach among the thinkers of the seventeenth centuries, there is widespread agreement that scientific knowledge is apodictically certain" (Laudan, 1996, p. 213). Comte (1830–42/1998) said, "We owe to mathematics both the origin of positive philosophy and its method" (p. 112); and one of Comte's assumptions was certainty in invariable relations: "The rational study of nature proceeds on the ground that all phenomena are subject to invariable laws," including the actions of organisms, "In the phenomena of living bodies, as in all others, every action proceeds according to precise—that is, mathematical—laws, which we should ascertain if we could study each phenomenon by itself" (p. 176). This mathematics advanced certainty, not probability. For Comte (1830–42/1855), the "pretended calculation of chances" was "an extravagance which is wholly incompatible with true positivity," (p. 791), and he "opposed the mathematics of probability all his life" (Lenzer, 1998, p. lxvii). Comte not only "consistently argued against probabilities and uncertainties," but he held that "a problem if considered solved is solved forever" (Schweber, 1991, p. 134). The content for certainty was supplied by observed facts: "Observed facts are the only basis of sound speculation" (Comte, 1830–42/1855, p. 799). This positivism, said Peirce (1931–1958), "forbid us to suppose that a fossil skeleton had ever belonged to a living ichthyosaurus…to believe in our memory of what happened at dinnertime today. . .[and] all opinions about everything not at this moment before our senses" (5.597, vol. & par.). For Comte (1830–42/1998) the facts determined whether a supposition was certain or not by means of the scientific method: "[W]e. . .form a

hypothesis, in agreement, as far as possible, with. . .the data. . .and the science . . .always ends by disclosing new observable consequences, tending to confirm or invalidate, indisputably, the primitive supposition" (p. 147). An indisputably validated supposition was certain: "In any science whatever," even those not amenable to mathematics, "everything that is positive, that is to say, founded on well-established facts—is certain" (Comte, 1830–42/1988, p. 61).

Positivism was also concerned with a unified reality common in writers of the time: "The *Philosophes* demolished the Heavenly City of St. Augustine only to rebuild it with more up-to-date materials" (Becker, 1932/2003, p. 31), which would realize the heavenly city on earth. This unification commonly had religious overtones. The idea of a religion of humanity had found strong acceptance in Saint-Simon, for whom the young Comte had worked for seven years as secretary (Pickering, 1993, pp. 101-244). Speaking of the unifying function of his own version of this religion, Comte (1830–42/1998) said, "The worship is the best expression of the state of complete synthesis, the state in which all our knowledge, scientific and practical, finds condensation in morals" (p. 462). Comte thought this religion would be more unifying if it was not democratic:

> The real rule of Positivist society must lie in the hands of those. . .at the top of the Positivist religion. . . .Positivism, he tells us. . .is Christianity denatured of its superstition and converted into worship of the Grand Being, which is society or humanity. (Nisbet, 1980, p. 257)

The concern for unification included a comprehensive, hierarchical view of science with one-way unifications for scientific knowledge:

> [T]he positive society is naturally divided into five fundamental sciences whose succession is determined by a necessary and invariable subordination. . . .These sciences are: astronomy, physics, chemistry, physiology, and lastly, social physics. The first considers the most general, simple, and abstract phenomena—those which are most remote from human interests; they affect all other phenomena without in turn being influenced by them. The phenomena influenced by the last science are, on the contrary the most special, complicated, and concrete phenomena—those which most directly concern human interests; they depend more or less upon all the preceding phenomena without, however, exercising any influence upon them. (Comte, 1830–42/1988, p. 57)

This simplification dismissed the possibility of any influence from a science below to a science above. A spectral analysis, benefiting from chemistry and physics, for the speed and distance of astronomy's stars would be impossible if such a scheme were relied on. Comte's organization also suggested a reductionism:

> [Comte] did not say that history was, or was reducible to, a kind of physics; but his conception of sociology pointed in that direction—of one complete and all-embracing pyramid of scientific knowledge; one method; one truth; one scale of rational, 'scientific' values. This obstinate craving for unity and symmetry at the expense of experience is with us still. (Berlin, 1954, pp. 3-5)

For Simon (1963), "This hunger for systematic and comprehensive explanation was the distinctive hallmark of the Positivist" (p. 270). In addition, the ideal of unity was allied to the idea of ever-onward progress toward completing it, and for many the idea of progress meant a utopian future.

> [T]he utopian dream of perfection. . .long identified with the golden age or the Garden of Eden, and then by the sophisticated transferred to remote or imagined lands. . .was at last projected into the life of man on earth and identified with the desired and hoped-for regeneration of society. (Becker, 1932/2003, p. 139)

In 1771, Priestly (cited in Becker, 1932/2003) affirmed that humankind "will grow daily more happy" and was destined for an utopian outcome on Earth:

> [N]ature, including both its materials, and its laws, will be more at our command; men will make their situation in this world abundantly more easy and comfortable; they will probably prolong their existence in it, and will grow daily more happy. . .the end will be glorious and paradisiacal, beyond what our imagi[n]ations can now conceive. (pp. 144-145)

Such "daily" progress was regarded as virtually certain if not inevitable. A

> great myth of the eighteenth century was that of steady progress, if not inevitable, at least virtually certain. . .which entailed the view of all earlier centuries as so many steps toward the superior life of the present and the still more wonderful life of the future. (Berlin, 2000, p. 215)

Comte (1849/1975) promoted this myth, and his third assumption was "a continuous progress in society" (p. 103), which was "inseparable from a sense of time flowing in unilinear fashion" (Nisbet, 1980, p. 5). Comte was "very probably the most famous and influential philosopher of progress of the nineteenth century" (Nisbet, 1980, p. 173). Such a view of progress in science was expressed, but not endorsed, by James Clerk Maxwell (cited in Badash, 1972) in 1871:

> The opinion seems to have got abroad, that in a few years all the great physical constants will have been approximately estimated, and that the only occupation [for] men of science will be to carry on these measurements to another place of decimals. (p. 50)

This view of decimal-point-by-decimal-point progress persisted (e.g., De Sitter, 1932, p. 134; Michelson, 1898–1899, cited in Gingerich, 1975, p. 242; and Richtmyer, 1932, cited in Badash, 1972, p. 57). Although typically cited to illustrate belief in the near-completeness of physical science (e.g., Silverstein, 1999), such a view also illustrated belief in inexorable progress.

Against this background, the following makes two main points. First, some modern utopias/dystopias reflected the literary side of positivistic issues, and *Walden Two* fits in that tradition. Second, the later Skinner largely rejected or replaced the positivistic views he had advanced in *Walden Two*. At the time *Walden Two* was written, Skinner was shifting from positivism to a pragmatic

selectionism (cf. Andery, Micheletto, & Sério, 2005; Moxley, 2001a, 2001b). To avoid misunderstanding, all correlations of stimulus and response (S-R), whether of classes or instances, that are formulated as S-R units are considered to be among the varieties of if–then S-R formulations, and the references to S-R formulations that follow do not distinguish one variety from another, although it can be assumed that Skinner's S-R formulations refer to class concepts after his 1935/1999 paper.

Positivistic Sources for Walden Two

When Skinner set out to write *Walden Two*, a model of the modern utopia available to him was John Watson's (1929) "Should a Child Have More Than One Mother?" Watson was "a thoroughgoing positivist" (Lattal & Laipple, 2003, p. 43). Skinner (1983/1984) said he considered himself a "disciple of Watson" (p. 191), and *Walden Two* reads as though written by a positivistic disciple. Much of what Skinner says in *Walden Two* has echoes or resonances from Watson's utopia and Watson's other writings. However, there are a variety of plausible sources that may have contributed to the positivism in *Walden Two.* They exist at the literary level as well as the philosophical level.

Any utopia written within the cultural influences of positivism was likely to show positivistic aspects, if only in its portrayal of a unified way of life, which would invariably be oversimplified. Berlin (1978/1990) saw that "Absolute faith in rational solutions and the proliferation of Utopian writing are both aspects of similar stages of cultural development" (p. 29). From Bacon's scientists in the Salomon House of his *New Atlantis* to the scientific planners in Wells's utopias, science found the answers. Calling these modern utopias "positive utopias, whose intellectual forebears included Bacon, Condorcet, and Comte," Wagar (1988) pointed out how the science in utopias served religious functions as traditional beliefs were transformed but not eliminated:

> The problem is. . .these same methods and findings have been called upon repeatedly to fill the void left by the collapse of the traditional suprarational belief systems. "Science" has become the new Bible, the new pope, the new gnosis. The masters of its mysteries have been appointed the ruling class of utopia. (p. 107)

The imaginary earthly utopias retained features of the imaginary heavenly city and its authority, which was in terms of a top-down hierarchy.

Wells and Bellamy "illustrate what may well be the modern utopia par excellence" (Wagar, 1988, p. 117). Wells (1933/2005) was a fertile source of positivistic ideas, e.g. the *certainty* of "the one sole right way," (p. 271), the *unification* of his World State modeled on the totalitarian rule of elites (p. 131), and the *progress* of "a continual advance in our average individual productive efficiency" (p. 50). In Wagar's (1990) view of Wells, "His creeds, as I catalogue them, were positivism (with a dash of idealism), collectivism, and technocracy" (p. 49), and there is more evidence for Wells's direct influence on Skinner (Moxley, 1999) than there is for Bellamy's. However, Bellamy is credited with a greater and

wider impact on the American culture in which Skinner grew up (cf. Morgan, 1944, pp. ix-xvii; Patai, 1988; Tichi, 1982, pp. 22-23, 1987). Bellamy was mentioned by name four times in Walden Two, and *Looking Backward* may well have been the primary model of an array of models for Walden Two (cf. Kuhlman, 2005). Accordingly, *Looking Backward* will serve as our example of a positivistic utopia. Bellamy's (1889/1968) short story "A Positive Romance" showed familiarity with Comte's philosophy, and Bellamy's "The Religion of Solidarity" (Morgan, 1944, p. 200) was equivalent to Comte's religion of humanity. The religion of solidarity permeated *Looking Backward*, just as applied science and efficiency also permeated it. In her book that profusely illustrated the subsequent efficiency craze, which even spawned a streamlined movement in art and design (Bush, 1975), Tichi (1987) said, "Every page of *Looking Backward* announced the new utilitarian religion just a few years in advance of the public worship that would swell into the Efficiency Movement of the 1910s" (p. 56).

The efficiency movement (including scientific management) was a fitting complement to positivism in its "one best way," which might "fail to materialize" (Mayo, 1933/1960, p. 6); in its "rigid rules for each motion of every man, and the perfection and standardization of all implements and working conditions" (Taylor, 1911/1998, p. 42); and in its "continuous *advance* in knowledge…especially in…practical applications" (Whitehead, 1936, p. vi). Efficiency eliminated what was unnecessary and ideally left only what was necessary. Ideal streamlined efficiency was accountable in a two-term construction with a necessary cause and effect, if-then, or S-R relation. Once the *if* occurred, the *then* was certain. If taken too literally and simply, such a formulation risked obscuring the complex causality of every day experience. Important aspects may be overlooked, as when the efficiency of trains running on time ignores safety, leads to higher speeds when late, and results in a train wreck. The efficiency movement reflected aspects of positivism in advancing certain action, a unified method, and continuous progress

The physician Dr. Leete explained to the protagonist in *Looking Backward* that there was little or no need for legislation because "The fundamental principles on which our society is founded settle for all time the strifes and misunderstandings which. . .called for legislation" (p. 156); he said, "The machine . . .is indeed a vast one, but so logical in its principles and direct and simple in its workings, that it all but runs itself" (p. 140). In addition, the entire nation was organized as an industrial army with machine-like efficiency from top to bottom. The attraction of work in this army was equalized by "making the hours of labor in different trades to differ according to their arduousness. The lighter trades . . .have. . .the longest hours, while. . .mining has very short hours" (p. 72). Instead of money, a "credit card" was issued. Everyone earned the same credit, and the worker "procures from the public storehouses whatever he desires" (p. 83). In addition, punishments were replaced by alternative treatments (p. 150). In his postscript, Bellamy (1888/1982) said, "*Looking Backward* is intended. . .as a forecast. . .of the next stage in the industrial and social development of humanity . . .[and] was written in the belief that the Golden Age. . .is not far away. Our children will surely see it" (p. 234). We see here the three positivistic features:

certitude in rational design, a unified top/down organization, and inexorable onward progress. These features were also in *Walden Two* along with the equalization of work, credit instead of money, and treatments replacing punishment.

However, a reaction to an overly optimistic presentation of positivistic utopianism set in. Berlin (1978/1990) said,

> [B]elievers in the possibility of social perfection tend to be accused by their opponents of trying to foist an artificial order on a reluctant humanity, of trying to fit human beings, like bricks, into a preconceived structure, force them into Procrustean beds…Hence the protest—and anti-Utopias of Aldous Huxley, or Orwell, or Zamyatin (in Russia in the early 1920s), who paint a horrifying picture of a frictionless society in which differences between human beings are, as far as possible, eliminated, or at least reduced. (pp. 40-45)

Such attacks gave double readings to the positivistic facets of utopias/dystopias.

In *We*, Zamyatin (1920–1921/1972) presented a satirical and pessimistic reading of utopian values: "[E]verything great is simple; only the four rules of arithmetic are eternal and immutable. And only an ethic built on the four rules can be great, immutable, and eternal. This is the ultimate wisdom, the summit of the pyramid" (p. 116). Mathematical precision pervaded life and its regulation:

> I cannot imagine a life that is not regulated by the figures of. . .our Table of hours!. . . .Every morning. . .at the same moment, we—millions of us—get up as one. . .in million-headed unison, we start work; and in million-headed unison we end it. And, fused into a single million-handed body, at the same second, designated by the Table, we lift our spoons to our mouths. At the same second, we come out for our walk, go to the hall for Taylor exercises, fall asleep. . . .I have heard many incredible things about those times when people still lived in a free, i.e., unorganized, savage condition. But most incredible of all. . .is that the state authority of that time. . .could allow men to live without anything like our Table, without obligatory walks, without exact regulation of mealtimes, getting up and going to bed whenever they felt like it. (pp. 11-13)

The narrator in *We* read from this proclamation: "[Y]ou, nurtured from earliest infancy on the Taylor system—have you not become pendulum-precise? Except for one thing: Machines have no imagination" (p. 179). But that could now be cured by an operation eliminating the imagination, which would mean: "You are perfect. You are machinelike" (p. 180). Again, we see the certitude of formal assumptions, the unified top-down system, and the inexorable progress toward some assumed perfection, all with simplifying assumptions. Zamyatin's reference to the Taylor system contacted existing reality. The Taylor system epitomized the scientific management movement with its abhorrence of *waste* and its promotion of *efficiency* and the *one best way* (cf. Callahan, 1962; Haber, 1964).

Scientific management had similarities with early behaviorism: "[W]e see in scientific management the self-conscious exemplification of what came to be the typical methods of behavior theory" (Schwartz & Lacey, 1982, p. 242); and many

similarities existed between scientific management and precision teaching (e.g., Joyce & Moxley, 1988). Frazier, Skinner's alter ego in *Walden Two*, advanced scientific management in Walden Two, frequently using variants of *efficiency* with approval. Reductions in time spent and materials used were sought in various ways. Musical concerts were shorter (p. 86); the need for bathrooms was minimized with staggered schedules (p. 45); and even the time taken for "[t]he deliberate expression of thanks is prohibited by the Code" (p. 171). *Waste* was a conspicuous term of disapproval, and selection was a "wasteful principle" (p. 114).

As additional evidence of belonging to the tradition of positive utopias, Walden Two had similarities with early positivism and with later positivism. Early positivism is prominently distinguished from later positivism by its religious aspects, and Walden Two showed similarities with early positivism in this respect. Skinner also acknowledged similarities between his early views and those of logical positivists. Continuing strands ran between early positivism and neopositivism, and they appear in Walden Two. The following addresses these two sets of similarities.

Religious Aspects of Walden Two

Positivism's unifying function is particularly notable in its religious aspects, and these are prominent in *Walden Two*. Frazier said, "[T]he actual creation of *Walden Two* was closer to the spirit of Christian cosmogony than the evolution of the world according to modern science" (p. 299); and Frazier—who emulated Christ on the cross (p. 295)—said, "I like to play God" (p. 299). Burris, Skinner's other alter ego in *Walden Two*, noted that Frazier "was working on faith, and it bothered him" (p. 110). He said, "Frazier's program was essentially a religious movement. . .inspired by a determination to build heaven on earth" (p. 308). Frazier said of Walden Two's borrowings from religion:

> We've borrowed some of the practices of organized religion—to inspire group loyalty and strengthen the observance of the Code. . . .I've mentioned our Sunday meetings. There's usually some sort or music, sometimes religious. And a philosophical, poetic, or religious work is read or acted out. . . .Then there's a brief 'lesson'—of the utmost importance in maintaining an observance of the code. . . .If the code is too difficult for anyone or doesn't seem to be working to his advantage, he seeks the help of our psychologists. They're our 'priests' if you like. (p. 199)

Walden Two had a religion of humanity of its own.

One of the possible sources for *Walden Two*'s religious aspects may have been George Eliot. Skinner had contact with Comte's religion of humanity through reading Eliot's novels and, as an undergraduate major in English literature, could have been aware of her specific links to positivism (cf. Byatt & Warren, 1990; Scott, 1972; Vogeler, 1980; Wright, 1981). The religion in *Walden Two* could have resulted from that contact with Eliot as well as from broader cultural influences, including his reading of utopias; indeed, Skinner (e.g., 1968/1999, p. 58; 1985/1987, p. 33; 1983/1984, pp. 7, 79, 181, 313) seemed well informed about

utopias. Eliot said, "Israel is the most complete presentation of Positivism in religion" (cited under *positivism* in the *Oxford English Dictionary*) and offered Israel as a religion of humanity in *Daniel Deronda*. Skinner (1983/1984, p. 402) read Eliot's novels and may have been sympathetic to her positivistic orientation. When he seriously considered writing a novel in the early 1960s, he (1983/1984) "tried rewriting parts of *Middlemarch* and *Daniel Deronda*, replacing references to feelings with references to the action from which the feelings were inferred" (p. 245).

Neopositivism

In its broad sense, *neopositivism* embraces the positivism of early behaviorism as well as logical positivism. Although not widely commented on, similarities between Comte's positivism and behavior analysis have been noted (e.g., Leahey, 1987; Newman, 1992). Speaking as a behaviorist, Newman (1992) said, "Comte. . .advocated applying the scientific study of human behavior, which he called sociology, to achieve social progress. In this, and in his insistence on observable relationships as the basis of science, Comte anticipated the behavior analysts" (p. 21). In addition, Skinner's neobehaviorism resembled the neopositivism of the logical positivists. Skinner (e.g., 1979/1984, p. 116; 1983/1984, pp. 394-395) acknowledged influences from Mach and Russell, forerunners of logical positivism. He was a charter subscriber to *Erkenntnis*, the journal of the Vienna Circle (1979/1984, p. 115), was a friend and colleague of the logical positivist Herbert Feigl (p. 248), and he considered the logical positivist Carnap a behaviorist (p. 149). Although logical positivism may not have influenced Skinner as strongly as Hull (Smith, 1987), Skinner (1979/1984) said, "As far as I was concerned, there were only minor differences between behaviorism, operationism, and logical positivism" (p. 161).

Although modified in various ways, the original three strands of certainty, unification, and progress continued in logical positivism. Carnap (cited in Friedman, 1999) said that establishing connections to certainty had been a goal for him:

> I believed that the task of philosophy consists in reducing all knowledge to a basis of certainty. Since the most certain knowledge is that of the immediately given, whereas knowledge of material things is derivative and less certain, it seemed that the philosopher must employ a language which uses sense-data as a basis. . . .[The Vienna Circle] assumed that there was a certain rock bottom of knowledge, the knowledge of the immediately given, which was indubitable. Every other kind of knowledge was supported by this basis and therefore likewise decidable with certainty. This was the picture which I had given in the *Logischer Aufbau*; and it was supported by the influence of Mach's doctrine of the sensations as the elements of knowledge, by Russell's logical atomism, and finally by Wittgenstein's thesis that all propositions are truth-functions of the elementary propositions. (pp. 117-118)

Commenting on the slightly larger quotation from which this is taken, Friedman said, “It would be difficult indeed to find a clearer statement anywhere of the assumptions and goals of phenomenalistic foundationalism” (p. 118). As pointed out by Toulmin (1988), the problem with this position was that such “a sensationalist approach places the alleged objects of direct knowledge essentially ‘in our heads,’ and so destroys all our hopes of bringing language to bear on them” (p. xiii). A physicalistic language seemed to avoid this problem and became a more agreed upon goal for logical positivists.

Unification was also a goal for the logical positivists in their quest for a unified science and in their quest for a unified language of physicalistic meanings. It was as if they regarded the various meanings a word could have as a source of confusing diversity, which could be prevented by eliminating words that could have different meanings. Speaking of a language that “attains ideal perfection” (p. 67), the logical positivist Schlick (1925/1985) said, “The merit of the theory unfolded here seems to me to lie in the fact that it rests solely on the relation of pure coordination or correspondence” which “means that the same sign is always to correspond to the ‘same’ object” (p. 68). Carnap (1963) said, “[A]n ideal language. . .meant for us a formalized symbolic language” (p. 29); and he (1932/1959) indicated how this one-to-one correspondence would be achieved: “[E]very word of the language is reduced to other words and finally to the words which occur in the so-called ‘observation sentences’ or ‘protocal sentences.’ It is through this reduction that the word acquires its meaning” (p. 63). Carnap also indicated a way to physicalistic language by discouraging the use of certain terms and gave a list of proscribed metaphysical terms “devoid of meaning” (p. 67). Although the logical positivist Neurath (1932–1933/1959) dismissed the “fiction of an ideal language constructed out of pure atomic sentences” (p. 199), he also recommended proscribing words:

> What is originally given to us is our *ordinary natural language* with a stock of imprecise, unanalyzed terms. We start by purifying this language of metaphysical elements and so reach the *physicalistic ordinary language*. In accomplishing this we may find it very useful to draw up a list of proscribed words. (p. 200)

As though heeding Neurath’s advice, Skinner (1938/1966, pp. 7-8) wrote up a list of proscribed words for *The Behavior of Organisms*. Citing Carnap’s *The Unity of Science*, Skinner further showed his sympathy with unified language by saying “One of the objectives of science is presumably the statement of all knowledge in a single ‘language’” (pp. 428-429). The idea that we can draw up lists of isolated words having meaning—making meaning the property of a word (a view explicitly rejected by the later Skinner, 1957, pp. 13-14)—or lists of isolated words not having meaning makes about as much sense as drawing up lists of isolated behavioral movements and saying these isolated behaviors have meaning or these isolated behaviors do not have meaning. Meaning requires probabilistic contingencies, as the later Skinner insisted.

In addition, an excessively optimistic view of progress continued. Laudan (1996) pointed out that "the positivists tended to believe that science was progressing inexorably" (p. 5): "From Comte to Popper, the positivist account of scientific progress was simple and straightforward. . . .Science progressed, quite simply, because later theories could always do everything their predecessors could and more besides" (p. 21). In Laudan's (1996) view, "cumulative retention of confirmed explanatory success is a precondition for judgments of progress" (p. 23).

In short, utopias and their dystopian counterparts became the literary side of positivism. In addition, early positivism was typically accompanied by a religion of humanity, and neopositivism shared a similarity with Skinner's early behaviorism. All of these sources may have contributed to the positivism in *Walden Two*.

Changes Away From the Positivism in *Walden Two*

Skinner was serious about the views that Frazier expressed. To an inquiry asking if *Walden Two* was written satirically, seemingly not long after its publication, Skinner (1983/1984) replied, "FRAZIER'S VIEWS ESSENTIALLY MY OWN—MORE SO NOW THAN WHEN I WROTE" (p. 9). However, Skinner later turned away from the positivism in *Walden Two*. The following presents some of Skinner's more striking changes away from positivism and away from certainty, unified realty, and inexorable progress.

Certitude

Frazier advanced certainty in accepting some of his hunches as certain, "[W]hen I feel this way about a hunch, it's never wrong" (p. 293). In addition, he advanced the reflex and its S-R formulation. The S-R formulation advanced certainty by the very way it was framed: if the stimulus occurred, the response was certain. Speaking of the relationship between stimulus and response, Skinner (1931/1999) said, "The reflex is important in the description of behavior because it is by definition a statement of the *necessity* of this relationship" (p. 495). If the relationship was one of necessity, the response followed the stimulus with certainty, and this certainty was pervasive. Skinner (1979/1984) said, "I was convinced that the concept of the reflex embraced the whole field of psychology" (p. 70). Even if an exact if–then relation was not observed, Frazier (p. 257) implied an underlying determinism meant it was there to be found. Frazier referred more than once to the certainty he would have with sufficient information: "the determining forces may be subtle but they are inexorable" (p. 258); and, echoing Watson, he said, "Give me the specifications, and I'll give you the man!" (p. 292). Burris added, "The matter had probably been determined for days—from the beginning of time, Frazier would have said" (pp. 312-313). In addition, Frazier's most conspicuous practices (e.g., pp. 86, 98, 108, 110) had precedents in S-R studies (Morris, Smith, & Altus, 2005, p. 109), including an explicit example of

the conditioned reflex: "It isn't the color or brightness or size of a poster which makes it exciting. It's the experiences which have accompanied similar posters in the past. The excitement is a conditioned reflex" (p. 86). Although Skinner (1979/1984) said, "In *Walden Two* the conditioned reflex was not king (Except for the Pavlovian desensitization of emotional responses, most of the behavior was sustained by operant reinforcement)" (p. 349), this did not mean that operant renforcement was conspicuous or that Frazier denied a reflexological account for operant behavior. Skinner's (1937/1999) early operant consisted of two reflexes. No formulation or description of Skinner's probabilistic three-term contingency appeared in *Walden Two*. The closest resemblance to the three-term operant occurred in narrations of two-term relations. To build up perseverative behavior, Frazier said, "A bit of a tune from a music box, or a pattern of flashing lights, is arranged to follow an appropriate response" (p. 124) and

> When he behaves as we want him to behave, we simply create a situation he likes, or remove one he doesn't like. As a result, the probability that he will behave that way again goes up, which is what we want. Technically it's called 'positive reinforcement.' (pp. 259-260)

Although probability—which fit the three-term contingency operant, but "did not fit the stimulus-response pattern" (Skinner, 1989, p. 124)—was introduced, this relation still conformed to a reflexological formulation with stripped-away endings of the paired S-Rs (e.g., S-R-S-R, ignoring sub- or superscripts and case differences). At best this may suggest Skinner was considering an R-S formulation or a change of some sort. Further evidence that Skinner, through Frazier, was yet to successfully incorporate the probability of selection in his theory shows in his educational program, "We give them an excellent survey on the methods and techniques of thinking, taken from logic, statistics, scientific method, psychology, and mathematics" (p. 121). Biology and the thinking of natural selection was *not* included, and no parallel was drawn between operant behavior and natural selection. Like Russell (1914/1981, p. 23), Frazier was dismissive of the "wasteful principle" (p. 114) of selection. Other than Frazier saying that *Walden Two* was closer to Christian cosmogony "than the evolution of the world" (p. 299), Skinner did not even use the term *evolution* in his publications until 1950 (Morris, Lazo & Smith, 2004, p. 158).

In contrast, the later Skinner (1971) limited the S-R model to respondent behavior and said, "The stimulus-response model was never very convincing" (p. 18), and he (1974) pointed out inadequacies in the S-R account of Watson: "Much of what [Watson] said seemed oversimplified and naïve" (p. 6). Instead of pursuing the necessity and certainty of the S-R model, the later Skinner turned to probability. He adopted an explicitly probabilistic view of facts. "Sentences about nature range from highly probable 'facts' to sheer guesses" (Skinner, 1955–56/1999, p. 6). Facts were not fixed and unchanging: "We may speak then of the evolution of facts. . . .At issue is. . .the evolution…of a verbal environment or culture" (Skinner, 1986, p. 121). No fact escaped the probabilistic verbal behavior in which all facts are expressed. Skinner's (1945) revised formula for operant

behavior was a probabilistic three-term contingency in which the relation between the (A) antecedent stimulus or setting and (B) behavior was because of (C) consequences (AB-because-of-C): "the contingencies of reinforcement [consequences]. . .account for the functional relation between a term, as a verbal response [behavior], and a given stimulus [antecedent setting]" (p. 277). The class concepts of the terms in the AB-because-of-C relations are more clearly indicated by cyclical triangular diagrams (Moxley, 1984; Platt, 1973, p. 24) than one-way S-R chains. The extensive generality of this formula is further shown in natural selection: (A) the conditions of life, (B) variation, and (C) selection are also in AB-because-of-C relations (e.g., Darwin, 1859/1958, p. 88). AB-because-of-C is a formula for probability just as S-R (or R-S) is a formula for certainty.

Unification

In addition to the unifying function of its religious aspects, *Walden Two* advanced a unifying framework, which was in opposition to variation and diversity in thought and practice. This uniformity was acceptable to its members who were compliant, had similar interests ("our interests are all alike," p. 197), and were uninterested in planning for the future (pp. 164 & 270). According to Frazier, "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). As the conclusion of a syllogism is contained in its premises, all that happened in *Walden Two* was contained in its plan: "All that happens is contained in an original plan . . . .The same is true of *Walden Two*" (p. 296). Further, Frazier had made changes in the plan of *Walden Two* difficult to make. The Constitution cannot be changed by a vote of the members. The Constitution can only "be changed by a unanimous vote of the Planners and a two-thirds vote of the Managers" (p. 270). Changes in the Code were also difficult to make. The Code also cannot be changed by a vote of the members, nor can the members organize as a group to voice any arguments for change. Each member can only express concerns individually to the authorities:

> 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. (p. 164)

This rule would prohibit arguing about the code with any other member or in any assembly of members, and it would also discourage any development of thought or diversity of thought while arguing about the code. The idea of the *Walden Two* plan was not to encourage discussions and disputes over the code that might lead to trying something different that held promise for improvement. The idea was to accept and follow the basic framework for what had previously been determined to be best from the start, like a religious rule. Experimentation was in the business of filling in the details of the framework.

In contrast, the later Skinner (1990) said, “A planned world was one of the casualties of evolutionary theory” (p. 104). This was a concession that a world planned in advance like *Walden Two*, with safeguards against deviations from the plan, was not workable. Designs, plans, and other rules did not come first. “The contingencies always come first” (Skinner, 1989, p. 44), and the contingencies were probabilistic. Instead of advancing the unifying stability of a pervasive plan, the later Skinner (1971) advocated “accelerating the evolutionary process” (p. 144); and he (1979/1984) said, “Change and be ready to change again” (p. 346). In addition, Skinner (e.g. 1981) pointed out the parallel between operant behavior and natural selection, with all their ongoing evolutionary variation and change.

Progress

Ever-onward progress was to be made in *Walden Two* as experiments filled in the details. As if a final solution occurred with every experiment for every sort of problem without any setbacks, Frazier said, “[With a] constantly experimental attitude toward everything. . .solutions to problems of every sort follow almost miraculously” (p. 30). Frazier spoke as if the solutions to problems were direct and final in an ever-onward progress.

In contrast, the later Skinner (1979/1984) modified Frazier and said, “Regard no practice as immutable. Change and be ready to change again. Accept no eternal verity. Experiment.” (p. 346), which also meant that no result from an experiment should be considered as final. Citing Skinner’s above statement, Altus and Morris (2004) said, “Skinner’s utopian vision was not any of *Walden Two*’s premises and practices, save one—experiment” (p. 280). Although Skinner presented his statement as a principle in *Walden Two*, this advice against accepting solutions as final was not unambiguously stated there but was a later revision. And although Frazier had said, “I’ve very much misrepresented the whole system if you suppose that any of the practices I’ve described are fixed” (p. 115), it is doubtful that the word “practices” was meant to include the results of experiments. If so, why did Skinner find the need for the revision? And if Skinner’s later vision did not include “any of *Walden Two*’s premises and practices, save one—experiment” in the sense of his later revision, then he has repudiated its positivism. The later Skinner also found some problems could not be solved, “I can’t imagine anything that will prevent the sheer destruction of the world as a planet long before it needs to be destroyed” (cited in Bjork, 1993, p. 230).

Conclusion

Today, probability and acting effectively has replaced apodictic certainty in science among those who philosophize about it. The program for a unified science is defunct as well as systematic endeavors for a unified language with lists of proscribed words. Instead of a simplistic pyramidal organization of society and knowledge, we also have more acknowledgment of “the enormously complex intermeshing” of human beings as well as their “system of scientific knowledge”

(Haack, 2003, p. 302). And progress is viewed more haltingly and questionably with steps backward as well as steps forward. In Haack's (2003) view:

> [A]s scientific inquiry proceeds in its ragged and uneven way, it finds new truths, better instruments, better vocabulary, etc., and ways to build on them, so that over the centuries the sciences have built a great edifice of well-warranted claims and theories (even though, to be sure, the trash-heap of discarded concepts and theories is larger by far). . . .We can't predict what currently accepted scientific ideas will turn out to need modification, minor or major; or what new discoveries will bring forth a cascade of new questions. (pp. 338, 351)

The meaning of new truth that makes sense here is not the truth of eternal existence but of effective action (Skinner, 1984/1988, p. 241). What matters is not unerring ever-onward progress, but progress on the whole and in the long run. Declines have occurred both in the advancement of positivism and enthusiasm for utopia. Frazier viewed a positivistic *Walden Two* optimistically, but Moulin (cited in Rouvillois, 2000) said, "All utopias are totalitarian" (p. 331); and Ridley (2003) said, "[T]he only lesson to be drawn from utopian dreaming is that all utopias are hells" (p. 67). Dystopias of positivism replaced the utopias.

The later Skinner replaced the positivism in *Walden Two* with changes that were more in line with his growing selectionism. Little in the way of positivistic excesses remains in Skinner's later work, even if he retained some degree of positivism or nostalgia for it (cf. Skinner, 1983/1984, p. 106). However, while Skinner's views changed, those of some of his followers lagged behind. Some behavior analysts did not abandon all the excesses of positivism. Take religious aspects. Place (1985) said, "[T]he works of B. F. Skinner in general and *Verbal Behavior* in particular are treated as holy writ" (p. 38). Nevin (1991) talked about "the most central tenets of our creed" (p. 36) and Lamal (2004) said of Joel Greenspoon, "Over the years he became concerned that behavior analysis had evolved into a quasireligion" (p. 288). As in assuming that later scripture did not take back what was said in earlier scripture, this criticized attitude is reluctant to accept that the later Skinner took back anything he said earlier. But it should not be surprising to find important writers taking back what they said as they continue to think through the issues. Throughout *Defending Science—Within Reason*, Haack (2003) found instances that bear out J. L. Austin's remark about important philosophical thinkers: "[T]here's the part where he says it, and the part where he takes it back" (cited on p. 33). Wittgenstein's taking back the early positivistic side to his writing comes to mind. The philosophy of the early Skinner also favored positivistic values. The later Skinner largely took them back. He replaced his positivism with a pragmatic selectionism.

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