

Ellen Swallow Richards: Mother of Human Ecology?

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Life and times

The first person to use the term “human ecology,” in 1892, was the remarkable Ellen Swallow (later Richards). She was born into the small, isolated rural community of Dunstable, Massachusetts, in 1842 and raised on the family farm. Both Ellen’s parents were well educated for the times, and both had been teachers. They resolved that Ellen would be better educated at home by them than at the local school, and so as a child she received no formal education. Ellen was bright and learned readily, but she was also considered frail and sickly. On her doctor’s orders, she was instructed to spend as much time as possible outside, in the belief that fresh air and exercise would be good for her. As was considered natural at the time, she also helped around the house, with duties such as cooking, cleaning, and needlework. Prizes won at the local country fair suggest that she was skilled at these arts too. These formative experiences of the curative power of a healthy environment and the importance of household arts are pointed to as the basis of her lifelong interest in the influence of the environment on the health and well-being of humans (Hunt, 1912, p. 77).

Ellen’s family sold their farm and opened a store in the nearby town of Westford in 1859. At this time, Ellen commenced her formal education at Westford College, at the age of 17. She proved a very capable student, developing a range of interests, and demonstrating an aptitude for languages and mathematics. She also tutored, helped in her father’s store, and cared for her sick mother. On graduating, she became a teacher, but remained impatient to advance her own knowledge, and particularly to pursue an interest in science. In the 1860s, opportunities for advanced education for women were few, and even fewer for a “male” subject like science. However,

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Vassar College for Women in Poughkeepsie, New York, had opened in 1865 and was offering the then unheard-of program of science studies for women. Ellen applied in 1868, aged 26, and was admitted as a third-year student, on the grounds that her entrance examination demonstrated advanced levels of learning. Given that only 100 women were admitted each year from the thousands that applied, this was a remarkable achievement (Swallow, 2014, pp. 22–23).



Figure 1: Ellen Swallow Richards

Source: Wikimedia Commons.

Vassar College made a significant impression on Ellen's future in two major ways. One was that her professor of chemistry, Charles Farrar, was convinced science could and should be applied to everyday household and community situations. The other was the professor of astronomy, Maria Mitchell, who was a strong activist promoting the role of women in science (Vassar Historian, 2016). Graduating after two years, Ellen took the remarkable step of applying to the then all-male Massachusetts Institute of Technology (MIT) to further develop her knowledge of chemistry; a move Farrar likely influenced. Supported by Farrar's recommendation, Ellen was

accepted by MIT under a “special student” classification. This status saved Ellen from paying fees; however, rather than indicating MIT’s generosity for her circumstances, it appears this status was to open an option for the institute to deny that a woman had ever been enrolled should the “experiment” of admitting one backfire (Kwallek, 2012). Regardless, Ellen went on to graduate from MIT with a Bachelor of Science in chemistry in 1873, making her the institute’s first female graduate. By then, Ellen had already established herself as a “preeminent international water scientist” (Clarke, 1973, p. 39) through her painstaking laboratory work analyzing the extent of industrial chemical pollution of urban water supplies. Far from pretending she had never been there, MIT kept her on as a laboratory assistant and, in due course, instructor and laboratory head, for the rest of her life. However, they could not bring themselves to ever confer a doctoral degree on her.

Environmental constraints on human health and well-being

The laboratory analysis of industrial pollutants that Ellen conducted was not merely driven by an emerging concern for the health side effects of industrialization, although it certainly included that. Her concerns were also both ethical and pragmatic. The process of industrialization was, as she saw it, charging ahead with no thought for its broader consequences or need for governance by appropriate new social institutions and regulations. As her friend and biographer, Caroline Hunt (1912), recalled:

The flow of industry had passed on and left idle the loom in the attic, the soap kettle in the shed. The form of the home was being gradually but surely changed, not, however, because of intelligent direction from within, but through pressure from without. The thoughtless were content to allow the changes to proceed, lead where they would, but the wise were anxious. They began to ask, to use Mrs Richards’ own words ... “*what forces in the community can be roused to action to secure for the coming race the benefits of material progress?*” (p. 260, emphasis added)

The forces in the community that Ellen devoted her life’s work to rousing were those at the household level (primarily women) and local governance (primarily municipal) levels. She recognized the reciprocal impacts between household activities and the social and ecological environment.

Impact on household, loss of power

During this time, how a citizen’s basic lifeworld was enacted was undergoing massive reconfiguration. Industry and technology were changing what stood as normal everyday life and, through newly emerging modes of consumption, the health of consumers and the environmental load of consumption.

With the rapidly industrializing nature of American society in the late nineteenth century, the population was shifting from rural to urban living. By 1920, just over half of Americans lived in cities (Bryant et al., 2003). This brought about changes in what and when people ate. The availability of adequate, nutritious foods for the working class did not always keep pace with the growth of industry, causing widespread malnutrition. The work day also meant a change from rural midday main meals, to a large breakfast and supper, with little to no lunch.

Transportation, refrigeration, and canning technologies stepped in alongside other industry to satisfy the need for inexpensive food that could be transported into cities and did not require significant cooking time at the end of a work day. However, this brought with it unintended consequences. Canning and processing led to the loss of essential vitamins (yet to be discovered) in staples such as canned milk, refined flour, and polished rice. Processing also led to the adulteration of foods with dangerous toxins (typically additives for preservation, texture, or color)—a fact known as early as 1820 (Bryant et al., 2003), but not acted on in the United States (US) until the *Pure Food and Drug Act* of 1906.

From a feminist perspective, control was an issue. Industrial technology also brought with it a shift in power as “many resource producing activities once controlled by the Family moved from the domestic (private) to the civic (public) domain” (Thompson, 1992, p. 16). According to Thompson (1992), home economics was not about “traditional” women’s roles, as some critics claimed, but strove to answer the question of “what knowledge is essential for people in each generation to live a satisfying life and maintain sustainable environments for human development?” (p. 19). Ellen’s contribution can be seen very much in this latter sense. She was determined that the people who adopted the “new normal” did so to benefit themselves and their families, and not merely the industries that would profit from the sale of the new modes of consumption. As Clarke (1973) put it, “she meant to make collective the homes that industry had collectively exploited, to organize them by educating their occupants for intellectual self-defence” (p. 174). The importance of Ellen’s work lay in the fact that, as Thompson (1992) articulated, “the skills, technologies, and knowledge necessary to perform household duties change from generation to generation, but their collective significance for human wellbeing is not thereby diminished” (p. 16).

Although Ellen concerned herself with the plight and education of women, she did not do so out of concern for a women’s equality and was not an outspoken supporter of women’s suffrage. Indeed, Ellen seemed quite accepting of men and women having distinct roles and responsibilities. Hers was a fundamentally pragmatic outlook: since women had responsibility over the household domain (Thompson, 1992), including most of the decisions and actions concerning consumption in the home, discharging their duties wisely required that they have the necessary education and practical knowledge to do this.

Impact on environment and need for control (euthenics)

In addition to her concern for increasing household (women's) knowledge, to allow them to regain some control over the industrializing economy, Ellen was also concerned with governing the sources of pollution, and the promotion of a clean and healthy environment across a range of scales. We might recognize this concern today as relating to the concept of “nested systems.” At her 1910 MIT convocation address, she said “the quality of life depends on the ability of society to teach its members how to live in harmony with their environment—defined first as the family, then with the community, then with the world and its resources” (Swallow, 2014, p. 95). She gave great importance to the therapeutic value of the pristine environment.

At the municipal and local levels, she was concerned with those polluting processes that could be “controlled”—one of her later labels for her work was “euthenics,” which she subtitled “The science of the controllable environment” (Richards, 1910, p. v). Her faith in science to facilitate the improvement in humanity's condition was unshakable and, for her time, understandable. After all, she was one of the first people to analyze urban water systems and to propose sewage treatment standards, and her work prompted the introduction of the first factory and food inspection laws in Massachusetts. At all scales, from the home to the broader environment, she held that knowledge could be liberating and a force for good, and she had “high hopes for the improvement of the controllable environment of human beings through the application of scientific knowledge” (Hunt, 1912, p. 406). She certainly thought that those environments that were largely constructed by humans and in which the primary problems in health and well-being were due to human activities could and should be controlled, which they had not been to date. It is also understandable that the primary location for her program of emancipation through knowledge was in the home. In practical terms, this is where “normal” everyday decisions were made about such issues as what foods to purchase and how to prepare them, and when and how to clean the body and the home. The home occupants' bodily health and disease exposure followed directly from these choices. Similarly, ecological resource pressure followed directly from these choices, and Ellen recognized both as part of a systematic challenge. Elizabeth Shove (2004), writing around a century later, argued along similar lines, saying:

Notions of what it is to be a normal and acceptable member of society have far-reaching environmental implications: they carry in their wake a trail of inescapable resource requirements like those associated with daily showering, with wearing freshly laundered clothing, with not having a siesta, with eating imported food or having foreign holidays. (p. 77)

Oekology/ecology

By the mid-nineteenth century, the term “nature’s economy” had for some time been used to describe the dynamic relationship between species and their habitats. The metaphorical extension of “economy” to nature implied that the way nature orders and distributes resources to its animal population could be understood as being *like* the way households acquire and distribute resources to their members (Gaziano, 1996). In 1866, Haeckel suggested a science for the study of nature’s economy that would focus on the interrelationship between organisms and their environments. “Oekology,” as it was originally spelled, was defined by Haeckel as “the body of knowledge concerning the economy of nature [in the original German, ‘*Naturhaushalt*’—literally ‘nature’s household’]” (Lawrence, 2001, p. 675).

Even within Germany, there was little immediate uptake of the term, and Haeckel himself seemed to have had no further use for it. Over two and a half decades would pass before Ellen picked up the term and used it for the first time in the US. There is no evidence that Ellen met Haeckel in person, although she could speak German and did visit his laboratory in Jena in 1876, and presumably encountered the term around that time.

Ellen saw the term “ecology” (focused specifically on humans) as neatly capturing her broad concerns for human-created environmental conditions and the health consequences for people living in those conditions. She resolved to use it to name her science. In her biography of Ellen, Pamela Swallow (2014, p. 93) claimed that Ellen formally wrote to and obtained Haeckel’s permission to use the term. In late November 1892, in a grand opening at the Boot and Shoe Club in Boston, Ellen formally launched what she termed “the science of the conditions of the health and well-being of everyday human life,” elaborating:

For this knowledge of right living, we have sought a new name ... As theology is the science of religious life, and biology the science of [physical] life ... so let Oekology be henceforth the science of [our] normal lives ... the worthiest of all the applied sciences which teaches the principles on which to found ... healthy ... and happy life. (Clarke, 1973, p. 120)

Central to this concept was that the environment formed people’s lived experiences and that they responded to that both physically, in terms of their health and well-being, and socially, in that they came to accept as normal what was in fact constructed by societal arrangements and policy process. Conditions could be improved if people only knew about and agitated for that change. She said, “the environment that people live in is the environment that they learn to live in, respond to, and perpetuate” (Clarke, 1973, p. 159). Haeckel’s unused term was adopted in the English language for the first time as the science of the everyday social and

environmental conditions conducive to humans living well. The *Boston Globe* front page headline of December 1, 1892 announced, “New Science. Mrs Richards Names it Oekology” (Swallow, 2014, p. 93).

It was not to last. The following year, in September 1893, Ellen’s use of Haeckel’s term was claimed in the *British Medical Journal* for a much narrower application. “Oekology,” the definition stated, “chiefly rests on the exploration² of the endless phenomena of animal and plant life as they manifest themselves under natural conditions” (Sanderson, 1893, p. 613).

There was no question which of these two incompatible uses of the term would persist. Ellen’s application of “oekology” was doomed for several reasons. First, despite Ellen establishing herself as a scientist, the practice of science was male-dominated, and if an established group of men wanted the term to mean one thing, there was little chance a woman’s alternative use of the term would prevail. Relatedly, from this group’s perspective, the only valid practitioners capable of conducting a proper science were bona fide scientists. Ellen’s science encouraged the involvement of non-scientists, such as civil engineers, public works officials, teachers, and business. From an orthodox perspective, knowledge generated by such individuals was inadmissible. Further, Ellen’s science was concerned with what *should be*, rather than only describing what *was the case*. She took an ethical stance in the conditions she studied. People were experiencing sickness, disease, and malnutrition, leading them to live lives far shorter and more miserable than they could be. Her science aimed to change the world, not just record it as a purely objective science would do. But, perhaps above all, the “ecology” that the male scientists were promoting had no room for the study of humans. Despite Darwin’s application of his evolutionary ideas to humans in, for example, *The Descent of Man* (1871), a newer interpretation of his thesis was being developed under the name of “eugenics.” In this view, unlike plants and animals, humans were not subject to evolutionary pressures from the environments in which they lived. The betterment of the human race, it was held, would come through breeding and the purity of bloodlines. To someone that held this perspective, Ellen’s notion that the condition of the environment largely determined the condition of the human that lived in it was anathema. As Clarke (1973) put it, “plants and animals were responsive to environment. But not man. Heredity predestined the human species, not environment, they said” (p. 155).

Although it was some years before Ellen completely gave up on her use of the term “oekology,” it was slowly and inevitably slipping from her grasp and into the male-dominated domain of professional biological scientists. She would have to find another term for her work.

² Clarke (1973, p. 154, quoting Sanderson) attributed to this definition the more dominating word “exploitation,” with italics for emphasis.

Home economics and human ecology

This search took her to Lake Placid in 1899, at the invitation of Melville Dewey, then the Director of the State Library and of Home Education in New York State. Lake Placid Club was Dewey's summer home. Dewey had a pragmatic issue: domestic science had been included as part of the state's test for college entrance and Dewey needed assistance in what questions might appear in that test. There was also the related issue of where in his library cataloguing system the subject would appear, which also required settling on what it should be called. More broadly, the general attributes of the home and domestic studies were very much under discussion at the time and these discussions needed an identity around which to coalesce. Dewey wanted Ellen to be the catalyst for that process.

It was a wrench for Ellen to throw in her lot with domestic science. Her vision had always been a conjunction of the science of the environment with its application in the domestic sphere. Overtly siding in a leadership role with the domestic consumer – nutrition side would mean diminishing the science. Interestingly, this disciplinary politicking would see the field of nutrition distancing itself from home economics for the same reason a century later. However, the reality was that the science side of the equation was not prepared to accept the partnership that she envisaged. Further, the science side was on stronger grounds than the domestic side and in less need of her help, which it had in any case rejected. Conversely, the domestic, female side “had too few scientists, less discipline, little agreement, and no direction” (Clarke, 1973, p. 169). Partly with Dewey's cajoling, and partly because it was clear which side needed her most, Ellen resolved to pour her efforts into domestic science.

For the next decade, Ellen led the annual Lake Placid conferences, always under her regime of daily morning outdoor walks to clear the mind and prepare the body. The conference drew in an ever-widening group of male and female intellectuals, academics, and progressive thinkers to discuss the form and content of domestic science. Eventually, the name “home economics” was settled upon. For Ellen, the term represented something of a compromise, but she accepted it, saying:

It is the economy of the human mind and force that is most important, and so long as the nurture of these is best accomplished within the four walls of the home, so long will the word Home stand first in our title. (Hunt, 1912, p. 270)

Home economics was more than teaching sewing and cooking, as Ellen unkindly characterized pre-existing domestic science programs. Home economics was:

The study of the laws, conditions, principles, and ideals which are concerned on the one hand with man's immediate physical environment and on the other hand with his nature as a social being, and is specially the study of the relation between these two factors. (“Lake Placid Conference on Home Economics”, 1902, p. 70)

It was both a practical science and a philosophical study of the ecology of everyday (human) life, which rested implicitly on early versions of the holistic and systems theory that would later emerge in the ecological sciences in the 1920s and 1950s, respectively (Thompson, 1992). It was also clearly influenced by the early work of Ellen in developing her ecology as a field.

In 1908, the American Home Economics Association was established, with Ellen as its president. Although she died in March 1911, home economics went on to be a major program of study in many institutions in the US and elsewhere. While its academic status is looked down upon in some quarters, at its time, it was a major part of a significant social and educational reform addressing pressing issues in poverty, health and aging, food and nutrition, and education and community development, all under great pressure from large-scale in-migration. Moreover, many of these issues endure in different forms today (Gentzker, 2012).

Despite this, some programs have sought to circumvent the stigmatizing gender-stereotypical association of “home economics” with “womanly household duties,” such as by adopting the title of “human ecology” for their studies, citing Ellen’s original consideration of that label for the field (“Cornell University Library”, 2001). Both terms share etymological roots in *oikos* (the household) and *oikonomia* (originally meaning the management and economy of the household). Had Ellen Swallow Richards not been blocked by male gate-keepers to “proper science,” there is evidence to suggest that the evolution of home economics may have been more closely tied to that of ecology and, moreover, human ecology. As Glaeser and Glaser (2010) commented, the fields may be related, with the difference being of scale and purpose:

These two [distinct ways the subject matter can be approached] represent two different directions of human ecology, the first [“home economics”] mainly oriented towards problem-solving and policy support, the second [as generalizable principles] towards methodological innovation. Both directions are needed because they mutually reinforce each other. (p. 135; see also the elaboration in Christensen [2014])

Conclusion: Was Ellen Swallow Richards a human ecologist?

Ellen Swallow Richards does indeed deserve recognition as the mother of human ecology. She was undoubtedly the first person to use the term “human ecology,” as a specific elaboration of what she had earlier intended “ecology” to cover. In the introduction to her book on euthenics,³ she wrote:

³ “Euthenics” was another term she coined to try to capture the broader sphere of concern of which home economics was but a part. The root is again Greek, with “eu” meaning “well.” It can be related to Aristotle’s “good life” or state of human flourishing, as literally the state of the “good spirit.” Euthenics is the cause of wellness or flourishing; that is, the conditions under which Aristotle’s “flourishing” can be achieved.

Human Ecology is the study of the surroundings of human beings in the effects they produce on the lives of men. The features of the environment are natural, as climate, and artificial, produced by human activity, such as noise, dust, poisonous vapors, vitiated air, dirty water and unclean food. (Richards, 1907, p. v)

Beyond noting the terms she used, we can seek key attributes that might identify Ellen as a human ecologist in the way we understand it today. Some general criteria describing a present-day human ecologist include:

- Their object of concern is the interrelationship between humans, their cultures, and their ecosystems.
- They seek a holistic or “comprehensive” approach to understanding these interactions as acting within a larger context, and hence hold that part of the situation cannot be remedied in isolation of the whole of which it is a part.
- They are concerned with the sustainability of any resource use in terms of the environment’s capacity to continue to provision that resource over time, or its capacity to assimilate or otherwise remove hazardous pollutants over time.
- They are concerned with the social and ethical dimension of the current social-environmental arrangements, asking are they *fair* or *ethical*? This includes the fairness by which the burden of creating a “solution,” however desirable, might be distributed.
- They are at least aware of the motivational aspects of social change and are concerned with what might enthruse people to work together to try to achieve a just, sustainable, and worthwhile future.

And finally:

- The attainment of such a future is a collective effort with unavoidable political challenges to overcoming entrenched barriers, including those that involve disparities of power, as well as those arising from the underlying cultural values (“paradigms”) that legitimize everyday assumptions about what constitutes normal, everyday behavior (Dyball, 2011; Dyball & Newell, 2015).

Without repeating key points from the above discussion, we can turn to Richardson (2002), who summarized Ellen’s contribution neatly:

Richards found it impossible to isolate the physical environment from the social responses of people to their surroundings. She actively used the term “*social environment*.” Daring to question the prevailing paradigms in the life sciences and social sciences alike, she urged more dynamic and interdependent views of global humanity in its relationship with the natural environment. Her hopes for the betterment of the human condition and conservation of nature’s ecological equilibrium led her to ask fundamental sociological and political questions about the environmental costs of capitalist technology. (p. 46)

Although there are several terms and concepts that Ellen would not have used or that did not exist in her day, broadly speaking, she shared the key concerns of contemporary human ecology and went some way to develop methods to understand and tackle the issues of this field. She also introduced the term “human ecology” in the US, and her sphere of concern and methodological approach was that of a human ecologist as we would understand it today. The rift between human ecology and home economics was not of her making, and provisional indications are that it is not such a rift at all. In fact, given current sustainability challenges with our food system (Ingram et al., 2016), it would be timely to re-examine how Ellen’s original conceptions of the intersection of human ecology and home economics could strengthen the contributions of both fields to a sustainable food future.

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