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Herder. Physiology and philosophical anthropology¹

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Abstract: In eighteenth-century Germany, a new field of philosophical anthropology emerged, signaling a profound reconfiguration of what, originally, in the Renaissance, was primarily a medical and anatomical discipline. This paper focuses on Herder’s contribution to this development and investigates its medical and physiological context. Set in the context of the long history of anthropology, Herder’s philosophy can be seen as a response to recent discoveries in medicine and physiology. The major impulse came from Albrecht von Haller’s new distinction between the irritability of muscle and the sensibility of nerves, that he first presented in the 1740s and 1750s. Haller’s limitation (and close association) of sensation and thought to particular bodily structures challenged major philosophical and theological dogmas insofar as it raised new questions about the existence of an immaterial soul and its ability to cause what the mind perceives as a voluntary motion. It blurred the traditional division of labours, the one ascribing the physician the task of investigating the body and leaving the study of the soul to the philosopher and the theologian. The chapter will explore how Herder makes creative use of Haller’s concept of irritability, in particular, as a way of demonstrating a neo-Aristotelian account of the soul as pervading and informing the entire body.

Keywords: Herder, Haller, philosophical anthropology, medical anthropology, philosophy of medicine, German Enlightenment philosophy, materialism, sensibility, irritability

It would be insufficient to view Enlightenment philosophical anthropology as merely a reformatory movement *internal* to philosophy. A glance at the disciplinary history of anthropology reveals, on the contrary, that it was a response on behalf of philosophy to changes affecting philosophy from the *outside*. More specifically, it was an attempt on behalf of philosophy to

¹ I would like to thank Nigel DeSouza and Anik Waldow for their precious editorial and stylistic help with this article, for sharing their own work on these matters with me, and for the fruitful philosophical discussions. And thanks to Fred Beiser for his 1 comments on a previous draft of this paper, on Herder’s materialism.

² Dedicated to my former colleague at the university Paris 8 Saint-Denis Pierre Péniçon. *In memoriam*.

reconquer a territory that at the dawn of the modern age had been occupied by the very human science that, historically speaking, had first claimed the title “anthropology”, i.e. medicine. Besides Herder, the philosophical anthropology of the Enlightenment involved various philosophers such as Kant and philosopher-physicians such as Ernst Platner, Markus Herz, who all happened to “stroll along the borders of both provinces, philosophy and medicine” (AA 10, 422), as Herz put it. To a certain extent, all of these Enlightenment authors attempted to design their own “anthropology”³. Nonetheless, these attempts all possessed several common characteristics: in particular, they all represented attempts to “recentre” philosophy on the human being⁴ and offered novel responses to the ancient dictum “Know Thyself”, *gnothi seauton* inscribed above the Temple at Delphi – an inscription that Karl Philipp Moritz was to take up in the title of his journal of empirical psychology or *Magazin zur Erfahrungsseelenkunde* in the 1770s. The change of paradigm from rationalist philosophy to anthropology reveals a common distrust in Enlightenment scholasticism or *Schulphilosophie* and metaphysics, now disqualified as “speculative” and “dualist”. At the same time, it also signals a particular state and progress in science and medicine: all of the new anthropologies can be characterized by the common attempt to rethink the interaction between soul and body on a new philosophical and *physiological* basis. They all attest to an intensive reception of Albrecht von Haller’s physiology and of his novel distinction between the irritability of muscle and the sensibility of nerves.⁵

This description also applies to the anthropology of Herder, who is one of the main figures of Enlightenment anthropology. Herder’s anthropology – as developed in greatest detail in his *Ideen zur Philosophie der Geschichte der Menschheit* [*Ideas on the Philosophy of the History of Mankind*] – is a project of self-cognition and a project that bears the traces of the deep influence left by Haller’s physiology. These are even more manifest in Herder’s earlier treatise *Vom Erkennen und Empfinden der menschlichen Seele* [*On the Cognition and Sensation of the Human Soul*] from 1774/1775/1778 where

³ See Ernst Platner, *Anthropologie für Ärzte und Weltweise*, 1772 and Herz’s review of Platner (1773). Although Herz seems to value Platner’s project very highly, it becomes clear from the review that “anthropology” was an ambivalent term in the Enlightenment: it designated a discipline at the crossroads between medicine and philosophy, with changing contours and shifting semantics. Herz himself adopted a definition of anthropology different from Platner’s. Rather than a “science of man and those spirits and bodies that bear a relation to man” (Platner, preface), Herz views anthropology as a form of psychopharmaceutic. As for Kant, in 1773, he explicitly announces to Herz that he is embracing an “altogether different idea of anthropology” (Kant to Herz, AA X, 145). The same seems to apply to Herder. The French also happen to employ the term “anthropology” as a synonym of “science of man”. Today “anthropology” possesses an even a greater range of different meanings. Our focus here is on the *Begriffsgeschichte* – the rise to prominence of the term – on a certain “anthropological turn” and disciplinary changes that these semantic changes indicate in comparison with the rationalist tradition, which precisely did not refer to itself as “anthropology”.

⁴ “Einziehung der Philosophie auf Anthropologie”, See Herder, *Wie die Philosophie zum Besten des Volkes allgemeiner und nützlicher werden kann*, 1765, FHA 1, 132, and the contribution by Marion Heinz in the present volume.

⁵ Platner, e.g., began his lifelong dialogue with Haller in 1770, with the *Briefe eines Arztes an seinen Freund über den menschlichen Körper*, before publishing, in 1772, the first edition of his *Anthropologie für Ärzte und Weltweise*.

he goes so far as to consider Haller's physiology to be "the shrine of the soul", as the very foundation of psychology. But even at the beginning of his literary career, Herder already seems to be well-informed about the ongoing debates and the famous polemics between Haller and Julien Offray de La Mettrie, which had rocked the *République des lettres* in the 1750s. He explicitly refers to Haller's response to La Mettrie in 1765, in a footnote in *Haben wir jetzt noch das Publikum und Vaterland der Alten?* [*Do we still have the public and the homeland of the Ancients?*] He refers there to the theological stakes of this medical debate and employs Haller's defense of religion as an example illustrating what he considers to be a "firm experience", namely, that "a pure reasonable religion" is the pillar and buttress of the state and the foundation of our happiness in this life and beyond (FHA I, 49). While sharing a number of common features with the anthropologies of his contemporaries, Herder seems to interpret the injunction "Know Thyself" in a manner quite different from his contemporaries. In order to better understand the originality of Herder's own anthropological project, I will, in the first part of this article, briefly sketch anthropology's disciplinary history between medicine and philosophy and depict the situation in Germany and Berlin around the time Herder was developing his anthropology. The reconstruction of the larger context of Herder's interpretation may also help to measure Haller's huge impact on German philosophy which, until now, has remained largely unacknowledged.⁶ In the second part, I will turn to Herder and his own methodological and philosophical conclusions, including Herder's "sagacity adept in the discovery of analogies", which are, *en passant*, what his teacher Kant found most disturbing⁷ and what his correspondent and friend Goethe⁸ found most interesting about Herder.

I. Anthropology, mid-way between medicine and philosophy

The disciplinary history of anthropology testifies to the deep affinities and thematic overlaps between philosophy and medicine (cf. Gaille 2011, Buchenau et al. 2013). Philosophers and doctors share a common object and a common vocation insofar as both their disciplines are "humanities" or "human sciences": they not only both pursue a common practical and "therapeutic" ambition, which is to maintain humans in good health and to administer them the regimen best suited to them, but they also share a common theoretical aim to know human beings in their physical and moral dimensions. This is why the two disciplines, which were still

⁶ Until quite recently, the history of medical anthropology has principally attracted the attention of specialists in aesthetics and literature (for a survey of the literature, see Riedel 1994 and Stiening's critical review, 2005). A few recent studies (Nowitzki 2003, De Angelis 2010, Gaukroger 2012) at the crossroads of the history of the sciences and the history of ideas are paying attention to the more philosophical implications of anthropology.

⁷ Kant, *Review of J. G. Herder's Ideas for the philosophy of the history of humanity*, AA 8, 45, English translation (2007), 124.

⁸ See the correspondence between Herder and Goethe on comparative anatomy and Goethe's discovery of the intermaxillary bone, in particular, Goethe's letters dated March 27, 1784 and October 12, 1784.

closely linked during the Hippocratic era, continued a profound dialogue in the modern age and entered into a competition or a “conflict between the faculties”, as Kant would put it toward the end of the 18th century (AA 7, 95-116), where each claimed supremacy among the humanities, over both theoretical principles and institutions and culture (cf. Andrault et al. 2014, ch. 1).

Originally, at the dawn of the modern Age, “anthropology” was a name first applied to certain Renaissance medical works, i.e., anatomical works aimed at celebrating the human body and recognizing its dignity (Casmann 1594/1596). In 1501, Magnus Hundt first published *Anthropologium, de hominis dignitate, natura et proprietatibus*, that was to be followed in 1594 by Otto Casmann’s *Psychologia anthropologica, sive animae humanae doctrina*, which offered a first definition of the discipline: “Anthropologia est doctrina humanae naturae” (Casmann 1594, pars prima, 1). Casmann conceived a work in two volumes, on psychology (or the doctrine of the soul) and somatics (or anatomy, the study of the human body). The original anatomical usage of “anthropology” and of related terms such as “anthropography” persisted far into the 18th century, as testified by the entry “anthropographie” in the French *Encyclopédie* of Denis Diderot and D’Alembert: “Anthropography, in anatomy is the description of man. This word is composed of Greek, anthro, man & Graf, I write.”⁹ This anatomical usage of the terms “anthropology” and “anthropography” shows that, in this era, medicine began to claim its role among the sciences of man (De Angelis 2010). Despite the rivalry between the disciplines, a certain division of labour then still seemed to be accepted: at the beginning of the 18th century, theology still claimed authority over the soul while medicine was concerned above all with the body, and philosophy acted as a “handmaiden” (*ancilla*) of the higher faculties of theology and medicine and as mediator between them, trying to acquire a leading status.¹⁰ This division—and the supremacy of philosophy and theology—was to be challenged more deeply by new medical and physiological insights as demonstrated by the vivid reactions that Haller’s new insights provoked all over Europe: they tended, at least for a while, to promote medicine to the rank of the very first human science.

While recognizing his debts to his teacher Boerhaave¹¹ and to a certain number of predecessors on irritability (Duchesneau 1973), Haller states the novelty of his distinction in the opening passages of his treatise, *Von den empfindlichen und reizbaren Theilen des menschlichen Körpers (Dissertation on the Sensible and Irritable Parts of Animals)*: in his view, it introduced an “entirely new division of

⁹ “*Anthropographie*, s.f. en Anatomie, c’est la description de l’homme. Ce mot est composé du Grec, anthro, homme, & Graf, j’écris”. D’Alembert and Diderot 1751/ 1758, tome 1, 497.

¹⁰ See Christian Wolff’s essay, *De philosophiae non ancillante*, in *Horae subsecivae*, vol. 1, 1729. Wolff, *Gesammelte Werke*, II, 34, 1, 425-478.

¹¹ See Haller’s own narrative in his treatise on sensibility and irritability, Haller 1755.

the human body” (Haller 1755, preface). His French translator Tissot went so far as to compare Haller’s effect on physiology to Newton’s effect on physics.¹² It is true that Haller launched some sort of revolution: in the years following its first presentation, Haller’s treatise was translated from Latin into most European languages, including Dutch, Swedish, French, English and his experiments were repeated everywhere in Europe. This revolution not only affected physiology, but also philosophy, and it gave rise to new philosophical traditions all over Europe and on both sides of the Rhine (Steinke 2005). In both France and Germany, it immediately provoked discussion among those *médecins-philosophes* who, like La Mettrie, considered philosophy and the knowledge of the human being to presuppose a certain acquaintance with and medical knowledge of “the labyrinth of man”.¹³ While the German anthropological tradition has similar medical origins to the French¹⁴, it nonetheless bears certain distinct characteristics. In particular, it is clear that the Germans did not employ anthropology as a weapon against religion as did the French. As Herder’s early note above on the polemics between Haller and La Mettrie shows, the Germans seemed rather attached to anthropology’s religious and Protestant origins and to its bipartite structure as a discipline devoted, respectively, to the body (somatics) and to the soul (psychology). Instead of simply rejecting the old vocabulary of the soul like the French, they attempted to refound psychology and save the dogma of the immaterial and immortal soul and thereby re-found the supremacy of theology and philosophy among the anthropological disciplines on a new basis. The proliferation of treatises on psychology and theology in the second half of the eighteenth century attest to these deep differences and to Germany’s hostility and/or anxiety toward the French *libertins*.

In order to better understand the philosophical issues at stake in the polemics, let us briefly return to the year 1752, when Haller first presented his “new division of the human body” and his distinction between irritability and sensibility to his colleagues from the Academic Society of Göttingen. Haller defines as irritable the part of the body that contracts through motion, while a part is sensible if it produces signs of pain or pleasure in the animal. Against the doctrines of his former teacher, Boerhaave, and even against his own prior conviction, Haller states that these two attributes can be closely associated with, and localized in, specific organs: while irritability is a

¹² Tissot, “Discours préliminaire du traducteur”, in Haller (1756): “Nous devons la Physique à l’Angleterre, on devra la Physiologie à la Suisse & le Mémoire sur l’Irritabilité en sera la base immuable”.

¹³ See La Mettrie, “Physicians have explored and thrown light on the labyrinth of man. They alone have revealed the springs hidden under coverings that hide so many marvels from our sight” (La Mettrie, 1748, 2).

¹⁴ According to Cabanis, who comments on the term in a footnote of the 1805 edition of the *Rapports du physique et du moral*, German “anthropology” is even just an equivalent to what he himself then introduces as the science of man: “la science de l’homme”, Cabanis 1805, 7 : “C’est celle que les Allemands appellent l’Anthropologie”. On the French disciplinary landscape, see Blanckaert 1989, Moravia 1970, and Gaille 2014.

property of muscle (of what he calls the muscular fibre and muscular organs such as the heart), sensibility is a quality of the nerve (the nervous fibre and organs), and elasticity is the quality of the fibre that reacts to pressure. Haller establishes this division on an experimental basis by performing a great number of animal experiments and vivisections in his laboratory in the newly founded Göttingen University, conjointly with his colleagues and students such as Johann Georg Zimmermann. By interrupting the communication between a muscle and a nerve in smaller animals such as dogs, the muscle remains responsive to stimuli, its irritation continuing to provoke its contraction. Something similar happens in parts that have been cut out and separated from the body and even for a while *post mortem* as Haller and his colleagues witnessed, for example, in the case of decapitated frogs. These gruesome experiments showed that sensation is limited to the nervous organs and revealed the insensibility of parts such as the tendon.

Although Haller was aware of the philosophical stakes of his discoveries, he himself seemed reluctant to engage in philosophical debates. He is, of course, known as one of the last polymaths, as a scientist but also as a writer whose writings and reviews cover a wide range of disciplinary fields, extending from anatomy, physiology, and botany, to literature, theology, and philosophy (Steinke et al. 2009). His poetry that earned him the title of Switzerland's national poet often touches upon deeply metaphysical topics. His highly interesting literary diary and the three-volume *Sammlung kleinerer Schriften* contain a representative selection of his writings and include a certain number of major book reviews on philosophy and theology. The *Briefe über die wichtigsten Wahrheiten der Offenbarung [Letters on the most important truths of revelation]* present his theological views in great detail.¹⁵ Despite his literary interests, Haller exhibited a complicated relationship to philosophy. Rather than speculating about those ultimate causes and origins of the irritability and sensibility that he considered to be deeply hidden in the *fabrica* of the body, he preferred to discuss with scalpel in hand. As a matter of fact, Haller, who like his teacher Boerhaave was a strict Calvinist, adopted a very pessimistic view of the human capacity to attain true knowledge. In Haller's view, both the true nature of things and divine ends are beyond the cognitive reach of human beings, and Haller calls upon his contemporaries to refrain from vain speculation about ends that necessarily escape their view and to humbly accept their own imperfection and finitude. In his view, the human being, whose fall has spoiled and obscured human faculties, is separated from God by an infinite distance and an unbridgeable gap. These religious views motivated Haller's rejection of contemporary metaphysics and philosophy and they underlie his views on science and poetry. As a matter of fact, Haller considered his scientific

¹⁵ For online access to Haller's major writings, see <http://www.haller.unibe.ch/e/index.php>

activity as a solely *descriptive* and *religious* exercise (cf. Duchesneau 1973, Monti 1990). Science is simply a particular form of physico-theology, aimed at describing the envelope of things and at glorifying the impenetrable aims of divine creation: just like poetry, it helps to translate creation's infinity and beauty into words, and it is meant to foster a vivid, practically motivating form of conviction and to reinforce faith.

The majority of Haller's readers, however, did not share his radical agnosticism. From the 1750s onwards, the Enlightenment began to oppose a more positive conception of natural philosophy to Haller's. In the eyes of deists such as Hermann Samuel Reimarus who, in 1754, devoted his *Die vornehmsten Wahrheiten der natürlichen Religion* [*The noblest truths of natural religion*] to an explicit defense of Haller against La Mettrie, the human being *is* endowed with a faculty of knowledge that is to be employed in order to celebrate God's creation. Rather than neglecting the truths of reason, religion calls for the exercise of "the noble gift of healthy reason": humans need to apply their reason so that they can know that God is the creator and attain the rational conviction of the divine origin of the world that is necessary for applying his commands and for leading a moral life (Reimarus 1754, Vorbericht). For most of his readers, Haller's physiology does raise a genuinely philosophical challenge. It in fact requires philosophers to revise and rethink quite a number of traditional dogmas concerning the soul. There are three such dogmas that I want to mention here: the simplicity and ubiquity of the soul, its immateriality and freedom, and its immortality. From mid-century onwards, these issues are at the centre of the philosophical debate and in what follows I want to shed some more light on the central issues involved in this debate, taking the three dogmas in turn.

First, sensation and consciousness seem to be more closely linked to certain bodily organs, i.e., to the nervous system, than had hitherto been assumed. If the soul is not to be thought of as divisible but as simple, its empire (the realm of self-consciousness) needs to be restricted to the sensitive, nervous parts of the body as opposed to the body as a whole; in other words, it cannot reach beyond the nervous system. This is a consequence that Haller himself partly acknowledges in his response to objections formulated by Robert Whytt, which were also discussed by Haller's contemporaries. To quote Haller, from his *Treatise on sensibility and irritability*:

Our soul is that being which is conscious of itself and which represents its own body and by means of its body the whole world. I am myself and am not someone else, because what is called I is changed by whatever befalls my body and its parts. If there is a muscle or an intestine whose modifications relates to another soul, and produces modifications in that soul but not in mine, then the soul of such a muscle, of such an intestine, is not mine and does not belong to me. Now, a finger separated from my body, a chunk of flesh cut from my foot do not concern me anymore, their modifications are no longer connected with me and occasion neither any pain nor any thought in me. And therefore such a separated

muscle is not inhabited by my soul or by a part of it, and I am not present in such a finger. My will has remained unharmed.¹⁶

From the restriction of the soul's empire to the nervous system, it follows that one can no longer consider the soul as the force that, via the nerves, moves the body (cf. Haller 1757-66, §§ 408-409). Strictly speaking, the soul can no longer be said to be the principle of the body's motion. The soul can be held to be the principle of voluntary movements but not of involuntary ones such as reflex movements, blood circulation, or the heartbeat. For one has to suppose a second moving force in the body, different from the soul, responsible for involuntary and vital motions. As a result, there seem to be two forces hidden in the very *fabrica* of the body whose nature and mutual hierarchy and relation necessarily remain unknown. This idea seriously threatens the Aristotelian idea of the soul as the animating principle of the body, as the principle of motion and life.

La Mettrie's discussion of Haller illustrates the problem very well. Himself a former disciple of Boerhaave, La Mettrie was well-informed about the Göttingen experiments and famously dedicated his *Homme-Machine* to Haller as early as 1748, devoting a substantial section of it to Haller's experiments at a strategic point of the treatise (La Mettrie 1748, 22f.). La Mettrie argues that our ignorance of the relation between the forces of voluntary and involuntary motion seriously threaten the second dogma mentioned above, i.e., the immateriality and freedom of the soul. Could it not be, he asks, that what we perceive as an intentional, willed motion of our limbs does not originate in an immaterial soul, but rather in the muscle itself or in some sort of material force of the body? This would mean that what we perceive as an immaterial and spontaneous cause determining our will and setting our body in motion is not a soul that works *via* the nerves and the animal spirits, but rather a material cause that has its origin in "the very substance of the body-parts (excluding the veins, arteries, nerves, in short the entire body's organization)" (La Mettrie 1748, 22). And it would also mean that "each part ... contains its own 'springs' [*ressorts*], more or less strongly depending on the part's needs" (Ibid.). What La Mettrie calls automatic or involuntary, i.e., reflex movements, such as the heartbeat or certain emotive reactions such as sudden blushing, seem to confirm the hypothesis of the man-machine and the brain-muscle:

Let's look in more detail at these springs of the human machine. All the body's movements – vital, animal, natural and automatic are carried out by them. Aren't all of these mechanical? The body draws back, struck with terror at the sight of an unexpected

¹⁶ Haller, 1756-1760, I, 51. I would like to thank John Zammito and John Dillon for their help with the translation of this passage.

precipice, the eyelid blinks under the threat of a blow, the pupils contract in bright light to protect the retina and dilate to see objects in the dark...

I shan't spend any longer on all these subordinate little springs that everyone knows. But there is another more subtle and wonderful one, which drives them all. It is the source of all our feelings, all our pleasures and all our thoughts; for the brain has muscles for thinking as the legs do for walking. I am talking about the instigating and impetuous principle, that Hippocrates called *ενορμων* [the soul]. This principle exists and is located in the brain at the starting-point of the nerves, through which it exerts its control over all the rest of the body. This explains everything that needs to be explained (La Mettrie, 23f.).

This passage shows in what sense Haller's distinction threatens the immateriality and freedom of the soul. In La Mettrie's materialist and naturalist interpretation of it, human action (and reaction) is reduced to some sort of muscular reflex movement whose sole difference from animal movement lies in its greater complexity. The principle of organization that philosophers held to be an "immaterial soul" originates here in a certain matter, endowed with motion and sensitivity, and reveals itself to be no more than a fiction of our imagination.¹⁷

Such a conclusion has ramifications, thirdly, not just for the soul's immateriality or spirituality, but also for its immortality: if "between a spiritual substance, and a material substance, there is no other difference than the one that one supposes to exist between the modifications or the ways of being of a same substance", then the idea of immortality expresses no more than a natural inclination of our mind to rid itself of the distressing idea of death (La Mettrie 2004, 183). These insights thus "shake the very foundations of the sacrosanct theology", as La Mettrie put it (La Mettrie 2004, 339). Again, as the correspondence between La Mettrie and Haller's colleagues from the faculty of theology at the university of Göttingen reveals, La Mettrie is acutely aware of these consequences.

La Mettrie's attack on Haller was devastating, and all the more so because it was grounded in Haller's very own premises. It gave rise to one of the major polemics of the century, whose first stage was carried out by La Mettrie and by Haller himself in the *Göttingischen Gelehrten Anzeigen* and was later continued by a number of colleagues (cf. Guthke 1962, Hintzsche 1968, Knabe 1978). Haller's reviews of La Mettrie's translation and commentary of their teacher Boerhaave's *Institutions médicales* and of La Mettrie's own *L'Histoire naturelle de l'âme* illustrate a gradual change of attitude from curiosity and benevolence to anger and indignation. Haller ended up directly accusing the author of plagiarizing and stealing his ideas, and of lacking both intellectual rigour and integrity. Here again, Haller refrained from venturing into philosophical territory, merely pointing out the difficulty of conceiving of parts of the body as communicating with each other

¹⁷ See the discussion of different types of soul—vegetative, sensitive and rational—in La Mettrie's *Traité de l'âme*.

without also invoking a centralizing agency. Haller then reacted with great indignation to La Mettrie's ironical dedication to him in *L'homme-Machine*. The polemics continued in the *Göttingische Gelehrte Anzeigen*, which reviewed not only all of La Mettrie's writings, but also the literary productions of La Mettrie's adversaries such as the physician Ludwig Tralle and the theologians Samuel Christian Hollmann and Adam Wilhem Frantzen. La Mettrie replied in a number of new pamphlets such as *Épître à mon esprit* (to Hollmann) and *Les animaux plus que machines* (to Tralle). In the meantime, he found refuge in Berlin where he had been nominated member of the Berlin Academy by Frederick the Great, who even pronounced an éloge to him after his accidental death at the French Embassy (cf. Péniſson 2006). The polemic reached its peak in 1751 with Haller's letter to Pierre Louis Moreau de Maupertuis, president of the Berlin Academy, demanding that his honour be reestablished. The letter arrived the day of La Mettrie's death.

Throughout this time and long after his death, La Mettrie remained at the centre of the German philosophical stage. Of course the enemy was not always called by his true name—often, he was discussed under the more general title of “materialism” and “new epicureanism”.¹⁸ Nonetheless, from the 1750s on, one observes a proliferation of defences of the soul's immateriality and immortality within and beyond the circles of the Berlin Academy. Among them, Moses Mendelssohn's *Phaedon oder über die Unsterblichkeit der Seele* from 1767, Bonnet's *Palingénèse philosophique* from 1769, and Sulzer's treatises *Observations sur quelques propriétés de l'âme comparées à celles de la matière: pour servir à l'examen du Matérialisme* from 1773 and *Sur l'immortalité de l'âme, considérée physiquement* from 1779. Bonnet, who, in a letter to Haller dated 1755 expresses his deep admiration for Haller's treatise¹⁹, speaks for many when he writes: “This irritability is something that is worthy of being meditated on further. But where will these meditations lead us in such a dark night?”²⁰

II. Enlivening Haller “like Pygmalion's statue”: Herder's physiological psychology

¹⁸ See Lessing's *Laocoon* (I, 3, FHA, V, 2, 33) for La Mettrie's portrait as a modern Epicurean, and Herder's comment in the first *Kritisches Wäldchen* (1769), FHA, II, 133.

¹⁹ “Jamais Morceau de Physiologie ne m'a plu autant que la Dissertation sur l'irritabilité. Je la relis la plume à la main. Chaque ligne de cet excellent Ouvrage renferme une Vérité ; et ces Vérités sont-elles fécondes en Conséquences utiles ! Un nouveau Jour vient éclairer la Médecine et la Chirurgie. L'Expérience triomphe de l'ignorance, de l'erreur et du préjugé.” Charles Bonnet to Albrecht von Haller, A Genève le 27 Janvier 1755, Bonnet 1983, 59.

²⁰ “Cette Irritabilité est quelque chose de bien digne de nos Méditations. Mais où nous conduiront-elles ces Méditations dans une Nuit si profonde ?”, *Ibid.*

It is true that before the mid-1770s Herder rarely referred to La Mettrie or to Haller. When first sketching his anthropological project in his 1765 treatise on *How philosophy can become more universal and useful for the benefit of the people*, he did not develop its physiological underpinnings at all. Nevertheless, there is no doubt that Herder was deeply influenced by the German debate sketched above, and he was surely well-informed of the polemics²¹ and well-acquainted with the philosophical claims of most of its protagonists, including Haller, La Mettrie, Bonnet, Reimarus, and Sulzer. He attentively followed the philosophical debates of the Berlin academy and was very receptive to its novel philosophical impulses. In his writings from the 1760s, he already elaborated a metaphysical physics and a novel concept of “force”; in his 1772 prize essay *On the origin of language*, he already considered the physiological dimension of communication and “language” in the broader sense of the word, the bonds of sympathy between beings, their receptivity and activity. These are issues he had probably struggled with for years before finally tackling them in his prize essay, *On the cognition and sensation of the human soul*, in its three versions from 1774, 1775 and 1778, later elaborating his argument in the first book of the *Ideas*. The prize essay *On cognition* leaves absolutely no doubt about the major significance of Haller’s physiology for Herder’s own psychology and anthropology. In two subsections entitled “Irritability” and “Sensation,” Herder first presents the physiological context of his psychology. In the published version from 1778, one reads:

In my modest opinion, no psychology is possible which is not in each step determinate physiology. Haller’s physiological work raised to psychology and enlivened with mind like Pygmalion’s statue, then we can say something about thinking and sensation.²²

Herder’s 1775 draft contains the following variant:

Sensation is only the aggregate of all obscure irritations, just as thought is the luminous aggregate of sensation. Physiology is the shrine of the soul. *Haller’s* work is Pygmalion’s statue warming up under the hands of the lover of the human soul.²³

Similar praise of the “immortal” Haller’s physiological discoveries can be found in the *Ideas*:

The immortal Haller has discriminated the different powers that display themselves physiologically in the animal body, as the elasticity of the fibre, the irritability of the muscles, and the sensibility of the nervous system, with an accuracy that will not only remain upon the whole incontrovertible, but promises the most valuable application to physiological psychology [*physiologische Seelenlehre*], even in other than human bodies (FHA, 6, 86, 48 f.; transl. Herder 1803, slightly revised).

²¹ See the reference to Haller in the footnote from 1765, quoted above.

²² SWS, 8, 180. See also the remarks on Haller in the 1775 edition, SWS, 8, 250: “die Haller, Mead, Zimmermann sind mehr als alle Grübler a priori [die] Vertrauten [des inneren Menschen]”

²³ SWS, 8, 277. For a comparative study of the different versions of Herder’s treatise, see Heinz 1994, 109-174.

However, Herder, who notes at the beginning of the prize essay on language that he only writes for those “quiet and decent readers” [*stille und züchtige Leser*] capable of religious feelings, chooses a novel line of defense and draws more radical conclusions from Haller’s novel insights than any of his German contemporaries. Since it no longer seems possible to stipulate the primacy of sensation (that is, the primacy of the nerves transmitting the soul’s impulse to voluntary motion in the body) over irritability, and thus, likewise, to stipulate the causal agency of an immaterial soul, Herder suggests adopting the inverse perspective. By supposing the original identity or some sort of genealogical link between the different bodily functions, that is, between the elasticity of the inorganic fibre, the irritability of muscle, and the sensation of the brain, it is still possible to defend the Aristotelian idea of the soul as the animating principle of the body, and to reconcile it with the view of the moderns of the soul as a force of representation.

Of course, for Herder, the knowledge of ultimate causes of effects such as irritability and sensation in the body lies beyond our cognitive limits. In this respect, Herder shares Haller’s Newtonianism and agnosticism. He furthermore admits that Haller’s distinction has complicated the claim that the soul has an immaterial origin and for this reason can in fact explain the possibility of freedom. And yet can we not save our old convictions? Can we not suppose that human attributes developed out of attributes we share with animals, just as sensibility, reason, will can be thought of as having emerged from the irritability of the muscle, or from the even more primitive force of elasticity? Can we not assume, contrary to La Mettrie, that a certain “immateriality” (see the edition of *On cognition* from 1778) or at least a sacred or divine part of the human soul originates in materiality? This is the solution that Herder seems to suggest in *On the cognition and sensation of the human soul* and that he will further develop in his *Ideas*.

We probably cannot accompany sensation in its origination further down than to the strange phenomenon that Haller has called ‘irritation’. The irritated little fibre contracts and expands again – perhaps a stamen, the first little glimmering spark, toward sensation, to which dead matter has purified itself up through many courses and levels of mechanism and organization. – As small and obscure as this beginning of the noble capacity that we call sensing may seem, it must be equally important – so much gets achieved through it. Without seeds there is no harvest, no plant without delicate roots and filaments, and perhaps without this sowing of obscure stirrings and irritations our most divine forces would not exist (Herder SWS 8, 171, transl. 2002, 189).

Similarly, one reads in the *Ideas*:

I shall not now explain whether these three phenomena, different as they appear, may not arise at bottom from one and the same power, displaying itself in one manner in the fibres, in another in the muscles, and in a third in the nerves. As everything in nature is connected, and these three effects are so intimately and multifariously combined in the living body, we can scarcely entertain a doubt about it. Elasticity and irritability border on one another, as do fibres and muscles. Since muscles are but an artfully interwoven structure of fibres;

irritability is probably nothing more than elasticity infinitely heightened and intimately combined, exalting itself, in this organic interlacement of numerous parts, from the inanimate fibrous sensation to the first step of animal feeling. The sensibility of the nervous system would then be a higher species of the same power, a result of all those organic powers; since the circulation of the blood at large, and all the vessels subservient to it, seem contrived to humectate the brain, as the root of the nerves with that subtle fluid, which considered as the medium of perception is so much exalted above the faculties of the fibres and muscles (FHA 6, 86; transl. Herder 1803, 1, 86).

A few commentators have found these passages disappointing (Steinke 2005, Nisbet 1970, Pross 1984). After having praised Haller's immortal physiology, Herder here seems to again blur the boundaries so laboriously established by Haller and to regress to some pre-Hallerian position where irritability, sensation, and elasticity are all mixed up as the various manifestations of one single all-pervading force. But as has been discussed, Herder was deeply immersed in the debate and familiar with its controversial points. For him it is precisely because of the distinction and close association between sensation and thought, and their link to particular bodily structures, that a new philosophical starting point had to be developed, one that broke most fundamentally with the traditional metaphysical outlook.

For Herder, the dualistic perspective that is closely tied to traditional Cartesian metaphysics and its Leibnizian variant is no longer convincing. These rationalists pretend to reach self-knowledge, i.e., insight into the human soul and into attributes such as substantiality, personality, immortality, reason, freedom via introspection alone, and to know the soul *without* or *before* inquiring into its physiological foundation—in Herder's view, they pretend that souls “lay formed in the moon, in limbo, and waited, doubtlessly naked and cold, for their preestablished sheets, or clocks, or clothes, the not yet formed bodies”.²⁴ For Herder, in contrast, the soul is closely tied to the body and it can only know itself by turning to what is different and external to itself, i.e., its body and the external world.²⁵

Herder here develops a Wolffian idea of the parallel progression of knowledge of the world and self-knowledge. For Wolff, the world is a mirror of divinity, just like the soul (Wolff, *German Metaphysics*, § 1045) and knowledge of the world helps to progressively refine and render more distinct a self-consciousness that first presents itself as self-feeling (Ibid., § 1). Herder takes up the same pattern and is simply more explicit than Wolff in excluding the possibility of self-knowledge via direct introspection: at the outset, I am opaque to myself, and I do not have more

²⁴ Herder, *On the Cognition*, 193. See also the 1774 and 1775 variants (SWS 8, 253 and 266) about Cartesianism and Spinozism.

²⁵ See DeSouza 2012, in particular 779 and 784.

than a unique obscure, but vivid self-feeling [*Selbstgefühl*].²⁶ I need to direct my attention to the world and to the beings surrounding myself, to the nature of the very body that, according to Herder, “mirrors”(cf. Heinz 1994, 139) the soul. Anthropology is to be attained *via* cosmology and via an analogical or comparative method exploring the similarities between the plant, animal, and human realms.

In a sense, Herder’s insights are also foreshadowed by Sulzer who is Herder’s direct interlocutor in his prize essay and, as a member of the Berlin Academy, formulated the 1775 academy question to which Herder responded in his essay. Note that Sulzer himself develops a “physics of the soul” (Sulzer, *Sur l’apperception et son influence sur nos jugements*, 415) nourished by Wolff on the one hand, and Haller’s physiology and a certain number of medical experiences on the other. It is clear that Herder wishes to enter into a dialogue with Sulzer on these issues and on similar grounds. Unfortunately for Herder, who is aware that he was forsaking his chances of winning the prize²⁷, the two authors build very different psychologies on the basis of the new physiology. The formulation of the academy’s question, “On the two basic faculties of the soul: the cognitive and the sensitive”, already indicates that Sulzer thinks of both faculties as separate. Sulzer considers feeling as an attention turned inward and away from the object whereas Herder consider feeling as a primitive form of representation and cognition, and in this sense, assumes their unity.

In order to justify this claim, Herder employs a highly original cosmological method, and in doing so, he draws upon two major philosophical traditions, namely physicotheology and natural history. With respect to the first, Herder directly follows in the footsteps of Reimarus, who, in his *Die vornehmsten Wahrheiten*, had already expanded the scope of physicotheology to include a proof not only of God’s existence and perfection, but also of human perfection and purpose [*Bestimmung*].²⁸ Physicotheology here had already transformed itself into anthropology, just like in Herder. Second, Herder borrows from the analogical methods of natural history and comparative anatomy, zoology, and physiology.²⁹ In *Ideas*, he develops this analogical method in the greatest

²⁶ On original self-feeling (“ein dunkles, aber Einziges lebhaftes Gefühl”), see the very beginning of *Plato sagte, daß unser Lernen bloß Erinnerung sei*; on the relevance of the sense of touch for remembering how our soul built itself a body, see *Zum Sinn des Gefühls* and *Plastik*.

²⁷ Herder includes an explicit justification of his strategy of *not* employing Sulzer’s work as the foundation and the objective of his own at the beginning of the essay published in 1775, where he praises the merits of Sulzer’s psychology and compares his own procedure to that of a sailor who needs to turn his back to his true aim, i.e., to the coast he wants to reach. See the 1775 edition, SWS 8, 270 and, for discussion, Heinz 1994, 109.

²⁸ For Herder’s debate with Reimarus, whom he highly appreciates, see in particular Herder, FHA I, 711f., FHA 6, 100. On the anthropological dimension of Reimarus’ physicotheology, see Buchenau, forthcoming.

²⁹ A few studies such as Nisbet 1970, Zammito 2002, and DeSouza 2012 develop this aspect.

detail. Herder explicitly affirms that he employs such comparative anatomy (and physiology) as the guiding thread of his philosophical anthropology or natural history.

How many animals, altogether unlike man in outward appearance, are internally, in the structure of the skeleton, the principal parts of sensation and vitality, nay in the vital functions, strikingly similar to him! This will be evident to anyone who peruses the dissections of Daubenton, Perrault, Pallas, and other academics. Natural history for children and youth must content itself with some distinction of outward form, to assist the eye and memory; manly and philosophical natural history investigates both the external and internal structure of the animal, to compare them with his mode of life, and to find his character and place. With respect to plants this has been called the natural method; and comparative anatomy is the guide that must lead to it step by step in animals. This naturally gives man a clue to himself, which conducts him to the great labyrinth of living creation; and if we can say of any method that through it our understanding ventures to scrutinize the profound comprehensive mind of God, it must be this (FHA 6, 74, transl. Herder 1803, 71 f. slightly changed).

All these disciplines share the same methodological premises. There must be an analogy between more primitive and original manifestations of the various human faculties and lower forms that can offer a path to the knowledge of man. The new comparative methods emerging in the early modern period are based on the conviction that the comparison with the animal (and, to a certain extent, the plant) can help to explain the internal structure or “mechanism” of the human “organ” or “tool”, as it is called in Greek, which otherwise remains hidden. For animals present the nature and economy of the same functions in greater simplicity and at the same time with greater variety. They reveal the adequacy of the tool or organ to the end. As Claude Perrault, one of the pioneers of comparative anatomy puts it: “The admirable functions of animals are produced by instruments that we can see.”³⁰ Later anatomists, and physiologists, will develop these thoughts in a new framework conceiving nature as a continuous chain of being, expressive of divine intentions and whose first and last element is man. These are ideas that Herder will expand upon, noting the great interest of such a comparative methodology for physiology. In line with the physiological insights just discussed, however, Herder radicalizes the former approach. Even human reason, consciousness, and *Humanität* need to be derived solely from anatomical and physiological criteria, from the analogy with, and similarity to, the animal faculties of irritability and sensibility, from material movements of attraction and repulsion, and from the organic fibre’s movements of expansion and contraction (DeSouza 2012). This is a paradoxical and a highly original claim. Although the former tradition had likewise explored the analogy with the animal, they had mostly relied upon a more traditional division of labour between medicine (or natural history) and philosophy and had believed that only the latter treats man’s properly human

³⁰ Perrault (1680) : “Les fonctions admirables des animaux sont produites par des instruments que nous pouvons voir”, 7.

attributes. This comes from the difficulty of grounding the distinction between the chimpanzee and the human being on anatomical and physiological criteria alone, as Edward Tyson had shown in his treatise *Orang-outan, sive Homo sylvestris, or the Anatomy of a Pygmic compared with that of a monkey* from 1699, which lists forty-eight anatomical and physiological resemblances and thirty-four differences. Herder concludes that “internally and externally the Orang-Utan resembles man” (FHA 116; transl. Herder 1803, 125) This resemblance had led Buffon to finally assume some kind of invisible difference, but Herder views such argumentative strategies as vain rhetoric. In his view, “Buffon wastes the stream of his eloquence in vain, when he takes occasion from these animals, to combat the similitude of the internal organism of nature to the external: the facts, that he himself has collected, sufficiently refute him” (FHA 6, 117; transl. Herder 1803, 127 f.). In order to determine man’s nature or his peculiar economy or proportion of forces, it is necessary to apply a more indirect procedure and to negatively measure the gap separating him from the animal.

Plants and animals mirror man because they yield insight into functions or faculties in which the human being has a share. Precisely because man does not possess all of the animal faculties in the highest perfection, because he is among animals that “intermediate creature in whom the most numerous and subtle rays of similar forms are collected, as far as consists with the peculiarity of his purpose,” he may learn from studying those beings who fulfil alone those functions which are subordinate ends in himself (FHA, 6, 74; transl. Herder 1803, 51). It is in this sense that the plant can shed light on humans’ most fundamental functions of nutrition and reproduction; precisely because these functions determine the nature of the plant which is “so to speak all mouth” it elucidates “the nobler creature” who possesses the same functions while not being “intended to be the slave of his belly” (FHA, 6, 77 f.; transl. Herder 1803, 85 f.). Similarly, cold-blooded animals like frogs show a fundamental function equally present in humans: they possess some “excessive” (ibid.) irritability that makes their members contract even when separated from the body and allows the body to renew its members, a capacity that warm-blooded, higher, and sensitive animals and humans lose. Muscular strength and irritability cease to be the predominant tendencies as sensibility creates new reciprocal relations and connections between the parts: “The more numerous and delicate the nerves of an animal, the more multifariously they are connected, artfully strengthened, and allied to nobler parts and senses; and lastly the larger and more delicate the focus of all perception, the brain; the more intelligent and exquisite is the kind of organization” (FHA 6, 82; transl. Herder 1803, 95 f.). The project is thus to enter into the comparison between the human being and his fellow creatures in order to revise some of the

central claims and methodologies of Aristotelian natural history; it assumes that features of humanity can be found in the lower creatures.

This new method of reaching psychology via cosmology and the comparison with the lower creatures offers novel solutions to the various philosophical problems raised by Haller's physiology. First, it presents a completely new perspective on the simplicity and the ubiquity of the soul: it abandons the vain debate on the "interaction" between soul and body – as if it could make sense, first, to conceive of two substances, i.e., of a soul and a body, and then, to inquire into the modes of interaction between both and the possible "seat" of an "immaterial" soul of the former rationalist tradition. In Herder's view,

all the experiments hitherto collected by Haller, the most learned physiologist any nation has yet produced, show how futile it would be to seek the indivisible work of the formation of ideas in substance and distributed among the material parts of the brain. The least calm reflection tells us that these faculties are not locally separated, as if judgment resided in one part of the brain memory and imagination in another, the passions and sensitive powers in a third; for the thought of our mind is undivided, and each of these effects is the fruit of thought. It would be in some measure absurd therefore, to attempt to dissect abstract relations, as if they were bodies, and to scatter the mind, as Medea did the limbs of her brother (FHA 6 125; transl. Herder 1803, 136).

Setting out from the faculties' fundamental unity and common origin in irritability and even elasticity proves to be a far better strategy for ensuring both the soul's ubiquity and its simplicity. From the outset and even in its most primitive manifestations, such a soul is present everywhere in the body. It is, at the same time, simple insofar as it can be related to a unique principle and a self. As such, simplicity depends on the soul's most fundamental faculty, sensibility. For sensibility is not only a more differentiated form of irritability and elasticity, conditioned by the higher blood temperature and the free circulation of the most refined material of sensation. It is not only the measure determining what Herder calls a "moderation" or "proportion", an economy and direction of forces. It is more: it is a primitive form of selfhood, consciousness, and reflexivity.

Moreover, Herder contrasts his views on the soul's immateriality and freedom with those of La Mettrie. If it is true that complete knowledge of the nature of the forces that govern the universe cannot be had, the same must be said about the force of our soul. Despite the necessity of positing such a force, its nature and ontological reality can only be grasped in an infinite process of clarification. Additionally, if there is something such as immateriality, such immateriality needs to be thought of as resulting from a progressive transformation and purification of matter: "I do not know, what material or immaterial would be – but I don't believe that nature would have

erected iron walls between both” (FHA 4, 354, transl. Herder 2002, 208). And whatever the material or immaterial nature of the soul’s causality may be, its freedom must simply lie in the intellectual insight into the conditions of the exercise of the force constituting its very nature. It is compatible with a certain kind of servitude, that of serving as an organ to divinity. “The more profound, pure and divine our cognition is, the more divine, pure and universal is our action, and the freer is our freedom” (SWS 8, 202). Immortality, finally, is a necessary attribute of such a human being and divine organ. Although such immortality cannot be deduced from the soul’s substantiality, as in earlier metaphysics, it is still conceivable as a continuous and an infinite progression and elevation toward greater perfection.

Conclusion

Herder’s philosophical anthropology is a post-Hallerian account which is intrinsically linked to Haller’s discoveries and which must be understood within this physiological and medical context in which it first takes shape. For Haller’s new insights restrict the empire of the soul to a faculty or force of voluntary motion while positing a second force of involuntary motion whose cause and relation to the first remains unclear. These views deeply challenge traditional perspectives on the soul as the principle of life and motion and, together with it, claims about its immateriality, freedom and immortality.

In line with Haller’s own thought, Herder attempts to defend the possibility of free will against the frightening materialist consequences of Haller’s doctrine that were first articulated and emphasized by La Mettrie and which then haunted both French and the German debates. Herder’s turn to cosmology results from the new idea that the external world can reflect my own ends or functions and offer a path to self-knowledge. This is a conviction that Herder shares with certain physicotheologists and modern comparative anatomists who employ the more primitive animal organism as an epistemic tool for gaining insights into the more complex human being. Herder offers novel responses to the various philosophical problems opened up by Haller’s physiology while consolidating philosophy’s rank as the first anthropological discipline and its priority over medicine. For *ἄνθρωπος*, according to the etymology suggested in the *Briefe zur Beförderung der Humanität* (*Letters on the promotion of humanity*), expresses the human and philosophical capacity to direct the eyes upwards and to come to know itself through the study of its own body, other bodies, and the world as a whole and by recognizing itself as being a small world or “microcosm”, according to a both old and new idea.

Bibliography

Andrault, Raphaële/ Buchenau, Stefanie/ Crignon, Claire/ Rey, Anne-Lise (2014, ed.), *Médecine et philosophie humaine de l'Age classique aux Lumières. Anthologie*, (Paris).

Blanckaert, Claude (1989), « L'anthropologie en France, le mot et l'histoire, XVI^e-XIX^e siècles », in *Bulletins et Mémoires de la Société d'Anthropologie de Paris*, vol. 1, n^o3, 13-43.

Bonnet, Charles (1983), *The correspondence between Albrecht von Haller and Charles Bonnet*, edited by Otto Sonntag (Bern, Stuttgart).

Buchenau, Stefanie/ Crignon, Claire/ Gaille, Marie/ Kolesnik, Delphine/ Rey, Anne-Lise (2013), « Découvertes médicales et philosophie de la nature humaine (XVII^e et XVIII^e siècles). Chronique de la Recherche », *Revue de Synthèse*, n^o 4, 1-15.

Buchenau, Stefanie, « La Mettrie en Allemagne. Matérialisme et anthropologie ». In *La Mettrie, médecine, philosophie, littérature*. Ed. by Francois Pépin et Adrien Paschoud (Paris). Forthcoming.

Cabanis, Paul-Joseph (1805), *Rapports du physique et du moral de l'homme*, (Paris), 3^{ème} éd.

Casmann, Otto, (1594/ 1596), *Psychologia anthropologica, sive animae humanae doctrina*, (Hannover).

De Angelis, Simone (2010), *Anthropologien. Genese und Konfiguration einer Wissenschaft vom Menschen in der frühen Neuzeit* (Berlin).

DeSouza, Nigel (2012), "Leibniz in the Eighteenth century: Herder's Critical Reflections on the principles of Nature and Grace", in: *British Journal for the History of Philosophy*, 20:4, 773-795.

Diderot & D'Alembert (1751/1758), *Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers* (Paris).

Duchesneau, François (1973), *La physiologie des Lumières. Empirisme, modèles et théories* (La Haye, Londres, Boston).

Gaille, Marie (2011), *Philosophie de la médecine. Frontière, savoir, clinique* (Paris).

Gaille, Marie (2014), *Cabanis, Anthropologie médicale et pensée politique* (Paris).

Gaukroger, Stephen (2012), *The Collapse of Mechanism and the Rise of Sensibility, Science and the Shaping of Modernity 1680-1760* (Oxford).

Göttingische Gelehrte Anzeigen (1739-1752), online access: <http://gdz.sub.uni-goettingen.de/dms/load/toc/?PPN=PPN319732576&IDDOC=65999>

Guthke, Karl S. (1962), „La Mettrie und die anonyme Schrift 'L'homme plus que machine'“, in *Etudes germaniques*, 17 (1962), 137-143.

Haller, Albrecht von (1754), *Von den empfindlichen und reizbaren Theilen des menschlichen Körpers*, in: *Hamburgisches Magazin*, 13, 4, 402-441.

- Haller, Albrecht von (1755/ 1936), *A Dissertation on the Sensible and Irritable Parts of Animals*, introduction by Owsei Temkin (Baltimore).
- Haller, Albrecht von (1756-1760), *Mémoires sur la nature sensible et irritable des parties du corps animal* (Lausanne)
- Haller, Albrecht von (1757-66), *Elementa physiologicae corporis humani*, 8 vol. (Lausanne).
- Haller, Albrecht von (1787), *Tagebuch seiner Beobachtungen über Schriftsteller und über sich selbst: zur Charakteristik der Philosophie und Religion dieses Mannes*, 2 vol. (Bern).
- Haller, Albrecht von (1772), *Sammlung kleiner Hallerischer Schriften*, 3 vol. (Bern)
- Heinz, Marion (1994), *Sensualistischer Idealismus. Untersuchungen zur Erkenntnistheorie des jungen Herder (1763-1778)*, (Hamburg).
- Herder, Johann Gottfried (1803), *Outlines of a Philosophy of the History of Man*, translated by T. Churchill (London).
- Herder, Johann Gottfried (2002), *Philosophical Writings*, ed. and translated by Michael Forster, (Cambridge).
- Herz, Markus (1773), „Platner E. Anthropologie für Aerzte und Weltweise, T. 1. Rezension“, in: *Allgemeine Deutsche Bibliothek*, 20. Bd., 1. St., 25-51.
- Hintzsche, Erich (1968), „Neue Funde zum Thema : L’homme-machine und Albrecht Haller“, in: *Gesnerus* 25, 135-168.
- Hundt, Magnus (1501), *Anthropologium, de hominis dignitate, natura et proprietatibus* (Leipzig).
- Kant, Immanuel (1900-), *Gesammelte Schriften*, hg. Preußische Akademie der Wissenschaften, (Berlin, Leipzig).
- Kant (1999), *Correspondence*, translated by Arnulf Zweig (Cambridge).
- Kant (2007), *Anthropology, History and Education*, edited by Günter Zöller, Robert B. Loudon, (Cambridge).
- Knabe, Peter-Eckhard (1978), *Die Rezeption der französischen Aufklärung in den Göttingischen Gelehrten Anzeigen (1739-1774)* (Frankfurt), in particular 121-149.
- La Mettrie, Julien Offray de (1748), *L’Homme-Machine*, (Leyde).
- La Mettrie, Julien Offray de (1748/2010-2015), *Man-Machine*, transl. by Jonathan Bennett, online, last accessed October 20 2015.
- Monti, Maria Teresa (1990), *Congettura ed Esperienza Nella Fisiologia de Haller* (Firenze).
- Moravia, Sergio (1970), *La Scienza dell’Uomo nel Settecento* (Bari).
- Moritz, Karl Philipp (1782/1999), „Vorschlag zu einem Magazin der Erfahrungsseelenkunde“, in: *Deutsches Museum*, 7, 485-503. Reprint in Moritz, *Dichtungen und Schriften zur Erfahrungsseelenkunde*, ed. by H. Hollmer und A. Meier, (Frankfurt).
- Nisbet, Hugh Barr (1970), *Herder and the philosophy and history of science*, (Cambridge).
- Nowitzki, Hans-Peter (2003), *Der wohltemperierte Mensch, Aufklärungsanthropologien im Widerstreit*, Berlin / New York.

Pénisson, Pierre (2006), « La Mettrie à Berlin », in : *Matérialistes français du XVIII^e siècle*, éd. par Sophie Audidière and Yves Charles Zarka (Paris), 91-99.

Perrault, Claude (1680), *Essais de Physique*, (Paris).

Platner, Ernst (1772), *Anthropologie für Ärzte und Weltweise. Erster Theil* (Leipzig).

Proß, Wolfgang (1984) Kommentar zu „Vom Erkennen und Empfinden der menschlichen Seele, in: Herder, Werke, vol. 1 (München).

Reimarus, Hermann Samuel (1754), *Die vornehmsten Wahrheiten der natürlichen Religion In zehn Abhandlungen auf eine begreifliche Art erklärt und gerettet* (Hamburg).

Riedel, Wolfgang (1994), „Anthropologie und Literatur in der deutschen Spätaufklärung. Skizze einer Forschungslandschaft“, in: *Internationales Archiv für Sozialgeschichte der deutschen Literatur*, 6. Sonderheft, (Tübingen), 93-157.

Riolan, Jean (1626), *Anthropographia, et osteologia. [...]*, (Paris).

Rouché, Max (1940), *Herder, précurseur de Darwin ? Histoire d'un mythe* (Paris)

Schings, Hans-Jürgen (1994, ed.), *Der ganze Mensch. Anthropologie und Literatur in 18. Jahrhundert*, (Stuttgart).

Steinke, Hubert (2005), *Irritating experiments. Haller's concept and the European controversy on irritability and sensibility 1750-1790*, (Amsterdam/New York).

Steinke, Hubert/ Boschung, Urs/ Proß, Wolfgang (2008, ed.), *Albrecht von Haller. Leben - Werk - Epoche* (Göttingen).

Stiening, Gideon (2005), „Rezension von: Zwischen Empirisierung und Konstruktionsleistung: Anthropologie im 18. Jahrhundert“. Hg. v. J. Garber und H. Thoma. Tübingen, 2004. In: *Das Achtzehnte Jahrhundert*, Jahrgang 29, Heft 2, 244-254.

Sulzer, Johann Georg (1773), *Vermischte philosophische Schriften* (Leipzig).

Wolff, Christian (1962-), *Gesammelte Werke* (Hildesheim).

Zammito, John (2002), *Kant, Herder and the Birth of Anthropology* (Chicago).

Zelle, Carsten (2001), *Vernünftige Ärzte. Hallesche Psychomediziner und die Anfänge der Anthropologie in der deutschsprachigen Frühaufklärung*, (Tübingen).