

[Forthcoming in *Penser l'évolutionnisme: Nietzsche, Bergson, Dewey*, ed. Antoine Daratos & Paul Walter, Paris: Vrin, 2019]

Dewey, Darwinism, and Directed Variation

Dewey was a Darwinian—what could be more obvious? He famously declared in 1909 that “the ‘Origin of Species’ introduced a mode of thinking that in the end was bound to transform the logic of knowledge, and hence the treatment of morals, politics, and religion.”¹ Turning to the history of biology, however, we discover that the period of Dewey’s education and early career—the 1880s and ’90s—saw an “explosion of interest in non-Darwinian ideas.”² Darwin had minimized the role of the organism and the environment in directing variation, but most naturalists instead followed Herbert Spencer, who argued that spontaneous variation and natural selection could not explain “a mass of morphological phenomena.” In particular, complex adaptations seemed to require that multiple variations be coordinated or directed in some way, suggesting that “functionally-acquired modifications”—those produced through the interaction of organism and environment—might have a greater role than Darwin admitted.³ Was Dewey really a Darwinian during the so-called eclipse of Darwinism?⁴

¹ J. Dewey, « Darwin’s influence upon philosophy », *Popular science monthly* 75, 1909, p. 90.

² P. J. Bowler, « Revisiting the eclipse of Darwinism », *Journal of the history of biology* 38, 2005, p. 19.

³ H. Spencer, *The principles of biology*, t. 1, London, Williams and Norgate, 1864, p. 449-453; cf. C. Darwin, *On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life*, London, John Murray, 1859, p. 133-134.

⁴ P. J. Bowler, *The eclipse of Darwinism: Anti-Darwinian theories in the decades around 1900*, Baltimore, Johns Hopkins University Press, 1983; M. A. Largent, « The so-called eclipse of Darwinism », *Transactions of the American Philosophical Society* 99, 2009.

No. Gérard Deledalle was right to say that “pragmatism is a biocentric philosophy” and that “life lived in its evolution is the essential category of pragmatism.”⁵ But I will argue that the evolutionary basis of Dewey’s pragmatism was non-Darwinian: according to Dewey, directed variation was a fundamental feature of social evolution.

Dewey would have encountered debates over the nature of biological variation in *Psychological Review*, the *Monist*, and *Open Court*, journals in which he himself published. These debates had become more heated in 1889, after the publication of two books by well-known biologists: Alfred Russel Wallace’s *Darwinism* and August Weismann’s *Essays upon Heredity*. Wallace devoted an entire chapter to “Fundamental Problems in Relation to Variation and Heredity,” attacking a variety of naturalists—including Spencer and the American paleontologist Edward Drinker Cope—for exaggerating the importance of evolutionary factors other than natural selection: “Whatever other causes have been at work, Natural Selection is supreme, to an extent which even Darwin himself hesitated to claim for it. The more we study it the more we are convinced of its overpowering importance.”⁶ Weismann argued that the most obvious examples of directed variation—namely, characters acquired during an organism’s lifetime—could not be inherited, since the germ cells were isolated from the rest of the body.⁷ The position of Weismann and Wallace would soon be labelled ‘Neo-Darwinism,’ in contrast to the ‘Neo-Lamarckism’ of Cope and others.⁸

⁵ G. Deledalle, *Histoire de la philosophie américaine, De la Guerre de Sécession à la Seconde Guerre Mondiale*, Paris, Presses Universitaires de France, 1954, p. 26.

⁶ A. R. Wallace, *Darwinism, An exposition of the theory of natural selection with some of its applications*, London, Macmillan, 1889, p. 444.

⁷ A. Weismann, *Die Continuität des Keimplasma’s als grundlage einer Theorie der Vererbung*, Jena, G. Fischer, 1885; translated in A. Weismann, *Essays upon heredity and kindred biological problems*, Oxford, Clarendon Press, 1889, chap. 4.

⁸ L. F. Ward, « Neo-Darwinism and Neo-Lamarckism », *Proceedings of the Biological Society of Washington* 6, 1891; E. D. Cope, « Alfred Russel Wallace », *Evolution in science, philosophy, and art, Popular lectures and discussions before the Brooklyn Ethical Association*, New York, D. Appleton, 1891, p. 12; H. F. Osborn, « The present problem of heredity », *Atlantic monthly* 67, 1891, p. 356, 360.

Weismann's theories were directly opposed to those of Spencer, who was an important figure for Dewey despite their differences.⁹ At the end of *Principles of Psychology*, a book that Dewey read and taught immediately after it appeared in 1890, William James had embraced Weismann as an ally in his fight against Spencer's psychology. Nevertheless, James admitted that Spencer's point about complex adaptations, mentioned above, was compelling:

Since, says Mr. Spencer, the accidental variations of all parts of the body are independent of each other, if the entire organization of animals were due to such accidental variations alone, the amount of mutual adaptation and harmony that we now find there could hardly possibly have come about in any finite time.¹⁰

A few years later, Spencer and Weismann had a public debate, in which this issue of the “co-adaptation of co-operative parts” was the “crucial case.” The important variations for Weismann were in the “determinants” of the germ-plasm, so called because they determined the character of the germ cells and thus the organism as a whole. Spencer asked, “What made [the ‘determinants’] simultaneously vary in the requisite ways?” and declared that Weismann had no answer beyond “*a fortuitous concurrence of variations*; reminding us of the old ‘fortuitous concurrence of atoms.’”¹¹

Weismann ultimately granted that “the main difficulty as to whence the necessary variations come still remains.”¹² He had one last trick up his sleeve, however: a process he called “germinal selection,” which depended on the idea that variations of a certain direction are more likely to appear than others because of a kind of co-operation between germ-level selection and organism-level selection. According to Weismann, the determinants are

⁹ T. Pearce, « The origins and development of the idea of organism-environment interaction », in G. Barker, E. Desjardins, and T. Pearce (eds.), *Entangled life, Organism and environment in the biological and social sciences*, Dordrecht, Springer, 2014, p. 23-27; T. Pearce, « The Dialectical Biologist, circa 1890: John Dewey and the Oxford Hegelians », *Journal of the history of philosophy* 52, 2014.

¹⁰ W. James, *The principles of psychology*, New York, Henry Holt, 1890, t. 2, p. 687.

¹¹ H. Spencer, « A rejoinder to Professor Weismann », *Contemporary review* 64, 1893, p. 905-906.

¹² A. Weismann, « Heredity once more », *Contemporary review* 68, 1895, p. 430.

constantly competing for nourishment. If individual selection favors the increase of a set of parts,

the determinants cannot vary in the *minus* direction, and at the same time the average capacity for assimilation of these groups of determinants is increased. The supply of nutritive fluid is therefore increased, and the *plus* variations are again favoured more than *minus* variations.

That is, in cases where individual selection favors organism-level variation in the plus direction, intra-selection results in a greater number of plus variations at the germ-level.

Weismann concluded that “the influence of selection on the elements of the germ in directing variation plays an important part in the whole process of natural selection.” Spencer’s criticisms had thus pushed Weismann to a new position: acquired characters could not be inherited but variation at the level of the organism could “become directed” through germinal selection, a theory he would soon elaborate in the *Monist*.¹³

Dewey began alluding to the Spencer-Weismann debate in 1894, only a year after it began. He almost certainly read an article on the subject by the American paleontologist Henry Fairfield Osborn (an ally of Cope): it was published in the May 1894 issue of *Psychological Review*, an important venue for Dewey’s own work at the time.¹⁴ Osborn explicitly mentioned the directedness of variation, siding against Weismann and the Neo-Darwinians:

The fundamental postulate of the selectionists that adaptive structures arise out of the fortuitous play of the adaptive and non-adaptive variations is negated by direct evidence to the contrary. Palaeontology shows conclusively that there is an adaptive trend in variation under the operation of some law; whether this is the Lamarckian law or some unknown law remains to be determined.¹⁵

¹³ Weismann, « Heredity once more », op. cit., p. 431-432; A. Weismann, « Germinal selection », *Monist* 6, 1896. For more on Weismann’s changing views at this time, see R. G. Winther, « August Weismann on germ-plasm variation », *Journal of the History of Biology* 34, 2001; F. B. Churchill, *August Weismann: Development, heredity, and evolution*, Cambridge, Harvard University Press, 2015, chap. 18.

¹⁴ E.g., J. Dewey, « The psychology of infant language », *Psychological review* 1, 1894. Dewey was also a member of the editorial board: see J. H. Tufts to W. R. Harper, n.d. [December 1893], in J. Dewey, *The correspondence of John Dewey, 1871-1953*, ed. L. A. Hickman, Charlottesville, VA, InteLex, 2008, t. 1, n° 00477.

¹⁵ H. F. Osborn, « The discussion between Spencer and Weismann », *Psychological review* 1, 1894, p. 315.

He also emphasized the debate's broad implications: "While inconclusive it is most stimulating and has attracted wide attention, because the question bears with equal force upon problems of ethics and psychology as upon all lines of biological thought."¹⁶

This claim was apparently vindicated by the arguments of Benjamin Kidd's book *Social Evolution*, which appeared that same year. As Spencer wrote in a letter "this book of Mr. Kidd takes Weismannism as one of its data & by doing so is vitiating social opinion."¹⁷ The main argument of *Social Evolution* depended on Weismann's analysis of the relaxation of selection, or panmixia. Weismann had actually opened his first response to Spencer with a discussion of panmixia, since the retrogression or degeneration of organs was usually attributed to the inheritance of the effects of disuse. Because unused organs no longer provide a fitness benefit, Weismann argued, organisms with any version of them will make the same contribution (*ceteris paribus*) to the next generation, resulting in the gradual decline of the organ: "Superfluous parts are no longer controlled by selection, are not preserved at the height of their development, but slowly sink through Panmixia."¹⁸ As Weismann had declared a few years earlier in *Open Court*, "if the fitness [*Zweckmässigkeit*] of living things in all their parts rests upon the principle of natural selection, then *this fitness must be maintained by the same process that created it*, and it must disappear so soon as this process of natural selection ceases."¹⁹

This idea that the relaxation of selection results in degeneration seemed to rule out certain views of social progress. In one of his forays into politics, the biologist Thomas Henry Huxley had argued that "the mitigation or abolition" of the struggle for existence is "the chief

¹⁶ Osborn, « The discussion . . . », op. cit., p. 312.

¹⁷ Spencer to Bunting, 3 June 1894, Sir Percy William Bunting Papers, Special Collections Research Center, University of Chicago.

¹⁸ A. Weismann, « The all-sufficiency of natural selection », *Contemporary review* 64, 1893, p. 311.

¹⁹ A. Weismann, « Retrogression in animal and vegetable life », *Open court* 3, 1889, p. 1830; translated from A. Weismann, « Ueber den Rückschritt in der Natur », *Berichte der naturforschenden Gesellschaft zu Freiburg* 2, 1887, p. 15.

end of social organization.” He claimed that “of all the successive shapes which society has taken, that most nearly approaches perfection in which the war of individual against individual is most strictly limited.”²⁰ Citing Huxley and various socialists, Kidd worried that society might begin to decline just to the extent that the struggle for existence was restricted in this way. According to Kidd, although writers such as Karl Marx, Henry George, and Edward Bellamy were right that “the lower classes of our population have no sanction from their reason for maintaining existing conditions,” they were wrong to think that the elimination of competition and rivalry was a progressive goal. On Kidd’s Weismannian view, “if the continual selection which is always going on amongst the higher forms of life were to be suspended, these forms would not only possess no tendency to make progress forwards, but must actually go backwards.”²¹

Dewey reviewed Kidd’s book in the July 1894 issue of *Psychological Review*. He ascribed to it an “extreme Weismannism of premise,” which he described as follows:

Progress is always effected through competition and struggle. There is infinite narrow variation, some variations tending slightly below, others slightly above, the existing average standard. Progress comes only through selection of favorable differentiations, and there is no selection save where there is rivalry and struggle. This biological law (with regard to which Dr. Kidd follows Weismannism in its extreme form) holds of human as of animal history. Its scene of operation is simply transferred to the rivalry of nations and of industrial life.²²

This complicated premise was Neo-Darwinism in a nutshell: evolution as a result of the natural selection of small, fortuitous, undirected variations. Given the chronology, Dewey could not have known about Weismann’s endorsement of a form of directed variation. But Osborn had recently mentioned “an adaptive trend in variation” and Dewey took this cue:

If we suppose that consciously acquired activity, and habits formed under the direction of intelligence, are conserved, the case against [Kidd’s] point is

²⁰ T. H. Huxley, *Social diseases and worse remedies*, London, Macmillan, 1891, p. 22-23; cited in B. Kidd, *Social evolution*, New York, Macmillan, 1894, p. 3.

²¹ Kidd, *Social evolution*, op. cit., p. 36-37, 68. For more on Kidd, see D. P. Crook, *Benjamin Kidd, Portrait of a Social Darwinist*, Cambridge, Cambridge University Press, 1984.

²² J. Dewey, « Social psychology », *Psychological review* 1, 1894, p. 408, 410.

much strengthened. . . . There is even no need to suppose that the conservation of rationalized activity is direct or through the organism; if the environment is so changed as to set up conditions which stimulate and facilitate the formation of like habits on the part of each individual, the same end is reached.²³

Dewey assumed that variation in human activity is plausibly directed by intelligence and involves the deliberate cultivation of certain habits. Moreover, the inheritance of such acquired habits need not involve germ-plasm changes, as it could be outsourced to the environment, with environmental modifications scaffolding the reliable production of habits. Dewey's proposed model of evolution thus included what we would now call non-genetic inheritance.²⁴

Why did Dewey favor this particular account of social evolution? Probably because it was consistent with contemporary work in developmental and comparative psychology. Psychologists such as William James and James Mark Baldwin had recently emphasized the importance of our responsiveness to the social environment—made possible by plasticity, along with imitation as the selection of preferred stimuli—in the formation of habits: “the phenomena of habit in living beings,” wrote James, “are due to the plasticity of the organic materials of which their bodies are composed”; and according to Baldwin, imitation is “the method by which our living *milieu* in all its aspects gets carried over and reproduced within us.”²⁵ Dewey was probably also familiar with the work of comparative psychologist Conwy Lloyd Morgan, who (like Dewey) had pointed out that repeated environmental shaping of

²³ Dewey, « Social psychology », op. cit., p. 410.

²⁴ On scaffolding, niche construction, and non-genetic inheritance, see J. Odling-Smee, « Niche inheritance: A possible basis for classifying multiple inheritance systems in evolution », *Biological theory* 2, 2007; W. C. Wimsatt and J. R. Griesemer, « Reproducing entrenchments to scaffold culture: The central role of development in cultural evolution », in R. Sansom and R. N. Brandon (eds.), *Integrating evolution and development, From theory to practice*, Cambridge, MIT Press, 2007; K. Sterelny, *The evolved apprentice, How evolution made humans unique*, Cambridge, MIT Press, 2012. Peter Godfrey-Smith has used ‘constructivism’ to name this aspect of Dewey’s philosophy and has linked Dewey to niche construction: P. Godfrey-Smith, *Complexity and the function of mind in nature*, Cambridge, Cambridge University Press, 1996, chap. 5; P. Godfrey-Smith, « Organism, environment, and dialectics », in R. S. Singh, et al. (eds.), *Thinking about evolution, Historical philosophical, and political perspectives*, Cambridge, Cambridge University Press, 2001, p. 258.

²⁵ James, *The principles of psychology*, op. cit., t. 1, p. 105, italics removed; J. M. Baldwin, « Imitation: A chapter in the natural history of consciousness », *Mind*, n.s., 3, 1894, p. 37; see also C. S. Peirce, « Man’s glassy essence », *Monist* 3, 1892, p. 16-18.

organisms each generation could mimic the inheritance of acquired characters: “If each plastic embryo is moulded in turn by a similar influence, how can we conclusively [sic] prove hereditary summation?”²⁶ In a criticism published in the *Monist*, Morgan had also highlighted Weismann’s admission that the mingling of germ-cells in sexual reproduction could not on its own produce “effective variation,” i.e., variation which exceeds current limits and makes evolutionary progress possible. Shortly before his debate with Spencer, Weismann had already granted that adaptations cannot be due “to rare, fortuitous variations, occurring only once” but must involve variations “exhibited over and over again by many individuals,” perhaps due to common nutritional changes.²⁷ Dewey had probably also seen Morgan’s report on experiments with young chicks and ducks, published in *Open Court*. After presenting a detailed series of observations, Morgan concluded that “inherited co-ordinations [of activities] are perfected and rendered more effective by intelligent guidance” and that “imitation is an important factor in the early stages of mental development.”²⁸ Dewey’s idea of the environment facilitating the formation and reliable inheritance of certain habits was thus ‘in the air’ for those working at the intersection of biology and psychology. Only a year later, Baldwin declared that “heredity does not stop with birth” and began to emphasize the importance of what he called “social heredity.”²⁹

Directed variation was also important to Dewey’s early functional psychology. As Jim Garrison has shown, Dewey’s early functionalism—as presented in his articles “The

²⁶ C. L. Morgan, *Animal life and intelligence*, Boston, Ginn, 1891, p. 167; see also C. L. Morgan, « The law of psychogenesis », *Mind*, n.s., 1, 1892, p. 92.

²⁷ C. L. Morgan, « Dr. Weismann on heredity and progress », *Monist* 4, 1893, p. 26-27; quoting A. Weismann, *The germ-plasm, A theory of heredity*, trans. W. N. Parker and H. Rönfeldt, New York, Charles Scribner’s Sons, 1893, p. 431-432.

²⁸ C. L. Morgan, « Instinct and intelligence in chicks and ducklings: A contribution to elementary psychology », *Open court* 8, 1894, p. 4060. As Jo Ann Boydston noted, Dewey was at this time a regular contributor to the *Monist* and its sister journal *Open Court*: see J. Dewey, *The early works, 1882-1898*, ed. J. A. Boydston, Carbondale, Southern Illinois University Press, 1969–72, p. lxxv-lxvi.

²⁹ J. M. Baldwin, *Mental development in the child and the race*, New York, Macmillan, 1895, p. 361, 364. Baldwin, the co-editor of the *Psychological Review*, had been following the Spencer-Weismann debate: Baldwin, *Mental development* . . . op. cit., p. 31.

Theory of Emotion” and “The Reflex-Arc Concept in Psychology”—was a hybrid of Hegelianism and the biological-functional approach of James and Darwin.³⁰ At the center of Dewey’s functional psychology was his claim in “Reflex Arc” that stimulus and response should “be viewed, not as separate and complete entities in themselves, but as . . . functioning factors” within a single “mode of behavior” or “organized coördination of activities.” In “Theory of Emotion,” Dewey had claimed that habitual coordinations could “become so organically registered—*pace* Weissman [sic]—as to become hereditary” and in “Reflex Arc” he applied his framework to the Spencer-Weismann dispute. According to Dewey, because neither disputant considered the functional activity of a particular organ when discussing its evolution, each of them had emphasized only one contributing factor: Spencer saw only “an external pressure of ‘environment’” and Weismann saw only “an unaccountable spontaneous variation from within the ‘soul’ or the ‘organism.’”³¹

Dewey elaborated on this point in his lectures at the University of Chicago. He argued in his “Political Ethics” classes, following the dialectical approach I have described elsewhere, that there is only “a relative distinction between organism and environment”:

Situation and functioning represent the whole process. Organism as organism does not represent the whole; neither does environment as environment. In any case of readaptation or readjustment, the old environment as well as the old organism have to adapt themselves to the new environment.

In Dewey’s view, any new variation is always a mediation of an old habit, with evolution as “a conflict within function . . . a conflict between the constant and the variable, between habit and [the] changed circumstances under which that habit must be exercised.” Without this

³⁰ J. Garrison, « Dewey’s theory of emotions: The unity of thought and emotion in naturalistic functional ‘co-ordination’ of behavior », *Transactions of the Charles S. Peirce Society* 39, 2003; see also R. J. Bernstein, *John Dewey*, New York, Washington Square, 1966, p. 15-21; A. Backe, « Dewey and the reflex arc: The limits of James’s influence », *Transactions of the Charles S. Peirce Society* 35, 1999; A. Backe, « John Dewey and early Chicago functionalism », *History of psychology* 4, 2001.

³¹ J. Dewey, « The theory of emotion. (II.) The significance of emotions », *Psychological review* 2, 1895, p. 19-20, 32; J. Dewey, « The reflex arc concept in psychology », *Psychological review* 3, 1896, p. 358, 360. The phrases “mode of behavior” and “organized coördination of activities” are from “Theory of Emotion,” which goes into more detail about the notion of coordination.

focus on mediation, said Dewey, you end up with “two schools of evolution, Spencer and Weismann; a spontaneous breaking loose, or complete control by environment.”³² The terms ‘organism’ and ‘environment,’ for Dewey, have no meaning “taken simply at large, without any statement of the function that is under consideration, and the historical development of that function.”³³ Spencer assumed that more advanced organisms—and more advanced people—were simply better adapted to a fixed environment. But for Dewey organism and environment vary together: what matters is the overall process. Spencer’s mistake was to “conceive the environment, which is really the outcome of the process of development, which has gone on developing along with the organism, as if it was something which had been there from the start.” Instead, “what has taken place has been the development of the environment, the creation of the environment, the evolution of the environment.”³⁴ As Dewey wrote in an 1898 article on Huxley’s “Evolution and Ethics,”

so far as the progressive varieties are concerned, it is not in the least true that they simply adapt themselves to current conditions; evolution is a continued development of new conditions which are better suited to the needs of organisms than the old. The unwritten chapter in natural selection is that of the evolution of environments.

And in human society, said Dewey, “selection along the line of variations which enlarge and intensify the environment is active as never before.”³⁵

In this same 1898 article, Dewey also returned to the idea that the social environment can reliably form certain habits, effectively side-stepping the Spencer-Weismann debate:

We do not need to go here into the vexed question of the inheritance of acquired characters. We know that through what we call public opinion and education certain forms of action are constantly stimulated and encouraged, while other types are as constantly objected to, repressed, and punished. What

³² J. Dewey, « Political ethics (1896) », in D. F. Koch (ed.), *The class lectures of John Dewey*, vol. 1, Charlottesville, Intelex, 2010, p. 1538. On Dewey’s dialectical approach, see Pearce, « Dialectical Biologist », op.

³³ Dewey, « Political ethics (1898) », op. cit., p. 1651.

³⁴ Dewey, « Political ethics (1898) », op. cit., p. 1655.

³⁵ J. Dewey, « Evolution and ethics », *Monist* 8, 1898, p. 339-340. For more on Dewey and Huxley, see T. Pearce, « American pragmatism, evolution, and ethics », in M. Ruse and R. J. Richards (eds.), *The Cambridge handbook of evolutionary ethics*, Cambridge, Cambridge University Press, 2017, p. 47-51.

difference in principle exists between this mediation of the acts of the individual by society and what is ordinarily called natural selection, I am unable to see. In each case there is the reaction of the conditions of life back into the agents in such a way as to modify the function of living.³⁶

Dewey focused on selection “within the life of one and the same individual” but his discussion of the “evolution of environments” implied that there would also be a kind of environmental inheritance, akin to what Baldwin called “social heredity.” As Dewey wrote in a review of Baldwin’s 1897 book *Social and Ethical Interpretations in Mental Development*,

physical heredity must, on the negative side, not be of a sort to throw the individual into antagonism beyond a certain point with the interests of the community; positively, it must lend itself, must have an active trend, towards just the sort and variety of relationships which the social tradition imposes.³⁷

Although Dewey was skeptical of certain “directed variation” views—he criticized Cope’s idea that the organism has “a type latent within . . . so that variations come along determinate directions”—this idea of an “active trend” in heredity, corresponding to the social environment, was consonant with the evolutionary framework of Osborn and other anti-Weismannians.³⁸

The Spencer-Weismann dispute was about the source of variation in evolution: Was it directed or undirected? What role did the environment play? Weismann ended up admitting that variation at the level of the organism must be directed in some way, consistent with the views of biologists like Osborn. From 1894 to 1898, Dewey participated in these debates, criticizing the Neo-Darwinian assumptions of Kidd’s *Social Evolution* and placing plasticity, variation, and heredity at the center of his own theories of psychological and social evolution.

³⁶ Dewey, « Evolution and ethics », op. cit., p. 337.

³⁷ J. Dewey, « Social and ethical interpretations in mental development », *New world* 7, 1898, p. 511; see J. M. Baldwin, *Social and ethical interpretations in mental development, A study in social psychology*, New York, Macmillan, 1897, p. 57-64. Dewey would later stress the importance of social heredity, for example in J. Dewey, « Principles of education (1902) », in D. F. Koch (ed.), *The class lectures of John Dewey*, vol. 2, Charlottesville, Intalex, 2015, p. 592. Dewey seems to have employed the notion of social heredity only after Baldwin’s extended discussion of it in his 1897 book. For more on social heredity and the related “Baldwin Effect” as part of the context for Dewey’s work at this time, see D. J. Depew, “The rhetoric of agency in William James and John Dewey: Evolutionary psychology at the turn of the 20th century” (unpublished manuscript).

³⁸ Dewey, « Political ethics (1898) », op. cit., p. 1652.

He refused to accept Weismannism: not only did he think that acquired psychological characters were often inherited, he also suggested that this inheritance could be secured by the continuity and modification of the social environment rather than through changes to the organism itself. For Dewey, organism and environment co-evolve: we make a mistake when we try to attribute variation and evolution to either the environment or the organism, taken alone.

By the time Spencer died in 1903, however, Weismann's views had triumphed.

Despite his earlier doubts, Dewey was fully in Weismann's camp when he addressed the National Negro Conference in New York City in 1909:

The whole tendency of biological science at the present time is to make it reasonably certain that the characteristics which the individual acquired are not transmissible, or if they are transmissible, then in such a small degree as to be comparatively a relatively negligible.

Echoing Kidd but rejecting his racism, Dewey now gave Social Weismannism a positive spin:

This doctrine that acquired characteristics are not transmitted becomes a very encouraging doctrine because it means, so far as individuals are concerned, that they have a full, fair and free social opportunity. . . . In other words, there is no 'inferior race,' and the members of a race so-called should each have the same opportunities of social environment and personality as those of a more favored race.

Given the realities of racism, there was of course no true equality of opportunity. However, Dewey thought it was society's responsibility—again following Kidd's harmonizing of progressive capitalism and Weismannism—"to see to it that the environment is provided which will utilize all of the individual capital that is being born into it." Explicitly embracing "social heredity," Dewey insisted that heredity and evolution are about intelligently evolving environments, not spontaneously varying germ-cells.³⁹

³⁹ J. Dewey, « Address of John Dewey », *Proceedings of the National Negro Conference, 1909, New York, May 31 and June 1*, [New York?], n.p., [1909?], p. 71-72, <https://hdl.handle.net/2027/nyp.33433081797809>. Thanks to David Depew for bringing this address to my attention. Kidd had claimed that "the coloured races" were inferior "as regards the qualities contributing to social efficiency": *Social evolution*, op. cit., p. 315. On

Despite Weismann's triumph, Dewey did not have to give up his earlier commitment to directed variation: Weismann, Baldwin, Morgan, and Osborn had all shown by the mid-1890s that some forms of directed variation were consistent with Darwinism.⁴⁰ Dewey ultimately made the originally non-Darwinian idea of directed variation—in particular, experimental variation guided by intelligence—the biological starting-point of pragmatism. As he wrote in 1908,

pragmatism holds that all the higher achievements of individual organic life result from the stress and strain of the problem of maintaining the functions of life. For life can be kept going only as the organism “*makes its living,*” by proper manipulation of the environment and adjustment of the latter to its own vital ends.⁴¹

The basis of pragmatism is directed variation.

Dewey and race, see S. Sullivan, « (Re)construction zone: Beware of falling statues », in W. J. Gavin (ed.), *In Dewey's wake: Unfinished work of pragmatic reconstruction*, Albany, State University of New York Press, 2003; P. C. Taylor, « Silence and sympathy: Dewey's whiteness », in G. Yancy (ed.), *What white looks like*, New York, Routledge, 2004; S. D. Carle, « John Dewey and the early NAACP: Developing a progressive discourse on racial injustice, 1909-1921 », in J. R. Shook and P. Kurtz (eds.), *Dewey's enduring impact, Essays on America's philosopher*, Amherst, NY, Prometheus, 2011; T. D. Fallace, *Dewey and the dilemma of race, An intellectual history, 1895-1922*, New York, Teachers College Press, 2011.

⁴⁰ R. J. Richards, *Darwin and the emergence of evolutionary theories of mind and behavior*, Chicago, University of Chicago Press, 1987, p. 469-495; B. H. Weber and D. J. Depew, *Evolution and learning, The Baldwin Effect reconsidered*, Cambridge, MIT Press, 2003; T. Pearce, “A perfect chaos?: Organism-environment interaction and the causal factors of evolution” (PhD diss., University of Chicago, 2010), chap. 2, ProQuest (ID 756453970); Pearce, « The origins and development . . . », op. cit., p. 20-23; D. Ceccarelli, « Between social and biological heredity: Cope and Baldwin on evolution, inheritance, and mind », *Journal of the history of biology*, forthcoming, <https://doi.org/10.1007/s10739-018-9522-2>.

⁴¹ J. Dewey, « The bearings of pragmatism upon education: First paper », *Progressive journal of education* 1, n° 2, 1908, p. 1.

Works Cited

- BACKE A., « Dewey and the reflex arc: The limits of James's influence », *Transactions of the Charles S. Peirce Society* 35, 1999, p. 312-326.
- , « John Dewey and early Chicago functionalism », *History of psychology* 4, 2001, p. 323-340.
- BALDWIN J. M., « Imitation: A chapter in the natural history of consciousness », *Mind*, n.s., 3, 1894, p. 26-55.
- , *Mental development in the child and the race*, New York, Macmillan, 1895.
- , *Social and ethical interpretations in mental development, A study in social psychology*, New York, Macmillan, 1897.
- BERNSTEIN R. J., *John Dewey*, New York, Washington Square, 1966.
- BOWLER P. J., *The eclipse of Darwinism: Anti-Darwinian theories in the decades around 1900*, Baltimore, Johns Hopkins University Press, 1983.
- , « Revisiting the eclipse of Darwinism », *Journal of the history of biology* 38, 2005, p. 19-32.
- CARLE S. D., « John Dewey and the early NAACP: Developing a progressive discourse on racial injustice, 1909-1921 », in J. R. Shook and P. Kurtz (eds.), *Dewey's enduring impact, Essays on America's philosopher*, Amherst, NY, Prometheus, 2011, p. 249-262.
- CECCARELLI D., « Between social and biological heredity: Cope and Baldwin on evolution, inheritance, and mind », *Journal of the history of biology*, forthcoming, <https://doi.org/10.1007/s10739-018-9522-2>.
- CHURCHILL F. B., *August Weismann: Development, heredity, and evolution*, Cambridge, Harvard University Press, 2015.
- COPE E. D., « Alfred Russel Wallace », *Evolution in science, philosophy, and art, Popular lectures and discussions before the Brooklyn Ethical Association*, New York, D. Appleton, 1891, p. 3-17.
- CROOK D. P., *Benjamin Kidd, Portrait of a Social Darwinist*, Cambridge, Cambridge University Press, 1984.
- DARWIN C., *On the origin of species by means of natural selection, or the preservation of favoured races in the struggle for life*, London, John Murray, 1859.
- DELEDALLE G., *Histoire de la philosophie américaine, De la Guerre de Sécession à la Seconde Guerre Mondiale*, Paris, Presses Universitaires de France, 1954.
- DEPEW D. J. "The rhetoric of agency in William James and John Dewey: Evolutionary psychology at the turn of the 20th century." Unpublished manuscript.

- DEWEY J., « Address of John Dewey », *Proceedings of the National Negro Conference, 1909, New York, May 31 and June 1*, [New York?], n.p., [1909?], p. 71-73, <https://hdl.handle.net/2027/nyp.33433081797809>.
- , « The bearings of pragmatism upon education: First paper », *Progressive journal of education* 1, n° 2, 1908, p. 1-3.
- , *The correspondence of John Dewey, 1871-1953*, Charlottesville, VA, InteLex, 2008.
- , « Darwin's influence upon philosophy », *Popular science monthly* 75, 1909, p. 90-98.
- , *The early works, 1882-1898*, Carbondale, Southern Illinois University Press, 1969-72.
- , « Evolution and ethics », *Monist* 8, 1898, p. 321-341.
- , « Political ethics (1896) », in D. F. Koch (ed.), *The class lectures of John Dewey*, vol. 1, Charlottesville, InteleX, 2010, p. 1532-1585.
- , « Political ethics (1898) », in D. F. Koch (ed.), *The class lectures of John Dewey*, vol. 1, Charlottesville, InteleX, 2010, p. 1586-1852.
- , « Principles of education (1902) », in D. F. Koch (ed.), *The class lectures of John Dewey*, vol. 2, Charlottesville, InteleX, 2015, p. 588-740.
- , « The psychology of infant language », *Psychological review* 1, 1894, p. 63-66.
- , « The reflex arc concept in psychology », *Psychological review* 3, 1896, p. 357-370.
- , « Social and ethical interpretations in mental development », *New world* 7, 1898, p. 504-522.
- , « Social psychology », *Psychological review* 1, 1894, p. 400-411.
- , « The theory of emotion. (II.) The significance of emotions », *Psychological review* 2, 1895, p. 13-32.
- FALLACE T. D., *Dewey and the dilemma of race, An intellectual history, 1895-1922*, New York, Teachers College Press, 2011.
- GARRISON J., « Dewey's theory of emotions: The unity of thought and emotion in naturalistic functional 'co-ordination' of behavior », *Transactions of the Charles S. Peirce Society* 39, 2003, p. 405-443.
- GODFREY-SMITH P., *Complexity and the function of mind in nature*, Cambridge, Cambridge University Press, 1996.
- , « Organism, environment, and dialectics », in R. S. Singh, C. B. Krimbas, D. B. Paul and J. Beatty (eds.), *Thinking about evolution, Historical philosophical, and political perspectives*, Cambridge, Cambridge University Press, 2001, p. 253-266.

- HUXLEY T. H., *Social diseases and worse remedies*, London, Macmillan, 1891.
- JAMES W., *The principles of psychology*, New York, Henry Holt, 1890.
- KIDD B., *Social evolution*, New York, Macmillan, 1894.
- LARGENT M. A., « The so-called eclipse of Darwinism », *Transactions of the American Philosophical Society* 99, 2009, p. 3-21.
- MORGAN C. L., *Animal life and intelligence*, Boston, Ginn, 1891.
- , « Dr. Weismann on heredity and progress », *Monist* 4, 1893, p. 20-30.
- , « Instinct and intelligence in chicks and ducklings: A contribution to elementary psychology », *Open court* 8, 1894, p. 4058-4061.
- , « The law of psychogenesis », *Mind*, n.s., 1, 1892, p. 72-93.
- ODLING-SMEE J., « Niche inheritance: A possible basis for classifying multiple inheritance systems in evolution », *Biological theory* 2, 2007, p. 276-289.
- OSBORN H. F., « The discussion between Spencer and Weismann », *Psychological review* 1, 1894, p. 312-315.
- , « The present problem of heredity », *Atlantic monthly* 67, 1891, p. 353-364.
- PEARCE T., « American pragmatism, evolution, and ethics », in M. Ruse and R. J. Richards (eds.), *The Cambridge handbook of evolutionary ethics*, Cambridge, Cambridge University Press, 2017, p. 43-57.
- , « The Dialectical Biologist, circa 1890: John Dewey and the Oxford Hegelians », *Journal of the history of philosophy* 52, 2014, p. 747-778.
- , « The origins and development of the idea of organism-environment interaction », in G. Barker, E. Desjardins and T. Pearce (eds.), *Entangled life, Organism and environment in the biological and social sciences*, Dordrecht, Springer, 2014, p. 13-32.
- . “‘A perfect chaos’: Organism-environment interaction and the causal factors of evolution.” PhD diss., University of Chicago, 2010. ProQuest (ID 756453970).
- PEIRCE C. S., « Man’s glassy essence », *Monist* 3, 1892, p. 1-22.
- RICHARDS R. J., *Darwin and the emergence of evolutionary theories of mind and behavior*, Chicago, University of Chicago Press, 1987.
- SPENCER H., *The principles of biology*, t. 1. London, Williams and Norgate, 1864.
- , « A rejoinder to Professor Weismann », *Contemporary review* 64, 1893, p. 893-912.
- STERELNY K., *The evolved apprentice, How evolution made humans unique*, Cambridge, MIT Press, 2012.

- SULLIVAN S., « (Re)construction zone: Beware of falling statues », in W. J. Gavin (ed.), *In Dewey's wake: Unfinished work of pragmatic reconstruction*, Albany, State University of New York Press, 2003, p. 109-128.
- TAYLOR P. C., « Silence and sympathy: Dewey's whiteness », in G. Yancy (ed.), *What white looks like*, New York, Routledge, 2004, p. 227-241.
- WALLACE A. R., *Darwinism, An exposition of the theory of natural selection with some of its applications*, London, Macmillan, 1889.
- WARD L. F., « Neo-Darwinism and Neo-Lamarckism », *Proceedings of the Biological Society of Washington* 6, 1891, p. 11-71.
- WEBER B. H., and D. J. DEPEW, *Evolution and learning, The Baldwin Effect reconsidered*, Cambridge, MIT Press, 2003.
- WEISMANN A., « The all-sufficiency of natural selection », *Contemporary review* 64, 1893, p. 309-338, 596-610.
- , *Die Continuität des Keimplasma's als Grundlage einer Theorie der Vererbung*, Jena, G. Fischer, 1885.
- , *Essays upon heredity and kindred biological problems*, Oxford, Clarendon Press, 1889.
- , *The germ-plasm, A theory of heredity*, trad. W. N. Parker and H. Rönnefeldt, New York, Charles Scribner's Sons, 1893.
- , « Germinal selection », *Monist* 6, 1896, p. 250-293.
- , « Heredity once more », *Contemporary review* 68, 1895, p. 420-456.
- , « Retrogression in animal and vegetable life », *Open court* 3, 1889, p. 1801-1804, 1827-1831, 1840-1843, 1855-1857.
- , « Ueber den Rückschritt in der Natur », *Berichte der naturforschenden Gesellschaft zu Freiburg* 2, 1887, p. 1-30.
- WIMSATT W. C., and J. R. GRIESEMER, « Reproducing entrenchments to scaffold culture: The central role of development in cultural evolution », in R. Sansom and R. N. Brandon (eds.), *Integrating evolution and development, From theory to practice*, Cambridge, MIT Press, 2007, p. 227-323.
- WINTHER R. G., « August Weismann on germ-plasm variation », *Journal of the History of Biology* 34, 2001, p. 517-555.