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W.E.B. Du Bois and interdisciplinarity: A comprehensive picture of the scholar's approach to natural science

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Abstract

Throughout his life, W.E.B. Du Bois actively engaged the scientific racism infecting natural sciences and popular thought. Nevertheless, he also demonstrated a sophisticated and critical engagement with natural science. He recognized that the sciences were socially situated, but also that they addressed real questions and issues. Debate remains, however, regarding exactly how and why Du Bois incorporated such natural scientific knowledge into his own thinking. In this article, we draw on archival research and Du Bois' own scholarship to investigate his general approach to interdisciplinarity. We address how and why he fused natural scientific knowledge and the influence of physical environs into his social science, intertwining each with his broader intellectual and political aims. This investigation will offer a fuller understanding of the scope and aims of his empirical scholarship. At the same time, it will illuminate a sociological approach to natural science that can still inform scholarship today.

Keywords

Dilthey, Du Bois, environmental sociology, interdisciplinarity, scientific racism

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Interdisciplinary scholarship is often promoted as a means to study a broad range of pressing concerns, such as climate change, health disparities and inequalities, to name just a few examples. To adequately grapple with such issues requires interdisciplinary knowledge that is open and fluent with sometimes wildly different epistemes. This work has many challenges, but it also offers unique opportunities for advancing our scientific understanding of the world. Strangely, recent calls for interdisciplinary scholarship are conducted as if it is something novel, a tendency that unfortunately has resulted in a failure to appreciate sophisticated approaches by classical scholars, especially W.E.B. Du Bois. In this article, we present how interdisciplinarity became and remained a foundational aspect of Du Bois' intellectual development.

Influenced by developments in contemporary debates, personal relationships, historical context and his own politics, Du Bois' epistemological approach was never static. Yet, one aspect of his epistemological practice that remained fairly constant was his critical, open and sophisticated engagement with natural science – which remains an overlooked and neglected dimension of his interdisciplinarity. Like his elder New Historicist colleague Max Weber, who 'anchored [culture] in material existence' and appreciated the ways 'environmental causes generate important, refracted effects on the world of social meaning' (Foster and Holleman, 2012), Du Bois recognized that social processes are not exempt from the (non-deterministic and relational) influence of natural-environmental processes (p. 1667). That is, Du Bois understood social and natural processes as being in constant interaction with one another. As a result, he sought to develop an approach to account for the form and meaning that such interchanges assumed for questions regarding how the social world develops, functions and changes. Du Bois therefore practised, in the language of Catton and Dunlap (1978, 1980), a 'postexemptionalist' sociology, as opposed to the human-exemptionalist paradigm in which natural-environmental processes are considered completely irrelevant (Clark et al., 2018). Impressively, from the late nineteenth century to the middle of the twentieth, Du Bois actively developed an interdisciplinary approach that combined knowledge from the sciences, history and culture to analyse a broad range of pressing issues, including questions regarding race.

Du Bois' interdisciplinary approach was nuanced and multi-dimensional. Famously, he disproved racist claims associated with biological determinism (e.g. Du Bois, 1897, 2014 [1939]; Sundquist, 1996). Yet, he also incorporated insights from natural science into his sociological framework in a positive manner, which is our primary focus here. Du Bois acutely recognized that the natural sciences are socially situated, which can bias the questions posed, the frameworks employed to study issues and the interpretations of findings (see Gould, 1996, for a history of these issues). Thus, he noted that some of the findings of natural scientists may reflect either unconscious or conscious biases that are used to justify racist ideologies and inequalities. Such problems were also ever-present within the social sciences and history – issues that Du Bois (1992 [1935], 1994 [1903]) continuously addressed throughout his life. Despite these challenges and concerns, Du Bois knew that a serious engagement with the natural sciences, just as it was with the social sciences and humanities, was important and necessary in order to provide a more comprehensive understanding of the world. After all, the findings within natural science were diverse. These scientists were addressing realist questions and issues that have

material meaning regarding the history of the world, the workings and processes that influence life and the conditions in which humans exist. Du Bois believed that such scientific knowledge was critically important for better understanding the historical development of relations between humans. To this end, there was essential work being done on numerous fronts, and given its implications, Du Bois deemed it necessary to stay acquainted with such scholarship, for it held the potential to serve as a powerful empirical and political resource. For these reasons, Du Bois intently followed developments in evolutionary biology, geography, physical anthropology, and the history and the philosophy of science. He befriended many leaders in these fields, assigned their work to his students and – during his editorship of *The Crisis* – recommended it to readers. In doing all of this, he embodied a postexemptionalist perspective and helped forge a dynamic interdisciplinary approach.

Despite his close attention and engagement with these various fields of study, there is considerable debate regarding how and why Du Bois incorporated such natural scientific knowledge into his own thinking. Much of this debate has focused on Du Bois' own elitism and the degree to which he embraced a form of biological essentialism to conceptualize race (Appiah, 1985; Jeffers, 2017; Outlaw, 1996; Reed, 1997). At times, it is evident that such characterizations reflect a general, purposeful, failure to recognize Du Bois as anything beyond a scholar fixated on race (Morris, 2015). While these debates are interesting for a number of reasons, working out Du Bois' dynamic conception of race is not the focus here, even though it provides a critical and inextricable contextual backdrop. Instead, we investigate Du Bois' approach to interdisciplinarity, focusing in particular on his engagement and incorporation of natural science knowledge into his work. This specific dimension of his interdisciplinarity has not received much attention, especially in comparison with his involvement, connections and contributions to the humanities. It is on this front that Du Bois demonstrated a postexemptionalist social science, which was also part of his broader intellectual and political oeuvre. Thus, our assessment helps provide a more comprehensive understanding of Du Bois as an interdisciplinary thinker who was not simply a race scholar but a broad, foundational, sociological figure (Morris, 2015; also see Collins, 2016). Moreover, this analysis highlights how his marginalization in much of sociology in the twentieth and twenty-first centuries hindered the advancement of a more robust sociology and its capacity to engage fruitfully with other disciplines.

In all, our investigation provides a fuller understanding of the scope and aims of Du Bois' empirical sociology. At the same time, it illuminates an interdisciplinary openness that can still inform scholarship today. He not only drew from natural sciences, but in both public and private examined the ways in which sociology should and should not draw from them, going so far as to critique allies for doing so in ways he thought inappropriate. The sophisticated, largely anti-positivist, yet decidedly empirical, interdisciplinary approach he developed over the course of his life can indeed serve as a model for integrative sociological analyses that can better address critical questions and issues today, from environmental justice to intersectionality to the influence of ecological imperialism to problems regarding neighbourhoods and public health. Our point, however, is not that what Du Bois claimed or did remains true or false, or that it is free from contradictions, but rather that his thoughtful, consistent engagement with and, as appropriate, incorporation of natural science remain relevant.

For this study, in addition to well-known books, we examined primary materials, including correspondence, unpublished essays, schoolwork, notes and ephemera held at the Special Collections and University Archives at the University of Massachusetts, Amherst and the Fisk University Archives in Nashville, Tennessee. We also surveyed *The Crisis* during the tenure of Du Bois' editorship. To further situate our findings and these source materials, we also engage contemporary work in the sociology of race, the philosophy of race and related disciplines, as well as with secondary sources detailing the life of Du Bois and his relationships with natural scientists (e.g. Baker, 1998; Lewis, 1994, 2000; Liss, 1998; Rabaka, 2009; Reed, 1997; Zumwalt and Willis, 2008). What emerges from this study is a picture of Du Bois as a scholar who is, throughout his ever-transforming life and work, focused on the philosophy and politics of interdisciplinarity. From his bachelor of arts forward, he integrated the powerful explanatory potential of scientific observation while insightfully placing this knowledge within its political, historical, spatial and epistemological context – even if he was inconsistently sceptical of how his own historical and epistemological context impacted his approach. Natural sciences were necessary for Du Bois, but they were also fallible, just like the other sciences and humanities. Physical, cultural and political influences thus existed within an indelible tension – an understanding that demanded a multi-causal, contingent and interdisciplinary approach. While these considerations were a persistent aspect of Du Bois' thought, he consistently, and rightly, insisted that racial stratification could solely by explained through socio-historical processes.

In what follows, we present key aspects of Du Bois' education that set the stage for his roving, multifaceted scholarship, as part of illuminating his epistemological background. We proceed by detailing his explicit engagement with physical science, including his relationships with specific scientists, reading interests and the assignments he gave students. From this assessment, we detail how Du Bois generated, both publicly and privately, an explicitly interdisciplinarity, postexemptionalist approach with broad application. Throughout, we integrate relevant transformations in Du Bois' thought and politics.

From da Vinci to Dilthey

At Harvard, Du Bois spent his initial years largely under the guidance of William James and shared with his mentor a general disgust with Spencerian organicism. Yet Du Bois was not a sycophant. Around 1889 or 1890, Du Bois wrote an essay for his composition course that revealed a detachment from James' line of thinking in regard to his elder's insistence upon an unbridgeable gap between observed facts and ethical belief. Written during a popular reappraisal of Leonardo da Vinci's empirics, Du Bois reviewed the astronomical, optical, mechanical and anatomical work of da Vinci. He argued that da Vinci deserved the title of 'the founder of modern experimental science' (Du Bois, 1890: 1).[1] In making his argument, he juxtaposed da Vinci's 'metaphysics' with those of the 'three rivals for the honor' – Roger Bacon, Gilbert of Colchester and Francis Bacon. He proposed that da Vinci was the first to theorize and develop general principles almost purely from patient observational work (pp. 1, 51). Throughout his career, Du Bois would similarly insist that the discovery of broader truths through measured empirical

investigation is, in fact, possible – both scientifically and ethically. As biographer David Levering Lewis (1994: 95–96) notes, this epistemic gap between James and Du Bois began at Harvard and grew exponentially throughout the latter's life.[2]

This essay on da Vinci also serves as a harbinger of Du Bois' emerging philosophy of science. 'Few lives even in modern times', the undergraduate Du Bois (1890) applauded, 'have been more completely given to empirical investigation of nature . . . His method is wholly inductive' (p. 41). Da Vinci's work was the embodiment of what Du Bois understood as the scientist's goal – the pursuit of steady empirical investigation as a vehicle of broader truth. As much as possible, science should remain unsullied by political, cultural or other influences. Hands-on research was fundamental to being able to draw conclusions about the world – standing in stark contrast to what he would later describe as 'car-window' scholarship, where people made grand statements about the world that often reproduced their own beliefs on issues of race, class and inequality (Du Bois, 1994 [1903]: 93). Done with caution and integrity, Du Bois believed science can provide new truths for public dissemination (Bright, 2018). Less than a decade after his da Vinci essay, Du Bois (1898) reiterated, this time in *The Study of Negro Problems* (p. 16), that 'science . . . has but one simple aim: the discovery of truth'.[3]

Yet this aim, however central, is an endless horizon one can never reach. In discussing the lives of da Vinci and his 'rivals', as well as Ptolemy, Linnaeus, Alexander von Humboldt and many more, Du Bois (1890) explicitly considered how the historical and epistemological contexts – 'contrasted with (their) times' – 'affected their work' (pp. 2, 51). For example, he explained that Francis Bacon 'profited [all too much] by the dead past which (the Renaissance) exhumed' (p. 51). He reflexively applied this lesson to himself, in a caveat that could be attributed to James (1950 [1890]), that he, like anyone, could 'be liable to read modern thoughts into obscure passages', an undeniable possibility that rendered his 'claim . . . relative and not absolute' (Du Bois, 1890: 2, 40).

From at least his time in Harvard forward, Du Bois demonstrated a sophisticated understanding of science, especially in regard to what is conceived of as 'the dual nature of science' (Levins, 1996), or that science is both a powerful tool for understanding the world and a fallible human activity that reflects the social conditions of its production (p. 103). In other words, it is socially mediated, yet also serves as the basis for acquiring information about the world. As a graduate student, Du Bois was already deeply concerned with the history of empiricism and conscious of his own epistemological approach to science. Throughout his career, he advocated for an interdisciplinary approach that valued both empiricism and historicity, believing that this approach helped strengthen and check science.

After receiving a second bachelor's and a master's degree in history at Harvard, Du Bois spent 2 years at the elite Friedrich-Wilhelms-Universität (now known as the University of Berlin). His views on interdisciplinarity matured both in sophistication and in terms of application to social science and social reform. It was the height of the German historical school of economics, which embodied the inductive values Du Bois celebrated in his essay on da Vinci. Du Bois studied under Gustav von Schmoller and Adolph Wagner, political economists who, according to Lewis (1994: 142), 'had a profound impact' on him (also see Schafer, 2001). They advocated for careful, multi-method empirical study of phenomena, for denaturalizing economic processes by placing them within their

changing cultural, spatial and historical context, and for openly discussing the policy implications of their work. Du Bois (1996 [1899]) applied all of these research virtues when he returned to the United States in his landmark study *The Philadelphia Negro*.

While in Germany, Du Bois also took a history of philosophy course with Wilhelm Dilthey in the summer of 1893, which fine-tuned his conception of interdisciplinary. Dilthey was a leading anti-positivist whose work focused, in part, on providing a philosophical rationale for distinguishing proper methodologies for the natural sciences from the (equally scientific) human sciences. His distinction rested upon the claim that the natural sciences provided knowledge of the histories and conditions supplied by nature, whereas the human sciences interpreted cultural and spiritual phenomena via developing a non-reductive understanding (i.e. *verstehen*) of whole persons.[4] He therefore rejected the direct import of natural scientific concepts to the human sciences. Du Bois (2007 [1940]), later on, called such practices 'fruitless word twisting', especially in regard to anything with a whiff of teleology, which resulted in biological reductionism (p. 26). Throughout his career, Du Bois emphasized the 'historismus', or historicity, of all knowledge. Dilthey also stressed that these two approaches, explanation of nature and interpretation of action, can be fruitfully united. 'We can combine knowledge of how nature shapes human beings with insight into how it provides us with material for action', he contended, for 'natural conditions determine the development and distribution of human life', yet these conditions do not determine 'consciousness' or systems 'of value judgments and imperatives wherein values, ideals, rules, and the aim to shape the future are connected' (Dilthey, 1991 [1883]: 70, 71, 78).

Robert Gooding-Williams (2009: 47–49) claims that Dilthey's influence is obvious in Du Bois' (1897) rejection of biological essentialism and embrace of an epistemological distinction between the social and natural sciences in *The Conservation of Races*. Appiah (2014) credits Dilthey for Du Bois' career-long 'disciplinary-schizophrenia, his . . . alternation between soaring, rhapsodic poeticism and dry, assiduous empiricism . . . (between) the subjects view and the scholar's' (p. 79). In agreement with these assessments, we also suggest that Dilthey's influence likely solidified Du Bois' foundation for, as appropriate, including insights from the natural sciences. In this, Du Bois extended his engagement and inclusion of important insights from other fields. He moved confidently between the natural and human sciences, better able to understand their impulses and, perhaps more importantly, to discern their limits, as he fit knowledge from these various disciplines together to better comprehend the ever-changing constellations of influences that have historically shaped the world as a whole.

Du Bois was thus deeply committed to culture and history but still incorporated knowledge from the natural sciences in a non-essentialist, historically specific and reflexive manner. He embodied this approach in a specific passage in *Conservation*:

> so far as purely physical characteristics are concerned, the difference between men do not explain all the differences of their history. It declares, as [Charles] Darwin himself said, that great as is the physical unlikeness of the various races of men their likenesses are greater, and upon this rests the whole scientific doctrine of Human Brotherhood.
>
> (Du Bois, 1996 [1897]: 40)

While clearly foregrounding race as a political, cultural and moral project, Du Bois also held a deep respect for what he considered to be legitimate natural science. As such, he acknowledged that natural science was surely unable to 'explain all the differences', but, in perhaps unknown ways, disjunctively helped round out the picture – even if that rounding out only took the form of confirming the impoverishment of genetic explanation for social circumstances and outcomes. Ergo, according to Jeffers (2013), 'scientific theory [for Du Bois] represents part of race's reality' (p. 410). Kyla Schuller (2017) stresses that this position represents a sophisticated recognition of the dynamic, coevolutionary relationship between human beings and the larger biophysical world, as Du Bois

> approached evolutionary thought as a resource . . . for racial groups are dynamic systems rather than stationary points on a hierarchy . . . He contested racial determinism by drawing on the evolutionary . . . notion of population, a fluctuating, malleable entity conceivable only through the measures of temporality and change.
>
> (pp. 192–193)

As a result, he developed a broader understanding of human development and relationships while also being able to specify the social and historical factors that generated racial inequality and oppression.

Yet, clearly, the inclusion of such interdisciplinary insights, especially those from natural sciences, is repeatedly misunderstood, often wilfully so, and in myriads of ways. These include lack of consideration for data collection and historical contexts; variation in how biology, social conditions and environmental factors may interact; and the ways in which political practices shape such interactions. Nevertheless, as Du Bois repeatedly stressed, to understand race, health and human beings in general and so on, it is necessary to consider both natural and social sciences. For these reasons, throughout his career, Du Bois not only stayed abreast of developments in a wide array of scientific disciplines, but actively also collaborated with geographers, physical anthropologists and other natural scientists to consider how best to politically confront scientific racism and, more broadly, the problem of the colour line.

Du Bois (1905) directly reflected upon this interdisciplinary approach in an essay that remained unpublished until the first year of the twenty-first century (Du Bois, 2000; also see Go, 2020) entitled 'Sociology Hesitant', which provides a window into how he fit his cautiously realist picture of science within his own sociological practice. Its title refers to a contemporary identity crisis in sociology, one derived from open questions regarding what sociology is *per se*, what sociologists should actually be doing, and how sociology should relate to other, more established, disciplines. As Du Bois saw it, these issues all derived from the question of whether or not established scientific methodologies should be applied to sociological projects, one which had left sociologists vacillating between Spencerian positivism and 'metaphysical wonderings'. The answer, Du Bois insists (echoing Dilthey), is certainly not through employing biological metaphors, for these 'impl(y) knowledge but do . . . not supply it'. This is because the goal can never be to 'formulate the exact laws of human action . . . simply to propose such a thing . . . (is) preposterous'. Nor should sociologists look to psychology for answers, a discipline which 'has scant

welcome for sociological novices'. The answer, according to Du Bois, is rather to face up to 'real life' in that 'in the deeds of men there lies along with rule and rhythm – along with physical law and biological habit, a something incalculable'. Sociologists, however, he explained, had been heretofore 'hesitant' to acknowledge the limits of sociology – that it will never be an exact science and that 'this is a world of Chance as well as Law' (Du Bois, 1905: 4–6). In Du Bois' eyes, this is the paradox that sociologists must 'frankly state'. He then affirms,

> This is what the true students of sociology . . . have been doing now a half century or more. They have adopted the speech and assumption of humanity in regard to human action and yet studied those actions with all possible scientific accuracy. They have refused to cloud their reason with metaphysical entities undiscovered and undiscoverable, and they have also refused to neglect the greatest possible field of scientific investigation because they are unable to find laws similar to the law of gravitation. They have assumed a world of physical law peopled by beings capable in some degree of actions inexplicable and uncalculable (sic) according to these laws. And their object has been to determine as far as possible the limits of the Uncalculable [sic] . . . What then is the future path open before Sociology? It must seek a working hypothesis which will include Sociology and Physics.
>
> (Du Bois, 1905: 6–8)

In other words, sociological inquiry requires interdisciplinarity, given that human beings and human history are influenced by myriad forces, processes and conditions. This is plainly a postexemptionalist sociological outlook.

Du Bois' broad interest regarding the interplay between material limits, physical entities, laws, social processes and natural and social histories; the fallibility of natural science; and the necessary humility of sociology was clearly influenced by the historical-materialist tradition and the German historical school of economics. Natural science is necessary to understand, as Dilthey (1991 [1883]: 70–71) put it, 'how nature . . . provides us with material for action (and for) the development and distribution of human life'. Yet these bounds only comprise a part of the picture. There is tremendous room for surprise, for the dynamism inherent in socio-natural relationships means there is ample space for chance to upset the historically regular. The possible roads chance can take are, if only loosely, contingent upon natural law, the historical manifestations of natural processes and, perhaps most of all, social conditions. The goal, Du Bois (1905) claimed, is that

> (w)e would no longer have two separate realms of knowledge, speaking a mutually unintelligent language, but one realm, and in it physical science studying the manifestations of force and natural law, and the other, Sociology, assuming the data of physics and studying within these that realm where determinate force is acted on by human wills, by indeterminate force.
>
> (p. 8)

The point is to give 'scope to historian as well as biologist' (p. 9). The path before sociology, in other words, is one that is interdisciplinary by necessity.

Engaging natural science to confront scientific racism

On 18 February 1932, the Harlem pastor Adam Clayton Powell (1932) wrote to Du Bois, then editor of the official magazine of the National Association for the Advancement of Colored People (NAACP), *The Crisis*, asking the latter to publish his recent address at an NAACP mass meeting in an upcoming issue. On 25 February, Du Bois (1932b) responded,

> I have read your (address) with greatest interest. I should criticize adversely only one statement, and that is on page 10-11 about Darwin's 'Origin of Species'. I do not think that it is historically accurate to say that this book advocates the 'survival of the fittest' or the 'conservation of races'. That doctrine was developed entirely apart from Darwin's book and long before its appearance. The book was seized upon to support the doctrine, when as a matter of fact, it did not at all. What Darwin said about the 'survival of the fittest' was simply a scientific statement of the results of competition between living beings, but he did not for a moment mean by 'fittest', those who ought to survive. It was simply a statement that as a matter of fact some would survive.
>
> As an interpretation of unanswerable scientific facts, Darwin and his successors are to my mind, unanswerable, but on the other hand, the philosophy of superior races, etc., built up long before Darwin, is, of course, deserving of all the criticism which you put upon it.

Du Bois' understanding of and approach to interdisciplinarity is here in full form. Akin to *Conservation*, he carefully read Darwin, appreciated the nuance of the argument, the larger historical context that shaped debates, and the various consequences of distinct conclusions. He was able to assess the evolutionary argument while also emphasizing that socio-historical conditions, including the development and maintenance of asymmetries of power and the control of violence across populations, were responsible for racial inequalities. He recognized that Darwin was also a proponent of steady empirical investigation above all else and, like da Vinci, was an embodiment of the scientific pursuit of unsullied, 'unanswerable', truth (Browne, 1995, 2003). He stressed that the empirical evidence, which stands on its own, should be read as culminating in the mechanics of natural selection as 'a matter of fact', and not as a value judgement that anything 'ought' to happen. He placed Darwin, as well as those who come before and after, within historical and political context. He rightly insisted that Darwin should not be liable for the racist ideologues that seized his work to cloak their own agenda in scientific objectivity. Darwin's work can clearly tell us a lot about the world, yet its production and reception are indicative of its historical and political context. Like Dilthey, Du Bois distinguishes the purpose of the natural sciences (the explanation of natural phenomena) from the purpose of the human sciences (the interpretation of cultural, political and moral phenomena) and encourages Powell to avoid allowing proponents of 'the philosophy of superior races' to confuse these two objectives. Not only did Du Bois believe in the importance of these points, but he deemed them worth defending to the powerful pastor, then head of the Abyssinian Baptist Church in Harlem, which at the time had the largest membership of any church in the country. How one reads Darwin was clearly not a minor issue. After much back and forth, Du Bois eventually agreed to

publish an excerpt of the address. The portion published, however, does not contain the statement at issue.

Throughout his life, Du Bois pursued staying abreast of new developments in natural science. He devoted time to seeking new knowledge, interrogated it and recommended it to colleagues, students and the public. For example, in late 1905, Du Bois wrote to Clark Wissler, then acting curator at the Museum of Natural History in New York City, and asked for the 'best works on Negro anthropology and ethnology'. Wissler replied that such literature is, unfortunately, 'incomplete and unsatisfactory'. Nevertheless, he recommended work by Friedrich Raetzel (who Du Bois was already familiar with) and a 'small book' by Joseph Deniker, useful mainly for the references contained therein. Du Bois wrote 'order' in pencil next to the Deniker reference in the letter (Wissler, 1905).

Du Bois was already in contact with Wissler's mentor, Franz Boas, who was the previous curator at the museum. Boas was at that time the most distinguished anthropologist in the United States, yet he was a controversial figure. He robbed graves for skeletons and commandeered indigenous Northwest prisoners for cranial measurements. He revealed that there was much variation in the cranial index of adults within the same group, undermining one of the attempts to scientifically rank and order the human population by race, under the assumption that the White population had larger brains and therefore were more advanced (Gould, 1996: 140). Boas was ostracized by his department at Columbia for his ardent rejection of armchair, non-evidential, scientific racism (Zumwalt and Willis, 2008).

In the 7 October 1905 issue of *Charities*, Boas published his first popular article against scientific racism. Within 4 days, Du Bois began actively courting Boas, hoping the latter would travel to Atlanta University in May 1906 to address the eleventh Conference for the Study of the Negro Problems (Baker, 2010: 208).

The conference theme was the 'health and physique of the Negro American'. According to the report published afterwards (an early harbinger of public health research [White, 2011]), its purpose was to update discussions of 'race problems' with 'the advances . . . anthropological science has made in the last decade', in particular, how anthropology was placing emphasis on 'cranio-facial skeletal characters' over things such as hair, skin or lips (Du Bois, 1906: 13, 16). Although Du Bois (2007 [1940]) was disappointed, Boas could not make it in time for his own speech, he was left 'too astonished to speak' by Boas' address later in the conference (p. xxxi). At the time, contemporary physical anthropology had demonstrated, Boas forcefully maintained, that whatever cranial difference exists between races 'is insignificant when compared to the wide range of individual variability in each race'. He stressed that the evidence showed that no demand on the mind or body is beyond 'the negro', in contrast to scientifically racist claims. He then backed up this assertion by detailing the significant agricultural, militaristic, political and technological advances contributed by the African peoples to the 'development of human culture' throughout history (Boas, 1906: 7, 16).

'All this I had never heard', Du Bois (2007 [1940]) reflected, 'and I came then and afterwards to realize how the silence and neglect of science can let truth utterly disappear or even be unconsciously distorted' (p. xxxi). It was likely this moment that inspired Du Bois to contribute to social scientific understandings of the historical development and

achievements of African civilizations. Here, as elsewhere, the influence of Dilthey on Du Bois' ability to navigate fluidly between the social and natural sciences, while maintaining a reflexive and historical vantage of both, is on display. Indeed, in a lecture he prepared concerning 'The Negro in America' and 'Some Higher Civilizations of Africa', he noted,

> The implications of the African background are more social than biological. [Leo] Frobenius points out that the history of peoples and the history of civilization fall short of identity in the measure in which forms of civilization, more than peoples, are the creatures of their surroundings and of the home soil . . . I propose to show that certain African peoples have developed social organizations which compare favorably with those which we regard as the achievement of civilization; that they have developed towns and cities and states, markets and exchanges, a juridical system and a jury system, a method of tracing property descent and property rights, and art, and that these owe very little if anything to the influence of example of the so-called higher cultures . . . When we think of civilization we think of one single evolution of which different cultures are steps. There are many civilizations.
>
> (Du Bois, n.d.: 1)

Boas, whose 'statements were always cautiously phrased', in that he never claimed all races had equal capacities but only that 'no one had ever been able to prove that they *did not*', St. Clare Drake (1980) contends, ended up participating in future Atlanta conferences and contributing essays to *The Crisis* (p. 11). He was generally an ally of Du Bois, and Du Bois an ally of his, for decades to come.[5]

During his 24 years as editor of *The Crisis*, Du Bois (2007 [1940]: 293) used the magazine as a platform to articulate his personal views and to promote social and natural science knowledge. Here, as elsewhere, he took Boas' (1906) address to heart, vowing not to 'neglect science' and to constantly confront it. On the one hand, Du Bois drew on contemporary physiological, anthropological, archaeological and other natural sciences, combining them with human sciences, to better contextualize Black histories. Such interdisciplinarity was necessary if his readership were to unearth lines of descent, both physical and social, erased by slavery and colonialism. In bringing this work to light, he was able to re-construct an alternative, non-White, politics in which Black history became a source of pride. On the other hand, he would use knowledge from the natural sciences to consistently and forcefully attack any and all forms of scientific racism.

In the first issue of *The Crisis*, published November 1910, in the first section 'Along the Color Line' under the subheading 'Social Uplift', there is a report regarding recent work by the French archaeologist M. de Zeltner, who, after studying 'ruins of unknown cities, runic signs and drawings' on the upper Senegal River, reportedly claimed that

> powerful Negro empires of great size and some culture existed in the Sudan before the white races entered Africa . . . M. Zeltner thinks that the archaeological exploration of the African continent is yet in its infancy and will doubtless yield surprising results in establishing the advanced state of development attained by the black races in early times.
>
> (Du Bois, 1910: 5)

Later in this issue of *The Crisis*, under the subheading 'Science', it is noted that a paper was read before the British Association for the Advancement of Science concluding that 'all earlier human races were probably colored', which generally supported the monogenism argument regarding human origins. Within this same section in this issue, it was also noted that a recent study by Cornell Professor Burt Wilder provided evidence that, in a direct rebuke to scientific racism, 'mere brain weight is no indication of mentality' (p. 6).

In its second issue, *The Crisis* published an article by Boas (1910) addressing 'The Real Race Problem'. In the third issue, Jane Addams (1911) blamed social segregation on 'the contemptuous attitude of the so-called superior race' (p. 22). In its fifth issue, *The Crisis* detailed how 'startling results . . . follow(ing) the last ten years of excavations in the upper Soudan' led 'Dr. Schweinfurth, the famous German ethnologist, and Dr. von Luschan, of the University of Berlin', as well as their European colleagues, to the conclusion that 'the black man, not the white, was the first to discover the art of working metals and gave this knowledge, which was the first great step forward in civilization, to Europe and nearer Asia' (Du Bois, 1911b: 23). Ten years later, *The Crisis* criticized President Harding's attack on 'racial amalgamation' with 'the voice of science' (Du Bois, 1921: 55). In 1932, in *The Crisis*, the anthropologist Ernest Hooton (1932) reviewed archaeological and anthropological history to facetiously conclude that 'if there are racial differences in mentality between Negroes and Whites it may be that Whites cannot devise intelligent tests which are fairly applicable to Negroes' (p. 346).

During Du Bois' editorship of *The Crisis*, he consistently reported on and recommended scientific works in its 'What to read' section. For instance, he encouraged readers to consider Peter Kropotkin's prescient defence of natural selection as a coevolutionary, cooperation-based process (Du Bois, 1911a: 30). Throughout his teaching career, he assigned a large amount of natural scientific work, so students could grapple with socionatural relationships. For example, in Fall 1937, he had his graduate students in sociology at Atlanta University read the anti-eugenicist, Lancelot Hogben's *Genetic Principles in Medicine and Social Science*, which highlighted the interdependence of genes and environment (Du Bois, 1937). (One year later, Du Bois (1938) would write to Hogben, asking him to contribute to the never completed 'Encyclopedia of the Negro'.)

Most of the scientists Du Bois and his students grappled with had a relational, dialectical view of science, and many of them explicitly embraced forms of social justice. Some, however, did not, but were important to engage as part of the larger discussion and debate. In the first issue of the third volume of *The Crisis*, Du Bois (1911a: 35) recommended Ellen Churchill Semple's *The Influence of Geography on the Environment*, which was a decidedly geographic determinist text.[6] In his aforementioned graduate class, in addition to Hogben, he had his students read Ellsworth Huntington's *Civilization and Climate*, which claims that climate determined human accomplishments. For Du Bois, it was crucially important to understand the range of arguments.

While Du Bois was at times unable to escape his own elitism to see beyond the epistemological trappings of his own age, he took the broad range of scientific knowledge very seriously. He believed that no ideas or arguments could stand alone; thus, it was necessary to critically assess all work and consider its contributions to understanding the world. In most of his later writings on African history, Du Bois (2007 [1940]: 1) incorporated the approach of the contemporary 'possibilism' school of French geography (e.g.

Febvre, 1974 [1922]), which held that environmental conditions set spatially and historically specific, if non-determinist, constraints on social life. He was keen to detail how, for example, 'physical distinctions depend obviously on climate, diet and environment', yet these are 'of no intrinsic significance unless they indicate lines of evolution and deeper physical, mental and social differences. Whatever men may believe concerning this . . . there is no clear scientific proof' (Du Bois, 2007 [1940]: 1).

In this, Du Bois embraced an open, relational interdisciplinary approach, anathema to physical, biological or geographical determinisms. It is one that is driven by the exploration of as-yet unknown boundaries between biological, geographic and diasporic racial histories. The incorporation of such boundaries, however unclear, is ultimately not restricting for Du Bois but politically freeing. For instance, in an early address, Du Bois (1909) remarked,

> What the age of Darwin has done is to add to the eighteenth-century idea of individual worth the complementary idea of physical immortality of the human race. And this, far from annulling or contracting the idea of human freedom, rather emphasizes its necessity and eternal possibility – the boundlessness and endlessness of possible human achievement. Freedom has come to mean not individual caprice or aberration but social self-realization in an endless chain of selves, and freedom for such development is not the denial but the central assertion of the evolutionary theory. So, too, the doctrine of human equality passes through the fire of scientific inquiry not obliterated but transfigured; not equality of present attainment but equality of opportunity for unbounded future attainment is the rightful demand of mankind.

If, like Dilthey, one pays attention to the limits of natural science, it becomes plain that nature cannot provide higher meaning in itself. With this in mind, natural science for Du Bois is not a biological straightjacket. It is rather a platform for humanistic and emancipatory politics. For, in a materialist sense, the appropriate incorporation of natural science and natural history provides entire populations of people who share a common history the ability to make their own meaning and determine themselves as they see fit (Schuller, 2017). Since at least *Conservation*, Du Bois had been advocating for what Julia E. Liss (1998) calls his 'anti-anti-racism', or an insistence that equal human potential does not obliterate meaningful variations *in socio-histories*, even as it does illuminate the bankruptcy of traditions that search for the source of such variation in the mythic genetic coherence of raced populations (p. 132). Darwin and the natural sciences more generally offered the cathartic opportunity to explore this variety of socio-historical experiences, so long as the lessons drawn from such resources were approached as standing in relation with, or more likely driven by, cultural, political, economic and other social processes. Natural science, for Du Bois, was in this way necessary and liberating.

This outlook eventually propelled Du Bois' later studies on African history, as well as his Marxism and pan-African politics. For example, in the preface to *The Negro*, Du Bois (2007 [1915]) states that 'much . . . work in history and science is needed to clear mooted points and quiet controversialist who mistakes present personal desire for scientific proof' (p. xxix). Opposite the first page of the manuscript is a map of the 'physical geography of Africa'. The first chapter describes this physical geography in detail and relates how such 'strange . . . physical peculiarities' interacted with both physiologies and migrations to produce histories that form 'an integral part of the great movement of

world history' (p. 1). In *Black Folk Then and Now*, Du Bois (2007 [1940]) begins in a similar manner, though the reader is reminded that 'it is impossible in Africa as elsewhere to fix with any certainty the limits of racial variation due to heredity, to climate and to (population) intermingling' (p. 3). While incorporating natural science in his larger analysis, Du Bois remained ever aware of science's dual nature, noting, for example, that it could quickly become 'the pensioner of business' (p. 162). Another example comes from a study proposed during his tenure at the University of Atlanta, 'The American Negro: Project of the University Survey of His History, Present Condition, Prospects', where Du Bois (1931) suggested that 'by using all scientific methods – sociological investigation, psychological measurements, biological experiments and economic studies' it would be possible to 'furnish an increasingly complete scientific basis which, by means of printed material and spoken word, can be used for wise and purposive action in the treatment of Negro problems' (p. 1).

To be clear, throughout these works, Du Bois insisted that monopoly power and colonialism were the principle shapers of contemporary race relations. He did not, in any way, incorporate natural history into his work in order to propose that differences in natural history, be they biological or geographic, establish racial or other forms of inequality. He rather incorporated natural science for the opposite reason – to contest racial determinisms by demonstrating how processes of natural selection render populations feasible through change and change only. Recounting racial histories in part through natural histories – in *The Negro*, in *Black Folk Then and Now*, in *Africa, Its Geography, People and Products* (where he begins his history in the Palaeozoic), and elsewhere – was ultimately a form of emancipatory politics, one which embraced both social and natural dynamism to reveal the range of factors that influenced the histories of populations around the world. It illuminated the possibilities of change, while also specifying that the socio-historical conditions that shaped inequality had to be addressed.[7]

Contesting racial determinisms necessitated an epistemic pluralism, one that was humble enough to respond and reassess as political, cultural, personal and scientific contexts changed. In notes for an unpublished manuscript, likely from 1946, Du Bois reflected upon the limits of what we can know about the world outside our own heads. After affirming that such a world exists independently of our emotions, and that through 'the great scientific tool of the Hypothesis', we are in fact capable of sufficiently knowing this world in ways that can guide our actions, he warns that we should hold 'all truth . . . tentatively and watchfully, ready to change our conception once a new explanation . . . fits the facts more perfectly'.[8] Furthermore, one should never be held back from accepting new scientific truths simply because 'we fear the ghosts of our fathers' for 'slowly but surely, the scientific spirit prevails . . . particularly in regard to the outer world' (Du Bois, 1946: 3–4). Here Du Bois is demonstrating a cautiously realist picture of science. He clearly believes that interdisciplinary science is a reasonable, even necessary, tool for understanding what the world is like. Du Bois even appears to prefigure the thought of Imre Lakatos (1970) and Larry Laudan (1978) in ways, asserting that science is dynamic, and knowledge must change in order to 'fit the facts more perfectly'. Yet there remains a necessary humility, one gleaned from Du Bois' pragmatism as well as an awareness of the fits and starts that spot histories of science. Scientific knowledge, in this picture, is necessary but forever partial, circumscribed, de-limited and contextually

dependent – in a word, mortal. Ever since his essay on da Vinci, Du Bois was cognizant of this dual nature of science.

Conclusion

Du Bois was a broad postexemptionalist, interdisciplinary scholar who forged an approach to examine human history in relation to biophysical worlds. He actively engaged the social and natural sciences, as well as humanities, in order to develop a more comprehensive understanding of everything around him. At the same time, he confronted scientific racism, rooting his critique in knowledge from the broader constellation of scientific research. His interdisciplinary approach, the outlines of which developed during his education at Harvard and in Germany, was wholly humble and intensely political. It was humble in that he recognized how in all cases science is an imperfect social process reflecting the epistemological and material conditions of its production; in that the natural sciences, the human sciences and the relationship between the two all had clear explanatory limits; and in that he believed the separation of various disciplines should be de-naturalized without renouncing their independent value. Nevertheless, Du Bois' defence of interdisciplinary science was deeply political. First and foremost, he was unwavering in his conviction that any scientific theory promoting racial and other forms of injustice was categorically wrong. He understood that a correct approach to relationships between natural and social sciences meant that barbarism could no longer be shrouded under ostensible notions of scientific objectivity. Furthermore, he did not defend natural or social science as is; he rather sought to engage scientists in multiple disciplines in order to employ comprehensive knowledge as a source of uplift. For instance, it was an opportunity to refine heretofore subjugated histories that could become radical political resources. An indelible element of this project, however, was understanding the proper place for natural science and physical influence within his sociological approach. This place was relational, contingent, dynamic and complex. It situated natural sciences as potential resources that could help explain parts of socio-historical processes, yet it never employed natural sciences as resources that could explain what drove social inequalities – that was a space reserved for the analysis of socio-histories, which included slavery, colonialism and monopoly capital.

Unfortunately, the marginalization of Du Bois' sociology also resulted in the marginalization of this rich, integrative, interdisciplinary approach. Indeed, during Du Bois' life, mainstream American sociology became increasingly self-referent and disassociated from politics. In contrast, Du Bois' own sociology became ever-more porous, expansive and political. According to Patricia Hill Collins (2016), Du Bois' marginalized status 'contributed to the integrity' of his sociology (likely enriching it through stronger associations with contemporary struggles) (p. 1398). This integrity, we contend, is in part based upon a conception of sociology with fewer limits – be they disciplinary or other. It is part of a rigorous commitment to understand and confront the world in all of its complexity.

The systematic racism that Du Bois experienced in his personal and professional life obscured many possibilities for sociological thought and practice. It is only rather recently that sociologists have begun the epistemological work necessary to engage with thought in fields as far flung as biology, epidemiology, architecture, engineering and computer

science, work that is requisite if sociologists are to meaningfully contribute to many of the most daunting social challenges of the twenty-first century. If Du Bois' interdisciplinarity had been taken seriously earlier, there is a chance that these efforts might not appear so novel, but rather as indelible parts of a vibrant, robust sociological enterprise.

Consider, for example, as we have argued here, the fact that Du Bois was a 'postexemptionalist' sociologist, who explicitly examined the ways in which natural-environmental and other non-human processes are foundational for sociological inquiry. He assessed how social systems and actors interacted with these non-human conditions and processes, and the outcomes of these relationships. In this, Du Bois offers a sophisticated approach that is extremely relevant to recent efforts to address the social dimensions of health and environmental concerns (Catton and Dunlap, 1978, 1980; Clark et al., 2018), whereas those scholars who excluded such insights from sociological purviews are not as useful for addressing these challenges. Decades after Du Bois' death, a postexemptionalist approach finally found footing in environmental sociology, yet it is only now finding its way into the mainstream discipline (e.g. Scott and Johnson, 2017).[9] With climate change, ocean acidification, exponential pollution and other instances in which relationships between social and natural processes are becoming increasingly dynamic, in addition to the developing awareness of epigenetic processes, and persistent claims of racial determinism, a nuanced, multi-dimensional, and decidedly postexemptionalist interdisciplinarity is plainly necessary, especially one that can adequately address a politics of justice. Such a critical, grounded approach is all the more important provided how the impacts of environmental change continue to be racialized and classed in ways that reproduce status quo inequalities. These outcomes would not surprise Du Bois, given that he explicitly studied and addressed them. Unfortunately, his critique and efforts to change these conditions have long been overlooked.

In all, Du Bois offers a useful, if hitherto ignored, classical grounding for interdisciplinary endeavours, as his scholarship managed to draw upon and, when appropriate, usefully synthesize the work of natural and social scientists across a range of fields, bringing them to bear on essential questions regarding race and biology, neighbourhoods and public health, ecological imperialism, environmental degradation and social inequities, and many others (Clark et al., 2018; Clark and Foster, 2003; Go, 2020; Pellow, 2016, 2018). His epistemology was inclusive of natural science, even if the manner in which it was inclusive changed over time, guided by ever-changing scientific debates, new knowledge, relationships, historical contexts and politics. If updated to be reflective of today's debates, such a postexemptionalist interdisciplinary impulse provides an example for how to bring together sociology and other disciplines in order to develop a comprehensive understanding of indelible human, environmental and other relationships.

To be clear, we are not claiming that substantive elements of Du Bois' interdisciplinarity should be instinctively mimicked. The substance of Du Bois' interdisciplinarity reflects his historical moment and should stand as such. What we are instead claiming is that if, as Aldon Morris (2015) has argued, Du Bois' influence should expand beyond narrow conversations of race, rediscovering and incorporating his interdisciplinary openness is one part of his legacy that can provide new ground for such development. Following Du Bois in this regard means refusing to cede the study of socio-natural relationships to natural scientists alone. Critically, it also involves encouraging natural scientists – from geneticists to climatologists – to understand the social processes that shape

both their objects of study as well as the ways in which they study them. At best, it reminds sociologists that sociology cannot stand alone; we should collaborate with and learn from natural scientists to consider more carefully how to conduct research that can influence human lives in a positive way. Fundamentally, such aims involve respecting disciplinary boundaries but not being bound by them. Du Bois clearly understood that methodological approaches in the natural sciences could not become a guide for the social sciences. Still, he remained attuned to the fact that the objects of study in the human sciences and natural sciences interact. The form and function of such interaction, however, is often unknown and, as such, Du Bois was as aware of disciplinary limits as he was of disciplinary possibilities.

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Notes

1. Page numbers refer to the written manuscript of the essay, not the typed manuscript.
2. Lewis (1994) indicates that Du Bois' essay, 'The Renaissance of Ethics', written when he was at Harvard, also demonstrates an early gulf between the two (pp. 95–96).
3. This position also represents a break from another of Du Bois' philosophical mentors at Harvard, George Santayana, who held more radical empiricist views.
4. Bakker (1999) notes that Dilthey's use of 'verstehen' is different than Max Weber's in that it relied less on causality per se.
5. See Liss (1998) and Baker (1998: 99–126) for detailed overviews of the relationship between Du Bois and Boas.
6. For a nuanced discussion of this era's geographic determinism, see Scott (2011).
7. We would be remiss to ignore that Du Bois (1932a) published an article in *Birth Control Review* that advocated for a few elite Black leaders to start a movement in which planned population growth would become a political strategy for the general betterment of Black life. While, at first blush, this article reads supportive of eugenics and thus a stain on Du Bois' legacy, eugenics meant something different to Black leaders than to Whites. As Roberts (2009: 203) notes, while Whites supported birth control as a means of preserving status quo racial hierarchy,

Blacks promoted birth control as a means of toppling it. 'In addition', Schuller (2017) points to how '(t)he contemporary critical commitment to understand race as an exclusively cultural phenomenon renders Du Bois's . . . eugenic efforts incomprehensible' (p. 203). Only when examined within his greater oeuvre, in particular, within his incorporation of natural science, as well as the debates and struggles of his own historical moment, does his consideration of Black eugenics as a form of racial uplift become more understandable (if not entirely excusable). Nevertheless, this issue deserves more attention than we can provide here.

8. Here, Du Bois' position is very much in line with the scientific approach of the ancient Greek philosopher Epicurus, who noted that there can be multiple possible causes that only could be adjudicated by empirical investigation. In addition, a single correct explanation may not be possible, given limitations in observing the exact phenomena. Thus, several alternative hypotheses are necessary in order to account for any other conditions that might influence the relationship or event under investigation. One must await confirmation and be willing to accept other explanations when evidence is counter to a hypothesis (Asmis, 1984: 321–330; Epicurus, 1994: 19–28, 34; Foster et al., 2008: 54–56).
9. Critical Environmental Justice scholarship is simply one example of a field that has largely picked up where Du Bois left off (Pellow, 2016, 2018). This work actively integrates and engages insights from the humanities, social sciences and natural sciences to understand environmental justice as more than spatial coincidence of hazards and people, but as a problem that is at once intersectional, multi-scalar, deeply political and dependent upon the sacrifice of essential environmental relationships (also see Besek et al., 2020).

References

Addams J (1911) Social control. *The Crisis: A Record of the Darker Races* 1(3): 22–23.

Appiah KA (1985) The uncompleted argument: Du Bois and the illusion of race. *Critical Inquiry* 12(1): 21–37.

Appiah KA (2014) *Lines of Descent: W. E. B. Du Bois and the Emergence of Identity*. Cambridge, MA: Harvard University Press.

Asmis E (1984) *Epicurus' Scientific Method*. Ithaca, NY: Cornell University Press.

Baker LD (1998) *From Savage to Negro: Anthropology and the Construction of Race, 1896-1954*. Berkeley, CA: University of California Press.

Baker LD (2010) *Anthropology and the Racial Politics of Culture*. Durham, NC: Duke University Press.

Bakker JI (1999) Wilhelm Dilthey: Classical sociological theorist. *Quarterly Journal of Ideology* 22(1–2): 43–82.

Besek JF, Robinson E and Rosenbloom A (2020) Critical environmental justice studies through the veil. *Environmental Justice* 18: 86–90.

Boas F (1906) *Commencement address at Atlanta University, May 31, 1906*. Atlanta University Leaflet, No. 19. Atlanta, GA: Atlanta University Press.

Boas F (1910) The real race problem. *The Crisis: A Record of the Darker Races* 1(2): 22–26.

Bright LK (2018) Du Bois' democratic defence of the value free ideal. *Synthese* 195(5): 2227–2245.

Browne J (1995) *Charles Darwin: A Biography, Vol. 1 – Voyaging*. New York: Random House.

Browne J (2003) *Charles Darwin: A Biography, Vol. 2 – The Power of Place*. New York: Random House.

Catton W and Dunlap R (1978) Environmental sociology: A new paradigm. *The American Sociologist* 13(1): 41–49.

Catton W and Dunlap R (1980) A new ecological paradigm for post-exuberant sociology. *The American Behavioral Scientist* 24(1): 15–47.

Clark B and Foster JB (2003) Land, the color line, and the quest of the golden fleece. *Organization & Environment* 16(4): 459–469.

Clark B, Auerbach D and Zhang KX (2018) The Du Bois nexus: Intersectionality, political economy, and environmental injustice in the Peruvian Guano trade in the 1800s. *Environmental Sociology* 4(1): 54–66.

Collins PH (2016) Du Bois's contested legacy. *Ethnic and Racial Studies* 39(8): 1398–1406.

Dilthey W (1991 [1883]) *Introduction to the Human Sciences*. Princeton, NJ: Princeton University Press.

Drake SC (1980) Anthropology and the black experience. *The Black Scholar* 11(7): 2–31.

Du Bois WEB (1890) *Does the scientific work of Leonardo da Vinci entitle him to be called the founder of the modern scientific method, 1890*. Identifier: mums312-b230-i015. W. E. B. Du Bois Papers, 1803-1999. Amherst, MA: Department of Special Collections and University Archives, University of Massachusetts Amherst Libraries.

Du Bois WEB (1897) The conservation of races. In: Sundquist EJ (ed.) *The Oxford W. E. B. Du Bois Reader*. New York: Oxford University Press, pp.38–47.

Du Bois WEB (1898) The study of the Negro problems. *The ANNALS of the American Academy of Political and Social Science* 11(1): 1–23.

Du Bois WEB (1905) *Sociology hesitant*. Identifier: mums312-b212-i003. W. E. B. Du Bois Papers, 1803-1999. Amherst, MA: Department of Special Collections and University Archives, University of Massachusetts Amherst Libraries.

Du Bois WEB (ed.) (1906) *The Health and Physique of the Negro American: Report of a Social Study Made Under the Direction of Atlanta University; Together with the Proceedings of the Eleventh Conference for the Study of the Negro Problems, Held at Atlanta University, on May the 29th, 1906* (Atlanta University Publications). Atlanta, GA: Atlanta University Press.

Du Bois WEB (1909) Evolution of the race problem. In: *Proceedings of the national Negro conference*. New York, pp.142-158. Available at: http://www.webdubois.org/dbEvolOfRaceProb.html

Du Bois WEB (ed.) (1910) *The Crisis: A Record of the Darker Races*, vol. 1(1). New York: National Association for the Advancement of Colored People.

Du Bois WEB (ed.) (1911a) *The Crisis: A Record of the Darker Races*, vol. 1(3). New York: National Association for the Advancement of Colored People.

Du Bois WEB (ed.) (1911b) *The Crisis: A Record of the Darker Races*, vol. 1(5). New York: National Association for the Advancement of Colored People.

Du Bois WEB (ed.) (1921) *The Crisis: A Record of the Darker Races*, vol. 23(6). New York: National Association for the Advancement of Colored People.

Du Bois WEB (1931) *The American Negro: Project of the university survey of his history, present condition, prospects*. W. E. B. Du Bois Collection. Box 6, Series IV, Subseries III. 1933-1934. Nashville, TN: Fisk University.

Du Bois WEB (1932a) *Black folk and birth control, ca. June 1932*. Identifier: mums312-b208-i051. W. E. B. Du Bois Papers, 1803-1999. Amherst, MA: Department of Special Collections and University Archives, University of Massachusetts Amherst Libraries.

Du Bois WEB (1932b) *Letter from W. E. B. Du Bois to A. Clayton Powell, February 25, 1932*. Identifier: mums312-b192-i371. W. E. B. Du Bois Papers, 1803-1999. Amherst, MA: Department of Special Collections and University Archives, University of Massachusetts Amherst Libraries.

Du Bois WEB (1937) *Readings for graduate students in sociology, September 15, 1937*. Identifier: mums312-b081-i303. W. E. B. Du Bois Papers, 1803-1999. Amherst, MA: Department of Special Collections and University Archives, University of Massachusetts Amherst Libraries.

Du Bois WEB (1938) *Letter from W. E. B. Du Bois to Lancelot Hogben, January 8, 1938*. Identifier: mums312-b085-i376. W. E. B. Du Bois Papers, 1803-1999. Amherst, MA: Department of Special Collections and University Archives, University of Massachusetts Amherst Libraries.
Du Bois WEB (1946) *Steps towards a science of how men act*. Identifier: mums312-b213-i071. W. E. B. Du Bois Papers, 1803-1999. Amherst, MA: Department of Special Collections and University Archives, University of Massachusetts Amherst Libraries.
Du Bois WEB (1992 [1935]) *Black Reconstruction in America*. New York: Atheneum.
Du Bois WEB (1994 [1903]) *The Souls of Black Folk*. New York: Dover.
Du Bois WEB (1996 [1899]) *The Philadelphia Negro: A Social Study*. Philadelphia, PA: University of Pennsylvania Press.
Du Bois WEB (2000) Sociology hesitant. *Boundary* 27(3): 37–44.
Du Bois WEB (2007 [1915]) *The Negro*. New York: Oxford University Press.
Du Bois WEB (2007 [1940]) *Dusk of Dawn: An Essay Toward an Autobiography of a Race Concept*. New York: Oxford University Press.
Du Bois WEB (2014 [1939]) *Black Folk Then and Now: An Essay in the History and Sociology of the Negro Race*. New York: Henry Holt.
Du Bois WEB (n.d.) *The Negro in America*. W. E. B. Du Bois Collection. Box 4, Series XXIV, Subseries IV. Nashville, TN: Fisk University.
Epicurus (1994) *The Epicurus Reader: Selected Writings and Testimonia*. Indianapolis, IN: Hackett Publishing.
Febvre L (1974 [1922]) *A Geographical Introduction to History*. Westport, CT: Greenwood Press.
Foster JB and Holleman H (2012) Weber and the environment: Classical foundations for a postexemptionalist sociology. *American Journal of Sociology* 117(6): 1625–1673.
Foster JB, Clark B and York R (2008) *Critique of Intelligent Design: Materialism Versus Creationism from Antiquity to the Present*. New York: Monthly Review Press.
Go J (2020) Race, empire, and epistemic exclusion: Or the structures of sociological thought. *Sociological Theory* 38: 79–100.
Gooding-Williams R (2009) *In the Shadow of Du Bois: Afro-Modern Political Thought in America*. Cambridge, MA: Harvard University Press.
Gould SJ (1996) *The Mismeasure of Man*. New York: W. W. Norton.
Hooton EA (1932) Is the Negro inferior. *The Crisis: A Record of the Darker Races* 11: 345–346, 364.
James W (1950 [1890]) *The Principles of Psychology*. New York: Dover.
Jeffers C (2013) The cultural theory of race: Yet another look at Du Bois's 'the conservation of races'. *Ethics* 123(3): 403–426.
Jeffers C (2017) Du Bois, Appiah, and Outlaw on racial identity. In: Zack N (ed.) *The Oxford Handbook of Philosophy and Race*. Oxford: Oxford University Press, pp.204-213.
Lakatos I (1970) Falsification and the methodology of scientific research programmes. In: Lakatos I and Musgrave A (eds) *Criticism and the Growth of Knowledge: Proceedings of the International Colloquium in the Philosophy of Science, London*. Cambridge: Cambridge University Press, pp.91-196.
Laudan L (1978) *Progress and Its Problems: Towards a Theory of Scientific Growth*. Berkeley, CA: University of California Press.
Levins R (1996) Ten propositions on science and antiscience. *Social Text* 46–47: 101–111.
Lewis DL (1994) *W. E. B. Du Bois, 1863-1919: Biography of a Race*. New York: Henry Holt.
Lewis DL (2000) *W. E. B. Du Bois: The Fight for Equality and the American Century, 1919-1963*. New York: Henry Holt.
Liss JE (1998) The science and politics of race in the work of Franz Boas and W. E. B. Du Bois, 1894–1919. *Cultural Anthropology* 13(2): 127–166.
Morris AD (2015) *The Scholar Denied: W. E. B. Du Bois and the Birth of Modern Sociology*. Berkeley, CA: University of California Press.

Outlaw L (1996) ‘Conserve’ races? In defense of W. E. B. Du Bois. In: Bell W, Grosholz ER and Stewart JB (eds) *W. E. B. Du Bois: On Race and Culture: Philosophy, Politics, and Poetics*. New York: Routledge, pp.15-38.

Pellow DN (2016) Toward a critical environmental justice studies: Black Lives Matter as an environmental justice challenge. *Du Bois Review: Social Science Research on Race* 13(2): 221–236.

Pellow DN (2018) *What Is Critical Environmental Justice?* Medford, MA: Polity Press.

Powell AC (1932) *Letter from A. Clayton Powell to W. E. B. Du Bois, February 18, 1932*. W. E. B. Du Bois Papers, 1803-1999. Amherst, MA: Department of Special Collections and University Archives, University of Massachusetts Amherst Libraries.

Rabaka R (2009) *Africana Critical Theory: Reconstructing the Black Radical Tradition, from W. E. B. Du Bois and C. L. R. James to Frantz Fanon and Amilcar Cabral*. Lanham, MD: Rowman & Littlefield.

Reed A Jr (1997) *W. E. B. Du Bois and American Political Thought: Fabianism and the Color Line*. New York: Oxford University Press.

Roberts D (2009) Margaret Sanger and the racial origins of the birth control movement. In: Baum B and Harris D (eds) *Racially Writing the Republic: Racists, Race Rebels, and Transformations of American Identity*. Durham, NC: Duke University Press, pp.196-213.

Schafer AR (2001) W. E. B. Du Bois, German social thought, and the racial divide in American progressivism, 1892-1909. *The Journal of American History* 88(3): 925–949.

Schuller K (2017) *The Biopolitics of Feeling: Race, Sex, and Science in the Nineteenth Century*. Durham, NC: Duke University Press.

Scott J (2011) *Conceptualising the Social World: Principles of Sociological Analysis*. Cambridge: Cambridge University Press.

Scott LN and Johnson E (2017) From fringe to core? The integration of environmental sociology. *Environmental Sociology* 3(1): 17–29.

Sundquist EJ (1996) *The Oxford W. E. B. Du Bois Reader*. New York: Oxford University Press.

White K (2011) The sustaining relevance of W. E. B. Du Bois to health disparities research. *Du Bois Review: Social Science Research on Race* 8(1): 285–293.

Wissler C (1905) *Letter from the American Museum of Natural History to W. E. B. Du Bois, November 31, 1905*. Identifier: mums312-b001-i072. W. E. B. Du Bois Papers, 1803-1999. Amherst, MA: Department of Special Collections and University Archives, University of Massachusetts Amherst Libraries.

Zumwalt RL and Willis WS (2008) Franz Boas and W. E. B. Du Bois at Atlanta University, 1906. *Transactions of the American Philosophical Society* 98(2): 1–83.

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