

NIETZSCHE AS A READER OF WILHELM ROUX, OR THE PHYSIOLOGY OF HISTORY

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This paper explores one of the main sources of Nietzsche's knowledge of physiology and considers its relevance for the philosophical study of history. Beginning in 1881, Nietzsche read Der Kampf der Theile im Organismus by Wilhelm Roux, which exposed him to a dysteleological account of organic development emphasising the excitative, assimilative and auto-regulative processes of the body. These processes mediate the effects of natural selection. His reading contributed to a physiological understanding of history that borrowed Roux's description of physiological processes. This physiological description of history proceeded from the similarity between the body's mediation of its milieu and history's mediation of the past.

In 1880, Nietzsche speculated that “our moral judgments and evaluations ... [may be] images and fantasies based on a physiological process unknown to us.”¹ He was unwilling, however, to reduce psychology to physiology, and cautiously qualified his comments as “all metaphors.” (D, §119) As the decade wore on, this cautious appreciation of physiology gained philosophical importance because it offered him a richer and more complicated phenomenon than psychology (see, for example, KSA², 11, 25[356]; 26[374]; 27[70]; 34[46]; 40[21]; 12, 1[87]; 2[91];

¹ Friedrich Nietzsche, *Daybreak: Thoughts on the Prejudice of Morality*, (tr.) R. Hollingdale (Cambridge: Cambridge University Press, 1997), §119. Hereafter referred to parenthetically in the text as D.

² Friedrich Nietzsche, *Kritische Studienausgabe*, (ed.) G. Colli and M. Montinari (Berlin: Walter de Gruyter, 1967–77). These are his so-called posthumous fragments (*Nachlass*). Hereafter referred to parenthetically in the text as KSA; as usual, the numbers refer to volume, notebook and fragment.

5[56]). This argument eventually took on published form in *Beyond Good and Evil* and in *On the Genealogy of Morals* where he appealed to the fertility of physiological study, but this time, without the guarded tone³: “[F]irst a physiological investigation and interpretation, rather than a psychological one[.]”⁴ Unmistakably, between 1880 and 1887, physiology gained significance for his philosophy and one may ask, first, what was the source of this growing emphasis on physiology? And, second, what was its philosophical meaning?

This paper will offer answers to both these questions by examining Nietzsche’s reading and reception of a then little-known German embryologist: Wilhelm Roux. Roux is arguably one of the most prominent sources of Nietzsche’s interest in physiology, which offered him a novel language for describing our relation to our world. In 1881, Roux published a rather philosophical discussion of the self-formation of the purposeful structure of organisms entitled *Der Kampf der Theile im Organismus*.⁵ There is nothing really new in discussing this book: Nietzsche scholars have long been aware of its importance. But for various reasons, Nietzsche’s agonistic biology and his rejection of Darwinism dominated most of the early discussion of Roux. Only in the last thirty years has there been a regained interest in Nietzsche’s reading of Roux, albeit focussing narrowly on the biological sources of the Will to Power.⁶ As

³ See Friedrich Nietzsche, *Beyond Good and Evil: Prelude to a Philosophy of the Future*, (tr.) W. Kaufmann (New York: Vintage Books, 1966), §12, §16. Hereafter referred to parenthetically in the text as BGE.

⁴ Friedrich Nietzsche, *On the Genealogy of Morals*, (tr.) W. Kaufmann and R. Hollingdale (New York: Vintage Books, 1967), First Essay, §17. Hereafter referred to parenthetically in the text as GM, followed by the essay and section numbers.

⁵ Wilhelm Roux, *Der Kampf der Theile im Organismus: Ein Beitrag zur Vervollständigung der Mechanischen Zweckmässigkeitlehre* (Leipzig: Englemann, 1881). Hereafter referred to parenthetically in the text as KdT.

⁶ There are several important discussions of Nietzsche’s exposure to Roux. The most important by far is by Wolfgang Müller-Lauter, “The Organism as Inner Struggle: Wilhelm Roux’s Influence on Nietzsche,” in *Nietzsche: His Philosophy of Contradictions and the Contradictions of his Philosophy*, (tr.) D. Parent (Chicago: University of Illinois Press, 1999), 161–82; see also Gregory Moore, *Nietzsche, Biology and Metaphor* (Cambridge:

more eminent scholars than I have discussed this topic, I shall not discuss the Will to Power nor any other Nietzschean keywords related to his reading of Wilhelm Roux. This paper will solely focus on the important influence Roux had on Nietzsche's philosophical discussion of history. This will be done in three sections. First, I will briefly explicate Roux's thesis, then move on to describe how Nietzsche interpreted his reading, and finally, I will explain the significance of Nietzsche's understanding of physiology and its relevance to the study of history.

Wilhelm Roux (1850–1924) is best known in the history of biology for introducing causal and mechanical analysis to developmental embryology through his *Entwicklungsmechanik* (developmental mechanics) at a time when speculative morphological analysis was still dominant. Although *Der Kampf der Theile im Organismus* has since been overshadowed by his *Entwicklungsmechanik*, it did not go unnoticed when published. Indeed, Charles Darwin wrote of it to the Canadian-born George John Romanes as “the most important book on Evolution which has appeared for some time.”⁷ Despite the stature of the comment's author, Roux's peers did not share his opinion. One of Roux's teachers wrote telling him to “never again write such a philosophical book, otherwise you will never become a Full Professor of Anatomy.”⁸ Now, a century later and despite its philosophical tone, or because of it, it is important for our understanding of the development and meaning of Nietzsche's philosophical understanding of physiology.

Roux's avowed intention in writing *Der Kampf der Theile im Organismus* was to supplement the work of previous evolutionary scientists by describing what he called the self-formation of the purposive (*Selbstgestaltung des Zweckmässigen*), without recourse to any form of teleology.⁹ (KdT, 27, 236) This early monograph describes the important

Cambridge University Press, 2002), especially 37–88; and Barbara Stiegler, *Nietzsche et la biologie* (Paris: Presses Universitaires de France, 2001), especially 46–58 and 72–85.

⁷ *The Life and Letters of Charles Darwin, including a biographical Chapter*, vol. 3, (ed.) F. Darwin (London: John Murray, 1887), 244.

⁸ R. Eucken quoted in Müller-Lauter, “The Organism as Inner Struggle,” 167–68.

⁹ See Barbara Stiegler, *Nietzsche et la biologie*, 49–51; and Christian J. Emden, *Nietzsche on Language, Consciousness and the Body* (Chicago: University of Illinois Press, 2005), 139.

antagonistic relations between cells, organs and tissues, provoked by the strengthening of these organic parts following functional excitations, which incite an overcompensation of expended material and fortify the organism's capacity to assimilate nutrients.

According to Roux, organic purposefulness results from an inner struggle between the various parts (*Theile*) of the body caused, in both the embryonic and post-embryonic stages of development, by the continual appearance of small organic variations that struggle for survival against older, already established parts. (KdT, 237) As a part grows, it consumes nutrients and occupies space to the detriment of its neighbours. The parts that assimilate the most material and regenerate the fastest are victorious and are able to survive and grow. The strengthening of one part at the expense of another is the result of its increasing capacity to assimilate nourishment. This ultimately leads to one part dominating another part and ascribing a function to it, which then regulates the organism, thereby allowing for the emergence of seemingly purposeful behaviour. Roux's understanding of organisms, therefore, develops two interesting characteristics, namely, the overcompensatory assimilation as a response to excitation and self-regulation.

The first essential property of the organic Roux described is the overcompensatory assimilation of expended material (*Übercompensation des Verbrauchens*). (KdT, 238) The assimilation of nutrients is provoked by functional excitations or stimuli (*functionelle Reize*) exterior to the cell or organ that act as incitements to assimilation. (KdT, 160–61) The excitations' effect is predetermined by the cell's inner state, which amounts to there being no passive feeding. (KdT, 163) It is only once excited that the part expends its accumulated energy, which the assimilation of nutrients then replenishes. According to Roux, the assimilation and replacement of expended energy is not proportional, however, to the expenditure. A cell, tissue or organ does not simply compensate losses incurred when functionally excited, but assimilates more than is required to regenerate itself. When a part thus overcompensates its losses, it grows and expands. (KdT, 161) But functional stimuli are more than the cause of assimilation; they also fortify the part's ability to assimilate material. (KdT, 160) An increase in functional stimulation leads to an increased ability to assimilate. Consequently, a highly stimulated part grows faster than a less stimulated one because it intussuscepts more material. Thus, as a part's ability to be excited increases, its size increases

accordingly. Therefore, there is an important relation between a part's ability to be affected, its ability to grow and its importance within the organism.

The second essential property of the organic is self-regulation (*Selbstregulation*) through the struggle of parts. (KdT, 239–40) The expansion and strengthening of a part leads to a struggle between the various organic components of the body. This struggle regulates and organises the organism. When a part of the organism grows by overcompensation, it consumes assimilable material at the expense of its neighbours and a competition then ensues for what resources are available. Struggle, therefore, is the consequence of an inequality between the various parts of the organism. (KdT, 69) This struggle works not only toward the elimination of weaker elements, but more importantly, to an inner harmony and morphological equilibrium, which gives physiological significance to the various parts of the body. (KdT, 237) Essentially, self-regulation is the result of a weaker part being transformed into the function of a stronger part, which produces struggle-processes (*Prozessen der Kampf*) that are only then selected in the struggle with external circumstances. (KdT, 237–38) Thus, Roux's counter-intuitive account of the unequal and agonistic relation between parts leads not to extinction and destruction, but to harmony and strength by working toward the formation of the body's purposeful structure. (KdT, 163–64)

Roux thus based his supplement to the already existing biological theories of evolution on the instability of the struggle between the parts of the organism. Functional excitation incites the part to assimilate nutrients and overcompensate the incurred loss, which then fortifies a part's ability to assimilate material and propels its growth. Consequently, a highly stimulated part grows faster than a less stimulated one. And, as one part gets stronger, another weakens and a competition between the various organic components of the body for resources and space then ensues. Through this struggle, there develops an equilibrium resulting from one part subordinating another that structures and determines the organism's morphology without any reference to the *milieu*. Natural selection would, therefore, be relegated to a secondary role. Thus, Roux was able to describe how the organism structures and determines itself through the inequality of its components without appealing to any extraneous teleology.

Having sketched out the general argument of *Der Kampf der Theile im Organismus*, I shall now give an account of Nietzsche's reading of it, using his notes as a guide. The purpose of this is to indicate where Nietzsche adopted Roux's ideas and where he adapted them. Nietzsche first read Roux in 1881, as his reading notes testify.¹⁰ His reading did not so much deepen his knowledge of physiological processes as give him a new philosophical language with which to discuss science.¹¹

Nietzsche began his commentary of Roux's ideas by defining the inner struggle as the agonistic relation between the cells, tissues, organs and organisms.¹² (KSA, 9, 11[128]) Beginning at the cellular level, which is the most basic physiological level of the organism (KSA, 9, 11[130]), the struggle develops throughout the body (*Leib*) in such a way that all parts having a similar function in the organism are perpetually on guard against those of a like kind. (KSA, 9, 11[134]) Cells struggle against cells and tissues against tissues, and so on. Thus, as with Roux's account, the inner struggle is primarily for food and space (KSA, 9, 11[132]; 10, 7[86]), and it is only once a part has gained these resources at the expense of its neighbours that a direct struggle ensues.

Nietzsche had already recognised the philosophical importance of physiological excitation (see KSA, 7, 19[209–10]), but here in his reading of Roux, he discovered its importance for the development of the inner organic struggle.¹³ Unlike Roux, who narrowly defined it as functional excitation, Nietzsche broadly understood it as the reception of something foreign into the cell, tissue or organ, which leads the part to assimilate it to itself. Thus, he did not link excitation to a part's function within the organism: *all* stimuli act trophically by inciting the assimi-

¹⁰ Nietzsche probably first read Roux in 1881 and again in 1883. Wolfgang Müller-Lauter developed a list of all the fragments linked to his reading of Roux. See Müller-Lauter, "The Organism as Inner Struggle," 163 n. 13 and n. 14.

¹¹ *Ibid.*, 167; see also Christian J. Emden, *Nietzsche on Language, Consciousness and the Body*, 87.

¹² One should note that Müller-Lauter misidentifies this passage. It is numbered KSA, 9, 11[28] when it should be as it is above.

¹³ See Stiegler, *Nietzsche et la biologie*, 30–36; see also Müller-Lauter, "The Organism as Inner Struggle," 177.

tion of what is foreign. Nietzsche gave the example of the appearance of a parasite in the body that obliges the body to grow around it by developing its capillary system. Thus, stimulated by the parasite, the body responds by assimilating it to itself. (KSA, 10, 7[197]) His description of excitation is not only important because it generalises Roux's concept, but also because it implies that assimilation is not narrowly limited to food. Assimilation is also a defence mechanism that neutralises potential threats to the body's organisation and survival.

Unlike excitation, overcompensatory assimilation was one of the novel elements that Nietzsche encountered in his reading.¹⁴ Following Roux, he understood assimilation as the overcompensation of incurred losses. (KSA, 9, 11[134]) Here, Nietzsche again extended the tenor of Roux's concept as literally designating the process by which something foreign is rendered similar to the receiving body (KSA, 10, 7[33]; 11, 26[448]; 41[11]; 12, 5[65]; BGE, §230). Added to his generalised version of excitation, assimilation became the attempt to overcompensate the presence of something foreign by rendering as much of it similar to the receiving body as possible. Thus, in *Kampf der Theile im Organismus*, Nietzsche discovered that cells, and the other parts of the organism, assimilate more than they need to compensate the losses incurred through excitation. Since it is the excitation that provokes an overcompensatory assimilation, it is the most strongly excited parts that grow stronger. (KSA, 10, 7[95]) The less excited parts must then conjugate themselves to stronger parts or perish for lack of nourishment. Thus, the ability to be excited is of paramount importance in the growth and development of the organism. (KSA, 10, 7[95][86]) The easily excited parts produce more progeny, and the less stimulated shrink in number.

This account of assimilative conjugation is important for Nietzsche's rendering of the self-formation of the purposeful. Through overcompensation, which stimulates growth, the various parts come into direct contact, which leads to the domination of one part over another. (KSA, 10, 7[93] [95]) Nietzsche would later famously describe this as the formation of an "*aristocracy of cells*." (KSA, 11, 40[42]; 12, 2[76]) The weaker part that is unable to secure enough nourishment reacts to the

¹⁴ Müller-Lauter, "The Organism as Inner Struggle," 163, 169; Stiegler, *Nietzsche et la biologie*, 30; Gregory Moore, *Nietzsche, Biology and Metaphor*, 37.

growth of the stronger part by conjugating itself to it. Faced with an expanding and strengthening neighbour, a part can either perish or link itself to a stronger one. The weaker part must, therefore, adapt to the stronger (KSA, 9, 11[132]), and through its adaptation, it becomes a function of the stronger and serves its needs. (KSA, 9, 11[134]) Nevertheless, these weaker parts must themselves dominate other parts because it is only in such a relation that the stronger part will allow it to exist as a function. (KSA, 9, 11[134]) The domination of one part serves the needs of another. (KSA, 9, 11[284]) Ultimately, a hierarchy develops between the various parts, which serves the whole organism.

Self-regulation by domination and coercion is another important element that Nietzsche found in Roux.¹⁵ (See KSA, 11, 26[272]) Without self-regulation, the organism could perish. (KSA, 10, 7[190]) If the various parts did not submit to each other according to their strengths, the organism would be constantly torn apart by its inner struggle and could not exist as a whole. The “functional auto-structuration of the most appropriate force relations” (KSA, 10, 7[190]), as Nietzsche called it, proceeds from the alliances formed between the various parts of the organism. Through the process of domination alliances develop, serving the various parts’ needs. (KSA, 10, 7[94]) However, according to Nietzsche, a strong part requires the cooperation of the weaker part, and vice versa.

In how far obeying also involves resisting; the obeyer by no means gives up its own power. Likewise, in commanding there is a concession that the opponent’s absolute power has not been vanquished, not incorporated, dissolved. (KSA, 11, 36[22])

The hierarchy of the organism’s constituent parts requires both the subordination of the weaker elements and the stronger parts’ recognition that they cannot maintain their position without the cooperation of their weaker counterparts. (KSA, 11, 25[430]; see also 9, 11[284]) Since the weaker elements are subordinated to the stronger ones and serve as a function of the latter, the strong are dependent on the weak because they

¹⁵ See Müller-Lauter, “The Organism as Inner Struggle,” 174; and Stiegler, *Nietzsche et la biologie*, 50–51.

themselves require cooperation in order to carry out the function demanded of them by their *own* masters. (KSA, 11, 34[123]) Thus, there is a reciprocal relation between qualitatively different parts of the organism that leads to an inner balance of forces. The stronger dominates the weaker, but the former does not vanquish and completely assimilate to the latter. The stronger has simply rendered the weaker as similar to it as possible, which does not mean that the subordinate has been completely transformed into a part of its master. Therefore, there is a tension in the organism between the competing parts, which incites further assimilation by being easily excited.

Thus, on Nietzsche's understanding, assimilation, provoked by the action of a stimulus, is never complete: the subjugated always resists to some degree. The reception and assimilation of something new provokes a counter-movement that resists this assimilation.¹⁶ (KSA, 11, 36[21]) This counter-movement means that the hierarchy established through assimilation and conjugation is only tentative. The new part, which resists assimilation, remains as an incitement to further assimilation.¹⁷ This resistance weakens the body's overall cohesiveness because there is an incompletely assimilated element, which, should it be excited and grow, would upset the organism's equilibrium. Nietzsche describes these products of incomplete assimilations as "wounds," which the organism tries to neutralise by further assimilation.¹⁸ (KSA, 10, 7[86–88][95]) His account of the body physiological thus describes an interrelation of competing forces rather than a unitary phenomenon. Consequently, one should not think of it as a being, but rather as an event or becoming¹⁹, an unstable equilibrium that carries with it the possibility of its own reconfiguration. The appearance of new elements or the strengthening of others may upset the previously established balance of forces. The presence of easily stimulated "wounds" implies the very real possibility of the body's reconfiguration. Such "wounds" are, therefore, the

¹⁶ See Müller-Lauter, "The Organism as Inner Struggle," 177; Stiegler, *Nietzsche et la biologie*, 69.

¹⁷ Stiegler, *Nietzsche et la biologie*, 72–73.

¹⁸ See *Ibid.*, 82–85.

¹⁹ Didier Franck, *Nietzsche et l'ombre de dieu* (Paris: Presses Universitaires de France, 1998), 183.

possibility of future excitation and the precondition of further assimilation. However, one should be wary of describing Nietzsche's understanding of the body as either passive or active. The passive excitability of wounds is counterbalanced by the active assimilation that attempts to neutralise these resistances. The body suffers and heals itself.

Let us now first describe physiology's philosophical significance proper before discussing its significance for the study of history. As an unstable interpreting synthesis of forces²⁰, the body physiological (*Leib*) exemplifies our relation to the world. Just as Roux described the body as mediating the way that natural selection can operate on it, the body is here the mediator between the world and the intellect.²¹ It receives stimuli from the outside, which it then translates into a text that the intellect can interpret. The body's excitability, developed through the struggle of the body's parts, is the means by which it pre-interprets the world and then determines the nervous signals sent to the intellect as a "pre-text" to its own interpretive assimilation.²² The world, as Nietzsche understood it²³, is chaotically devoid of any intrinsic properties or attributes, and exists as a differentiated whole only insofar as it is able to affect the subject through the body. The body's interaction with the world pluralises the undifferentiated chaos of the world, thus predetermining how the world appears to the intellect.²⁴ The intellect receives this pre-text and then simplifies and falsifies the plurality of affects sent to it by the body by filing "new things in old files." (BGE, §230) Thus, it is through the body that we understand and organise our world and that we populate its chaos

²⁰ Eric Blondel, *Nietzsche, le corps et la culture : la philosophie comme généalogie philosophique* (Paris: Presses Universitaires de France, 1986), 297; Patrick Wotling, *Nietzsche et le problème de la civilisation* (Paris: Presses Universitaires de France, 1995), 88; Sarah Kofman, *Nietzsche et la métaphore* (Paris : Éditions Galilée, 1983), 199; Kristen Brown, *Nietzsche and Embodiment: Discerning Bodies and Non-Dualism* (Albany: SUNY Press, 2006), 142.

²¹ Blondel, *Nietzsche, le corps et la culture*, 282.

²² Kofman, *Nietzsche et la métaphore*, 198.

²³ See, for example, Friedrich Nietzsche, *The Gay Science*, (tr.) W. Kaufmann (New York: Random House Vintage Books, 1974), §109.

²⁴ Brown, *Nietzsche and Embodiment*, 111–13; Blondel, *Nietzsche, le corps et la culture*, 282.

with meaningful objects. The body is the basis of our relation to the world inasmuch as it is able to receive something foreign into itself.²⁵ Therefore, physiology's description of the body's intussusceptive capacity, which predetermines the ways that the world may affect us, marks the body as philosophically important.

Let us now turn to physiology's philosophical significance for the study of history and think of the body not as a physical body, but as a *body of knowledge* or, as the Latin says it so well, as a *corpus*. History is physiological because it has the interpretive qualities of the body. Like the body, history pluralises the chaos of the past, which historians then simplify through their interpretations. History acts as if it were a body inasmuch as it mediates the chaos of past events and translates this chaos into past peoples, places, events and objects, as a pre-text to our interpretations, which we customarily call "facts." Historians, therefore, act as the consciousness to history's body inasmuch as they simplify the pre-text given to them by history. The pre-text donated to the historian is composed of pre-interpretations produced by preceding generations of historians. The appearance of new experiences or information is conditional on history's pre-text, which is the basis for any new interpretation. All new information about the past is assimilated to already existing interpretations. History thus acts as the basis for an assimilation of new experiences, and any new interpretation developed by a historian, therefore, becomes a pre-text to new assimilation.

Nevertheless, history is *not* an addition of interpretations produced by succeeding generations of historians. As has already been described, in the reception and assimilation of something new, a counter-movement always resists this assimilation and produces easily excitable "wounds." Understood in relation to history, these "wounds" are loose threads that threaten the carefully woven fabric of history and beckon their interpretation and integration into the body historical. Like the body that restructures itself in response to the apparition of a foreign object, likewise history also re-equilibrates its internal force relations through successive interpretations. As an explanation for this, Nietzsche distin-

²⁵ Stiegler, *Nietzsche et la biologie*, 87; see also Barbara Stiegler, *Nietzsche et la critique de la chair : Dionysos, Ariane, le Christ* (Paris: Presses Universitaires de France, 2005), 31.

guishes two aspects that interact within the historian's work. There is the enduring aspect, which consists in the "custom, the act, the 'drama'," and the fluid aspect that consists in "the meaning [and] the purpose." (GM, II, §13) Accordingly, the enduring aspect is older than the fluid aspect that is applied to it. The enduring aspect incites interpretation and the fluid aspect is the interpretation, the meaning, applied therapeutically to the enduring "wound." Understood hermeneutically, these "wounds" are irrupting questions that beckon a response and an interpretation. Thus construed, they give the sense and direction demanded of this new interpretation. In this sense, the question, the "wound," is the *pre-text* that orients the exegesis. Thus, the enduring aspect pluralises the chaos of the past and presents the historian with a pre-text to further interpretation. The fluid aspect is the answer that attempts to suture the historical wound. However, as with the physical body, the act of assimilation, and the accompanying restructuring of the hierarchy of parts, may result in new resistance that incites further assimilation. History, therefore, like the body, is closer to an event, a state or a becoming, than a being.

Thus, history may be understood as a body. Like a body, history can be affected in multiple ways. The past is transformed from an undifferentiated chaos of events, peoples and places, into a series of objects that affect the historian as a pre-text for further interpretations. These historical affects are then assimilated and related to the existing historical interpretations by which they are simplified and given meaning. However, the interpretation of the past is never complete, there always remains a series of "wounds" that act as oriented questions offering a new perspective on the past. Thus, history actively produces the ways that the past may affect it through its incitation to interpretation that produces new questions and perspectives. This physiological interpretation of history is philosophically significant because if history is indeed written from the perspective of the present, it need not be accused of relativism and being untruthful. The past, as an undifferentiated mass, only exists as sets of peoples, events and places through the pre-text of incomplete past interpretations and not as some ephemeral object known asymptotically. More importantly, by interpreting the past through a physiological history, not only does the past gain meaning, but it also gains relevance by provoking further resistance and questions that animate further interpretation. History, because it is turned toward the past, is open onto the future; and a physiological understanding of history allows knowledge to

regain some lost vitality, thus avoiding a dismal account of a dead past, opening perhaps the possibility of a *Gaya* science.

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