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Biological and Social New Orders: Charles Robin (1821–1885) and Comteanism in the Third Republic

ABSTRACT

In this paper, I examine the intertwined science, politics, and religion of a major figure of nineteenth-century French biology, the Parisian professor of histology Charles Robin (1821–1885). Historiography generally associates his name with France's rejection of the cell theory formulated by Schwann and then Virchow in the 1830s–1850s. One of the main factors put forward is the influence of Comtean positivism. Here, I propose to go beyond this historiography and discuss not only convergences but also divergences between Robin's and Comte's visions of the organism and society. Moreover, I analyze Robin's research agenda in light of the political ideas he defended as a republican in the context of the emergence of the Third Republic. At first sight, Robin's political activity (marked by his late tenure as senator) may initially appear disconnected from his scientific agenda. However, I argue that Robin's approaches to different areas of knowledge (biology, sociology, politics, and metaphysics) were mutually supportive and lent one another authority, especially through the parallel structure and shared vocabulary of their discourses. Ultimately, I demonstrate that Robin's biological materialism, combined with his outspoken anticlericalism, constitutes a political stance, and show how the concept of "solidarity" helped him to cast a new light on the relations between the parts and the whole, both in biology and social policy.

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KEY WORDS: Charles Robin, Comtean positivism, Third Republic, materialism, anticlericalism, women education, biological individuality, cell theory

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INTRODUCTION

Charles Robin (1821–1885), who occupied the first chair of histology in Paris in 1862, was a leading figure in the nineteenth-century French scientific community. His international historical reputation has been established thanks to his outspoken opposition to cellular theory, including Theodor Schwann’s idea that the cell is the basic unit of every living being and Rudolf Virchow’s view that every cell has its origins in another cell.¹ Retrospectively, cellular theory as it was developed between 1830 and 1850 is now seen as a major scientific discovery on a level with Darwin’s theory of evolution by natural selection (which Robin also opposed).

In a recent article, Laurent Loison has reconstructed Robin’s scientific program and explored the reasons for his opposition to both Schwann’s and Virchow’s cell theories.² According to Loison, Robin’s rejection of cell theory was largely due to the influence of Comtean positivism on his biology. Like Auguste Comte, Robin never relinquished his hostility toward what was perceived in France as a new incarnation of German *Naturphilosophie*.

In this paper, I propose to go beyond this historiography, which explains Robin’s biology by his adherence to Comte’s positivism and a reaction against German idealism, an approach that places him on the losing side of history and suggests that he is responsible for obstructing the progress of French biology. Here, I will present not only the convergences between the thoughts of Robin and Comte, but also the divergences between the two men’s visions of the organism and society. Indeed, based on Comte’s thought, Robin’s biology raises the question of the individual organism and the relationship between the parts and the whole while articulating this reflection with his social thinking. The other chief aim of this paper, then, is to examine the interwoven links among science, politics, and religion in Robin’s works. I will analyze Robin’s research agenda in light of the political ideas he defended, as a republican and staunch anticlerical, in the context of

1. Marc Klein, *Exposés d'histoire et philosophie des sciences, publié sous la direction d'Abel Rey, III. Histoire des origines de la théorie cellulaire* (Paris: Hermann & C^e, 1936); Klein, “Sur les débuts de la théorie cellulaire en France,” *Thalès* no. 6 (1951): 25–36; Klein, *À la recherche de l'unité élémentaire des organismes vivants. Histoire de la théorie cellulaire* (Paris: Palais de la Découverte, 1959); and Georges Canguilhem, “La théorie cellulaire,” in *La Connaissance de la vie* (Paris: Vrin, 1992/1965): 43–80.

2. Laurent Loison, “Pourquoi refuser la théorie cellulaire? Le projet d’une anatomie chimique chez Charles Robin (1821–1885),” *Revue d'histoire des sciences* 68, no. 1 (2015): 23–45.

the emergence of the Third Republic. At first sight, Robin's political activity (marked by his late tenure as senator) may initially appear disconnected from his scientific agenda. For instance, Robin did not use sociobiological metaphors to develop connections between the domains of science and politics, nor did he use biology to give credit to a new political regime, in contrast with larger Third Republic political discourses in which he was taking part. However, I argue that Robin's approaches to different areas of knowledge (biology, sociology, politics, and metaphysics) were mutually supportive and lent one another authority, especially through the parallel structure and shared vocabulary of their discourses. Robin's radical materialism was the link between these different realms of knowledge, serving as an alternative authority to which Robin appealed in his fight against clerical powers, and as a way of departing from Comte's "Religion of Humanity." Ultimately, I demonstrate that Robin's biological materialism, combined with his outspoken anticlericalism, constitutes a political stance, and show how the concept of "solidarity" helped him to cast a new light on the relations between the parts and the whole, both in biology and in social policy.

The first section briefly traces Robin's biography and his tireless support of Comte's original philosophy and biology, and the second examines Robin's scientific program and how both Comte and Robin, in their own different ways, laid the foundations of a new biological way of thought connected with a new social thought. I show how the concept of solidarity in Robin's writings helped him bridge sociology and biology, even if Robin, unlike Comte, did not refer to a specific brand of molecular (vs. cellular) materialism to account for it, nor did he use sociobiological metaphors like some of his contemporaries did. In the third section, I examine the connections between Robin's radical materialism and his relentless anticlericalism, and demonstrate that they earned him the ill will of the particularly active clerical party during the Second Empire, and to a certain extent Comte's ire. Finally, in the fourth section, I show how Robin's anticlericalism, materialism, and political action all came together in a rather unexpected place: a report on education, which championed a secularized and mixed educational system. I show how the apparently quite remote topic of women's education embodies many of Robin's commitments. The examination of this report, which redefined the role of women in republican society, is not an add-on, but the culmination of my argument, showcasing as it does Robin's blend of biological materialism, anticlericalism, and republicanism, as well as his views of women.

CHARLES ROBIN, PARISIAN PHYSIOLOGIST AND OUTSPOKEN COMTEAN

Like Claude Bernard, who had moved out of his Beaujolais home to try his luck in Paris, Robin left his native region of Bresse to pursue medical studies in Paris, where he also made his career. The Latin Quarter was his home turf; he lived and worked there all his life. He became a colorful character at the Faculty of Medicine in Paris, particularly after 1862, when he was appointed as holder of the first chair of histology in Paris. Robin was a lifelong bachelor, but enjoyed a very rich social life, befriending a bevy of Parisian intellectuals such as Charles Augustin Sainte-Beuve, Jules Michelet, Gustave Flaubert, Gustave Doré, and the Goncourt brothers. Robin devoted his life to teaching and research. He was a prolific author, with some 300 publications to his name during his scientific career. Although he was not a charismatic teacher and could inspire fear in students,³ he did forge strong intellectual ties with some, among them: Georges Pouchet, who penned a remarkable biography of his “master,”⁴ and Georges Clémenceau, whose medical dissertation Robin supervised, and who went on to hold the highest political offices under the Third Republic.

In Paris, where he arrived in the autumn of 1839 to begin his medical studies, Robin quickly made friends who would play a key role in his career. These included, first, his fellow student Charles-Édouard Brown-Séquard, with whom he founded the *Journal de l'anatomie et de la physiologie normales et pathologiques de l'homme et des animaux* in 1864, and later Pierre Rayer, the dean of the Faculty of Medicine, who provided crucial support in his appointment as holder of the Paris chair of histology.⁵ Rayer introduced him to philosopher Émile Littré, who in turn introduced him to Comte and positivism. As Robert Fox has noted, Robin “imbibed positivist philosophy from the purest sources, first from Littré and later . . . at the lectures on the history of humanity that Comte gave at the Palais national (as the Palais royal was called in the heady days of the Second Republic).”⁶ Fresh out of his immersion in

3. Victor Genty, *Un grand biologiste Charles Robin (1821–1885). Sa vie, ses amitiés philosophiques et littéraires* (Lyon: Imprimerie A. Rey, 1931), 40; and G. Variot, “Histoire de la médecine. Quelques souvenirs anecdotiques sur Charles Robin, le premier Professeur d’Histologie de la Faculté de Médecine de Paris,” *Le Progrès médical* no. 7 (1925): 245–51, on 248.

4. Georges Pouchet, *Charles Robin. Sa vie et son œuvre* (Paris: Félix Alcan, 1887).

5. Loison, “Pourquoi refuser” (ref. 2), 27.

6. Robert Fox, *The Savant and the State: Science and Cultural Politics in Nineteenth-Century France* (Baltimore: The Johns Hopkins University Press, 2012), 164.



FIG. 1. Charles Robin in the late 1870s. Courtesy of Jean-Gaël Barbara.

Comte's lectures in 1848, Robin helped engineer the foundation of the French Society of Biology, whose members included such eminent figures as Rayer and Bernard.⁷ This society was one of the most active centers of French biology throughout the late nineteenth century.⁸ As Loison has observed, the speech given at the unveiling of this new institution, written by Robin, was "a full-blown positivist manifesto for the life sciences."⁹ It began with a purely Comtean classification of science divided into six branches (mathematics, astronomy, physics, chemistry, biology, and social science) and expressed Robin's vision

7. Loison, "Pourquoi refuser" (ref. 2), 27. See also Fox, *The Savant* (ref. 6), 164; and Harry W. Paul, *From Knowledge to Power: The Rise of the Science Empire in France, 1860–1939* (Cambridge, London: Cambridge University Press, 1985), 62–63.

8. Paul, *From Knowledge to Power* (ref. 7), 63.

9. Loison, "Pourquoi refuser" (ref. 2), 28. See also Fox, *The Savant* (ref. 6), 164; and Paul, *From Knowledge to Power* (ref. 7), 62–63.

of these sciences as rooted in an original positivism that implied the wholesale dismissal of all forms of speculative (theological or metaphysical) thinking.¹⁰

Robin and Littré stayed faithful to the early Comte, rejecting his subsequent construction of positivism, from 1852 on, as the “Religion of Humanity.”¹¹ As positive philosophy remained split over this issue after Comte’s death in 1857, Littré became a leader of an atheist faction, showcased in his journal *La Philosophie positive* (1867–83).¹² Robin contributed articles to this journal, but he exercised an even more influential role as a Comtean via his editorship, with Littré, of the new edition of the *Dictionnaire de médecine, de chirurgie, de pharmacie, des sciences accessoires et de l’art vétérinaire de P.-H. Nysten* (*Dictionary of Medicine, Surgery, Pharmacy, Accessory Sciences and Veterinary Art of P.-H. Nysten*) after 1855.¹³

Like Comte, Robin considered that biology had to be rooted in chemistry—albeit not reduced to it. He pursued the plan of basing a general anatomy on a chemical definition of the phenomena of life. More precisely, drawing on ideas published in 1822 by the naturalist Henri-Marie Ducrotay de Blainville, Robin argued that life must be understood at a chemical level, and saw it as a perpetual movement of successive assimilation and dissimilation.¹⁴ This chemical conception of life at the molecular level, below the cell level, was at odds with the views of the proponents of cell theory, such as the Strasbourg physician Émile Küss, who had claimed in 1846 that “the problem of life” had “found refuge [in the cell].”¹⁵ In 1866, in his inaugural lecture as holder of the

10. Charles Robin, “Sur la direction que se sont proposée en se réunissant les membres fondateurs de la Société de biologie pour répondre au titre qu’ils ont choisi,” *Comptes rendus de la Société de biologie* 1 (1849): i–xi, on i.

11. Annie Petit, “Positivism biologique, médecine: Comte Littré, Robin,” in *Les Savants et l’épistémologie vers la fin du XIX^e siècle*, ed. Marco Panza and Jean-Claude Pont (Paris: Librairie scientifique et technique Albert Blanchard, 1995), 193–219, 203 n. 84; and “Émile Littré, médecine, philologue et historien,” in *Médecine, sciences de la vie et littérature en France et en Europe de la Révolution à nos jours, Vol. III, Le Médecin entre savoirs et pouvoirs*, ed. Lise Dumay-Queffelec and Hélène Spengler (Genève: Droz, 2014), 343–56, on 351–54.

12. Nathalie Richard, *Inventer la préhistoire. Les débuts de l’archéologie préhistorique en France* (Paris: Vuibert/ADAPT-SNES, 2008), 48. See also Guillaume Carnino, *L’Invention de la science. La nouvelle religion à l’âge industriel* (Paris: Le Seuil, 2015), 237.

13. Émile Littré and Charles Robin eds., *Dictionnaire de médecine, de chirurgie, de pharmacie, des sciences accessoires et de l’art vétérinaire de P.-H. Nysten*, 10th ed. (Paris: J.-B. Baillière, 1855), 6.

14. Loison, “Pourquoi refuser” (ref. 2), 28–29. See also Paul, *From Knowledge to Power* (ref. 7), 72–73.

15. Émile Küss, *Appréciation générale sur les progrès de la physiologie depuis Bichat* (Strasbourg: Imprimerie L. F. Le Roux, 1846), 13.

chair of histology, Robin dismissed all forms of vitalism, stating in no uncertain terms that “there are no *vital forces*, no extrinsic *vital properties*, independent of *organized matter* and manifesting themselves above it, that is to say outside of it. . . .”¹⁶ Likewise, he reiterated the importance of a chemical understanding of life: “there is something beyond [formed anatomical elements that include cells but also fibers and tubes] that we must take into account and [something] that lies in each of them: a special molecular state of various basic principles of which organized substance is composed. . . .”¹⁷

Here it is important to describe Robin’s anti-vitalism in more detail. Robin certainly rejected the idea of vitalism as the “notion that saw the physical organism as containing a . . . life force, separate from body and soul and transcending physiochemical laws.”¹⁸ This notion of “life force” would also have struck Comte as too metaphysical. However, Comte’s own biological thinking still made room for a redefined brand of vitalism—not as an immaterial principle, but rather as an emergent property of tissues, of the holistic unity of the organism, and of the dynamic interaction of organism and milieu. In other words, as Juliette Grange nicely put it, to Comte, “[l]ife is *relation* . . . it is not a principle, substantial force, or property of matter.”¹⁹ Although Comte rooted biology in chemistry, he recognized the specificity of life. Robin in fact remained a loyal Comtean on this point. His notion of a special molecular state determining life and existing at a distinct analytical level from its chemical components, his continued reference to Blainville on life as continuous composition and decomposition in relation to the milieu, as well as his firm opposition to a conception of life akin to that of the animal-machine,²⁰ all suggest that he also considered that life could not be reduced to physical and chemical laws. To Robin (and Bernard), to understand life was admittedly to understand the mechanics of it, but without reducing it to a machine, because life was distinct.

16. Charles Robin, “Principes généraux d’histologie,” *Revue des cours scientifiques de la France et de l’étranger* 5, no. 26 (1868): 409–15, on 410.

17. *Ibid.*

18. Mary Pickering, *Auguste Comte, An Intellectual Biography*, Vol. 2 (Cambridge & New York: Cambridge University Press, 2009), 313.

19. Juliette Grange (1998), cited in *ibid.*, 313–14. For more on Comte’s vitalism, see Giuseppe Bianco, “The Origins of Canguilhem’s ‘Vitalism’ Against the Anthropology of Irritation,” in *Vitalism and the Scientific Image in post-Enlightenment Life Science, 1800–2010*, ed. Charles T. Wolfe and Sebastian Normandin (London: Springer, 2012), 243–67.

20. Charles Robin, “Sur la substance organisée et l’état d’organisation,” *Journal de la physiologie de l’homme et des animaux*, no. 5 (1862): 501–26, on 506–07.

Although in theory, Robin's biology was rooted in Comte's biology, in practice it diverged radically in one aspect: the use of the microscope to examine natural phenomena. Unlike Comte and Xavier Bichat, who trusted only observation with the naked eye, Robin very quickly saw the microscope as an indispensable ally in the development of scientific anatomy and became an expert in the art of microscopy.²¹ Robin learned microscopy from Hermann Lebert, a Prussian physician who later became the head of the French school of microscopy in the late 1840s.²² As Loison has pointed out, Robin made eclectic choices of empirical materials and "explored a wide array of anatomical structures, plant and animal species" to account for the diversity of life.²³ As we will see, both his discerning use of the microscope and his encyclopedic approach contributed to steering him away from a unitary and universal view of life.

BIOLOGICAL ORGANIZATION AND SOCIAL ORDER

Robin's theory on the organization of life was complex. While he admitted the existence of cells, he refuted the idea that the cell could be the main unit of life. Not only did life inhere in activities at the molecular level, but other structures besides cells were also involved. Indeed, in his 1853 treatise of anatomical chemistry, Robin claimed that not only the cell but also other "formed anatomical elements" such as the fiber, the tube, and the canal accounted for the construction of an organism. The cell could not be the basic anatomical element of organisms, "a sort of stem starting from which one would have established a gradual ascending scale, without brusque transitions, in which each element would only be a level, no more different from the following than from the preceding one." Robin believed that "having all elements derive from the same type . . . would be removing all organization and physiology, because it would mean looking at what is characterized by independence, but with solidarity, as *homogeneous*."²⁴

21. Loison, "Pourquoi refuser" (ref. 2), 31.

22. Ann La Berge, "Medical Microscopy in Paris, 1830–1855," in *French Medical Culture in the Nineteenth Century*, ed. Ann La Berge and Mordechai Feingold (Amsterdam, Atlanta: Rodopi, 1994), 296–326, on 299.

23. Loison, "Pourquoi refuser" (ref. 2), 31.

24. Charles Robin and François Verdeil, *Traité de chimie anatomique et physiologique normale et pathologique ou des principes immédiats normaux et morbides qui constituent le corps de l'homme et des mammifères*, Vol. 1 (Paris: J. B. Baillière, 1853), III.

Although Robin rejected the universal dimension of Schwann's cell theory (and subsequently Virchow's), he did propose a theory of the genesis of "formed anatomical elements" that partly converged with Schwann's blastema theory. Like Schwann, Robin thought that these elements were created by a spontaneous generation system, itself derived from a crystallization system. But unlike Schwann, Robin did not see the blastema as solely a "cytoblastema," that is, a creator of cells.

Robin had defined the molecular level—not the cellular level—as the basic level of life. He was also led to define the upper level, accounting for the integrity of life, as the organism, produced through the interactions of its parts. In his theory of the organization of life, body fluids were no longer understood as accessory parts but as the main loci of the molecular exchanges between "formed anatomical elements" and what Robin called the "interior milieu."²⁵ As Mirko Grmek noted, Robin coined this phrase, which would later be made famous by Bernard, to stress the role of fluids, not only solids, in organisms.²⁶ In the aforementioned treatise, Robin wrote the following:

... it is impossible to conceive an organized being living without a milieu from which it draws and to which it discharges; one is the agent, and the other provides the conditions for activity. The agent is in turn divided into several equally indispensable groups of parts: first, the solids, which act, and second, the humors, which maintain the former in a position to act. . . . If the general milieu disappears or is altered, the agent stops acting; if the humors (this interior *milieu*) are altered, everything stops in the solids, just as if the agent disappeared or if they were destroyed.²⁷

To Robin, a living being was thus a product of reciprocal biochemical activities residing in all "formed anatomical elements," whether they are cells or not. In other words, the harmony that existed on the level of an organism was not the result of an aggregate of potentially autonomous individual lives, but rather of an exchange between solids and liquid interior milieus. Additionally, as Loison has made clear, these interior milieus served as the guarantor of an organism's individuality, ensuring the cohesion of the whole from an anatomical standpoint, and allowing for the functional integration of parts from a physiological standpoint.²⁸ The organism was a genuine biological individual on its own right.

25. Loison, "Pourquoi refuser" (ref. 2), 32.

26. Mirko D. Grmek, *Le Legs de Claude Bernard* (Paris: Fayard, 1997), 133.

27. Robin and Verdeil, *Traité de chimie anatomique* (ref. 24), 13–14.

28. Loison, "Pourquoi refuser" (ref. 2), 33.

Thus, to Robin, two hierarchical levels of life coexisted: the organized substance (formed of molecules) and the organism. The cell did not have a privileged place in either of those levels. But if one had to pinpoint the basic unit of life, it would be the tissue. Indeed, in his comments on the 41st lecture of the *Course in Positive Philosophy*, in which Comte identified the tissue as the basic unit of life, Robin argued: “. . . it is easy to see that this notion is certainly more accurate than the supposedly new idea expressed by some modern physicians, which holds that the *globule* [i.e., the cell] is to the physiologist what the atom is to the chemist, and what the line is to the geometrician.”²⁹ This statement put him at odds with the proponents of cell theory, the “modern physicians” (by which he referred to Strasbourg doctor Küss and his disciple Mathias Duval, who authored a *Course in Physiology* based on Küss’s teachings), who viewed the cell as an indivisible unit, and the true biological individual.³⁰ Additionally, whereas cell theorists reckoned that cells were autonomous living units (being the seats not only of physiological activity, but also of disease), for Robin, “the real seat of life was constituted by the humoral parts of the organism.”³¹

Although anatomy and the life sciences were the main foci of his career, Robin, as a loyal disciple of Comte, regularly showed interest in the social question. Along with Littré, in 1872, he founded the Society of Sociology for the application of the positive and scientific method to the study of social doctrines. This society was short-lived, and Robin did not devise a program for the development of sociology as he did for biology. Yet, Robin was convinced that sociology had to be anchored in biology: “the need to root the immediate starting point of sociology in the entire body of biological philosophy is most evident,” he argued, and further reckoned that “humanity, which actually constitutes a collective being that represents the highest degree of development of animality, and all the notions of the social

29. Charles Robin, *Anatomie et physiologie cellulaires ou des cellules animales et végétales du protoplasma et des éléments normaux et pathologiques qui en dérivent* (Paris: J. B. Baillière, 1873), 558. The term *globule*, which should be translated as “corpuscle,” was used by Küss to refer to the cell, and here Robin borrows from him. Let’s note that “globules” existed before Schwann and Schleiden’s cell theory, and so were part of a different theoretical system.

30. Mathias Duval, *Cours de physiologie professé à la Faculté de médecine de Strasbourg par E. Küss* (Paris: Librairie J.-B. Baillière et fils, 1872).

31. Mirko D. Grmek, “Robin, Charles-Philippe,” in *Dictionary of Scientific Biography*, Vol. II, ed. Charles Coulston Gillispie (New York: Charles Scribner’s Sons, 1981), 491–92, on 491.

dynamic, even the most advanced, necessarily find in dynamic biology their first outline.”³²

In the following I identify connections between Robin’s theory of the organization of life and Comte’s thoughts on biological and social organization. In particular, I highlight their common use of the concept of solidarity, used by Comte to address the relationships between the parts and the whole.

Comte’s classification of the sciences was based on the recognition of the plurality of sciences that are incommensurable, yet bound by logical, methodological, and historical ties. In this system, sociology came right after biology. Indeed, in his *Système de politique positive* (*System of Positive Polity*, 1851–1854), Comte had established partial analogies between the living organism and the body social, noting that there is an “essential similarity” between the statics of the “collective organism” and of the “individual organism.”³³ To Comte, both the social organism and the biological organism were defined by a combination of functions, and it was therefore possible to draw parallels between them, and to study the organization of society as a living organism.

Early on in his theorizing, Comte had identified the basic unit of life in tissue—not in what he called the “organic monad” described by Lorenz Oken, which would later be identified as the cell by Parisian physiologists.³⁴ From an understanding of the organization of life that favored tissue over cell, Comte had moved on to society. In his words, “human society is made up of families, not individuals. . . . A *society* can no more be broken down into *individuals* than a geometrical surface can be broken down into lines or a line into dots.”³⁵ Thus, the basic unit of society could not be a simple element like the individual (whose biological equivalent would be the “organic monad” or cell), it could only be a complex element, the family—a microcosmic society.

Additionally, if a society was structured as an organic whole, this meant a distinctive relationship existed between the parts and the whole. To Comte, a society was more than the sum of its components: it was a whole that unified

32. Charles Robin, “De la biologie: son objet et son but, ses relations avec les autres sciences, la nature et l’étendue du champ de ses recherches, ses moyens d’investigation. Premier article,” *La Philosophie positive*, no. 1 (1867): 78–101, on 86.

33. Auguste Comte, *Système de politique positive ou Traité de sociologie, instituant la Religion de l’Humanité*, Vol. 2 (Paris: L. Mathias, 1852), 289.

34. Auguste Comte, *Cours de philosophie positive*, Vol. 3 (Paris: Bachelier Imprimeur-Libraire, 1838), 41^e leçon 487–536, on 529–31.

35. Comte, *Système de politique positive* (ref. 33), 181.

its parts and gave them functional meaning.³⁶ More precisely, the parts efface themselves for the benefit of the whole, in the name of a principle of solidarity. Along with the concept of solidarity, Comte used the term “consensus” to further specify this arrangement.³⁷ This implied continual mutual actions and reactions between the parts, as well as “evident spontaneous harmony” within the organism.³⁸

Robin picked up these ideas in his biology. In his theory on the organization of life, he claimed that “[the] solidarity between all the constituting parts on the one hand, and between all acts on the other, is the fundamental problem of biology.”³⁹ As I noted above, Robin reckoned that the whole was greater than the sum of the parts, and the harmony that existed at the level of the organism resulted from an exchange between solids and interior fluids (or humors). Likewise, in very Comtean fashion, he used the terms “solidarity” and “consensus” to account for the connections between the parts making up a human being. On the one hand, he argued “that [there] is . . . necessarily solidarity between all the parts constituting the new being, and that their interplay can only lead to acts whose order is determined by that solidarity, which is the arrangement that is conducive to the accomplishment of these acts. . . .” On the other hand, he noted that “the preponderance of solidarity and consensus” was “all the greater in more composed organisms and more eminent phenomena in their complexity.”⁴⁰ In this he concurred with Comte, who had claimed that a consensus already existed in the most simple living beings.⁴¹ However, Comte would go further than Robin.

In Comte’s work, the idea of consensus was equally social and biological; to him, an “inevitable universal consensus” manifested itself both in “the various phenomena of living bodies” and in “social bodies, necessarily in the highest degree.”⁴² While Comte appeared to give credit to a “socio biological” form of thought, Robin did not. In Robin’s writings, no organicist vision of society

36. Laurent Fédi, *Comte* (Paris: Les Belles Lettres, 2000), 86.

37. Auguste Comte, *Cours de philosophie positive*, Vol. 4 (Paris: Bachelier Imprimeur Libraire, 1839), 48^e leçon 287–470, on 324.

38. *Ibid.*, 335.

39. Robin, *Anatomie et physiologie cellulaires* (ref. 29), 170.

40. Charles Robin, “De l’appropriation des parties organiques et de l’organisme à l’accomplissement d’actions déterminées. Deuxième article,” *La Philosophie positive*, no. 5 (1869): 5–38, on 29, 33.

41. Jean-François Braunstein, *La philosophie de la médecine d’Auguste Comte. Vaches carnivores, Vierge Mère et morts vivants* (Paris: Presses universitaires de France, 2009), III.

42. Comte, *Cours de philosophie positive*, Vol. 4 (ref. 37), 324.

appears. Robin's vision of society is, however, showcased in another text: the report on education he wrote toward the end of his life. In the last section of this paper, we will see how many of Robin's commitments appear in his work on the seemingly far removed topic of women's education. I will show how Robin integrated the Comtean view of social organization in his reflection on education of mothers and their key role in the education of children and the perpetuation of family solidarity—and by extension social solidarity. Then, I will argue that Robin's discussion of the role of women in education (involving a new role for them in the republican society) was shaped not only by his anticlerical ideas, but also by his view of women's nature. But before we can take that step, another key facet of Robin's life and work must be revealed: his anticlerical politics.

AN ANTICLERICAL IN THE SERVICE OF THE THIRD REPUBLIC

Like many of his academic peers, Robin was asked to run for political office. In 1875, after the new regime of the Third Republic was fully established, he became a senator in his native department of Ain (1876–1878).⁴³ According to his biographer Pouchet, “at the Senate, Robin sat with the left and always voted accordingly, even when his personal opinions differed from those of the republican majority.”⁴⁴ Pouchet also reports that Robin “had become attached to the republic, not as a transcendently higher form of government . . . but as an excellent means . . . to pursue freely and with everyone's contribution, with no regard to dynastic preoccupations, the far-reaching program of political experiments comprised in the search for the conditions ensuring the health and well-being of the body social.”⁴⁵ Thus Robin had agreed to be a senator out of a sense of duty as a citizen rather than of personal motivation. Yet personal motivations were not entirely absent from his political work, for Robin's life and work were characterized by his longstanding opposition to the Catholic Church and the power of its clergy, which accompanied his materialist stance on nature.

Robin remained anticlerical his whole life, which made him the target of a clergy that was particularly powerful under the Second Empire and still very active in the early years of the Third Republic. This anticlericalism took many

43. Genty, *Un grand biologiste Robin* (ref. 3), 74.

44. Pouchet, *Charles Robin* (ref. 4), 148.

45. *Ibid.*, 149.

forms, from the most private—his will stated that he did not want to be buried in Church (a request denied by his very religious family),⁴⁶ and he thought nothing of feasting on Good Friday⁴⁷—to the most public—for instance, his participation in *Nysten's Dictionary of Medicine*, denounced by members of the clergy as a materialist tract, or his lectures at the Faculty of Medicine, which were accused of promoting materialist ideas.⁴⁸

To the members of the clergy, the Faculty of Medicine was a stronghold of materialism, because scientists whose writings were “imbued with materialist doctrines” taught there, including Alfred Vulpian, Paul Broca, Germain Sée, and Robin himself.⁴⁹ Robin’s application for the chair of histology had already sparked a controversy involving the clergymen in power.⁵⁰ His lectures were also eagerly monitored by the clerical party for any sign of materialist excess, which they associated with positivism.⁵¹ The introductory lecture of the histology class, which Robin taught every two years, brought down the wrath of the clerics. In this lecture, a true positivist profession of faith, Robin raised the delicate question of the materiality of “acts of volition.” Although he had prudently mentioned that this would make him “stray beyond the bounds of general anatomy,” the clergymen did not care for the precaution and saw this (correctly) as evidence of his allegiance to materialism.⁵²

Another target of Catholic wrath, particularly from the prominent cardinal Henri Marie Gaston de Bonnechose, was Robin’s co-authored 1855 entry on the soul (*âme*) in *Nysten's Dictionary*. The article read: “in biology, this term expresses all functions of the brain and spinal cord considered anatomically and all functions of sensibility, meaning the perception of outside objects and inner feelings, considered physiologically.”⁵³ The entry’s lack of any reference to an immaterial principle was inconceivable to the clergymen, who treated it as an open assault on the foundations of Christian beliefs: “the consequence of such a definition [of the soul],” they railed, “was that in us [human beings] all

46. Pouchet, *Charles Robin* (ref. 4), 165; Genty, *Un grand biologiste Robin* (ref. 3), 92; and Variot, “Histoire de la médecine. Robin” (ref. 3), 251.

47. Genty, *Un grand biologiste Robin* (ref. 3), 10. See also Variot, “Histoire de la médecine. Robin” (ref. 3), 246.

48. Fox, *The Savant* (ref. 6), 165, 167; and Paul, *From Knowledge to Power* (ref. 7), 64.

49. “Séance du 20 mai 1868,” in *L'Enseignement supérieur devant le Sénat* (Paris: Librairie J. Hetzel, 1868), 125–200, on 171.

50. Fox, *The Savant* (ref. 6), 165.

51. “Séance du 20 mai 1868” (ref. 49), 172.

52. *Ibid.*

53. Littré and Robin, “Âme,” in *Dictionnaire de médecine* (ref. 13), 57.

is matter and the soul is an empty word.”⁵⁴ In the 1865 edition of *Nysten’s Dictionary*, Robin and Littré added a few important (and controversial) lines to the entry: “This definition results from the current scientific dogma, which allows no property or force without matter, no matter without property or force, whilst claiming to entirely ignore what force and matter actually are.”⁵⁵ This claim confirms the idea that in Robin’s work, ideas on biology, and more specifically the rejection of vitalism, are combined with anticlerical, if not atheist positions. As we have seen, Robin, very much like Comte, rejected the existence of an immaterial principle of life. He argued that “the metaphysical idea of finality [must] be turned into a positive idea, that is, an irreducible fact.”⁵⁶ To Robin, not only was there no way of reintroducing God into the explanation of the phenomena of life, there was not any kind of spiritual dimension to them. In this respect, as we have seen earlier, Robin had departed from Comte. When Comte, who remained faithful to Franz Joseph Gall’s phrenology, had claimed that the soul could be reduced to the brain, he had added that the brain could take on some characteristics of the soul, including immortality.⁵⁷ This materialistic and spiritualistic approach, typical of Comte’s late philosophy, was undoubtedly not tenable for Robin. Ultimately, Robin’s combination of radical materialism and his anticlerical positions appear key to understanding his studies of cells and his views on the question of the soul.

The materialist language featured in Robin’s lectures at the Faculty of Medicine was a double threat for the clergy: by questioning religious authority, it weakened their power over the education of youth, and it was also perceived as a tool for corrupting youth and inciting rebellion. Indeed, on the one hand, the members of the clergy still hoped that some of these “now waylaid youths, drunk on perfidious beverages, [would . . .] turn away from the ungodly and the atheists and join the ranks of those who still believe in God and the immortal soul.”⁵⁸ On the other hand, they concurred with Bonnechose in claiming that “one should not be surprised if those young people, having

54. “Séance du 20 mai 1868” (ref. 49), 172.

55. Littré and Robin, “Âme,” in *Dictionnaire de médecine, de chirurgie, de pharmacie, des sciences accessoires et de l’art vétérinaire de P.-H. Nysten*, 12th edition, ed. Émile Littré and Charles Robin (Paris: J. B. Baillière, 1865), 55.

56. Robin, “De l’appropriation” (ref. 40), 37.

57. Braunstein, *La philosophie* (ref. 41), 153.

58. “Séance du 23 mai 1868,” in *L’enseignement supérieur devant le Sénat* (Paris: Librairie J. Hetzel, 1868), 278–353, on 290.

imbibed these [materialist] doctrines, turn them into a weapon to support socialism and spark revolutions.”⁵⁹ The Second Empire clergy’s perception of Robin as a radical materialist and political agitator is attested by his biographer Pouchet:

By temperament Robin was what we call a radical; he was from the party that wants speedy progress with the risks it entails, not the slow progress that walks a deliberate step on already solid ground. . . . Robin was probably one of those who, as they heard it repeated that the population at large [was] not ready for certain reforms, would have answered, “That may be so, but if we had waited for the provincials to take the Bastille, it would still be standing.”⁶⁰

This contrasted with Comte’s hostility to revolution. Indeed, in his new social project based on the concepts of “order” and “progress,” themselves rooted in the biological concepts of “organization” and “life,” Comte wanted to put an end to the particularly manifest revolutionary state in France.⁶¹ In the 46th lecture of his *Course in Positive Philosophy* (1839), Comte explained that although the Revolution of 1789 had been necessary, it was now time to find a way out of the “revolutionary crisis” and pacify a society that was torn between what he called the “retrograde school” and the “anarchist school.”⁶² To move beyond the constant shifts between “kings” and “peoples,” Comte developed the idea of “scientific politics,” requiring the rise to power of a scientific elite.⁶³ It would be formed by “youths deeply imbued with the positive spirit,” coming from “medical schools and particularly the École Polytechnique. . . .”⁶⁴ This predilection for doctors is an important point, as it signals Comte’s rupture from the biologists, whom he had held in great esteem until the early 1850s. Comte faulted biology for its “deplorable oscillation between a corrosive materialism and powerless spiritualism.”⁶⁵ In Comte’s view, biology was “now given exclusively to encyclopedic thinkers” who, so

59. “Séance du 20 mai 1868” (ref. 49), 181.

60. Pouchet, *Charles Robin* (ref. 4), 154.

61. Comte, *Cours de philosophie positive*, Vol. 4 (ref. 37), 46^e leçon, 1–223, on 11–12.

62. *Ibid.*, 100.

63. Braunstein, *La philosophie* (ref. 41), 79. On Comte’s hostility to political revolutions, see also Bianco, “Origins of Canguilhem’s ‘Vitalism’” (ref. 19).

64. Comte, *Cours de philosophie positive*, Vol. 4 (ref. 37), 46^e leçon 10, 1–223, on 219.

65. Auguste Comte, *Système de politique positive ou Traité de sociologie, instituant la Religion de l’Humanité*, Vol. 1 (Paris: La librairie scientifique-industrielle de L. Mathias et chez Carilian-Goeury et V^{OR} Dalmont, 1851), 568.

far, did not fulfill “the standard requirements of positivist education.”⁶⁶ This applied to Robin’s encyclopedic approach to biology, as seen above. As a consequence, biologists were “too specialized” and constantly at risk of indulging in “materialistic reductionism.”⁶⁷ In Comte’s sights were men like Littré, who later would claim that “there is no physiology without chemistry.”⁶⁸ Robin and Littré were leading figures in the dissident positivist group, whose radical materialism ultimately drove them away from Comte; most supporters of the orthodox group were simple physicians.⁶⁹ However, in his teachings at the Faculty of Medicine, Robin appeared to remain faithful to Comte’s idea of regenerating “the medical profession to make doctors more knowledgeable about the whole human condition and thereby prepare them an important role in the Occident Republic.”⁷⁰

Indeed, it is worth noting that the political dimension of Robin’s course did not leave students indifferent. Some of them remained defiant in the face of the clericals’ relentless attacks on professors of medicine. Undaunted, they made shows of support by staging demonstrations, while others manifested their sympathy by fervently attending their lectures.⁷¹ “In 1874, during Charles Robin’s lecture, when a student suddenly stood up and cried ‘Hats off to science!’ all in the amphitheater rose as one, hats in hand. The informer Cujas, who related this story, and who had often harsh words against the fellow students he spied on, was highly impressed at this sight. . . .”⁷² Another witness to the protests that took the Faculty of Medicine by storm at the time was Clémenceau. In 1865, he wrote a medical dissertation entitled *De la génération des éléments anatomiques* (*Of the Generation of Anatomical Elements*) under Robin’s supervision.⁷³ Here, Clémenceau reaffirmed Robin’s views on biological organization, the genesis of the elementary units of life, and his dismissal of cells as the fundamental units of life. As well as endorsing Robin’s scientific views, Clémenceau also embraced Robin’s radical materialism, and some lines in his dissertation echoed Robin’s rejection of occult forces as a possible

66. Ibid., 573.

67. Braunstein, *La philosophie* (ref. 41), 137.

68. Littré (1873), quoted in Ibid., 138.

69. Ibid., 149.

70. Pickering, *Auguste Comte*, Vol. 2 (ref. 18), 316.

71. Genty, *Un grand biologiste Robin* (ref. 3), 60.

72. Jacqueline Lalouette, *La libre pensée en France, 1848–1940* (Paris: Albin Michel, 1997), 162.

73. Georges Clémenceau, *Thèse pour le doctorat en médecine. Présentée et soutenue le 13 mai 1865. De la génération des éléments anatomiques* (Paris: A. Parent, Imprimeur de la Faculté de médecine, 1865).

explanation of natural phenomena.⁷⁴ While still a medical student in Paris, Clémenceau became a republican activist and developed a strongly anticlerical mentality; he “promised never to receive any sacrament from any religion: no priest at a birth, no priest at the wedding, no priest upon death,”⁷⁵ and remained true to this commitment throughout his life.

Overall, Robin owed his popularity not to his way with words or his kindness to students, but rather to the innovative, if not provocative contents of his lectures and their openly anticlerical spirit. In the next part, we will see how a few years later, in the field of education, the anticlericals, now entirely devoted to the republican cause, successfully ended the religious monopoly on women’s education, and document the key role Robin played in that effort.

ROBIN ON WOMEN’S EDUCATION AND WOMEN’S NATURE

Robin was an unassuming presence in the Senate, and did not have the talent for oratory or writing that usually characterizes the greatest politicians.⁷⁶ Still, he became involved in one of the Third Republic’s main policy debates, education. In part, this again reflected his anticlericalism and his Comteanism. As an anticlerical, intellectual senator he worked to reduce the role of the church in state matters and heralded major education reforms—primarily the creation of secular, free, and mandatory primary schools, set up by Jules Ferry in the early 1880s.

Robin’s anticlericalism, materialism, and political activities came together with his original Comtean commitments in a document titled *L’Instruction et l’éducation* (*Instruction and Education*) published in 1877, late in his life.⁷⁷ Beyond the light it sheds on the principles and implications of secularized education, this report shows Robin promoting a thought that seeks to assign a special place to women in education and by extension to give them the same role but justified in a new way in republican society.

In *Instruction and Education*, Robin supported a mixed secular education system, aiming at making men, but particularly women, overcome the

74. *Ibid.*, 106–07.

75. Michel Winock, *Clémenceau* (Paris: Perrin, 2007), 35.

76. Pouchet, *Charles Robin* (ref. 4), 148.

77. Charles Robin, *L’Instruction et l’éducation* (Paris: Decaux & Dreyfous, 1877). This book was an annotated compilation of four articles originally published in *La Philosophie positive* in 1876.

prejudices they carried from superstition or religion, and teach them “true” knowledge—positive knowledge in the sense of Comte.⁷⁸ We might expect that an anticlerical republican biologist would advocate equality for women. However, Robin’s goals for education rested more on a traditional division of labor among men and women than on a goal of true gender equality. Far from challenging the idea of an ahistorical, immutable motherly nature of women, the core objective of this “positive” education was to turn women into good mothers, fully dedicated to the education of their future children, as well as good spouses.⁷⁹ Indeed, according to Robin, women were “physiologically destined to raise both boys and girls.”⁸⁰ As she nurtured her child, the mother would teach him or her to develop positive social feelings, particularly those of continuity and solidarity. Robin argued that being with their parents, and their mothers in particular, gave children “a sense of continuity that developed before that of solidarity.”⁸¹

This choice of words was not innocent; they were drawn from the Comtean vocabulary, as we have already seen with “solidarity” in the biological context. In this context, “solidarity” referred to mutual assistance between humans in contemporary society, humanity being forged by the shared awareness of belonging to the same species, whereas “continuity” referred specifically to the historical link between the generations.⁸² The concept of solidarity was taken up by the “solidarist” political movement (*solidarisme*) championed by Léon Bourgeois in the late nineteenth century; it would become the credo of radicals and radical socialists in the years leading up to the First World War.⁸³ In his most important book, *Solidarité (Solidarity)*, Bourgeois argued that the individuals within a society are just like living cells that “appear to be the last degree of simplicity of organized matter”; “while they individually strive to exist and grow,” they are nevertheless “connected” to one another by a “tight solidarity.”⁸⁴ Supported by a quotation from Comte, Bourgeois argued that solidarity went hand in hand with continuity, based on the idea that from

78. *Ibid.*, 323, 163–64, 167.

79. *Ibid.*, 162.

80. Pouchet, *Charles Robin* (ref. 4), 150. See also Genty, *Un grand biologiste Robin* (ref. 3), 77.

81. Charles Robin, foreword to Eugène Bourdet, *Principes d'éducation positive*, 2nd ed. (Paris: Librairie Germer-Baillière et C^{ie}, 1877), xviii.

82. Fédi, *Comte* (ref. 36), 101.

83. For more on solidarism and Bourgeois, see Jean-Marc Bernardini, *Le Darwinisme social en France (1859–1918). Fascination et rejet d'une idéologie* (Paris: Éditions du CNRS, 1997), in particular 249–54.

84. Léon Bourgeois, *Solidarité* (Paris: Presses universitaires du Septentrion, 1998/1896), 25.

birth, one had a debt to society, including past generations.⁸⁵ This logic also applied to Robin's philosophy of education.

Robin expressed this not only in his own program for education⁸⁶ but also in the foreword to the second edition of Eugène Bourdet's *Principles of positive education*, an explicitly Comtean text published in the same year as Robin's own *Instruction and Education*. "Until the age of twenty-one," he wrote, "man remains under the tutelage of family. . . . Humanity still feeds him, and he does not yet give back what he costs, which he will later have to do."⁸⁷ Thus, thanks to maternal education, a child could move on from domestic life to civic life through the extension toward the social sphere of feelings of "attachment" and "gratitude" first developed in the family sphere.⁸⁸ As in many arguments put forward across Europe for women's education in the nineteenth century, the woman was held as the family's keystone, and as such had a strong social responsibility.⁸⁹ If the woman were to fail in her duty as a mother, she would be responsible for the bad state of the family, which, it bears reminding, is a miniature society in Comte's system. To Comte, indeed, a woman without tenderness would be a "social monstrosity."⁹⁰

Robin centered domestic life—the realm of feelings—on women.⁹¹ While women are superior to men when it comes to affect, they are conversely inferior in intellectual strength and action. Too impressionable, too easily swayed by the high emotions constantly conveyed in social life, a woman cannot "produce . . . the relentless effort that gives strength to aesthetic or expressive faculties, whether they relate to the fine arts or to oratory." Additionally,

85. Ibid., Chapter "Dette de l'homme envers la société; le quasi-contrat social," esp. 43–47.

86. Robin, *L'Instruction et l'éducation* (ref. 77), 170.

87. Robin, foreword to *Principes d'éducation positive* (ref. 81), xxxiv.

88. Ibid., xviii. Comte similarly used the words "attachment," "veneration," and "goodness." On this point, see also Fédi's insightful analysis, *Comte* (ref. 36), 90.

89. For further reading on this classic position among many feminist educators (both male and female) and educational "reformers" of the late nineteenth century, in Britain, in the United States, and in France, respectively, see: Cynthia Eagle Russett, *Sexual Science: The Victorian Construction of Womanhood* (Cambridge, MA: Harvard University Press, 1989); Kimberly A. Hamlin, *From Eve to Evolution: Darwin, Science, and Women's Rights in Gilded Age America* (Chicago, London: University of Chicago Press, 2014), esp. 69–82; Elinor Accampo, *Blessed Motherhood, Bitter Fruit: Nelly Roussel and the Politics of Female Pain in Third Republic France* (Baltimore: The Johns Hopkins University Press, 2006), esp. 35–69.

90. Fédi, *Comte* (ref. 36), 89.

91. Charles Robin, "Sexe, sexualité, sexuels (Organes et caractères)," in *Dictionnaire encyclopédique des sciences médicales, série 3*, Vol. 9, ed. M. Amédée Dechambre (Paris: Masson-Asselin, 1881), 462–92, on 487.

women's inability to control their feelings around others required them to be submissive.⁹² In a Comtean schema, also endorsed by Robin, women stay at home while men go out to work.⁹³ While the obvious justification for assigning these complementary social roles to men and women was the cementing of social solidarity through a gendered division of labor, there was clearly a principle of women's self-sacrifice at stake as well.⁹⁴ Indeed, a woman endowed with a superior intellectual capacity (and able to control her emotions) would not be encouraged to get a job with social responsibility despite being well qualified for the position. Robin explicitly stated that he judged such a situation improbable: "the exceptional cases of intellectual superiority of women over men are so rare that we may say without any exaggeration that they are evidence for the rule."⁹⁵ Likewise, Comte had concluded that his very gifted wife was an exception to the rule of male intellectual superiority.⁹⁶

This unequal vision of men and women appears to have been anticipated in Robin's reproductive biology, thus showing another strand of continuity and mutual support between his biological and social ideas. In the late 1840s, Robin was among those biologists who attempted to redefine the role of both sexes in reproduction. Until then, the prevailing view was that the egg alone provided the material to the embryo. The sperm was regarded as a vital force that triggered the development of the egg into an embryo. Arguing that this understanding did not account for the male's material contribution, Robin started to investigate the male and female generative substances in terms of analogies.⁹⁷ In 1848, Robin claimed that "there is also in the male organs of plants and animals the formation of an ovum that resembles that of the females and is constituted similarly."⁹⁸ Robin even coined the term "male ova" that

92. *Ibid.*, 488, 487.

93. Robin, foreword to *Principes d'éducation positive* (ref. 81), xvi.

94. For further reading on the notion of woman's self-sacrifice in late nineteenth- and early twentieth-century France, see Accampo, *Blessed Motherhood, Bitter Fruit* (ref. 89), esp. 99–134.

95. Robin, "Sexe, sexualité, sexuels" (ref. 91), 487.

96. Vincent Guillin, "Le penchant biologique de la sociologie comtienne: la question de l'égalité des sexes," *Revue d'histoire des sciences* 65, no. 2 (2012): 259–85, on 269.

97. Charles Robin, "Mémoire sur l'existence d'un œuf ou ovule chez les mâles comme chez les femelles des végétaux et des animaux, produisant, l'un les spermatozoïdes ou les grains de pollen, l'autre les cellules primitives de l'embryon. Lu à l'Académie des sciences, le 23 octobre 1848," *Revue zoologique*, no. 11 (1848): 287–92, 319–34, on 331, 333. For more detail about the context of nineteenth-century studies on generation, see Florence Vienne, "Chapter 29: Eggs and Sperm as Germ Cells," in *Reproduction: From Antiquity to the Present Day*, ed. Nick Hopwood, Rebecca Flemming, and Lauren Kassell (Cambridge: Cambridge University Press, forthcoming 2017).

98. Robin, "Mémoire sur l'existence" (ref. 97), 287.

mirrored “female ova.”⁹⁹ Robin established that the sperm, too, contributed materially to reproduction, reckoning that the embryonic cells contain “both male and female matter and the nascent being belongs materially to both and not just the latter.”¹⁰⁰ However, if Robin argued for an equal contribution to reproduction, he did not ascribe the same properties to ovum and sperm. He described the ovum as large, soft, almost liquid, once the egg has been released, and slowly drifting across genital organs, whose immobility he emphasized.¹⁰¹ Conversely, the sperm is mobile, fast and tenacious, and has a head and an emblematic tail. It rushes into the ovum as it lunges across the oviduct: the sperms are racing, if not competing.¹⁰² Such depreciative descriptions of the ovum in contrast to the active sperm are found on several occasions in Robin’s writings.¹⁰³ Thus, Robin’s attempt to renew reproductive biology did not suppress, but rather maintained notions of difference and complementarity of the sexes. For him, to establish man’s contribution to reproduction went hand in hand with inscribing woman’s inferiority and dependence on the male sex at the cellular level. Similarly, the advent of a new republican society did not suppress but reinforced a sexual division of labor that confined women to motherhood and the private sphere.

Robin’s treatise on education shows clearly how his assumptions about women’s lesser biological status supported the limitations he assigned to their “new” role in republican society. Though women would benefit from a new form of education, the latter was in no way a means to nurture high-level intellects and lead them to pursue professional studies.¹⁰⁴ The support of mixed education should not be confused with support of female emancipation; it was mostly a means to free women from the shackles of the clergy. In their effort to inscribe women within the new cosmology of the Third Republic, the

99. *Ibid.*, 319.

100. Littré and Robin, “Fécondation,” in *Dictionnaire de médecine* (ref. 55), 581.

101. Charles Robin, “Fécondation,” in *Dictionnaire encyclopédique des sciences médicales, série 4, tome 1*, ed. M. Amédée Dechambre (Paris: Masson-Asselin, 1877), 326–406, on 348.

102. *Ibid.*, 357.

103. Anne Carol evidenced gender biases in Robin’s studies on fecundation. See Carol, “Le genre face aux mutations du savoir médical: sexe et nature féminine dans la fécondation (XVI^e–XIX^e siècles),” in *Le genre face aux mutations. Masculin et féminin du Moyen Âge à nos jours*, ed. Luc Capdevila et al. (Rennes: Presses universitaires de Rennes, 2003), 83–92, on 91. See also Emily Martin, “The Egg and the Sperm: How Science Has Constructed a Romance Based on Stereotypical Male-Female Roles,” *Signs: Journal of Women in Culture and Society* 16, no. 3 (1991): 485–501.

104. Robin, *L’Instruction et l’éducation* (ref. 77), 324.

republicans ascribed them a role that paradoxically changed very little. The republican woman had to obey her nature, which was to feed and educate her children and to ensure the reproduction of future generations and, by extension, the future of the republic. If both men and women were to express solidarity and “Live for others” (*Vivre pour autrui*) in the Third Republic, they were to put these precepts into action in strikingly different ways.¹⁰⁵ A woman’s destiny was to “Live for others”—above all, for her children and family—a goal she was expected to pursue to the point of sacrificing herself. In a way, this republican justification of women’s willing sacrifice replaced the biblical justification of female suffering, rooted in the original sin.¹⁰⁶

CONCLUSION

Although Comte had a considerable influence on Robin’s scientific and social thought, Robin diverged from him in some crucial respects. Where Comte had sought to establish theoretical connections between the biological and the social, for example, Robin did not take such direct steps. Yet Robin’s biggest departure from Comte’s thought lies in his blend of radical materialism and anticlericalism. Beyond the idea of emancipation from Comte’s mentorship, I have attempted to demonstrate that this metaphysical stance influenced Robin’s scientific and socio-political thought. Crucially, I have sought to demonstrate how Robin’s radical materialism expressed itself not only in his biological view of life (including “his” cell theory) but also in his anticlericalism and republicanism, which were just as much a part of his political engagement as his role as a senator. For instance, the radical materialism that appeared in his entire scientific body of work was used as grounds for clerics to brand him as a political agitator during the Second Empire. Similarly, his rejection of a vital force accounting for biological phenomena must be understood not only in light of his adhesion to Comte’s original positivism but also in light of his atheism.

While the concepts of solidarity and consensus helped Robin to forge links between biology and sociology, some of his contemporaries developed further connections between science and politics in order to legitimize the young

105. Comte uses the phrase “Live for others” next to “Order and Progress” as watchwords on the title page of his *Système de politique positive* (Paris: L. Mathias, 1851–1854).

106. Elinor Accampo, “The Gendered Nature of Contraception in France: Neo-Malthusianism, 1900–1920,” *Journal of Interdisciplinary History* 34, no. 2 (2003): 235–62, on 240.

Third Republic. For instance, Bourgeois' solidarism was explicitly and deeply rooted in biological thought, and he did not hesitate to draw analogies between even the smallest organic individuals and human societies. Bourgeois' political thought was particularly influenced by the writings of the marine zoologist and administrator Edmond Perrier. In his major work *Les Colonies animales et la formation des organismes* (*Animal Colonies and the Formation of Organisms*, 1881), Perrier clearly showed "that lessons to be learned from biological association, the division of labor, and parasitism . . . might be applied to human society via solidarism and an organicist conception of society."¹⁰⁷ With the aim of reinforcing and supporting the republican regime, Perrier claimed that "a living being is nothing other than an association, a Republic of plastids."¹⁰⁸ Clémenceau, a radical socialist and Robin's former student, also promoted solidarity and gave it the status of the social bond *par excellence*. This approach formed part of the argument behind the "Live for others" slogan of the young Third Republic, aligning it with the principles of solidarism. In *La Mêlée sociale* (*The Social Melee*, 1907), Clémenceau continued to amalgamate biological and political language, making an analogy between the relationship of cell to organism and that between citizen and the social body in order to encourage mutual aid in human societies rather than the *struggle for life*:

Even if they do struggle against each other, the organisms that are combined to live help each other. A cell neighboring another cell will take its share of life when it can, but it is regulated in its action of living by the balance of surrounding forces, and the solidarity of its individual effort contributes to the common defense effort. Likewise for the man within the social body: part of his power harms his neighbor, but another part protects and supports him.¹⁰⁹

Deploying these analogies, metaphors, and an associated vocabulary that blended biology with the social, Bourgeois, Perrier, and Clémenceau quite actively and openly heeded Comte's call by advocating what could be considered a form of "sociobiology." Although less visible than the others, Robin merits a place in this group. Robin's goal was to provide a scientific and

107. See Michael A. Osborne, "Parasitology, Zoology, and Society in France, ca. 1880–1920," in *Biological Individuality: Integrating Scientific, Philosophical, and Historical Perspectives*, ed. Scott Lidgard and Lynn Nyhart (Chicago: University of Chicago Press, 2017), 206–24, on 215–16.

108. Edmond Perrier, "Charles Darwin et le transformisme," *La Nouvelle revue* 4^e année, t. 6 (1882): 317–55, on 352. Perrier uses the term "plastids" for describing primordial single-celled simple organisms.

109. Georges Clémenceau, *La Mêlée sociale* (Paris: Fasquelle, 1907), xxv.

therefore legitimate foundation for the new Republic, which remained fragile throughout this period of the late nineteenth and early twentieth century. Like his contemporaries, but in the name of a materialism and anticlericalism that sometimes led him to adopt provocative stances, Robin strove to be the architect not only of a new biological order, but also of a new social order.

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