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Marie Gaille

## **► To cite this version:**

Marie Gaille. “Rational surgery” by building on tradition Ambroise Paré’s conception of “medical” knowledge of the human body . Human and animal cognition in early philosophy and medicine, 2017. halshs-01675316

**HAL Id: halshs-01675316**

**<https://shs.hal.science/halshs-01675316>**

Submitted on 4 Jan 2018

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“Rational surgery” by building on tradition

Ambroise Paré’s conception of “medical” knowledge of the human body

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Marie Gaille

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Abstract

One must depart from Paré's common reputation to understand Paré's interest for the history and philosophy of medicine. He is actually more a “user” of the anatomical knowledge than an important figure of its renewal. From this point of view, he could be seen as a secondary character of the plot that gave rise to the study of nature and anthropology with a modern “scientific” basis. Still, he is a fully relevant figure in this respect for two reasons. First of all, this contribution intends to show that his use of anatomical knowledge implies a very specific way to both keep on and break with the medical Ancient tradition. His apparently paradoxical relationship with tradition is linked to his conception of an anatomical knowledge able to answer the practical requirements of what he calls “rational surgery”. Besides, he advocates specific epistemological views on the proper order according to which medical knowledge must be elaborated and expressed. This leads him to reject what he calls the “philosophical” approach of the human body, in order to promote a “medical” type of method and knowledge of the latter we will examine in the third part of our paper. He thus contributes to delineate a border between philosophy and medicine that was still, in his times, quite blurred and uncertain.

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Introduction

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Ambroise Paré was a man of the sixteenth century. He was probably born in 1510 near Laval, France. Several members of his family earned a living with skills related to medicine. They stood on the lowest level of the hierarchy of medical professions. Paré's father was (among other things) a barber, and his brother Jean was a barber-surgeon in Vitré. As a child, Paré received a basic education from a priest whom he served as a handyman. He probably took his first steps toward becoming a surgeon before the age of 20 in Laval. In his early youth, he went to Paris as an *apprenti-barbier*. In the French capital, he took anatomical courses for future surgeons at the rue de la Bûcherie. He learnt the practice of surgery above all at the Hôtel-Dieu, a five-hundred-bed hospital in the very heart of Paris, where he worked for three years. His primary "university," however, was battlefields, and this education lasted for more than thirty years, beginning in 1537. His writings attest that he took great pride in this unique experience. He became "maître barbier-chirurgien" in 1540 or 1541. Later, in 1553, despite controversy over his lack of an academic education and command of Latin, he became "docteur en chirurgie," thanks to the patronage of King Henry II. In 1562, he finally received the title "premier chirurgien du roi" under Francis II, which he retained under Charles IX. The latter seems to have protected Paré during Saint Bartholemew's Day massacre (1572). After this event, Paré dedicated himself above all to writing books and to gathering and arranging them in a single collection of *Œuvres*, the first edition of which was published in 1575 by Gabriel Buon. He died in 1590, a year after Henry IV became king of France.<sup>i</sup>

It is important to bear in mind both this historical and political context and Paré's reputation as the "father" of modern surgery. Paré is famed for various innovations in the fields of diagnosis (firearms wounds), treatment (techniques for stopping haemorrhages, bandages), child delivery and artificial feeding, care and medical instruments.<sup>ii</sup> In studies dedicated to his thought, scholars frequently refer to his intense life experiences in order to place him side by side with Vesalius, who participated in the Renaissance rebellion against outmoded and

irrelevant “tradition.” Paré has personified the ideal surgeon who learnt most of his craft on the battlefield and who took a stand against and wrote against a conception of medical knowledge based entirely on reading ancient texts.

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We must move away from this view in order to understand Paré’s importance for the history and philosophy of medicine. He was actually more a “user” of received anatomical knowledge than an important figure in its reform. From this point of view, we might regard him as a secondary character in the story of the rise of the “scientific” study of nature and anthropology. He is nonetheless a very important figure in this story for two reasons. First, his use of anatomical knowledge implied a very specific way of both adhering to and breaking with the ancient medical tradition. As we will see, his apparently paradoxical relationship with tradition derives from his conviction that anatomical knowledge should satisfy the practical demands of what he calls “rational surgery.” Paré moreover held specific epistemological views on the proper order in which medical knowledge should be developed and expressed. This led him to reject what he called the “philosophical” approach to the human body and to promote a “medical” method and knowledge of the body. He thus helped to delineate a border between philosophy and medicine, which, in his day, remained blurry and uncertain.

Taking this hypothesis as my starting point, in the present chapter, I will give a very different interpretation of Paré’s attitude toward the ancient medical tradition from the commonly held view about his work. Relying on a textual analysis of his writings,<sup>iii</sup> I will first survey the various reasons why, on the one hand, Paré’s iconoclastic reputation seems deserved and why, on the other, it should be questioned. In general terms, we may conclude that Paré had nothing against the ancient medical tradition *per se*. On account of epistemological arguments, however, he indeed considered it necessary to improve medical knowledge with additions and corrections. In the second part of this paper, I will move on to examine the

nature of what Paré calls “rational surgery.” Anatomy occupies a prominent position in this concept, alongside what Paré calls “experience.” It appears that the relationship of Paré’s medical conceptions to the ancient tradition was not foremost on Paré’s mind. He was not primarily waging an epistemological war against the ancient tradition, but rather a practical one, focused on the urgent need to find efficient ways to treat injured people. In the third part of this paper, I will address the epistemological implications of this primary concern, which led Paré to stress the distinction between a “philosophical” and a “medical” approach to the human body.

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#### I. The development of medical knowledge: building on tradition

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At first glance, Paré’s works seem to confirm his usual reputation: that of an experienced, undoubtedly competent, but slightly provocative surgeon who puts aside the medical knowledge of his time to set forth his own conceptions of pathologies and how to treat them. First of all, as mentioned above, Paré decided, like the Pléiade poets, to gather his various works in a single collection, which appeared in several editions that he constantly amended and revised from 1575 on.

Besides this well-known authorial gesture, in his first work, *La Méthode de traicter les playes faites tant par hacquebutes et aultres bastons à feu . . .* (1545),<sup>iv</sup> Paré tackled the subject of firearms. By addressing this issue first, he associated the practice and art of medicine with “modernity” or what was considered as modern in his era.<sup>v</sup> Obviously, the treatment of wounds caused by firearms could not have been covered in ancient medical textbooks.

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Finally, Paré also decided to write his first treatise in ordinary French, like other contemporary authors in the arts, literature and sciences. He abided by this decision throughout his works. It may not have been an original gesture – nor was it original in the

specific field of surgery, in which translations in vernacular European languages began to appear in the early fourteenth century<sup>vi</sup> – but Paré had specific reasons of his own for his decision. In particular, he had two concerns in mind. He not only opted for the vernacular instead of Latin, but also expressed himself in French in the simplest language possible in order to be easily understood. His emphasis on clarity is related to the somewhat delicate task of interpreting the writings of Hippocrates and Galen. According to Paré, these authors are often obscure, but reference should still be made to them on some points. Then, one must make them fully intelligible to contemporary medical practitioners. Paré's decision to write in vernacular French also satisfies his particular desire to address young future surgeons who need clearly formulated information in order to be able to treat their patients effectively:

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However, because it may be useful to young surgeons, I have been very careful to make it easy for them to understand me, which I do in all my writings. That is because these texts are addressed to them, and not to scholars, for whom I have nothing but reverence and honour. That is why I have used ordinary and plain language, knowing full well that their goal and intention is to learn the method of healing well rather than speaking elegantly. As Galen says, talking does not cure the sick, but rather manual labour.<sup>vii</sup>

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Do these statements point to the common image of Paré we know by reputation as a fierce enemy of medical tradition? That is hardly the case. First of all, Paré is not merely concerned with tradition, but is at least as concerned with drawing a line between actual physicians and impostors. In several works, and particularly in *Discours sur la momie, la licorne les venins et la peste* (1582), he attacks what he considered to be charlatanism. In his field of competence, he criticized surgeons who had abandoned the art of surgery to people devoid of anatomical expertise.<sup>viii</sup>

Paré's relationship with tradition may be described more accurately as follows: he not *opposed to* tradition, but rather *endorses it* and *builds on* it. In this sense, he follows a twofold strategy of correction and addition. Paré indisputably considers the knowledge transmitted by tradition insufficient to treat the pathologies of his times. He does not charge the ancients with ignorance and incompetence, however, but rather holds that the tradition must be enhanced and amended as new pathologies appear or manifest themselves in new ways:

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It seems that the advent of every century always adds some new kind of unknown disease and some new disguise and variety to the diseases that existed before. As the poet says, nature is fertile with evil. Hence, as new diseases appear, new remedies must also be found.<sup>ix</sup>

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Paré applies this requirement that one advance the state of medicine to his own work: we thus cannot dismiss it merely as a rhetorical argument for rejecting the tradition, but rather must consider it as Paré's real epistemological view. For example, Paré's *Dix livres de la chirurgie...* (1564) replaced his first published work *La méthode de traicter les playes faites par Hacquebutes* (1545), because, with the passage of time, some difficulties had emerged and new treatments had been devised that had to be written down and disseminated.<sup>x</sup> To Paré, constant learning was a normal and unique feature of the human condition: God had granted animals various abilities, but man must learn everything by himself through unending effort.<sup>xi</sup> Two complementary metaphors express Paré's belief in building on tradition rather than opposing it. Paré uses these metaphors in various places to convince the reader of the legitimacy of distinguishing what should be adopted from tradition and what should be set aside. The first metaphor is that of a child sitting on the shoulders of a giant. It stresses the necessity of increasing and improving existing human knowledge. Paré reverses the meaning of the formula attributed to Bernard de Chartres, *nani gigantum humeris insidentes*, which

emphasized Bernard's humility and encouraged others to rely on past "giants." On the contrary, as Francis Bacon would also do in 1620,<sup>xii</sup> Paré opens up the door to the acquisition of new knowledge and argues for the legitimacy of this approach. The second metaphor is that of a candle faintly shining in the sun, implying that the modern physician (the candle) may legitimately formulate new medical theories, since his light does not diminish that of his predecessors.<sup>xiii</sup> Paré's use of these two metaphors mark him as belonging to a "modern era" in which the Aristotelian concept of man's "natural" desire for knowledge was interpreted in such a way as to distinguish between legitimate and illegitimate forms of curiosity.<sup>xiv</sup> In the editions of his complete works published since 1575, Paré consistently presents himself as a follower of the ancients and of previous authors generally – "in whose footsteps I have followed ("la trace desquels j'ai suivi pas à pas") – *and* he is eager to add to their work, when it appears necessary.<sup>xv</sup>

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## II. The practice of "rational surgery" and its epistemological conditions

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This ambition led Paré to develop the idea – and ideal – of "rational surgery." Paré was not the first person to mention it. As M. McVaugh notes, medieval surgeons had already made clear calls for rational surgery, especially in opposition to what they considered as ignorant and deceitful empiric practitioners.<sup>xvi</sup> However, the concept was not clearly defined in this era:

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I use the phrases "rational surgery" and "rational surgeons" here loosely and therefore with some diffidence. My surgeon-writers were certainly not pursuing a systematic philosophical program; most had not even thought very carefully or deeply about what it was that, ideally, should characterize surgery as an intellectual rather than a purely practical activity; and their remarks on the subject were not



always consistent. Yet they were all convinced that surgery needed to be recognized, at its highest level, as a scientific enterprise.<sup>xvii</sup>

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A century later, Paré helped to endow this view with specific content. He has a very precise conception of the appropriate knowledge for practicing what he called “rational surgery,” the only viable way to treat patients from his point of view. Paré’s idea of rational surgery is based on a combination of “experience” and anatomical knowledge – the latter already illuminated by the medieval surgeons.<sup>xviii</sup> Studying this combination will allow us to understand more concretely the reasons behind Paré’s support for tradition and his commitment to build on this tradition. We will also gain insight into the medical practice associated with Paré’s approach and how this approach gave rise to a specific anatomical discourse.

At first glance, one might think that Paré paradoxically sidesteps tradition by privileging experience, yet aligns himself with it by acknowledging the importance of anatomy. This impression ultimately proves to be incorrect. In order to understand what Paré meant by combining experience and anatomical knowledge, let us turn first to what Paré calls “experience.” “Experience,” in the first place, refers to Paré’s status as the direct and bewildered witness of wounds caused by firearms. His intense testimony on this subject may be read in various works, for example, in the second edition of his first published work, *La manière de traiter les plaies* (1552).<sup>xix</sup> It is certainly important to take into account the surgeon’s astonishment and feeling of powerlessness: the novelty of the wounds engendered a debate over their specific cause, which surgeons sought to identify in order to devise an appropriate way to treat them. Quarrels over these causes were not fought out for the sheer pleasure of controversy. Surgeons tried different therapies, compared their respective efficiency and learnt from each other when possible on the battlefields.<sup>xx</sup>

However, something else about “experience” is also at stake in Paré’s works. He compares

himself to an old war captain or sailor.<sup>xxi</sup> He stresses the time he has dedicated to practicing surgery: “God is my witness, sire, and no one is ignorant of the fact that, for more than forty years, I have worked and striven to illuminate and perfect the art of surgery.”<sup>xxii</sup> Paré does not mention his experience in order to discard the information contained in books, whether ancient or contemporary. It serves rather as the basis of Paré’s claim, noted above, that it is sometimes necessary to add new elements to the tradition or to correct it in a specific way: Paré’s experience allows him to engage in “conjecture méthodique,” that is, in reflection based on the observation and study of as many cases as possible. This “conjecture méthodique” eliminates false medical inferences. If we cannot consider this reflection as a first step toward a theory of experimentation, we may at least affirm that Paré is proposing an inferential conception of medical knowledge and attempting to define a method to improve and increase it. He uses various phrases in his complete works to describe such knowledge: “raison expérimentée” (first edition)<sup>xxiii</sup> or a combination of reason and experience (fifth edition).<sup>xxiv</sup>

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Consequently, it is wrong to include Paré among the early modern writers who boldly affirmed the superiority of experience to tradition, of art and technique to established knowledge, of practice to theory. Matters are more complicated. Paré’s conception of knowledge is actually rather close to the conception of political knowledge developed by Machiavelli a few years before: that is, an inherently incomplete science, nurtured by the interplay of reading and examining existing knowledge and drawing on one’s own repeated and reflective experience.<sup>xxv</sup>

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According to Paré, the second element necessary to give rise to “rational surgery” is the anatomical knowledge that had already been available to medieval surgeons. Paré vehemently insists on the necessity of knowing anatomy to practice surgery. Possessing this knowledge is

what distinguishes “rational surgery” from deceptive medical practices.<sup>xxvi</sup> In order to avoid dangerous treatments for sick patients and wounded soldiers and to choose sure methods of healing them, surgeons must acquire expert knowledge of the anatomy of the human body:

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In addressing myself to you, friend reader, I suppose that you are not one of these shameless empiricists who meddle according to the fickle hand of fortune in the treatment of wounds, fractures, dislocations and other such accidents to the human body. On the contrary, I suppose that you adhere to the school that teaches, through the precepts and disputations of good authorities, the skilled method of reliably curing such disorders as occur.<sup>xxvii</sup>

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Ten years later, Paré expresses the same idea that anatomy is the first subject a methodical surgeon should know, in his *Methode curative des playes et fractures de la tete humaine, avec les portraits des instruments nécessaires pour la curation d’icelles, par M. Ambroise Paré, Chirurgien ordinaire du roi et juré à Paris.*<sup>xxviii</sup>

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Let us now consider a specific example in order to understand the kind of anatomical knowledge that Paré has in mind: that cited by Paré in connection with skull and head surgery. This is the focus of the 1561 treatise *Methode curative des playes et fractures de la tete humaine, avec les portraits des instruments nécessaires pour la curation d’icelles*. In this treatise, Paré does not explain to the reader why he decided to dedicate an entire treatise to the medical knowledge and treatment of the “head” rather than about other parts of the body. Readers are led to infer that this focus is justified, however, by the fact that the head is the most essential body part for the senses, reason and wisdom. This is explicit in Paré’s *Anatomie universelle du corps humain*, published in the same year, one part of which is dedicated to what Paré calls the noblest of the “animal elements” of the human body: that is,

the head.<sup>xxix</sup>

In the third book of this set of four, Paré describes the various parts of the head and skull, the former surrounding the latter and protecting it from external injuries. Paré insists on the importance of the brain, which he describes as the “principle” of the nerves and deliberate movement and as the seat of the main faculty of the “soul”: reason.<sup>xxx</sup> Paré also describes the other faculties of the soul: the five senses, the common sense (“sens commun”), the imagination (“sens imaginatif, estimatif ou fantaisie”) and memory. Paré uses the word “soul” to indicate a power of life. It is disembodied but circulates within the body and gives life to it. In this description Paré follows the Aristotelian distinction between vegetative, animal and human lifeforms.<sup>xxxi</sup> The soul nurtures and permeates every aspect of the body.<sup>xxxii</sup>

Now, if we look again at the 1561 work *Methode curative des playes et fractures de la tete humaine, avec les portraicts des instruments nécessaires pour la curation d’icelles*, we find that the anatomical analysis, *L’anatomie de la tête humaine, illustrée par les figures de ses parties. Ensemble la methode de traiter les plaies et fractures, avec les portraits des instruments nécessaires pour la curation de celles-ci* precedes a second part bearing the title of the whole work. This arrangement clearly reveals how anatomy serves as the foundation of the surgeon’s art.

The most interesting characteristic of Paré’s writings, however, is that he does not separate his anatomical and his surgical discourses. On the contrary, he constantly intertwines the “anatomical” description of the head and skull with surgical considerations, in such a way that anatomical knowledge about the body becomes practical knowledge that is orientated toward medical praxis from the very start. In other words, Paré strives to “translate” anatomical analysis into instructions for treatment. He regularly interrupts the description of human body parts and organs to comment on surgical practices. This occurs in his *Methode curative des playes et fractures de la tete humaine, avec les portraicts des instruments nécessaires pour la curation d’icelles*, par M. Ambroise Paré, Chirurgien ordinaire du roi et juré à Paris. The

same practice may be observed in his *Anatomie universelle du corps humain*, although this work is supposed to be merely a description of the human body and not a treatise about surgical treatment.<sup>xxxiii</sup>

These “interludes” in anatomical descriptions indicate that the practice of surgery, on account of its particular demands, was Paré’s main concern in arranging his books for disseminating anatomical knowledge: in other words, he approached anatomy with a surgeon’s eye. We may see this specific approach to anatomical knowledge also reflected in the drawings that Paré includes in his works. Although he informs the reader that he has borrowed most of his anatomical illustrations from Vesalius,<sup>xxxiv</sup> he supplements these with many drawings of surgical tools. Although surgical books from the Middle Ages, including treatises translated from Arabic, already contained such drawings,<sup>xxxv</sup> those presented by Paré are distinct both for their accuracy and for his clear effort to help the reader to understand how each tool is adapted to the anatomy of the body and to a specific method of treating disease. Both the drawings and text guide the reader to an understanding of Paré’s practical approach to anatomy.

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These findings help us to understand how two apparently contradictory ways of relating to the ancient medical tradition coexist in Paré’s works. On the one hand, Paré frequently refers to Aristotelian, Hippocratic and Galenic thought<sup>xxxvi</sup> and personally subscribes to the common discourse of anatomy as a way to observe and glorify the perfection of the divine creation.<sup>xxxvii</sup> On the other hand, he explicitly bases his surgical methodology on Vesalian anatomical knowledge, whose controversial stance against the custom of taking the medical tradition for granted he could not ignore.<sup>xxxviii</sup> What is interesting is that Paré does not consider it to be an issue. As a result, in his works, the critical side of Vesalius’ anatomy is simply erased. The controversy, which is so central to Vesalius’ writings, is obviously of secondary importance in Paré’s works. Why? In my opinion, it is because Paré is interested in

his relationship to the medical tradition only insofar as it contributes to the accuracy of his diagnostic, prognostic and treatment practice. He sees no point in criticizing it as such. He concentrates rather on assessing how the state of the anatomical knowledge of his times may benefit his practice as a surgeon. That is why, without contradiction, he cites both Vesalius and the ancient medical tradition. That is also why he very freely mentions the tradition in both positive and negative terms, in a manner, again, very similar to Machiavelli's own practice in the *Discourses on the first decade of Titus Livy*, in which he developed his political thought by studying the rise of the Roman Republic.

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### III. Toward a specific “medical” knowledge of the human body

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Paré's conception of “rational surgery” led him to reflect on the appropriate order in which one should explain what is known about the human body. As E. Berriot-Salvadore has observed, Paré has in mind several criteria for presenting anatomical knowledge and justifying its importance – a problem raised by many anatomists in the sixteenth and seventeenth century.<sup>xxxix</sup> Here, I would like to focus on a specific aspect of this problem, namely, Paré's distinction between the philosophical and medical approach to the human body and his argument for the distinct character (and dignity) of medical knowledge. At first, the question of the appropriate order may appear to be a simple question of the “presentation” of medical knowledge, related to Paré's concern for clarity and pedagogy, as mentioned earlier with regard to his decision to use vernacular language. The arrangement of his work, however, has deep epistemological implications for him. Paré declares, as we have noted above, that knowledge of anatomy opens a “window” on divine creation. But he justifies the search for this knowledge primarily with its immediate utility for medical practice. Paré stresses that this is true of all medical areas – “médecine,” “chirurgie,” “pharmaceutique,” later introduced as “diététique,” “chirurgie” and “pharmaceutique.”<sup>xl</sup> But surgery is the

practice on which Paré focuses: the knowledge of healing wounds and curing diseases according to method and active manual skill,<sup>xli</sup> which does not only rely on speculation. As expressed in his *Cinq livres de chirurgie* and again in the first edition of his complete work in 1575, surgery is the most prominent subject to Paré.<sup>xlii</sup> As we have seen, this entails that anatomical knowledge be expounded from a surgeon's perspective.

From this conception of medicine and surgery, Paré derives a specific order in which to present anatomical knowledge. In his *Anatomie universelle*, published in 1561, he explains the order in which he has decided to present the anatomical knowledge he has collected. He first reminds the reader that there are several ways to get acquainted with a topic. He mentions three available models: the first is that of the demonstrative sciences, illustrated by Aristotle's argumentation in his works on logic and physics. This method proceeds from the simplest elements to the most complex composites. The second model, practiced by Galen in some works, takes the opposite approach, proceeding from complex composites to the simplest elements. This method is based on division. Finally, the third path to knowledge is that of definition, which investigates the essence and nature of things, which Galen also used in some of his works.

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Paré himself declares his preference for the second method, which presents anatomical knowledge from the most complex composites to the simplest elements. He defends this choice with the argument that surgeons' goals differ from philosophers' ambitions. While philosophers search for the essence and nature of things, surgeons are "opérateurs sensuels." In consequence, they do not require the same kind of definitions as philosophers do. The essence of things remains hidden to surgeons, but they need not be concerned with it. What they need is the anatomical knowledge that will enable them to operate with a sure hand. The definition appropriate to their practices thus proves to be rather a "description" intended for medical practice. It does not tell us about the essence of things but rather indicates the various

parts of the human body and its characteristics as far as this knowledge is useful to surgeons.<sup>xliii</sup>

By declaring that there are several different ways to approach the human body, and that the medical approach has specific advantages over the philosophical, Paré thus contributes to the reform of medical knowledge in the early modern age. He accomplishes this without breaking with tradition and without making an actual contribution to anatomical knowledge. In his own way, however, he proves to be far more than an experienced “practitioner”: he is aware that the surgeon’s eye has epistemological implications, and he clearly formulates these.

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Conclusion

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It is interesting to note that Paré’s contribution to the understanding of human intelligence and animal perception may have been inspired by his strong interest in human pain. If he had developed his ideas on this topic, he could perhaps have anticipated the crucial debates on sensitivity and sensation in the eighteenth century. Paré’s attention to pain is well known,<sup>xliv</sup> as also is his complex relationship to human suffering.<sup>xlv</sup> Paré chose, however, not to pursue this path, and consequently it is not a topic we may explore here.

In this contribution, I have argued that Paré significantly participated in the reform of the medical knowledge of his time. His contribution may be fully appreciated first of all if we abandon the idea that this reform of medical knowledge was primarily due to the development of new anatomical practices and thus implied a break with the ancient medical tradition. We also must consider his specific point of view on anatomy, based on his practice of surgery, and include it in the history of the reform of anatomy in the Renaissance.<sup>xlvi</sup>

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From this perspective, we may give three reasons why Paré is a key figure for anyone who hopes to perceive how what may be described as a medical, philosophical and anthropological



discourse evolved over the centuries since antiquity. First of all, as we have seen, Paré's use of anatomical knowledge as the basis of his conception of "rational surgery" is a very specific and consistent way of both upholding and breaking with the ancient medical tradition. This consideration invites us to shift the moment in which G. Canguilhem identifies the emergence of "rational medicine" from the seventeenth back to the sixteenth century and to revise our conception of it.<sup>xlvi</sup> Paré moreover identifies an approach to the human body that is specifically appropriate to the art of diagnosis, prognosis and medical care; his approach relies on description and thus inherently differs from the philosophical quest for the essence of things. He thus proposes to draw a clear boundary between two types of thought that in his day were still very much intertwined. Finally, the examination of his works gives us important insight into the necessity of qualifying even the most established history of medical discourse, at least in one part: that is, the conviction that scholars of early modern anatomy should focus exclusively on the reform of anatomical knowledge and the critical reception of the medical tradition.

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<sup>i</sup> On Paré's life, see: L. Willaume, *Recherches biographiques, historiques et médicales sur Ambroise Paré* (Epernay: Warin-Thierry et fils, 1837); S. Paget, *Ambroise Paré and his times, 1510-1590* (London and New-York : G. P. Putnam's sons, 1897); C. S. Le Paulmier, *Ambroise Paré: d'après de nouveaux documents découverts aux Archives nationales et des papiers de familles* (Paris: Charavay Frères, 1884); F. R. Packard, *The Life and Times of Ambroise Paré* (New-York, P. B. Hoeber, 1926), 2nd ed.; W. B. Hamby, *Ambroise Paré, surgeon of the Renaissance* (St Louis, Missouri: Warren H. Green, 1967); P. Dumaître, *Ambroise Paré, chirurgien de quatre rois de France* (Paris: Perrin/Fondation Singer-Polignac, 1986). Dumaître in particular clearly explains the difficulty of assessing certain aspects of Paré's biography. Finally, see the virtual exhibition on Paré's life and work at the

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Bibliothèque interuniversitaire de médecine de Paris:

<http://www.biusante.parisdescartes.fr/pare/>. For a general overview of the history of surgery from the Middle Ages to the Enlightenment, see F. Malgaigne, *Histoire de la chirurgie en Occident depuis le VI<sup>e</sup> jusqu'au XVII<sup>e</sup>* (Paris: Baillière, 1870); M. D. Grmek and P. Huard, *La Chirurgie moderne; ses débuts en Occident: XVI<sup>e</sup>-XVII<sup>e</sup>-XVIII<sup>e</sup>* (Paris: R. Dacosta, 1968); M. G. Grmek, "La main, instrument de la connaissance et du traitement," in *Histoire de la pensée médicale en Occident*, vol. 2, *De la Renaissance aux Lumières*, ed. M. D. Grmek (Paris: Le Seuil, 1996), p. 225-251.

<sup>iii</sup> The fact that Paré has maintained some basic ideas about medical knowledge and practice throughout his life has made my task easier. My analysis takes into account Paré's practice of constantly rewriting, amending and improving his *Œuvres*.

<sup>iv</sup> Ambroise Paré, *La Méthode de traicter les playes faites tant par hacquebutes et aultres bastons à feu et de celles qui sont faictes par fleches, dardz et semblables, aussy des combustions spécialement faictes par la pouldre à canon, composée par Ambroise Paré, maître Barbier Chirurgien à Paris*, was published by V. Gaulterot in Paris, 1545 (cote Medic@: 35186). In this chapter, I will quote the second edition of this work, published in 1552 by Veuve Jean de Brie in Paris (cote Medic@: 35183) as printed in the following modern edition: *La manière de traiter les plaies*, ed. M.-M. Fragonard (Paris: PUF/Fondation Martin Bodmer, 2007).

<sup>v</sup> Jean de Vigo (circa 1450-60 ?-1525), surgeon of Pope Julius II, wrote a treatise on this topic, discussing wounds in general, in his *Practica in chirurgia* (1514). It was subsequently translated into French (*De Vigo en francoys. S'ensuit la pratique & cirurgie de... maistre Jehan de Vigo*, Imprimé à Lyon par Benoist Bounyn imprimeur aux despens dudit Bounyn et de Jehan Planfoys, 1525). Paré knew of this French translation of de Vigo's treatise. He

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disagreed with de Vigo's explanation of the cause of firearms wounds.

<sup>vi</sup> M. McVaugh, *The Rational Surgery of the Middle Ages* (Firenze: Sismel – Edizioni del Galluzzo, Micrologus' Library, 2006), p. 241.

<sup>vii</sup> Ambroise Paré, *Cinq livres de chirurgie, Par Ambroise Paré, premier Chirurgien du Roy et juré à Paris* (Paris: André Wechel, 1572) (cote Medic@: 88200), 17: “Mais pour ce que cependant il pourra servir aux jeunes Chirurgiens, je me suis fort étudié à me faire entendre de ceux-ci, ce que je procure en tous mes écrits: car c'est à eux que ces pièces se rapportent, et non pas aux doctes, lesquels je révère et honore uniquement: qui est cause que j'ai usé de langage familier, et non fardé, sachant bien que leur but et intention est plutôt d'apprendre la méthode de bien curer, que de parler élégamment, car le parler ne guérit pas les malades (comme dit Galien) mais l'œuvre de main et les remèdes dûment appliqués.” All English translations of Paré are my own.

<sup>viii</sup> Paré, *ibid.*, letter to Charles IX, 5: “En quoi je ne peut assez émerveiller de la misérable condition de ce temps, auquel les Chirurgiens, méprisant cette partie tant salutaire à la vie des hommes, l'on laissée aux vulgaires et imposteurs, qui se nomment renoueurs: comme prêtres, moines, artisans, charlatans, bourreaux, exécuteurs de haute justice, ladres, femmes et paysans des champs: lesquels font cent mille fois plus de mal que de bien, rendant les pauvres malades impotents, voire souvent leur ôtant la vie: d'autant que telle manière de gens ne savent aucunement l'architecture, ou composition de l'homme, qui s'acquiert par l'anatomie, laquelle est très nécessaire, principalement aux fractures et luxations.”

<sup>ix</sup> Paré, *Traicté de la peste, verolle et rougeolle, avec une brefve description de la peste* (Paris: A. Wechtel, 1568), 6 (Cote Medica@ 35180): “... il semble que chaque siècle se renouvelant apporte toujours quelque nouvelle espèce de maladie inconnue et quelque déguisement et diversité à celles qui étaient auparavant: tant est la nature féconde à produire du mal, comme dit le Poète, dont vient que selon les nouvelles maladies qui surviennent, il

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faut aussi inventer nouveaux remèdes.” See also: *Methode curative des playes et fractures de la tete humaine, avec les portraicts des instruments nécessaires pour la curation d’icelles, par M. Ambroise Paré, Chirurgien ordinaire du roi et juré à Paris* (Paris: Jehan le Royer, 1561) (Medic@ 72176), p. 8-13. In his first anatomical treatise, Paré stresses the fact that he personally checked the information reported by the ancients about the human body (*Briefve collection de l’administration anatomique, avec la manière de cojoindre les os, et d’extraire les enfants tant mors que vivans du ventre de la mère, lorsque la nature de soi ne peult venir a son effect, composée par Ambroise Paré* (Paris: G. Cavellat, 1550).

<sup>x</sup> Ambroise Paré, *Dix livres de la chirurgie avec le Magasin des Instruments nécessaire à icelle, par Ambroise Paré, premier chirurgien du Roy* (Paris: Jean Le Royer, 1564).

<sup>xi</sup> Ambroisé Paré, *ibid.*, p. 10. See also Ambroise Paré, *Cinq livres de chirurgie, Par Ambroise Paré, premier Chirurgien du Roy et juré à Paris*, *op. cit.*, p. 6-7.

<sup>xii</sup> F. Bacon, *The advancement of learning*, ed. Michael Kiernan, The Oxford Francis Bacon, 4 (Oxford: Clarendon Press, 2000). French translation: *Du progrès et de la promotion des savoirs*, livre I, trans. M. Le Doeuff (Paris: Tel Gallimard, 1991).

<sup>xiii</sup> Ambroise Paré, *Traicté de la peste, verolle et rougeolle, avec une brefve description de la peste*, *op. cit.* p. 8.: “Et si en cette œuvre j’ai imité les doctes qui en ont écrits les uns après les autres, ce n’a été avec intention de dérober leur peine et me parer de leurs plumes, en quoi je ne leur fais ni ne veux faire aucune injure: car la clarté du soleil ne s’amoindrit point pour la chandelle qu’on allume de jour.” Paré uses both metaphors again in the section “Au lecteur” of his *Deux livres de chirurgie. 1. De la génération de l’homme, et manière d’extraire les enfants hors du ventre de la mère, ensemble ce qu’il faut faire pour la faire mieux, et plus tôt accoucher avec la cure de plusieurs maladies qui lui peuvent survenir. 2. Des monstres tant terrestres que marins, avec leur portrait. Plus un petit traité des plaies faites aux parties nerveuses. Par Ambroise Paré, premier Chirurgien du Roy, et juré à Paris* (Paris: chez André

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Wechel, 1573).

<sup>xiv</sup> H. Blumenberg, *La légitimité des Temps modernes* (1966) trans. M. Sagnol, J.-L. Schlegel and D. Trierweiler, with M. Dautrey (Paris: Bibliothèque de philosophie, NRF Gallimard, 1999); M. Gaille, “‘Ce n’est pas un crime d’être curieux de l’anatomie’: la légitimation de la connaissance médicale du corps humain dans l’Europe catholique et protestante des XVI<sup>e</sup> et XVII<sup>e</sup> siècles,” in *La mesure du savoir, Etudes sur l’appréciation et l’évaluation des savoirs*, ed. P. Hummel and F. Grabriel (Paris : Philologicum, 2007), 217-242.

<sup>xv</sup> Ambroise Paré, “Dédicace au très chrétien roi de France et de Pologne Henri III,” *Oeuvres complètes d'Ambroise Paré, revues et collationnées sur toutes les éditions, avec les variantes; ornées de 217 planches et du portrait de l'auteur; accompagnées de notes historiques et critiques et précédées d'une introduction sur l'origine et les progrès de la chirurgie en Occident du sixième siècle au seizième siècle et sur la vie et les ouvrages d'Ambroise Paré*, ed. J.-F. Malgaigne (Paris: J.-B. Baillière, 1840-1841), 2 (from the 5th edition of Paré’s complete works, with variants).

<sup>xvi</sup> M. McVaugh, *The Rational Surgery of the Middle Ages*, op. cit., p. 66-67.

<sup>xvii</sup> Ibid., p. 10-11.

<sup>xviii</sup> Ibid., p. 67.

<sup>xix</sup> Ambroise Paré, “Adresse au roi Henri II,” *La manière de traiter les plaies*, op. cit.: “Il ne se trouve point, Sire, par histoires des guerres qui ont été menées de toute antiquité usage aucun en celles-ci d’instruments tant terribles et dommageables, comme font canons, harquebuses et autres bâtons à feu puis naguère inventés: lesquels comme tonnerres ou foudres artificielles mis en la puissance des hommes, abattent ce qu’ils rencontrent, faisant résistance, tuent, brisent, et blessent nombre des hommes en très grande distance: laquelle action et violence plus que humaine ou naturelle, a non seulement troublé les gens de guerre [...] mais aussi les chirurgiens voulant traiter et guérir les plaies faites par lesdits bâtons à feu,

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lesquels étonnés (comme j'estime) de la nouveauté de telles machines, ont beaucoup travaillé à trouver les moyens de les curer.”

<sup>xx</sup> Paré's own hypothesis about the cause of firearms wounds was that the bullet breaks the bones and nerves. He opposed the idea of the poisonous nature of gunpowder.

<sup>xxi</sup> Ambroise Paré, *Discours de la Licorne* (1582), in *Des monstres et des prodiges* (Paris: éd. L'œil d'or et Jean-Louis André d'Asciano, 2003), p. 241.

<sup>xxii</sup> Ambroise Paré: “Car [Dieu m'est témoin, SIRE, et les hommes ne l'ignorent point], il y a plus de quarante ans que je travaille et me peine à l'éclaircissement et perfection de la Chirurgie,” in *Oeuvres complètes d'Ambroise Paré*, op. cit., p. 2.

<sup>xxiii</sup> Ibid., p. 3.

<sup>xxiv</sup> Most studies on this subject begin later than the sixteenth century (see F. Duchesneau, *La physiologie des Lumières: empirisme, modèles et théories* (La Hague: M. Nijhoff, 1982); C. Licoppe, *La formation de la pratique scientifique – le discours de l'expérience en France et en Angleterre, 1630-1820* (Paris : La découverte, 1996); Fr. Pépin, *La philosophie expérimentale de Diderot et la chimie: philosophie, sciences et arts* (Paris, Classiques Garnier, 2012). This concept of “experienced reason” suggests that the history of experimental science should commence at an earlier point.

<sup>xxv</sup> Niccolò Machiavelli, *Il Principe*, ed. M. Martelli, Edizione Nazionale delle Opere di Niccolò Machiavelli (Salerno Editrice, 2006). See on the Machiavellian conception of political knowledge: Cl. Lefort, *Le travail de l'œuvre Machiavel* (Paris, Gallimard, 1972); M. Gaille, *Liberté et conflit civil – La politique machiavélique entre histoire et médecine* (Paris, Champion, 2004).

<sup>xxvi</sup> Ambroise Paré, *Cinq livres de chirurgie*, Par Ambroise Paré, premier Chirurgien du Roy et juré à Paris, op. cit., p. 9 and p. 11.

<sup>xxvii</sup> Ambroise Paré, ibid., 17-18: “Pour ce que m'adressant à toi, je présuppose (ami Lecteur)

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que tu n'es du nombre de je ne sais quels empiriques impudents, qui sous la main hasardeuse de fortune, s'ingèrent à la guérison des plaies, fractures, dislocations, & autres pareils accidents du corps humain, mais au contraire, de l'école qui par préceptes et disputations prises de bons auteurs, enseigne la méthode artificielle de sûrement guérir ces survenantes affections.”

<sup>xxviii</sup> Ambroise Paré, *Methode curative des playes et fractures de la tete humaine, avec les portraicts des instruments nécessaires pour la curation d'icelles, par M. Ambroise Paré, Chirurgien ordinaire du roi et juré à Paris*, p. 14-15.

<sup>xxix</sup> Ambroise Paré, *Anatomie universelle du corps humain, composée par A. Paré, Chirurgien ordinaire du Roy & Iuré à Paris: reveue et augmentée par le dit auteur, avec l. Rostaing du Bignosc provençal aussi Chirurgien Iuré à Paris*, Paris, Jehan Le Royer, Imprimeur du Roy ès Mathématiques, 1561 (cote Medi@: 82949)., p. 23.

<sup>xxx</sup> Ibid., p. 301.

<sup>xxxi</sup> Ibid., p. 323.

<sup>xxxii</sup> Ambroise Paré, *ibid.*, 49: “Comme l’âme donc, qui est perfection du corps et principe de toutes ses actions, selon la commune opinion de tous, est divisée en trois facultés premières et universelles: c’est à savoir l’animale, vitale et naturelle; et derechef l’animale en principal, sensitive et motive comme aussi une chacune de celles-ci en plusieurs autres, c’est à savoir la principale en l’imagination, raisonnable et mémorative. La sensitive, en la faculté visive, auditive, odorative, gustative et tactive. La motive, en progressive ou ambulative et appréhensive. La vitale, aussi en faculté dilatative et constrictive du cœur et des artères qui sont entendues par la faculté pulsative. Et la naturelle, en la faculté nutritive, augmentative et générative.”

<sup>xxxiii</sup> For example, *Anatomie universelle du corps humain*, III, Du cuir musculieux de la tête, *op. cit.*, p. 290: “Or pour conclusion, faut que le Chirurgien sache le nombre des sutures et

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leur situation: afin qu'il sache discerner les fractures fissurées d'avec les commissures: de peur qu'il n'applique son Trépan sur celles-ci (tant qu'il lui sera possible) à raison qu'il romprait les veines et artères, et quelques fibres nerveuses, qui communiquent des parties intérieures aux extérieures, dont s'en pourrait ensuivre flux de sang qui découlerait entre le Crâne et la Duremère, et plusieurs pernicieux accidents." We may find the same view in his *Methode curative des playes et fractures de la tete humaine, avec les portraits des instruments nécessaires pour la curation d'icelles, par M. Ambroise Paré, Chirurgien ordinaire du roi et juré à Paris*, op. cit., p. 39-40.

<sup>xxxiv</sup> On Vesalius' illustrations, see the recent works by J. Vons, "Entre art, science et illusion: les illustrations anatomiques dans les ouvrages de Vésale", and J. van Wijland, "La Fabrique du corps humain de Vésale: la matérialité à l'oeuvre", *Péristyles*, 42, Actes du colloque "La représentation du corps à la Renaissance", December 2013, p. 33-40 and p. 41-48. On Paré's iconography, see Cl. Menges, 'Images et figures de l'anatomie et de la chirurgie: les éditions illustrées d'Ambroise Paré', in (dir.), in (dir.) E. Berriot-Salvadore, *Ambroise Paré (1510-1590), Pratique et écriture de la science à la Renaissance*, Paris, Champion, 2003, p. 89-105.

<sup>xxxv</sup> N. G. Siraisi, *Medieval & Early Renaissance Medicine, An introduction to knowledge and practice* (The University of Chicago Press, 1990), chapter 6 "Surgeons and surgery", p. 153-186.

<sup>xxxvi</sup> Ambroise Paré, *Methode curative des playes et fractures de la tete humaine, avec les portraits des instruments nécessaires pour la curation d'icelles, par M. Ambroise Paré, Chirurgien ordinaire du roi et juré à Paris*, op. cit., p. 15; *Cinq livres de chirurgie*, op. cit., Epître à Charles IX, in which he mentions the Hippocratic and Galenic "fountain" as the source of anatomical knowledge, p. 6.

<sup>xxxvii</sup> Ibid, p. 6-7 and "Au très illustre et débonnaire Roi de Navarre," p. 10.

<sup>xxxviii</sup> Ambroise Paré, *Anatomie universelle du corps humain, composée par A. Paré*,



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*Chirurgien ordinaire du Roy, & Iuré à Paris: reveue et augmentée par le dit auteur, avec l. Rostaing du Bignosc provençal aussi Chirurgien Iuré à Paris*, op. cit., p. 25. See also “Au lecteur,” in *Oeuvres complètes d'Ambroise Paré, revues et collationnées sur toutes les éditions, avec les variantes; ornées de 217 planches et du portrait de l'auteur; accompagnées de notes historiques et critiques et précédées d'une introduction sur l'origine et les progrès de la chirurgie en Occident du sixième siècle au seizième siècle et sur la vie et les ouvrages d'Ambroise Paré* par J.-F. Malgaigne, op. cit..

<sup>xxxix</sup> E. Berriot-Salvadore, ‘L’ordre de l’anatomie’, in (dir.) E. Berriot-Salvadore, *Ambroise Paré (1510-1590), Pratique et écriture de la science à la Renaissance*, op. cit., p. 73-87.

<sup>xl</sup> Ambroise Paré, *Cinq livres de chirurgie*, op. cit.; and *Anatomie universelle du corps humain, composée par A. Paré, Chirurgien ordinaire du Roy, & Iuré à Paris: reveue et augmentée par le dit auteur, avec l. Rostaing du Bignosc provençal aussi Chirurgien Iuré à Paris*, Paris, op. cit., p. 39-40. The same opinion appears earlier in regard to Hippocrates and Galen, p. 36. The series of words describing the practice of medicine is mentioned in: *De l’invention et excellence de médecine et chirurgie* (1575), preface, published in *Oeuvres complètes d'Ambroise Paré*, op. cit., p. 23.

<sup>xli</sup> *De l’invention et excellence de médecine et chirurgie*, ibid.

<sup>xlii</sup> *De l’invention et excellence de médecine et chirurgie*, p. 24.

<sup>xliii</sup> Ambroise Paré, *Anatomie universelle du corps humain*, op. cit., p. 41-42.

<sup>xliv</sup> R. Rey, *Histoire de la douleur* (1993) (Paris: La Découverte, 2000), “La douleur renaissante”, p. 61-84.

<sup>xlv</sup> On one side, he has affirmed that pain was sometimes unavoidable if the cure was to be efficient and called for the patient’s understanding and collaboration. On the other side, he paid attention to substances that could alleviate pain and the comfort necessary to get over a wound and a disease.

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<sup>xlvi</sup> His name is not even mentioned in A. Carlino's *La Fabbrica del corpo – libri e dissezione* (Torino: Einaudi, 1960); English translation: *Books of the Body – Anatomical Ritual and Renaissance Learning* (Chicago and London: The University of Chicago Press, 1999). Paré is mentioned several times, but not in a significant way, by R. Mandressi, *Le regard de l'anatomiste – Dissections et invention du corps en Occident* (Paris: Le Seuil, 2003).

<sup>xlvi</sup> G. Canguilhem, "Puissances et limites de la rationalité en médecine", *Médecine, science et technique. Recueil d'études rédigées à l'occasion du centenaire de la mort de Claude Bernard (1813-1878)* (Paris, CNRS, 1984), p. 111-112.