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“Endless Forms” of Evolution? Heuristics in Darwin and Taine.

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I. Misinterpretations of Darwin

1959 was the centenary year of the publication of *The Origin of Species*. Literary critic and Darwin scholar Morse Peckham wrote a review of the impact of Darwin’s theory on work in the humanities, for a special issue of the *Victorian Studies* journal. Coming to the conclusion that much of what had been attributed to Darwin’s legacy was in fact spuriously based on the Darwin found in the pages of the *Origin*—that it was not Darwinian at all, but merely “Darwinistic”—Peckham declared that it was “indeed to be expected, that the history of the impact of Darwinism should principally have been a history of rejection or misinterpretation” (33).

A further forty-eight years have passed since Peckham wrote these words, and even now what characterises the history of Darwinism—at least in its literary guises—are these dual facets of rejection or misinterpretation. But while the important entries in the literary discussion of Darwinism that resulted in an out-and-out *rejection* were written mainly in the mid-twentieth century—an article by René Wellek written three years before Peckham’s piece is prominent here, and will be examined shortly—there is now renewed interest in the application of evolutionary ideas to literary studies.

The central text of this new wave is Joseph Carroll’s *Evolution and Literary Theory* (1995), and in the last few years the publication record of the new evolutionary critics has been expanding steadily.¹ These critics are arguing that Darwin’s ideas ought to be fundamental to our conceptions of what literature is and what literature does, and with mutual admiration extending between the evolutionary critics and such iconic Darwinians as E. O. Wilson, it would be derisible indeed to suggest there is any kind of rejection of Darwinism going on here. (That there may be a continuing rejection of scientific approaches to humanistic studies more generally is another story.)

But what about misinterpretation, Peckham’s second charge? In *Evolution and Literary Theory* Carroll finds a precedent for his own position in Hippolyte Taine’s *History of English Literature* (1863–64). I will be suggesting that Carroll then proceeds to misrepresent not just Taine but Darwin, too, by making a bold argument for Taine’s

¹ E.g., Storey, Carroll 2004, Barash & Barash, and Gottschall & Wilson.

Darwinism. Like the simple beginnings of life that Darwin imagined in the closing passage of the *Origin*, his theory itself seems to have spawned “endless forms” (Darwin 1959:759).

I hope to suggest that what connects a position like René Wellek’s mid twentieth-century rejection of evolutionary ideas in literary history with Carroll’s much more recent misinterpretation of what is Darwinian in Taine is, in both cases, a failure to provide an adequate account of the methods for historical inquiry outlined by such writers as Taine. I suggest that to make a claim for a theoretical approach (biological, historical, literary-critical, or what-have-you) being Darwinian (rather than merely “Darwinistic”) one must draw parallels at the methodological level.²

II. Wellek, Analogy Rejected

First, an examination of Wellek’s essay, entitled “The Concept of Evolution in Literary History” (1956). Here, Wellek worked chronologically through the various instances of what he called “evolutionism” in literary criticism and literary theory, from the Renaissance and neo-classical adoption of Aristotelian teleological thinking to Jan Mukařovský’s attempt to combine an historical approach with formalist notions of autonomy in his work on the “transformation” of poetic “relations” (654, 658–9). There appears to have been scope in Wellek’s survey for a large number of kinds of “evolution,” but the use in his title of the term “concept” in the singular is perhaps not misleading once it is realised that what unified these various incarnations, for Wellek, was the mismatch between actual historical processes—what Wellek had elsewhere called “concrete process” or “true history” (e.g., Wellek 1941:21, 82)—and any attempt to provide some explanatory purchase through an evolutionary theory about them.

But there was a more significant fudging of terms by Wellek than whether or not what counted was a plural or a singular “concept.” I think it most instructive to focus on what Wellek wrote here about late nineteenth-century literary historians. For Wellek, Herbert Spencer’s 1857 essay on “Progress: Its Law and Cause” first “suggested how the development of literature could be conceived in terms of a law of progression from the simple to the complex” (Wellek 1956:655). Spencer’s essay predated Darwin’s *Origin of Species* by two years, but as far as Wellek was concerned the almost

simultaneous working out of an evolutionary doctrine by Darwin and Spencer produced something of a conceptual entanglement in the work of anyone influenced by the evolutionary point of view after 1859. Spencer's theory appeared first, and when Darwin published the *Origin* two years later, his theory was held by contemporaries (according to Wellek's argument) to be entirely of a piece with Spencer's.

At the time, Darwin was actually at pains to point out how his theory of biological evolution *did not* recognise the metaphysical progression or teleology implied in Spencer's doctrine of cosmological evolution.³ But what is perhaps more curious is that even in 1956 the conceptual entanglement was still present, prompting Wellek to provide a template to retroactively distinguish the influence of Darwin or Spencer on different practitioners. Spencer's influence was the greater of the two, Wellek claimed, and thus the proviso that "[e]volutionism should be called Darwinian only when it implies the mechanistic explanation of the process (which was Darwin's special contribution) and when it uses such ideas as 'survival of the fittest,' 'natural selection,' 'transformation of species'" (655). This might have been less confusing had Wellek provided some examples of kinds of "evolutionism" that met his prescription. Darwin's was certainly not the only theory of species "transformation" going in the nineteenth-century, and the phrase "survival of the fittest," introduced in the fifth edition of the origin in an attempt to clarify some confusions about the term "natural selection," was actually taken from Spencer, and thus hardly could serve its purpose as a means of differentiating him from Darwin!⁴

But Wellek did not name a single example of a Darwinian literary "evolutionism" that fitted his template successfully. All attempts to use biological arguments in theories of literary history, he found, were characterised by a misguided application of biological *analogies* to historical phenomena. There could be no Darwinian "evolutionism" in literary theory because Darwin's "special contribution" did not suit the study materials. What was really damning for Wellek about evolution in literary history was that would-be evolutionary critics argued from analogy. His article catalogued the failures of every

² Carroll's book is detailed and nuanced, and my disagreement about his use of Taine does not call his larger argument fundamentally into question.

³ For a general discussion of the differences, doctrinal and influential, between Darwin and Spencer, see Bowler.

⁴ Darwin's work was preceded by the evolutionary theory of Jean-Baptiste Lamarck, and actually retained some parts of Lamarck's mechanism. Robert Chambers' pseudo-scientific and notorious *Vestiges of Natural History* was published in 1844. See Bowler for discussions. Peckham's introduction to his variorum edition of the *Origin* (Darwin 1959) provides an excellent discussion of the differences between editions. See page 22 for the reference to Spencer's phrase.

evolutionary argument from analogy that he encountered—failures, that is, not necessarily for being inadequately Darwinian, but for failing to account for those key words for Wellek, “true history” or “concrete process,” in historical explanation. Despite his criteria for distinguishing Darwinian from Spencerian influence in literary thinking, both were similarly “false when applied to literature.” Literary works were not organisms. The product of this misconceived mating of ideas, wrote Wellek, was an attempt to argue analogically from categories alien to literary history (659–60).

In fact, there was some sleight of hand in Wellek’s conclusions about biological analogising. As we shall see, what was crucial to the efforts of late nineteenth-century literary historians to apply scientific theories to the historical study of literature (in Taine, J. A. Symonds, Ferdinand Brunetière, H. M. Posnett, among others) was an analogy drawn between scientific and historiographical methods. Wellek despatched terminological analogies in historical explanation, and with the same flourish dismissed the methodological analogy without consideration. He provided no sustained discussion of the methodological consequences of using biological analogies, and did not look closely in his essay at the explanations such men as Taine, Symonds, and Posnett gave for their preoccupation with science.

In the remaining sections, I wish to consider why a particular type of scientific methodology might have appealed to these men when they came to write up their literary histories. I take Taine as my example, and consider why Darwin’s theory, as presented in *The Origin of Species*, might have had particular methodological appeal for Taine, and why Wellek’s rejection of analogy was an inadequate response. I wish to propose that there is a better evaluative criterion by which to adjudge the “Darwinian” content of late nineteenth-century literary historiography than Wellek’s isolation of a mechanistic “special contribution,” and that my criterion goes some way to disqualify Carroll’s recent attempt to characterise Taine as Darwinian.

III. Darwin’s Analogy, Controversy and Justification

In light of Wellek’s massive contribution to historical studies in literature, it might seem dubious to argue that what was missing in Wellek’s account of “evolutionism” was an important historical component. But while he stressed that traces of Darwin’s “special contribution” to evolutionary thinking could not be found in late nineteenth-century literary histories, and that their analogical arguments were, moreover, simply “false,”

Wellek does not seem to have been at all aware that a debate about the role of analogical argument in science broke out immediately upon the publication of the *Origin*. This argument is assuredly relevant to Wellek's discussion of the validity of analogy, and must therefore be taken into account.

This is not a whimsical diversion from the promised discussion of literary historiography. Without being clear about what I think were the aspects of Darwin's theory that were attractive to literary historians, there is no chance of improving on Wellek's claims, nor arguing for a particular kind of Darwinian influence on men like Taine.

In presenting his theory of natural selection—which for Wellek, we recall, was part of Darwin's "special contribution"—Darwin relied on an analogy between selection in domestic breeding and selection in nature. This analogy was presented in chapter four of the *Origin*.⁵ In domestic or artificial selection, wrote Darwin, great changes were observed to be obtained by a breeder's selection of desired traits in, say, cattle or sheep. Variations between individual animals regularly arose, and breeders could reasonably be assured of success in selecting for desirable traits because of the fact that variations were often inherited by offspring. Variation of traits and inheritance of variations were not the work of the breeder. Only the act of selection was (and its corollary, the destruction of animals exhibiting undesirable traits). Darwin pointed out that variation and inheritance also were observed in nature, outside the remit of domestic breeding. Given this parallel between observations of breeding in agriculture and observations of populations of animals in nature, Darwin posed the question of whether there might be a process of selection in nature analogous to that observed in domestic breeding. He answered in the affirmative, and called this analogous process "natural selection" (163–4).

Not everyone was happy with this result, nor the means by which it was obtained, with the dissent often latching onto the very issue of analogy. Reviews printed in the months after Darwin's book was published claimed that his argument from analogy did not amount to a *scientific* theory. Darwin had not *proved* natural selection to be a *law* of nature, said his reviewers, because his argument from analogy was insufficiently *inductive*. Inductive reasoning required the collection of a vast number of facts, from

⁵ Darwin used a different analogy, that of "ten thousand sharp wedges packed close together and driven inwards by incessant blows" in chapter three of the *Origin*, while developing his argument about the

which regularities and laws could be generalised. Instead, Darwin's reviewers found him to have jumped to conclusions about a scientific law (natural selection) in the opening chapters of the *Origin*, and then used his theory to explain the facts. In lieu of a rigorous inductive procedure, the analogy was not accepted as proof of the theory advanced. This rejection of Darwin's argument, in many cases by other scientists, went on for over seven years and five editions of the *Origin*.⁶

But the reviewers filing these negative reports on Darwin's theory appear to have overlooked a number of important philosophical works on scientific method, written before the *Origin*, in which the use of analogical arguments in science had been mandated. Books by John F. W. Herschel, William Whewell, and J. S. Mill contained justifications for analogical reasoning and argument in scientific discovery and explanation. These books were written in the 1830s and '40s, crucial decades for Darwin. The *Origin* was not published until November 1859, but it was in the closing years of the '30s that Darwin's inquiries into what he then called the "transmutation question" built up pace. Darwin was familiar with these books on scientific method.⁷ His reviewers, on the other hand, were not—or by 1860, when the reviews of Darwin's *Origin* began appearing, had forgotten that they were.

That there was some philosophical mandate for Darwin's use of analogy does not single-handedly explain why Darwin needed to use this style of argument. His reasons are considered in the next section, where I argue that Darwin's method was "hypothetico-deductive," not inductive; that he had to argue from analogy because certain parts of his mechanism were scientific unknowns, for which there was no theory; and that the presentation of his theory mirrored his process of discovery, giving a clue to its mode of influence. But already it seems possible to suggest that a point can be scored easily against Wellek simply by taking this historical point (philosophical mandate of analogy) into consideration. Furthermore, a considerable amount of the scientific controversy after 1859 centred on Darwin's use of analogy, suggesting that this was as characteristic of his argument as the "mechanistic explanation" itself.

"struggle for existence," but it is the selection analogy in the chapter on natural selection which I concentrate on here.

⁶ For a survey and discussion of the contemporary scientific responses to Darwin's work on evolution, see Hull 1973. All discussion in this essay regarding Darwin's contemporary reviewers is based on Hull's collection, unless alternative citations are given.

IV. “Heuristic Support” in Darwin

Why did Darwin use an argument from analogy to develop the centrepiece of his book, the theory of natural selection? In the face of critical reviews focusing on his style of argument and declaring it to be unscientific, why did Darwin not provide compelling (inductive) arguments in later editions of the *Origin*? Were there better evidence and stronger arguments for his theory than the successes of domestic and agricultural breeding, or not?

In short, the answer is that Darwin realised that inductive reasoning was not adequate to the development of new theories in science—not the theory he was looking for, anyway. Instead, Darwin’s method was “hypothetico-deductive,” a term used in twentieth-century philosophy of science to describe a procedure whereby, rather than relying on an induction from facts to laws, the scientist *starts by conjecturing* an hypothesis, a law, a theory, or an axiom, and *then* brings facts to bear on the conjecture as a test for whether it is, or is not, supported by observation. In hypothetico-deductivism, the relationship between facts and observation is reversed (see Ghiselin for a discussion of hypothetico-deductivism in Darwin).

There were strong historical precedents for Darwin’s position, but given that Isaac Newton was the paradigmatic scientist in the eyes of nineteenth-century thinkers, and that Darwin wrote that he wanted to be the Newton of biology (Ruse, 166, 175), his is perhaps the most significant example.

Starting in 1860, Darwin was criticised for not establishing the precise causes of variation and inheritance—processes upon which his theory depended—before publishing. Lacking this causal basis, Darwin’s theory in the *Origin* was dismissed by some as hypothetical speculation. Darwin’s reviewers claimed that he had invented an hypothesis by espousing natural selection, and inventing hypotheses was strictly forbidden by Newton, for whom scientific theories had to arise from observed phenomena only: *non hypotheses fingo*.

But it must be pointed out here that Newton himself was not particularly Newtonian in this regard, at least not as “Newtonian” as some nineteenth-century interpreters would have liked him to have been. This lowers the threshold by which the “Newtonian” content of scientific theories (Darwin’s, say) ought to have been

⁷ See Ruse for a discussion of the influence of Herschel, Whewell, and Mill on Darwin’s research.

measured, making the “Newtonian test” of theories worthless unless an accurate picture emerged about Newton’s own procedure.

In fact, Darwin provided just such a picture. In response to the allegation that he hypothesised in a manner unbecoming a follower of Newton, Darwin argued that Newton’s own theory of optics involved invention. “I should really much like to know,” wrote Darwin in a letter to the Cambridge botanist John Henslow, “why such an hypothesis as the undulations of the ether may be invented [by Newton], & why I may not invent (not that I did *invent* it, for I was led to it by studying domestic varieties) any hypothesis, such as natural selection” (Barlow 204). In another letter, this time to Heinrich Bronn, the first German translator of the *Origin*, Darwin pointed out that just because the precise nature of electricity was not known by scientists studying it, did not mean that they ought to forfeit on ever developing an exact science of electrical phenomena (Darwin & Seward 1:172–3).

Hence it is possible to draw the conclusion that Darwin’s use of analogy was justified by nineteenth-century philosophers of science, and his hypothetico-deductive approach was, in his eyes, perfectly Newtonian. But this still does not explain the necessity of Darwin’s approach.

Although variations and their inheritance had been documented extensively by naturalists and breeders in the nineteenth century, there simply was no causal explanation of—no scientific theory about—variation and inheritance when Darwin was developing his theory of evolution. Put baldly, there was no theory of genetics in the nineteenth-century. Did this mean that Darwin ought to have waited for a theory of genetics before publishing the *Origin*? As it turned out, this would have meant waiting more than forty years: the significance of Gregor Mendel’s experiments was not “discovered” by the world of science until 1900 (Bowler 256). By the time Darwin started writing the *Origin*, he had already been working on his theory for over twenty-two years. He died in 1882. Even Darwin could see that time was of the essence: Alfred Wallace, a British naturalist working in the Malay Archipelago, had hit upon the same selective mechanism as Darwin, and sent Darwin a report for his consideration—news which necessitated something of a rush into print (Gruber 28)!

But there was no need to wait. Darwin dealt with the unknown causal nature of the mechanism of transmutation by arguing from analogy, a procedure justified by philosophers of science. The fact that he had no causal explanation of the forces at work (variation, inheritance) mattered little. In light of Herschel and Whewell’s remarks on

scientific method, it was this *lack of causal knowledge* that necessitated Darwin's use of analogy. He could posit, and feel scientifically justified in doing so, a selective mechanism in nature analogous to that of the agricultural breeder.⁸

To put this another way, the analogical argument from artificial to natural selection provided *heuristic support* for Darwin. It was heuristic in the sense that it solved his problem, a problem about the limitations in scientific knowledge about the causes of inheritance and variation in animals and plants, and how to work around these limitations. Contrary to Wellek's assertion that the "mechanistic explanation" itself *exclusively* was to be considered Darwin's "special contribution," and building on a suggestion made by Michael Ghiselin about Darwin's method (Ghiselin 236), I propose that *it was Darwin's scientific demonstration of the heuristic support of analogical argument that was central to his legacy in the late nineteenth century.*

Obviously, Darwin was not the first writer, scientific or otherwise, to rely on analogical argument. To suggest that it was analogy alone that characterised Darwin's theory would thus be a risible basis for any claim about demonstrable influence. Nor is it enough to suggest that each and every kind of "evolutionism" after 1859 must have been in some way Darwinian, the result of an evolutionary *Zeitgeist* in the late nineteenth century. It may have "rained, hailed, and poured theories of life" in the 1800s, but suggesting that the idea of evolution itself is the important consideration in tracing influence would merely restate this bald and rather tired fact.⁹

I wish to make two additional points to back my argument for "heuristic support" being the critical factor in considering Darwin's influence on literary historians. Then it will be possible to test this hypothesis in the next section.

Firstly, positing natural selection did not miraculously serve up causal theories of variation and inheritance. Darwin knew that a scientific audience would be aware of the data on agricultural breeding, and may have realised that presenting his theory by using the same analogy that had led him to it would be the best way of getting his theory across to his readers. The analogy was left in the *Origin*, even though this resulted in lending the concept of "natural selection" some anthropomorphic overtones (the notion of an intelligent selective "agent" in nature). Darwin considered divesting his theory of

⁸ In fact, Whewell's discussion of "consilience" in science, a "jumping together" of different "classes of facts," strengthened the philosophical mandate for Darwin's analogy, as well as arguably making it appear to Darwin that his theory was likely to be true. See Ruse 163–4. Darwin's next major theoretical work was a book on the *Variation of Plants and Animals Under Domestication* (1868) in which he put forward his theory of "pangenesis" as a tentative causal explanation of inheritance.

its metaphorical implications, but beyond adding a caveat to the third edition of his book, to the effect that the phrase “natural selection” was inherently metaphorical, the analogy stayed (Darwin 165). Despite its earlier philosophical and historical justification, Darwin’s procedure has in fact been declared an *innovation* in scientific theorising by historians (e.g., Manier 172–3).

A related, second point is that the idea of “heuristic support” addresses not only the role of analogical argument in Darwin’s process of discovery (his realisation that there was a selective force in nature of the same kind as that in the domestic sphere), it also suggests how this role overlaps with that of his reader. If, as suggested in the last paragraph, Darwin’s heuristic support for discovery was left in the *Origin*, it provides a clue as to how that theory might be used as heuristic support for other types of inquiry, by thinkers familiar with the *Origin* (Ghiselin 236).

In fact, the criterion of “heuristic support” can be used to evaluate the Darwinian content of other thinkers’ work. It should be clear from the preceding discussion that what must be demonstrated is that Taine relied on “heuristic support” in his literary historiography. This is the task of the next section.

V. “Heuristic Support” in Taine

At first glance, there is scant evidence in Taine for a direct borrowing from Darwin. In roughly a thousand pages on the history of English literature there is but the one footnote mentioning Darwin (1:10). Does this make the attempt to claim the influence of Darwin on Taine futile?

I think not. As I argued in the previous section, Darwin’s presentation of his theory in the *Origin* is key to establishing his likely influence on later writers (as opposed to the general “influence” of an evolutionary *Zeitgeist* or a generalised evolutionary doctrine). In lieu of chancing upon statements by literary historians writing after 1859 that they followed the debate about Darwin’s argument closely or indeed communicated with Darwin or other scientists, that influence must have been taken from the book they are most likely to have read: *The Origin of Species*. What was clear in that book about Darwin’s process of discovery was the heuristic function of the argument from analogy.

But it is not only *Darwin’s* process of discovery that must be considered. As I have

⁹ The meteorological allusion was made by Samuel Haughton, in his review of the *Origin*. See Hull 223.

suggested, there is another process of discovery to account for—that undertaken by readers of the *Origin*. The heuristic use of analogy in Darwin’s book was meant to persuade scientific readers of the truth of his theory despite certain mechanisms remaining unknown in detail. It was meant to persuade, and to appeal to the understanding. The analogy in the *Origin* effectively linked Darwin’s own understanding of his theory and the reader’s comprehension of the theory’s usefulness, providing heuristic support for his own process of discovery, and for the understanding of his book by readers. In Darwin’s mind, the theory had assumed a particular “shape,” and by keeping the analogy which led him to his theory in its published version, that “shape” was described clearly to readers.¹⁰ This, I propose, is how one man’s process of discovery might have influenced others who read his work.

The hypothesis to be tested, then, is this: that the “shape” of Taine’s theory in *History of English Literature* is the same as that of Darwin’s theory.

There are three steps in the test. Firstly, I summarise Taine’s theory in brief outline, concentrating on his presentation in the theoretical introduction to *History of English Literature*. Secondly, I counter Carroll’s claim that Taine was a “biological determinist,” or indeed that Taine was “evolutionary” in the default sense that to think in non-evolutionary terms in the late nineteenth century was a practical impossibility. Thirdly, I show that Taine’s theory in the *History* was congruent at the explanatory, methodological level with Darwin’s theory in the *Origin*; that is, that Taine used the same kind of heuristic support to overcome procedural problems similar to Darwin’s.

(1.) The three words everyone who has ever come across Taine remembers about him are *race*, *milieu*, and *moment* (or race, surroundings, and epoch, for those who got their Taine from H. van Laun’s Edinburgh English translation). These are Taine’s three categories for providing an explanation of the relationship of cultural productions (literature, for example) to racial, climatic, and sociological conditions. For Taine, each of his three terms was one of a set of “motive forces” which produced a given work or “document” by acting in unison. “Race,” or “innate and hereditary dispositions,” accounted for “marked differences in the temperament and structure of the body” and resulted in “a natural variety of men, as of oxen and horses.” For Taine this was the most important of his “motive forces,” the other two resulting in “deviations” from its

¹⁰ That the theory had a “shape” intrinsic to it is testified to by the fact that Darwin was unable to remove the metaphorical and analogical content from any of the future editions of the *Origin*, despite his

influence (1:10). “Milieu” accounted for geographical and climatic conditions, influencing such things as “the inventions of science, letters, and arts.” The arts and sciences were invented by the Greeks, wrote Taine, because they occupied a landscape conducive to such “social ways” (1:12). The third component in Taine’s theory is “moment.” He appears to have felt less need to clearly define this concept. At first, moment appears to be no more than a combination of the other two terms (1:12). But as we shall see, moment was not only crucial to Taine’s historiography, but also key to a comparison of Taine with Darwin.

(2.) Joseph Carroll, citing Taine as a precedent for his own position in *Evolution and Literary Theory*, holds that only the first two of Taine’s terms, race and milieu, really matter. In order to bring out the “biological determinist” that Carroll sees lurking in Taine he suggests thinking of Taine’s race and milieu in terms of the Darwin-inflected “species” or “heredity” and “environment” (Carroll 1995:39, 16–7; 2004:46).

While Taine did gloss “race” as “innate and hereditary dispositions,” he also described it as a “permanent impulse” (1:12) and there is little to suggest that he thought of it in real Darwinian terms—as the inheritability of structural and behavioural variations, rather than an inalterable, eternal genetic legacy, only changing in expression when forced by circumstance, never in essence. For example, he wrote that three hundred years after the Norman invasion—a critical moment in the development of an English language and literature for Taine—the original Saxon character of the English prevailed and reasserted itself over the Latin influences of the invaders (1:56–7). The idea of change as something internal and built in to all life, as inevitable but random, as something requiring a strictly *biological* evolutionary explanation is, I contend, completely absent in Taine. By dismissing the concept of moment, because it “merely signifies the cultural environment in its temporal aspect” (16), Carroll sees fit to provide a dubious translation of Taine’s remaining concepts into a Darwinian lexicon, thus overlooking the significance of Taine’s third term.

Hence I claim that Taine was not “evolutionary” in the Darwinian sense—that his theory is *not* influenced by the “idea” or “doctrine” of evolution as such. Trying to argue that Taine was a “biological determinist” is about as worthwhile as Wellek’s provision of a template for distinguishing between Darwin and Spencer. The question is beside the point, which is to trace influence at the methodological level. This can only

awareness that this content was responsible for some of the arguments against his theory. See Manier

be accomplished by looking more closely at the “moment” concept.

(3.) Taine described “moment” as “the acquired momentum” resulting from the relationship of “race” and “milieu” (1:12). Although at first this equation appears to support Carroll’s claim, since it was contained in or merely the result of the first two, Taine’s conception was crucial. We must consider what Taine hoped to explain by using this concept. He wrote that when reflecting on the characteristics of succeeding historical periods, it was apparent that the “dominant idea” of each period could not exist in complete independence from those dominant ideas of the periods which led up to it. Each “idea” (the Hegelian overtones are fairly obvious) “depends in part upon the first,” which, in conjunction with the effects of “race” and “surrounding circumstances” (milieu), “imposes on each new creation its bent and direction” (1:12). This, for Taine, was the basic historiographical problem: how to explain the *causes* of historical phenomena and the relationship of seemingly distinct historical periods.

Taine then went on to suggest that this was “but a mechanical problem.” The reader might have prepared for an argument along the lines of a physical explanation of historical phenomena. Not quite. Taine wrote that the problem in history was not the same as the problem in the physical sciences. Rather, while there was a similarity, perhaps a parallel justifying an analogy with problems in the physical sciences, there was no identity between physics and history. “The only difference which separates these moral problems from physical ones is, that the magnitude and direction cannot be valued or computed in the first as in the second” (1:13). By “magnitude and direction” Taine appears to have meant the forces which historical formations of the past brought to bear upon the present, or the historical period under investigation. But what he was admitting here was that the solution to historical problems, unlike physical ones, was not amenable to a quantitative solution. This may have been the “only difference” between the historical and the physical sciences, but it was a difference nonetheless.

This was where Taine introduced the idea of “force” as heuristic support. Why was a heuristic needed here? While the analogy between historical and physical problems appears to have been tantalising for Taine, it seems that given the lack of quantitative solvability of historical problems, which made them of a different kind than physical ones, along with the fact that the actual causes behind historical phenomena were unknown, it appeared justified, to Taine, to attribute a heuristic function to the physical

concept of force in order to proceed. Knowledge of the causal processes believed to be involved was incomplete. “But,” he wrote, “though the means of notation are not the same in the moral and physical sciences, yet as in both the matter is the same, equally made up of forces, magnitudes, and directions, we may say that in both the final result is produced after the same method” (1:14). In Taine’s view, then, there was the possibility of a *methodological* identity (not doctrinal) between the historical and physical sciences (not biological), despite differences in the nature of the phenomena each dealt with. This methodological identity was possible through Taine’s recognition of the use of a physical concept as heuristic support for his explanation, despite the tacit admission that the actual phenomena of historical causation remained unknown.

The criterion of *heuristic support* can usefully be applied here to evaluate the influence of Darwin on Taine. Let us consider the similarity between Taine’s and Darwin’s basic problems.

Darwin’s problem was biological: how to explain the causes of organic development and the relationship of varieties and species. How did Darwin address this problem? First, he appears to have accepted that the causes lying behind variation and inheritance were themselves unobservable. There was no genetic theory, and Darwin had to find a heuristic to assist in his investigation. What he found was an analogy between the processes involved in domestic breeding and selection in nature. An anthropomorphic concept, “selection,” was adopted for its heuristic function, and became part of Darwin’s biological theory and his presentation of that theory.

Taine’s problem was historiographical: a matter of how to explain the causes of historical phenomena and the relationship of historical periods. How did Taine address this problem? First, he appears to have accepted that the causes lying behind historical phenomena were unobservable. Making direct observation impossible, this meant that Taine had to find a heuristic to assist in his historical investigation. What he found was an analogy between the methods of history and physics. A physical concept, “moment,” was adopted for its heuristic function, and became part of Taine’s historiographical method.¹¹

VI. Conclusion

¹¹ It ought also be recalled that the mandate for Darwin’s analogical method came mainly from Herschel and Whewell, for both of whom the physical, Newtonian sciences were paradigmatic. Taine’s “force”

While the actual causes of historical phenomena remained unknown in 1863, when Taine published his *History*, the actual causes of biological evolution were equally unknown in 1859, when Darwin published the *Origin*. Wellek's discussion, in its outright rejection of analogical arguments from science, overlooked completely this kind of similarity. Moreover, when Carroll resorts to interpreting or translating Taine's terminology to show that Taine was a Darwinist after all, he does something wholly unnecessary to Taine. Hence I find that Wellek and Carroll have not adequately answered Morse Peckham's charges of rejection or misinterpretation of Darwin.

While the heuristic support of analogical argument in science, condemned by Darwin's contemporaries, became a commonplace in twentieth-century studies in the history and philosophy of science, this aspect of Darwin's legacy has been poorly treated in literary discussions of Darwinism and evolution. The lesson here is that literary scholars dealing with scientific issues must make better use of specialist scholarship on scientific questions.

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