
Maurizio MELONI, *Political Biology: Science and Social Values in Human Heredity from Eugenics to Epigenetics*
(London, Palgrave Macmillan, 2016)

Maurizio Meloni, sociologist at the University of Sheffield and co-editor of the recent Sociological Review Monograph *Biosocial Matters* (2016)¹, studies the social life of the biological theories of “heredity.” At the crossroads of social studies of science and history of ideas, his book *Political Biology* analyzes the rise and fall of the “modern” paradigm of heredity, i.e. the notion that “hereditary material is fixed once and for all at conception and unaffected by changes in the environment or phenotype of the parents” [1]—and its sociopolitical implications.

The book’s structure is mainly a chronological one. Its general principle is presented in the first chapter—*Political Biology and the Politics of Epistemology*—which serves both as a general introduction and as a theoretical manifesto. Meloni distinguishes mainly between three successive “biological eras,” “each involving specific articulations of the relationship between biology and politics and each separated by more or less visible caesuras” [25]. Chapters 2, 3 and 4 deal with the first era—the first half of the 20th century. The two following chapters (5 and 6) focus on the second era, from 1945 to the 1990s. Chapter 7 and most of the concluding chapter (chapter 8) discuss the most recent period, the life sciences postgenomic “revolution” starting with the 21st century.

The notion of “political biology” requires some clarification. Defined as the “application of political epistemology to the history of biology” [13], it invites the reader to follow a general rule of “triangulation”. The development and social uses of the theories of heredity should be analyzed as the outcome of a “negotiation” between three main “poles” or “forces”: rhetorics (or knowledge claims), science, and politics. “Knowledge claims pass through an intense negotiation with the other two components of the political epistemological triangle: the constraints imposed by acceptable [...]

¹ Meloni M., Williams S., Martin P., eds, *Century*, Wiley-Blackwell/The Sociological Review, 2016, *Biosocial Matters: Rethinking the Review*.
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epistemic statements and available sociopolitical values” [18]. More theoretically, the notion of political biology is used as a conceptual antidote to the historical blindness of most of the available “biopolitical” or “biopower” literature: “The project for a political biology is meant to offer an alternative to the frustration with the kind of philosophy and social theory which especially after Foucault (and alas, oblivious of Foucault) has indulged in abstractions over biopower. To make biopower more analytically tractable” [22]. Clearly, the reference to Michel Foucault and his famous 1966 book *Les mots et les choses* (title oddly translated in English as *The order of things*) is decisive for Meloni’s choice of a “non-linear” historical approach, and the partition of history into three main eras.

The first era is investigated in chapter 2 “Nineteenth Century: From Heredity to Hard Heredity”, chapter 3 “Into the Wild: The Radical Ethos of Eugenics”, and chapter 4 “A Political Quadrant”. It starts at the turn between the 19th and the 20th centuries with the rise of the hard heredity thesis. Meloni focuses mostly on the contributions of three authors: Francis Galton (the nature-nurture dichotomy, pp. 41-48), August Weismann (the germ-plasm theory pp. 48-59) and Wilhelm Johannsen (the genotype-phenotype dichotomy, pp. 59-63). Despite their obvious differences, these three scientists are described as agents of “modernization” (in a Latourian sense) as they decisively contributed to the purification of heredity “from any dangerous confusion with the body or sociocultural factors” [63]. They paved the way for a theoretical framework in which former biological research questions or theories—for instance Darwin or Mendel’s questions and theories—have been frequently retrofitted: “Teleological thinking can be the source of many mistakes and erroneous assumptions, especially when the understanding of a revolutionary development such as the creation of hard heredity is at stake” [36].

This first era coincides also with an intense (“aggressive”) politicization of biological knowledge, mainly through the development of the eugenics movement. Meloni recalls that Galton once coined the term “eugenics” as the science which deals “with all influences that improve the inborn qualities of a race.” This term symbolizes the “construal of reproduction as a political problem” [72]. And clearly what makes this book valuable is that its author guides us through the voluminous and growing historiographical literature on eugenics and the politics of human reproduction. As he lists the numerous “shifts” of this historiography, one key idea that emerges from this reading is

that, although hard heredity played an important role in the making of the eugenic movement, there is no natural or logical “affinity” between eugenics and any specific conception of heredity. The politics of reproduction are plural. Not only can hard hereditarian eugenics take multiple political forms— “positive” or “negative,” “utopian” or “dystopian,” “regenerative” or “degenerative”—but “eugenics could be soft hereditarian as well, depending on national and cultural contexts” [65]. And it is precisely this sense of pluralism that the book intends to convey.

Meloni’s “political quadrant” [94] unsurprisingly highlights the well-known alliance between “right wing values” and hard heredity, as exemplified in its most extreme forms by the writings of Charles Davenport [80] or Eugen Fischer [148]. But the most interesting, and somehow counterintuitive, part of his discussion deals with the three “rival” alliances that require intensive “excavation” work [95]: the “right Lamarckians” (the alliance between right wing political values and soft heredity), the “left Lamarckians” (the alliance between left wing political values and soft heredity) and the “left Mendelians” (the alliance between left wing political values and hard heredity). The book shows, through the accumulation of quotes and references to the existing historiographical literature (see the 40-page bibliography at the end of the book), that, despite our contemporary oblivion, the 1910s and 1920s enjoyed a rich variety of alliances between science and politics: “racist and reactionary political values could be mobilized on behalf of nurture and the environment. Conversely, egalitarian, radical, and even overtly communist discourses were constructed under the banner of strictly hard-hereditarian eugenics” [93].

I consider these two chapters (3 and 4) as an important contribution to the field of the political sociology of science as they show the political “malleability” of science but also the variety and intensity of the political involvements of scientists. To mention one example among the many discussed in these two chapters, the case of the geneticist and eugenicist Hermann Joseph Muller appears fascinating. Known for his work on the physiological and genetic effects of radiation (Muller won the Nobel prize in 1946), Muller moved to the Soviet Union in 1932. There he tried to convince, without success, Joseph Stalin to officially endorse the hard heredity paradigm as a scientific means to “raise all the masses to the level at which now stand our most gifted individuals” (Letter from Muller to Stalin, quoted p. 127). Muller’s case not only breaks the stereotype of a “natural” affinity between left wing political values and soft heredity

but, symmetrically, this historical case breaks the stereotype of the “natural” link between hard-heredity and conservative politics.

The second biological era, investigated in chapter 5 “Time for a Repositioning: Political Biology after 1945” and chapter 6 “Four Pillars of Democratic Biology”, starts in the aftermath of World War II. This second era, just like the previous one, is characterized by the hegemony of hard heredity. But this hegemony is even more complete as the discovery of the double helical structure of DNA in 1953 marked the end of the transition from the “Mendelian gene” to the molecular one: “The molecular gene, through the establishment of Francis Crick’s central dogma of molecular biology [...] put to rest the controversy over hard and soft heredity [...] For decades, the prevailing trend had favored hard heredity, and DNA sealed now its victory [...] With the Central Dogma in no way the environment can send signals to the genome” [138-139]. Unlike the first era, however, the politicization of biology just could not ignore the historical traumas of World War II, the German racial state and the atrocities of its “scientific racism”. It required not only the official “repudiation” of eugenics and racism (chapter 5), but the “repositioning” of biological thinking within a post war “liberal-democratic” framework (chapter 6). Meloni describes some of the cosmetic changes needed. Some eugenicists started to rename themselves as population scientists, human geneticists or psychiatrists. They also had to rework some of their initial conceptual repertoires: “after 1945 Huxley and Muller made major efforts to rebrand their eugenic agendas in new terms. ‘Mutations load’ became one of Muller’s preferred phrases; ‘population control’ functioned likewise for Huxley” [142-143]. But more “substantial” changes were necessary and this section of the book is an occasion to point out some of these changes that are deeply “resonating” with liberal democratic values: the reconstruction of evolutionary thought in terms of population thinking instead of racial types [165-169], the humanist conception of “culture” as a distinct level of evolution [170-175], or the affirmation of an individualistic approach of the biological processes undermining the “collective ethos” of eugenics which traditionally subordinated the individual to the collective [175-180]. Each one of these conceptual reconfigurations should be conceived, in the words of Meloni, as a “milepost indicating not just new science but the beginning of a new political epistemic discourse” [182].

Finally, the book ends with the more recent biological era, the third one, investigated in chapter 7 “Welcome to Postgenomics: Reactive

Genomes, Epigenetics, and the Rebirth of Soft Heredity” and chapter 8 “The Quandary of Political Biology in the Twenty-First Century.” Beyond the useful inventory of the multiple meanings of the term “postgenomic,” Meloni portrays our “postgenomic” present as a “real rupture. Postgenomics should not be conceived as a mere prolongation of what came before” [194]. And the locus of this revolution, its main flagship, is epigenetics. Meloni describes epigenetics as an “embryonic discipline” dealing with the molecular regulation of genes and its transgenerational consequences. But it is also a “high-resolution theoretical spyglass through which to see the changing thought-style, and possibly ethos, of the biosciences in the early twenty-first century” [195-196]. One central feature of this new thought-style is the decline of the hard heredity paradigm, a core component of the two first biological eras discussed in the book. Contemporary epigenetic research erodes the boundary between heredity and environment. Its focus on the transgenerational consequences of the interactions between gene and environment brings the life science community closer to “softer” versions of heredity. The ones that were already in circulation at the end of the 19th century: “epigenetics comes close to Lamarckian ideas of soft inheritance [...] It may be more accurate to speak not of soft heredity—with its historical baggage—but of inclusive inheritance, exogenetic inheritance, or, in more popular terms, heredity 2.0” [201]. But the real value of these last chapters is not so much how Meloni tells this story of epigenetics and its rupture with the “linear logic” of 20th century genetics, than how he puts this postgenomic narrative in a historical perspective. What can we learn from the history of the politics of reproduction that makes sense for our “epigenetic present”? At least, that the sole decline of the hard heredity paradigm is never in itself a guarantee of sociopolitical progress. If epigenetics, and more broadly the postgenomic revolution, brings the seeds of a new alliance between science and politics, then concludes Meloni, one should remain very vigilant: “I rely on history to show the broken logic behind the assertion that this alternative notion of heredity will necessarily have better social policy implications than has staunch DNA-centrism” [ix]; “Without denying that epigenetics can be used in favor of liberal arguments [...] and serve as a weapon against racism [...], classism or sexism, its underlying soft-inheritance view may be no less exclusionary than is a genetic view of social relationships” [222].

Political Biology is a dense and useful addition to the voluminous literature on the history of the biological theories of heredity and their

sociopolitical consequences. Meloni's invitation to learn from our past—"history, history, and again history" [ix]—should definitely be heard. But, despite the importance of the lessons to be learned from his remarkable "excavation" work, one should also keep some minimal critical distance from the different stories told in this book. As it should be clear by now, this book's profound ambition is to tell at least four different, but interrelated, stories: 1) the story of the rise and fall of the "modern" paradigm of heredity, 2) the story of the relationship between science and political values, 3) the story of the relationship between life sciences and social sciences, and 4) the story of the consecutive ways in which historians have written the three previous stories. Each of these stories deserves some brief critical remarks.

Meloni is undeniably right: "Writing a history of heredity is a complex task" [37]. And historians of science have occasionally fallen into the trap of the "whiggish fallacy" described a long time ago by Herbert Butterfield². However, one cannot but wonder whether Meloni's explicit choice to use the alleged 21st century hegemony of epigenetics as a "high-resolution theoretical spyglass" through which to look at the hard heredity paradigm "in all its precariousness and even finitude" [5] is not a self-exemplification case of teleological thinking. As already mentioned, this theoretical choice produces interesting and counterintuitive results. It helps us see forgotten conceptions of heredity as well as forgotten alliances between these conceptions and political values. But this choice brings also an imbalance in the appraisal of the strengths and weaknesses of different theoretical frameworks that should be assessed according to the criteria of their own time. In short Meloni's initial choice might lead him to underestimate the "relative" scientific robustness of certain theories while overestimating others.

For instance, does epigenetics really mean the "fall" of modern paradigm heredity? Meloni claims that this is the case—the "rupture" thesis already mentioned. However, as the few empirical sociological studies on the area of epigenetics have shown, the scientific community is still divided on this important issue.³ Just like there is yet no

² Butterfield H., 1931, *The Whig Interpretation of History*, Reed, Norton & Company, 1965. Cf. also Mayr E., 1990, "When is Historiography Whiggish?", *Journal of the History of Ideas*, 51 (2): 301-309.

³ For example Niewöhner J., "Epigenetics: Embedded bodies and the molecularisation of biography and milieu", *Biosocieties*, 6 (3): 279-298; Pickersgill M.,

Niewöhner J., Müller R., Martin P., Cunningham-Burley S., 2015, "Mapping the new molecular landscape: social dimensions of epigenetics", *New Genetics and Society*, 32 (4): 429-447; Tolwinsky K., 2013 "A new genetics or an epiphenomenon? Variations in the discourse of epigenetics researchers", *New Genetics and Society*, 32 (4): 366-384.

“standard” definition of epigenetics, there is currently no strong scientific consensus on the relation between genetics and epigenetics. Meloni is well-aware of this, but as he advocates openly for a “bio-social” research agenda in which “social epigenetics” acts as a possible bridge between life sciences and social sciences, he seems to deliver in these last chapters of the book a “proactive” account of this “promising” area of research by mixing cautious statements with more speculative or provocative ones. Many paragraphs begin with a few words of caution: “I do not intend to oversell [...] Many questions in epigenetics remain highly controversial [...] I will therefore approach it with care” [196]; “there is still a ‘long way to go’ to fully understand” [200]. But these same paragraphs generally end with much more definitive or provocative statements: “epigenetics undermines the nature-nurture dichotomy on both sides [...] Genes are socialized entities” [203]; “The epigenome is historical memory: the molecular archive of past environmental conditions. Our ancestors’ experiences ‘manufacture’ our biological features” [209].

The “postgenomic revolution” described by Meloni might be a real opportunity for social scientists to rethink their relationship to life science and foster new interdisciplinary collaborations. But for these collaborations to be “sustainable,” social scientists need more than a performative discourse on the strength of 21st century epigenetics (and symmetrically the weakness of 20th century genetics): a deep sense of the conceptual and theoretical instabilities and uncertainties of this area of research. They also need to fully grasp the many difficulties related to the creation and development of these interdisciplinary collaborations. Many life scientists working in this area of research today are aware that one should not be “serving epigenetics before its time”.⁴ And they might view a too hasty collaboration with social scientists (sociologists, anthropologists or political scientists) as an objective risk to damage, more than to consolidate, the general “brand” of epigenetics.⁵

Finally, regarding the political implications of epigenetics, and more broadly the alliances to be studied, the very notion of “political biology” is meant to express the “entanglement” [6], the “inextricable, messy interconnection” [8], the “irreducible reciprocity” [12], or the “entwinement” [42] between science and politics. But, if the successive biological theories of heredity represent the scientific part of the

⁴ Juengst E., Fishman J., McGowan M., Stersten R., “Serving epigenetics before its time”, *Trends in Genetics*, 30, 10, 2014: 427-429.

⁵ See for instance J. Greally’s blog, <http://epgntxeinstein.tumblr.com/post/127416455028/over-interpreted-epigenetics-study-of-the-week>.

“interconnection,” what is the other part? What is Meloni’s specific conception of “politics”? And how should we understand sociologically the so-called “entanglement” between the two? Strangely, the section devoted to characterizing the notion of “politics” does not really help us to answer to these questions. Making successive references to Bruno Latour, Michel Foucault or Carl Schmitt (and forgetting by the way the 1990s “new” political sociology of science), Meloni claims that “in biology no major theory [...] was ever elaborated without implicit or explicit reference to political factors” [15]. Interestingly the book does not really demonstrate this. Eugenics is undeniably an appropriate space in which to study the interaction between science and ideological values and, from this perspective, Francis Galton is a fascinating historical case. But eugenics is not genetics, and when it comes to demonstrating empirically the “entanglement” of science and ideology in genetics, things are sometimes more complicated than expected. For instance, Meloni clearly over-interprets the political dimension of Weismann’s germ-plasm theory. After quoting Weismann saying that “the hypothesis of the continuity of the germ-plasm gives an identical starting-point to each successive generation,” Meloni acknowledges that with this sentence “Weismann was probably more concerned with the biological potential that hard heredity leaves intact for each generation rather than with a full-fledged politics”. But, he adds immediately, “the broader political implications of this sentence had reverberations in the arc of the next century (when the philosopher Fukuyama made the point about the democratic value of the genetic lottery, he was actually rehearsing this Weismannian topos” [57]. Is it really convincing to assess the degree of “politicization” of August Weismann on the basis of Fukuyama’s theory of democracy? Of course not. The book clearly shows that many scientific theories of heredity have been politically “enrolled” or more simply that these theories have important political implications. It also shows that numerous geneticists were deeply politically involved (cf. the geneticist Muller already mentioned). But this is not specific to biology and it does not mean that all scientists behind these theories were themselves deeply “politicized.” Sociologists of science should not *a priori* assume this politicization of science but build it as an empirical site of investigation.

MICHEL DUBOIS