

"A Social Lamarckism Crisis in American
Reform Thought: Lester Frank Ward"

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The late nineteenth-century announcement of August Weismann's findings in regard to the impossibility of inheriting acquired characteristics created a crisis of confidence among a school of American social reformers who prided themselves on the scientific basis of their evolutionary reform thought and who had consistently sought to appropriate the aura of scientific reliability to validate their reform programs. Most striking of these reformers who believed in an immediate, monistic application of natural scientific ideas to human society was Lester Frank Ward. Ward, a paleobotanist with the United States Geological Survey and a founder of sociology in this country, led an attack on Weismann's conclusions in fear that they would undermine Ward's program of melioristic and nationalistic reforms generally centered on educational programs.

Lester Ward, along with nearly all American biologists and social philosophers of the generation following the Civil War, accepted the idea of biological transmission to their descendants of certain characteristics acquired by organisms during their lifetime. The concept itself was quite old, an established element in the folk-beliefs of Western culture, but early in the nineteenth century it received a scientific formulation and the name of its formulator, Chevalier de Lamarck, a French naturalist. Lamarck held that the habitual exercise of an organ by any creature increased the capacity of the organ and that any structural modifications were preserved thereafter through biological inheritance. Charles Darwin, as well as most early Darwinians, accepted Lamarckism as one source of the variation in species which provided the occasion for the operation of natural selection. The young Ward, like other early supporters of evolutionary theory, was happy to accept theoretical support wherever it might be found, and given the very real inadequacies in Darwinian theory to explain the origin of variations, he too brought Lamarck into service. In Ward's case, the acceptance of Lamarck by Auguste Comte and Herbert Spencer, his key intellectual mentors, served to confirm his acceptance of the idea.

Just as important to Ward as the biological necessity of Lamarckism to help explain the origin of variability, was its sociological utility. American reformers, because of the very history of their society and its ethos, were drawn to environmental and institutional programs of reform as those most consistent with American values and aspirations; Ward was an embodiment of such a position. For such people, Lamarckism provided a source of legitimacy in validating the efficacy of social reform; the improvements of one generation, like their sins, could be passed on to subsequent generations. From this foundation it was

possible to affirm a belief in unilinear progress for American society and to create the public opinion necessary for providing the financial and political support needed by most reform movements (2).

Lamarckism, like other early scientific concepts based on shrewd guesses and philosophical conclusions, was shy of empirical proofs and experimental confirmations. In fact, it was particularly vulnerable to association with crude tales of the inheritance of mutilations and marks on the offspring of women traumatized during pregnancy. In the late 1880's, evolutionary scientists and social reformers who rested their premises on biological evolution were forced to reconsider their Lamarckian assumptions because of the experimental evidence offered by a German embryologist at the University of Freiburg, August Weismann.

In studies conducted during the 1880's, and first published in English in 1889, Weismann sought to demonstrate that because of the nature of cellular action at the heart of the reproduction process, only germ—or sex—cells were involved; there was no way for the more ordinary body—or somatic—cells to influence the hereditarian transmission carried by the germ-plasm. Acquired characteristics gained through exercise or from the effect of environment could not be passed on to progeny; an organism could inherit only those traits provided in the make-up of the germ-cells of its parents. Natural selection alone, concluded Weismann, operating on the variations created by the complex union of ancestral germ-plasms from dual parents and by less-well-explained genetic "sports," or mutations, explained the processes of biological evolution. Darwin, now dead, was out-Darwined by the exclusive prominence given to natural selection by the adherents to Weismann's conclusions; and the Neo-Darwinians, as they were soon called, moved to strike Lamarckian conceptions from evolutionary theory and to minimize the evolutionary role of sexual selection and mutations.

Lester Ward, confronted with Weismann's challenge to his understanding of biological evolution and evolutionary social reform, as well as being faced with the necessity of preparing a presidential address for the Biological Society of Washington, spent the summer of 1890 bouncing in a buckboard over the Triassic terrain of Maryland and Virginia while engaged in Geological Survey work, reading Weismann and drafting his response. In his address, as later, Ward's critique was based on criticisms of Weismann's logic and support for Ward's own ideological needs, since his personal work in paleobotany and sociology left little time or inclination for work in experimental embryology. When his address on "Neo-Darwinism and Neo-Lamarckism" finally emerged, it took the form of a vigorous criticism of Weismann's "hypotheses" and a reaffirmation of the "laws" of Neo-Lamarckism (4).

The warmth of Ward's reply suggests that in the absence of a concept of culture severed from all biological connections, to abandon Lamarck while accepting Weismann was viewed by him as an abandonment of the social sciences to unrestrained biological determinism (2). The difficulty for Ward in parting company with Lamarck was the absence of an alternative theory of culture with scientific authority that could legitimize the efficacy of social reform activity. Before

Weismann it had been possible in Lamarckism to emphasize the cultural aspect of a mixed socio-biological process, but now at first flush it seemed necessary to Ward to choose between race and culture. The nature of cultural change had not yet been severed from the biological processes that found shelter in the muddled biocultural terminology of Lamarckism.

Ward's lecture to the Washington area biologists in early 1891 initiated a spirited campaign of several years by him to maintain room for Lamarckism in evolutionary theory. During the campaign, however, Ward conceded increasing territory to the Neo-Darwinians. The contest continued into the early 1900's for Ward, as it did for many other American social scientists, although the evidence in his work of that decade suggests that he reluctantly gave up Lamarck as the weight of contrary evidence accumulated and as he recognized more hostile deterministic forces in the eugenics movement. Yet the importance of Lamarck to his social thought makes "social Lamarckism" as accurate a description of Ward's thought as does the more commonly ascribed designation of "social Darwinism (1)."

Ward based his defense of Lamarckism on two main grounds: the failure of Weismann to provide a satisfactory explanation of the appearance of variations and the very limited knowledge yet confirmed about the very minute and largely unknown processes of inheritance. The verdict was not yet in, Ward contended, and until it was, Lamarck's reliability should be presumed given the assistance his ideas had provided Darwin and the pragmatic value they retained for influencing public support of social action. Ward did not spare Lamarck in his critique, however. The French naturalist, according to Ward, had not recognized the operation of natural selection, and Ward never doubted that that process was much more instrumental in the course of evolution than Lamarck's "law of exercise." Many of the examples of variation credited to acquired characteristics, he admitted, were no doubt less clearly understood actions of natural selection. And the tendency of Lamarck and later proponents to believe that accidental mutilations could be transmitted to offspring was disavowed by Ward, although he accused the Neo-Darwinians of continuing their fire on such strawmen.

In Weismann's work, Ward was particularly critical of how the embryologist could explain hereditary variation if environment could not cause specific changes and if the substance of germ-plasm could only be explained by referring it back further to more ancestral germ-plasm. From whence, Ward questioned, could the ancestral variations have appeared? Both Weismann and Ward at this time minimized mutations, although Ward was able later to accept mutations as a substantial replacement for acquired characteristics since his ego found consolation in his own earlier "fortuitous variation" theory of heredity that came close to the concept of mutations (3).

On the issue of acquired characteristics, Ward's paleontological orientation using fossil evidence was a handicap. Not coincidentally, many of the strongest critics of Weismann in America were paleontologists, including men like Edward D. Code, Henry Fairfield Osborn, Alpheus Spring Packard, and John A. Ryder. The nature of their evi-

dence differed dramatically from that of the experimental embryologists since the evolutionary series they were able to reconstruct were biased toward evolutionary successes which demonstrated functional variations and since the distance in time from the variations studied led them to credit changes to the influence of the powerful climatic and environmental forces that their work also uncovered.

In his critique of Weismann, Ward professed to be unable to comprehend how his adversary could argue that climate, temperature, and nutrition were able to create variation in the germ-plasm, but still reject the idea of acquired characteristics. Weismann had been forced to concede that environmental agents might have some random genetic effects, but he insisted quite rightly that this was not the same as saying that an organism could transmit functional modification to its offspring through its own efforts. Apparently the overlapping arguments of environmental influences and the much more narrow and teleological idea of the inheritance of structural modifications through exercise and exertion confused the issues. Ward's argument was further weakened, given his minimization of fortuitous variation in 1891, by his apparent assumption that most variations were functional as a result of the Lamarckian phenomenon despite the fact that numerically most variation was clearly nonadvantageous and often disadvantageous.

The transmission of heredity, Ward conceded, was a subtle process not yet fully understood. He was unable to supply evidence to support his modified Lamarckian beliefs, but, he insisted, neither was Weismann able to demonstrate empirically the source of variation. "The truth is," Ward suggested at one point, "that the real phenomena of heredity are too recondite for direct observation (4)." Nevertheless, he argued defensively, the burden of proof rested on the embryologists and until that was supplied the idea of the inheritance of acquired characteristics should be accepted because of its pragmatic utility.

By utility, Ward, of course, referred to the effect that scientific ideas might have on human behavior. The importance of Ward's automatic intellectual reflex to draw the social implications from a debate in the nature of biological evolution became clear in the concluding remarks of his Washington address and in his later amplification of those ideas in an article for laymen (5). Unfortunately, the urge to judge his scientific ideas by a test of their pragmatic value to society locked Ward in to his Lamarckian position. What most exasperated him about Weismann, he admitted, was the contention that environment could affect germ-plasm in only an irrational, haphazard fashion, while application, effort, and the habits of the organism were of no account. "If nothing that the individual gains by the most heroic or the most assiduous effort can by any possibility be handed onto posterity," he wrote, "the incentive to effort is in great part removed. If all the labor bestowed upon the youth of the race to secure a perfect physical and intellectual development dies with the individual to whom it is imparted, why this labor (4)?" In short, Weismannism was a socially immoral and un-American ethic.

What Ward feared was that Weismann's conclusions would bolster the proponents of *laissez-faire* and of social determinism. If effort and

social reform could not change man, then it was absurd to try. The public's tenuous financial support to education was particularly in jeopardy, he believed, by this new refinement in "nature-worship." Consequently, it was to the effects on education of the debate between the Neo-Lamarckians and the Neo-Darwinians that he devoted his popular writing on heredity. While most mental traits were non-advantageous in the struggle for survival, Ward contended, those of cunning, money-getting, and political intrigue had held survival value as had the competitive traits in lower animals. But the higher intellectual and ethical faculties, he maintained, had not been advantageous in a competitive jungle and could only have survived through other than natural selection processes. The growth of capacity, which he assumed in those traits, could only have been created by the incremental increases of each generation that exercised their brain cells and transmitted the structural increase to their progeny.

The Neo-Lamarckians, he stressed, had never believed that knowledge or culture were transmitted directly to descendants through inheritance. Only the *capacity* for acquiring knowledge was hereditary. Each generation had to acquire anew the knowledge that humanity had accumulated—a sufficiently discouraging circumstance in itself. Yet the social need was imperative; each generation had to replenish and exercise the store of knowledge or else both the social inheritance of the knowledge content and the biological inheritance of cellular capacity would diminish. The struggle had always been uphill, he suggested, so the "comforting popular belief" in the transmission of acquired characteristics had emerged to bolster the morale of those in that struggle. While this pragmatic explanation for the origin of the idea suggests that Ward was less than sure of the scientific accuracy of Lamarckism itself, he feared any immediate acceptance of Weismann would dangerously weaken the public's resolve to support education and the social ethic of work on which he believed civilization depended. So, he concluded, "until the doctors of science shall cease to differ on this point and shall reduce the laws of heredity to a degree of exactness which shall amount to something more like a demonstration than the current speculations, it may perhaps be as well to continue for a time to hug the delusion (5)."

Ward continued the Neo-Lamarckian debate up to the mid-1890's, but in substance he conceded territory to Weismann at the same time that he proclaimed Weismann's concessions (6, 7, 8). Once Weismann was willing to accept the genetic influence of climate and nutrition on the germ-plasm, however, Ward was apparently satisfied that environment as an important biological and social force was preserved as a weapon against the naturalistic determinists, and he edged out of the debate. Lamarckism had become the symbol for environmentalism, but once the broader environmental principle had been accepted in however muted a fashion, Ward was willing—though reluctantly—to abandon his overt espousal of the inheritance of acquired characteristics.

In *Pure Sociology*, written in 1902, Ward still championed Lamarckism as it applied to the mind, or brain, but, paradoxically, he now accepted Weismann as the authoritative spokesman for an explanation

of the inheritance process (9). The acquisition of knowledge, "the social germ-plasm," he acknowledged, followed social processes unlike those in biology. "Organic and social heredity are not the same and cannot be interchanged," he wrote, as he prepared his retreat from Lamarck. "We may be spared," he concluded, "from entering into the endless and hopeless discussion of the transmission of acquired characters."

By the time Ward's *Applied Sociology* was published in 1906, he no longer mentioned the inheritance of acquired characters, credited himself with supplying new information to Weismann, and in his brief discussion of genetic inheritance placed himself in full accord with the matured Neo-Darwinian position (10). "This view," he now found, despite a lingering trace of Lamarck, "has its hopeful or optimistic side, for, as we have seen, nothing is ever wholly lost, and the accumulations of unnumbered generations continue to exist, . . . ultimately to come forth and exert their due influence upon the world." The Weismannism that had once seemed to threaten activist reform efforts finally had been domesticated by Ward to serve as a supporting rationale for reform replacing the now-discredited Lamarckism.

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