Paul Sears: Cautious “Subversive” Ecologist¹

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In January 1960, columnist Jack Anderson (not yet number one on Richard Nixon’s enemies list) wrote to Paul Sears at Yale, asking if he would answer two questions for *Parade* magazine, the widely circulated Sunday newspaper supplement that he edited: 1) “Do you believe in life after death?” and 2) “What scientific reasoning or theories can you offer to support your belief?” Ever the careful scientist and the diplomat, and not one to pass up a teaching moment, Sears (1960a) replied:

The question you ask is one which science is unable to answer because its competence is limited to those matters which can be investigated by observation through the senses, an approach which to the present time has been unable to shed any light on the mystery. You may, however, be interested in the following quotation from the opening chapter of my book *Deserts on the March*.

The face of earth is a graveyard, and so it has always been. To earth each living thing restores when it dies that which has been borrowed to give form and substance to its brief day in the sun. From earth, in due course, each new living being receives back again a loan of that which sustains life. What is lent by earth has been used by countless generations of plants and animals now dead and will be required by countless others in the future (Sears 1935:1). (p. 1)

Those were indeed the first four sentences of *Deserts on the March*, the book that established Sears’s reputation in 1935. Nearly 30 years later, he wrote a much smaller piece that also attracted some attention: “Ecology—A Subversive Subject.” Its opening lines are also memorable:

My choice of titles is not facetious. I wish to explore a question of growing concern. Is ecology a phase of science of limited interest and utility? Or, if taken seriously as an instrument for the long-run welfare of mankind, would it endanger the assumptions and practices accepted by modern societies, whatever their doctrinal commitments? (Sears, 1964a, p. 11)

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These words reflect a theme recurrent in Sears's writing in various forms since *Deserts on the March*: ecology, which he purposely held off mentioning by name until the final chapter of *Deserts*, is a science that forces us to reflect on the larger picture, to see things whole, and perhaps to question the underlying assumptions by which we live and work. Sears himself was no subversive. He once characterized his politics as "a bit to the right of Herbert Hoover" (Sears, 1964b, p. 8). In his review of *Deserts* for the *Journal of Ecology*, Arthur Tansley (1936) rightly pointed out that, despite the left-wing politics prevalent in the 1930s, Sears did not call for the abolition of private property as a solution to abusive land use practices. However, Tansley did ridicule Sears's suggestion toward the end of the book that every municipality or civic unit of reasonable size hire an ecologist as a consultant, just as cities and counties regularly hire engineers and chemists. The suggestion does seem a bit naive, but Sears himself actually played that role briefly. He was head of the botany department at the University of Oklahoma when he wrote *Deserts*. After the book was published, the governor of the state appointed him to chair a committee to push through legislation to create a soil conservation district. He succeeded against strong opposition from Oklahoma business leaders. In a description of the incident published years later, Sears (1954), referring to himself in the third person, discreetly praised himself for winning the businessmen to his side: "A bitter fight was in prospect, but it was avoided by quiet and reasonable explanations, based strictly on the most traditional American practices and upon the firsthand knowledge that the chairman had of ecological conditions within the state" (p. 963). That description appeared in a paper that Sears presented in a symposium on human ecology at the Ecological Society's meeting in Gainesville, Florida, in 1954. This was one of Sears's many efforts over the previous two decades to promote human ecology within the Ecological Society of America (ESA) and apply an ecological perspective to a wide range of practical problems. Since Sears did not start out as an ecologist, it will be helpful to take a brief look at his career.

Paul Bigelow Sears was born in Bucyrus, Ohio, in 1891. His father was a lawyer who also ran a farm just outside town. Paul worked at both the law firm and the farm when he was growing up and took lessons from both into his adult life. At the law office, as he described in several autobiographical sketches found in his papers and his published works, he developed an appreciation for clear thinking, gained some insight into the vicissitudes of human nature, and learned to type (Figure 1). The accompanying photo shows him working in his makeshift office on the site of the old family farm while he was teaching at Oberlin College. Eventually, Sears let the farm succumb to the process of old-field succession and donated it to the state, where it exists today as a nature preserve (Figure 2).

Figure 1: Paul Sears in his “office” on the family farm circa 1940

Source: Potter, 2010. Reproduced from Loren, with permission.

Figure 2: Sears Woods, just outside Paul Sears’s hometown of Bucyrus, Ohio

Source: Photo by author.

After graduating from Ohio Wesleyan in 1913, Sears went to the Universities of Nebraska and Chicago for his MA and PhD degrees, respectively, and not to study ecology. His main interests then were in plant morphology and the new field of cytogenetics. His 1922 doctorate at Chicago was based on research he had begun at Nebraska on morphological and cytological variations in a species of dandelion. However, at Nebraska, he came under the influence of ecologists John Weaver and Raymond Pool, and at Chicago, a field course to Door County, Wisconsin, in the summer of 1919 made him a lifelong fan of Henry Chandler Cowles (Figure 3). A year earlier, during the First World War, Sears was stationed with an army air force unit in Florida, where he did some experimentation, never followed up, with the use of aerial photography to study vegetation. To summarize his academic career, following the war, Sears went from the University of Nebraska (1919–1927), to the University of Oklahoma (1927–1938), to Oberlin College (1938–1950), and then to Yale (1950–1960), where he chaired the country's first graduate program in conservation. After retiring from Yale, he held visiting positions at a half-dozen universities and colleges between 1960 and 1965, teaching courses on conservation and human ecology.

Figure 3: Paul Sears, center with hat, with classmates from Henry Cowles's field course in Wisconsin, 1919

Source: Paul Bigelow Sears Papers (MS 663). Manuscripts and Archives, Yale University Library, Box 133, Folder 194.

Sears may well have had an early interest in ecology, but his full transition from morphology and cytogenetics to ecology was the result of a pet project that he had begun as an instructor at Ohio State University, just before the war. Inspired by the existence of prairie relics in the part of Ohio in which he had grown up, he attempted to reconstruct the vegetation of the entire state before European settlement (Stuckey, 2010). He received initial assistance from his Ohio State colleague Edgar Nelson Transeau and a lot of encouragement from Henry Cowles. After exhausting the information he could glean from old county records, Sears learned about the work that Swedish researchers were doing to reconstruct vegetation history by studying fossil pollen found in bog and lake bottoms. From that point on, Sears's major research field was the study of vegetation history, and therefore climate history, by means of pollen records. He became a United States (US) pioneer in paleoecology and coordinated his findings with anthropological records as well, correlating changes in vegetation and climate to changes in means of subsistence and related cultural changes among Native American societies from the Midwest to the Southwest and eventually to Mexico (Sears, 1932a, 1932b, 1948, 1952, 1956; Shane, 2010). However, *Deserts on the March* turned his career in a different direction. Sears (1960b) alluded to this directly in an assessment of his achievements in an address given in 1959 as the outgoing president of the American Society of Naturalists:

If it has not been my privilege to engineer any of the dazzling advances in biological science of recent decades, I assume that my efforts to interpret some of them to laymen have been appreciated. It was, in fact, the shock, nearly thirty years ago, at discovering the serious consequences due to public ignorance of basic ecological principles, that diverted me from interesting technical studies. Even so, this experience has been professionally rewarding, for it has obliged me to give considerable thought to principles, and enabled me to effect some synthesis of social and biological science. (p. 193)

After publishing *Deserts*, although he continued his pollen studies, Sears became a kind of public intellectual, writing articles on the Dust Bowl, conservation, and land use policy for *Harper's*, *The New Republic*, *American Mercury*, and other periodicals, and carrying on a dizzying schedule of lectures and radio talks. He also became a regular book reviewer for both the *New York Herald Tribune* and the *Saturday Review* for more than two decades (Figure 4).

Figure 4: Undated photo of Paul Sears, probably from the 1930s

Source: Paul Bigelow Sears Papers (MS 663). Manuscripts and Archives, Yale University Library, Box 76a, Folder 1022.

Within the Ecological Society, he became active in promoting the broad application of ecology to a wide range of practical problems and in encouraging more emphasis on human ecology. In these efforts, he often worked with his friend, pioneering ecologist Charles Adams, who was then director of the New York State Museum. Sears chaired the ESA's Symposium Committee from 1938 to 1940, during which time he and Adams organized sessions at both the summer and winter meetings, often held in collaboration with the American Association of the Advancement of Science (AAAS), in which they tried to integrate the perspective of social scientists with that of ecologists. Sears was also an active member of the ESA's Committee on Applied Ecology during the 1940s. In one symposium organized by the committee for a 1946 meeting, Sears presented a paper on the "Importance of Ecology in the Training of Engineers." In this, and in his many popular works, there was nothing particularly profound about the understanding of ecological principles that he wished to convey to engineers and the public. His message was simple: basic knowledge of community structure and composition, population dynamics, and the general properties of ecosystems will help engineers, planners, and ordinary citizens make

better policy decisions at all levels. When the Ecological Society honored him with its Eminent Ecologist award in 1965, it was mainly for his role as a spokesperson for ecology and not for his original scientific work (“Paul Sears,” 1965; see also Kingsland, 2015).

When Sears was hired to chair the new graduate Conservation Program at Yale in 1950, the appointment was given much national publicity. His old friend Charles Adams saw the announcement in the *New York Times* and wrote Sears a letter of congratulations praising the proposed Yale program as a fine answer to the general opposition of the editorial board of the Ecological Society toward human ecology (Adams, 1950). Adams was referring to a recent incident in which Donald Lawrence and Thomas Park, then editors of *Ecology*, had conducted a survey of the journal’s editorial board and concluded that *Ecology* could publish human ecology articles provided they were not propagandistic, they were grounded in science rather than economics or politics, and they made “an intellectual contribution” to ecology (Lawrence & Park, 1949). Adams had complained about the lack of attention to human ecology in the journal for years. Sears, ever the more practical and cooperative kind of colleague, agreed to chair a new ESA Committee on Human Ecology and tried to work more of a human ecology perspective into the society’s meetings and publications, which he continued to do throughout the 1950s, despite a ridiculously crowded schedule.

Two themes that preoccupied Sears in much of his writing were the low status of the biological as compared with the physical sciences, and the general lack of ecological knowledge in society and among experts in other fields. In an address in December 1957, he stated: “The biologist who attempted to apply his knowledge in defiance of known physical principles would be laughed out of court. Yet we seem singularly trustful of engineering projects carried out in disregard of ecological principles” (Sears, 1958, p. 13). Yet, less than two years after speaking these words, Sears found himself on a distinguished committee giving his blessing to perhaps the most ill-conceived of all engineering projects: Project Plowshare. This was the Atomic Energy Commission’s (AEC) program to use nuclear detonations, mainly hydrogen bombs, for all sorts of large-scale excavation and mineral extraction projects. Sears was the only member of the Plowshare Advisory Committee who had any knowledge of the science of ecology, and yet he approved of one of the early Plowshare experiments, Project Chariot—a very controversial plan to use a series of nuclear explosions to simulate the excavation of a harbor in a remote corner of Alaska. He was not just an observer, he was deeply involved in the committee’s deliberations over this project. Barry Commoner later admitted that Project Chariot was the incident that transformed him from an anti-nuclear activist to an environmentalist, since there were issues involving patterns of fallout in the Arctic ecosystem that he had been unaware of, as he was not trained in ecology (O’Neill, 2007, pp. 228–229). Why did Sears have such a different reaction?

I explored this question in a recent paper (Cittadino, 2015). In my view, Sears's positive response to Plowshare was due to three factors: his association with the AEC, which had begun a few years before; his willingness to believe AEC scientists like Willard Libby, who dismissed the harmful effects of fallout, and other AEC scientists who claimed to have invented "clean" bombs; and, most importantly, his strong conviction that nuclear excavation, whatever its harmful effects, was certainly preferable to all-out nuclear war. Sears was a loyal citizen who trusted the US government, a team player, and a very careful thinker who was reluctant to jump to hasty conclusions. In short, his approval of Chariot and other Plowshare projects was consistent with his character and personal history. Sears had an often humorous, sometimes even homespun, style of expression, so I will let him have the last words with two examples of his humor and one more serious reflection. As the outgoing president of the AAAS in 1957, Sears chose to speak on "The Inexorable Problem of Space." In the wake of the recent hysteria over the Soviet launching of *Sputnik*, he tried to make the point that the space race was diverting attention from the much more serious problem of the condition of the space on planet Earth in which we live. He put it this way: "The golden moment for the pickpocket comes when everyone at the county fair is craning his neck at the balloon ascension" (Sears, 1958, p. 9). Always concerned about the status of ecology among the sciences, he once made this observation:

I have recently heard ecology described as a kind of intellectual halfway house, whose justification will disappear when physiology has been reduced to proper mathematical precision. I feel no particular urge to combat this suggestion otherwise than to remark that halfway houses exist because of their usefulness on the way up and that their occupants are not necessarily half-wits. (Sears, 1960b, p. 195)

Finally, on a more serious note, in one of his last books, *The Living Landscape*, Sears (1966) returned to the issue he raised in "Ecology—A Subversive Subject":

It may sound fatuous to suggest that since ecology, economy and economics have a common root they may have common principles, to be ignored at our peril. Perhaps human cleverness may be able to outwit Nature. But, in the meantime, civilization based so largely as ours on the use of conceptual models should weigh the risk it takes in ignoring the model set before it in the dynamics of natural ecosystems. (p. 192)

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