



# What does it mean to be an Empiricist in Medicine? Baglivi's *Praxis Medica* (1696)

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## **Introduction**

[p. 169] How are we to connect the mechanist methodology used by Baglivi in his physiological treatises with the apparently strict empiricism that he promotes in his therapeutic work entitled *Practice of Physick, reduc'd to the Ancient Way of Observations*? In order to answer this question, we examine the methodological implications of the “history of diseases” that Baglivi promotes by using Bacon’s recommendations in the *Novum organum*. Then, we compare this result with the place that historians generally gave to Baglivi in the medical context of that time: the place of a dogmatic and “iatromechanist” physician who was far from practical and therapeutic concerns. This confrontation allows us first to apprehend the polemical origin of the so-called “iatromechanism” as a historiographical label, and second, to question the preeminence of the role of observations in the shaping of the classical distinction between “rational” physicians and “empirical” ones. When Early Modern physicians use the dichotomy between “empirical” and “rationalist” in order to discredit what they perceive as oversimplification or dogmatism, there is most often a third group at stake; a group which is depicted as the providential and intelligent solution to sectarianism. For Baglivi, this third group would be an “Empirick rational sect.” The distinction between a *medicina prima* and a *medicina secunda* allows us to understand such an apparently paradoxical category.

**Key words:** Baglivi, iatromechanism, solidism, methodism, history of diseases, induction, Sydenham, Bacon, Grmek, Canguilhem

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[p. 170] Baglivi (1668-1706) holds a rather paradoxical place in the historiography of medicine. On one hand, he is supposed to be the paragon of iatromechanists, because he developed an even stricter means of comparing living bodies and artificial machines than Descartes<sup>1</sup>. On the other hand, Baglivi is known as the author of an empiricist treatise on diseases, *De praxi medica ad priscam observandi rationem revocanda*, which was first published in Roma in 1696.<sup>2</sup> This double classification is redoubled by the nationalization of the epistemological traditions:<sup>3</sup> (a) as an iatromechanist, Baglivi is defined by Galileo's legacy, which is supposed to have led specifically to a mechanization of the medical sciences at the end of the 17<sup>th</sup> century in Italy, with Borelli and Bellini; (b) as an empiricist, Baglivi is seen as the scientific heir of Bacon, the father of a British empiricism, supposedly remote from the Italian tradition. This double classification would not be contradictory if his iatromechanism was not so regularly depicted as a dogmatic current of thought, which uses observations and experiences only secondarily and to support *a priori* hypotheses.

Thus, Baglivi represents an interesting case: his works, theoretical and practical, seem to indicate the failure of our standard classifications, which appear too strict or at least ill-adapted to the reality of the scientific methods used in the medical sciences. Under these conditions, we could simply give up those categories in order to study Baglivi's works for themselves. But it seems more useful here to consider them as a means to compare, on one hand, the way that our categorization was shaped and, on the other hand, the way that authors like Baglivi comprehended their own methodological positions in the scientific context of that time. Indeed, the contradictory classification of Baglivi's position reveals a real embarrassment to those who use the simple rationalist empiricist distinction due to the heteroclitic aspect of his doctrine: how are we to connect the mechanist methodology that Baglivi used in his theoretical, physiological treatises, on one hand, and, on the other hand, the strict empiricism that he promoted in his practical, therapeutic treatises?

In this chapter, I will first address the question of the role of observations in Baglivi's *Praxi medica*, and then compare it with the reasons why Baglivi has been understood as a

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<sup>1</sup> See G. Canguilhem, « Machine et organisme », in *La connaissance de la vie*, Vrin, 1992 (1965<sup>1</sup>), p. 101-157, p. 104; Canguilhem, « Du singulier et de la singularité en épistémologie biologique », in *Études d'histoire et de philosophie des sciences*, Paris, Vrin, 1970, p. 211-225, p. 222; Ch. Daremberg, *Histoire des sciences médicales*, Paris, Baillière, 1870, p. 783.

<sup>2</sup> See Jean Bouchet, in « De l'influence du baconisme en médecine », *De l'accroissement de la médecine pratique*, Paris, Labé, 1851, p. I-LXIX, footnote 1 p. VII, p. VIII.

<sup>3</sup> See chapter 6 *supra*, on the “split between Continental Rationalism and British Empiricism.”

iatromechanist. Finally, I will show how his “empirical” position in medicine, as opposed to the “empiricist” one, has to do with the connection between practice and theory.

## **I. The role of observations in Baglivi’s *De praxi medica***

[p. 171] Baglivi summed up the general intention of his book in these few words: “The design of this performance is to show clearly the importance of observation.” The first chapters of the *De praxi medica*, translated from Latin to English (*The practice of Physick, reduc’d to the Ancient Way of Observations*), advocate two corollary principles. According to the first principle, “the springs and causes of diseases lye far beyond the reach of humane reason.”<sup>4</sup> The undiscoverable “causes” here are not to be understood as the particular conditions that provoke the diseases, but as general causes that would account for some basic principles in the birth and development of every single disease. As a consequence, the second principle advocated by Baglivi is as follows: the task of the physician, who would like the art of healing to progress, is to observe, at the patient’s bedside, the appearance and progression of each clinical feature of a disease.

This epistemological recommendation relies on a strongly worded postulate about the intimate nature of diseases: “every disease has, not a fictitious, but a certain and peculiar nature, as well as certain and peculiar principles, increase, state and declination.”<sup>5</sup> There are three consequences. First, because of this singularity, the conclusions drawn from the observations of a disease cannot be useful in the understanding or cure of another disease, even if the symptoms of the two seem closely related. That is why it is necessary to constitute a “history of the phenomena” for each disease. Second, it is true that due to the variety of diseases, the changes in their aspects and the modifications in their development, it is not an easy task to know how they function. However, the fact that there is a permanent nature for each disease that obeys certain laws guarantees the possibility of having knowledge of diseases — it guarantees the scientific feature of medicine, against those who consider it an uncertain discipline deficient in method and laws:

We may justly conclude, that physic is not so uncertain, or grounded upon such a slight Foundation, as ‘tis commonly thought; but built upon certain rules, confirm’d by repeated

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<sup>4</sup> Baglivi, *The practice of Physick, reduc’d to the Ancient Way of Observations*, London, Printed from Andr. Bell, Ral. Smith, Dan. Midwinter..., 1704, (anonymous translation), book 1, chap. 1, p. 1. Now quoted: PM (*De praxi medica*), I, I, p. 1. If the translation is relatively free, the meaning of Baglivi’s book is, for the passages we quote, entirely faithful to the Latin.

<sup>5</sup> PM, I, II, § 3.

Experience: For the Observations which make the principal part of the Art, have the human body for their Subject; the Motions of which, whether Natural or Sickly, have a stable spring and regular and constant Periods: so that the advances of medicine, being grounded upon such observations, cannot but be certain and perpetual.<sup>6</sup>

In the work of Baglivi as well as in the work of Sydenham,<sup>7</sup> the importance of a history of diseases as a scientific and independent part of medicine is promoted by [p. 172] the comparison between diseases and botanic species. Both have their own laws and deserve an independent description, separated from the studies of other kinds of plants or diseases:

As animals, plants undergo their specific and peculiar Mutations in a constant order; as they grow and flourish, some in May, some in July, and so on; as they bring forth seed in regular order, and at last fade away: so diseases by virtue of the specific and peculiar exaltation of the humours, do all of 'em, observe their respective periods, and carry along with them their peculiar symptoms<sup>8</sup>.

The analogy between plants and diseases allows Baglivi to use the natural history promoted by Bacon as a model for his own conception of medicine. It means that diseases constitute, as living individuals, a proper object of observation; they are not just vicious and haphazard modifications of human nature that we could simply apprehend from the knowledge of the healthy state of human body. As a consequence, the therapeutic cannot be based only on physiological studies of living bodies. It should rely on an empirical nosology. Third, if the nature of diseases does not always appear behind the complexities and modifications of the symptoms, it is mostly because of the treatments proposed by the physicians: these treatments very often hide the natural course of diseases and complicate observations. So, in order to propose a faithful “history of diseases”, it is necessary to suspend all medications, diet and care and observe nature itself. Baglivi notes a difficulty here. The observations of a physician, for one part, have to rely on the speech of the patient (on the pain that he feels, on the food that he eats and so on): a physician cannot *always* stay at his patient’s bed side in order to observe the progression of disease by himself. Even so, there are some symptoms, invisible ones, knowable only by the pain felt by the patient. So, exhaustive observations of a disease imply two therapeutic recommendations. The first one is a certain passivity regarding the natural course of disease, at least, as long as the history of diseases is not partly constituted

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<sup>6</sup> PM, I, II, § 7, p. 11.

<sup>7</sup> Thomas Sydenham, *Observationes medicae morborum acutorum historiam et curationem*, Londini, G. Kettily, 1676, praefatio, n. p.. See on the question of the diseases as “specific entities”, L. S. King, “Empiricism and rationalism in the works of Thomas Sydenham”, *Bulletin of the history of medicine*, 44 (1), 1970, p. 1-11. See more recently Andrew Cunningham, “Thomas Sydenham: Epidemics, Experiment, and the “Good old causes”” in Roger French and Andrew Wear (eds.), *The Medical Revolution in the Seventeenth Century*, Cambridge, Cambridge University Press, 1989, p. 164-190.

<sup>8</sup> PM, II, V, § 4, p. 245.

and cannot guide a therapeutic.<sup>9</sup> The second one is to be able to interpret patients' speech and complaints and to be patient enough to stay at the "nasty beds of the sick":

that end [the appeasing of the pain of diseases] will be effectually compas'd, if you frequently visit the publick hospitals and the nasty beds of the sick, and with an austere fearless patience observe what good or ill happens in the several periods of the disease, how the symptoms make their progress...<sup>10</sup>

Following these first chapters, the *De praxi medica* is divided into two parts, according to the structure of Bacon's *Novum organum*<sup>11</sup>: a *pars destruens*, book one, [p. 173] identifying the main obstacles preventing the progress of the discipline (for instance, the misleading authority of the "ancients" like Galien, or again the "false opinions" – "idols" – of modern physicians<sup>12</sup>); and a *pars praeparans*, book two, indicating the different means, methods and rules for making the discipline progress.

In the third chapter of the second book, Baglivi enumerates four conditions first to produce a history of diseases and then to propose, from the *data* provided by this history, "practical aphorisms" guiding the therapeutics. In this matter, Baglivi relies on Hippocrates's methodology, which he quotes very often. The four important steps for Baglivi --- steps which guarantee the liability of the "induction" promoted by Bacon<sup>13</sup> --- are the following: 1/ "The infinite acquisition and description of particulars," which supposes, first, to "spend many years in acquiring a large number of observations," and, then, to describe them as clearly as possible, in a "rough and unpolish'd style, that is, in the same sort of words that patient use when they express their ails," noting every circumstance, "like a faithful scribe."<sup>14</sup> 2/ Then, it is necessary to *dispose* of those *data*, which are useless in themselves if they are not organized: the most important things have to be sorted out into "heads" and common places. For instance, it is possible to separate symptoms that are not necessarily related to the disease, to the ones which are "its constant companions."<sup>15</sup> 3/ The next step is the "digestion" of the particulars, which consists in rejecting false things, carefully examining inconstant and doubtful details and determining differences between things that appear similar. 4/ The next

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<sup>9</sup> PM, I, 2, § 7, p. 11 : "For two patients seiz'd with a plurisie, (for instance) and treated different ways, by two different Physicians, will likewise have different symptoms : so that if there be an error in the method of cure, the physician and not the disease, will be the author of many symptoms".

<sup>10</sup> PM, I, 5, § 6, p. 30.

<sup>11</sup> On Bacon's influence and the importance of the *De praxi medica* for Sauvages's Nosology, see Julian Martin, « Sauvages' Nosology. Medical Enlightenment in Montpellier », in Andrew Cunningham and Roger French (eds.), *The Medical Enlightenment of the Eighteenth Century*, Cambridge, Cambridge University Press, 1990, p. 111-137, p. 115-118.

<sup>12</sup> PM, I, VI. For instance, p. 24, invoking the fact of believing exclusively in the virtue of only one remedy supposed to cure every disease, either the milk, or purgation and bleeding, or else the "acids and alkalis".

<sup>13</sup> Bacon's induction is quoted PM, p. 224.

<sup>14</sup> PM, II, III, § 2, p. 220.

<sup>15</sup> PM, II, III, § 3, p. 223.

and final rule is to form some general precepts, those precepts called “aphorisms” by the ancients. These are the conditions for a true and useful history of diseases and they depend in part on the institutional organization of sciences. Indeed, although Baglivi praised existing scientific academies, particularly the Royal Society,<sup>16</sup> he also recommends building some “colleges” exclusively for physicians, which he refers to as “practical colleges.”<sup>17</sup> These colleges would be divided into two bodies: a “literate society”, reading the books that contain observations, and a “practical society” “finding out and marking down new observations of diseases.” But the main point of Baglivi’s approach is to recommend a specialization for researchers in medicine: “every member of [these societies] must take a particular disease as its province.”<sup>18</sup> The observations of one disease constitute a life’s work.

Thus, the combined influence of Hippocrates and Bacon is clearly detectable in Baglivi’s project of proposing a history of diseases. It is worth noting here that Baglivi was not content with simply providing some general program for the discipline: [p. 174] he illustrates this program with a lot of examples, which are either based on his readings or on his own experience as a physician and clinician. Those examples are particularly detailed in chapter nine of the first book, where a certain number of diseases or symptoms, like asthma and fevers, receive a comprehensive description. Baglivi extended this section of *De praxi medica* in the second edition of the text from 1704.<sup>19</sup> In this second edition, Baglivi is prolix on the observations that he made as a physician at the very beginning of the 18<sup>th</sup> century in Roma. He detailed the climatic conditions, the exact place where the observations were made and the nature of the examined patients. Indeed, in the first part of his career, Baglivi worked in hospitals (in Padua, Venice, Florence and Bologna). In 1695, he became the pope’s “second physician” – his *De praxi medica* is dedicated to Innocent XII. Besides his teaching and anatomical demonstrations, as a professor of theoretical medicine in *la Sapienza* (from 1701 on), he continued to give medical consultations, which acquired a very high reputation in Europe. So, the different statements in his *De praxi medica* about the necessity for the physician to stay at the patient’s bed side are not to be considered wishful thinking: on the contrary, they are the result of a career and a long experience.

To summarize regarding the importance of observation for Baglivi, we may conclude that the *De praxi medica* presents several features, which would easily lead us to classify Baglivi as an “empiricist,” according to our present-days labels – we will question the

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<sup>16</sup> He became a member of the Royal Society in 1697.

<sup>17</sup> PM, II, IV, 1, p. 231.

<sup>18</sup> PM, II, IV, 2, p. 234.

<sup>19</sup> *Opera omnia medico-practica, & anatomica...*, Lyon, Anisson & Posuel, 1704.

relevancy of such labels later on. Usually, this labeling brings the following elements together: (i) the influence of Bacon, (ii) the thesis that general causes are outside of the reach of our understanding, (iii) the necessity to multiply observations and progressively proceed to inductions, (iv) the irreducibility of therapeutic experiences to rational deductions from physiological and/or physical knowledge, and sometimes even (v) the importance of temporal and geographical conditions, which can substantially change the aspect of a disease. All of these features may be found in Baglivi's works.

Despite this apparently perfect illustration of an "empiricist epistemology," *De praxi medica* is rarely read, and even more rarely studied.<sup>20</sup> It is true that formally, this book is long, often repetitive and sometimes even seems contradictory. For instance, Baglivi expresses admiration for the brevity of the aphoristic form, but illustrates this admiration with long and sometimes muddled descriptions. This aspect may explain the lack of interest in this book. In addition, Baglivi does not seem to add much to Sydenham's methodology, considered as a paradigmatic and exemplary rehabilitation of clinical experiences in medicine. Thus, whenever historians of medicine want to study an empiricist approach towards medicine at that time, they find a more convincing and promising subject of study in Sydenham's *Observations medicae*<sup>21</sup>— all the more so because of the open relationship between [p. 175] Locke's empiricism and Sydenham's medicine.<sup>22</sup> Indeed, Baglivi borrows Sydenham's clinical description of gout. Over several pages, Baglivi's description is quite similar to Sydenham's one and doesn't include any quotation marks. If Baglivi claims that he follows "Sydenham's method" on this point, he does not indicate that he copies any of his observations.<sup>23</sup> For all of these reasons, Mirko D. Grmek wrote the following about *De praxi medica*:

It was a lucid program of what medicine should be in the future, and attack against the medico-philosophical systems, and a claim for the Hippocratic principles of sound clinical observation. With the exception of some fine general statements in an aphoristic form and a small number of fairly good clinical descriptions (e. g. of typhoid fever and of cardiac decompensation), this book offers a little to a modern reader; its style is somewhat baroque, and its factual medical content is often doubtful. In any case, Baglivi's treatise is

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<sup>20</sup> Apart, mainly, from the long introduction of Baglivi's book by Boucher in his French translation of the *De praxi medica: De l'accroissement de la médecine pratique*, Paris, Labé, 1851, p. I-LXIX; J. Jimenez Girona, *La medicina de Baglivi*, Madrid, 1955 and L. Salomon, *Giorgio Baglivi und seine Zeit*, Berlin, 1889.

<sup>21</sup> Sydenham is not quoted in the methodological parts of *De praxi medica*, but his name is mentioned a few times as a heir of Hippocrate, along with Septalius, Morton, Manget, Tulpius, Rivière or Tozzi. See II, chap. 2, § 3, p. 216.

<sup>22</sup> In this matter, see François Duchesneau, *L'empirisme de Locke*, La Haye, Martinus Nijhoff, 1973, chap. 1 and chap. 2.

<sup>23</sup> PM, II, VI, § 1, p. 250. Compare to Sydenham's *Tractatus de podagra*, London, 1683.

representative of a stream of thought opposed to philosophical generalization in medical practice<sup>24</sup>.

According to Grmek, Baglivi's book should just be considered "representative" of a "stream", which is not characterized as empiricist here; a "stream" that one could probably better study in other authors. However, there are two major differences between Baglivi and Sydenham: 1/ Sydenham promotes the classification of diseases according to the model of botanic classifications; that is, by reducing diseases to specific species. Contrastly, Baglivi insists on delaying such generalizations insofar as it is possible. Perhaps it can partly explain the prolixity of his book compared to the clarity of Sydenham's observations. 2/ Baglivi clearly indicates what authors have influenced him as well as those who were useful as counterexamples, and he explains his own methodology in relation to the other medical currents of thought. For these reasons, studying Baglivi's book allows one to apprehend the specificity of his methodology, the way that he conceives it in the scientific context of his time and thus the nature of his so-called medical empiricism, if his own categories allow us to speak of it so.

## II. The portrait of Baglivi as an iatromechanist

Just after the statement quoted above, Mirko Grmek presents Baglivi as "a member of the Iatrophysical School, a defender of biomechanism." This conception of Baglivi is indeed widespread. It is the second reason why the *De praxi medica* has been neglected as an empiricist treatise on diseases; it simply does not fit in with the portrayal of Baglivi as an iatromechanist. In these conditions, the first point to begin with is to establish quickly why historians of medicine have defined Baglivi [p. 176] quasi-systematically as an iatromechanist and for what reason an iatromechanist has always been seen as a rationalist vs. an empiricist.

This portrayal of Baglivi as an iatromechanist is based on three kinds of arguments. The first one, spread in France by Canguilhem, comes from a reading of Daremberg's *History of Medical Sciences*, which quotes one passage of the *De praxi medica*.<sup>25</sup> This passage seems to allow one to identify the *Praxi medica* as the statement of belief of an iatromechanist. At the very least, it inclines one to neglect the specificity of the book, which mainly addresses

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<sup>24</sup> « Baglivi », in C. C. Gillispie (ed.), *Dictionary of scientific biography*, New York, Scribner's, 1981, p. 391-392, p. 391.

<sup>25</sup> Ch. Daremberg, *Histoire des sciences médicales*, Paris, Baillière, 1870, p. 786-787.

the question of the observation of diseases. In this passage, Baglivi seems to assimilate the human body to a machine:

For whoever takes an attentive view of its fabric, he'll [a human body] really meet with shears in the jaw-bones and teeth, a phiol in the ventricle, hydraulick tubes in the veins, arteries, and other vessels, a wedge in the heart, a sieve or straining-holes in the viscera, a pairs of bellows in the lungs, the power of a leaver in the muscles, pulleys in the corners of the eyes, and so on. And tho' the chymists explain the *phaenomena* of natural things, but the terms of *fusion*, *sublimation*, *precipitation*, &c. And so make a separate sort of philosophy; yet all these ought to be imputed to the force of a wedge, balance, leaver, spring, and such like mechanical principles<sup>26</sup>.

In Canguilhem's famous paper "Machine et organisme", this quotation is used to prove that iatromechanism required the invention of automata as a technical condition. This quotation inclines Canguilhem to see the influence of Descartes' *Treatise of Man* in Baglivi.<sup>27</sup> However, what does it mean to be an "iatromechanist" here? In the context of Baglivi's quotation, it mainly means to believe that physiological processes are essentially similar to mechanical processes observed in artificial machines (and more precisely, automata). However, the reading of the passage immediately after the quotation *supra* should substantially moderate Canguilhem's point on Baglivi, which has profoundly shape the image of Baglivi in French literature on medicine:

Indeed if all diseases sprung from the disorder of the solid parts, the origin and causes of the preternatural effects we meet with in them, would questionless be easily pointed to by the above mention'd principles ["mechanical and mathematico-experimental principles"]: but considering that the greatest part of 'em owes their origin to the various complexion of fluids, we must but be surpriz'd to find, that the true and genuine cause of diseases, can never be found by theoretick philosophical principles. For the ablest philosopher and the greatest master of the best hypothesis that is, will be forc'd to acknowledge, after all his meditations and labour in tracing the true constituent parts of any humours, that the *minima*, or least particles of any humour of the body, whether natural or sickly, lye beyond the reach of all art and speculation<sup>28</sup>.

[p. 177] Indeed, Baglivi's statement about the machine of our body had only one meaning in its context: despite the usefulness of "mathematico-experimental principles" in physiology, despite the seductive character of the analogy between a human body and an automaton, this analogy has no utility in therapeutics, because the principles of our diseases are much more complicated. In other words, what Canguilhem hastily interpreted to be an unconditional adoption of the first principle of iatromechanism, the similarity between

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<sup>26</sup> PM, I, XI, § 7, p. 135-136.

<sup>27</sup> G. Canguilhem, « Machine et organisme », in *La connaissance de la vie*, op. cit., p. 101-157, p. 104.

<sup>28</sup> PM, I, XI, § 7, p. 136-137. We could add the conclusion of this passage: « Now these truths being premis'd, we can't but confess that the art of curing human bodies is acquir'd only by use and exercise; and consequently, that practice is of more importance than the theory. »

physiological processes and artificial processes, is actually a criticism of the medical consequences of such an analogy between living bodies and machines. Baglivi's aim was to moderate the analogy.

The second kind of argument in favor of Baglivi's affiliation to iatromechanism would be equally moderated by this quotation. It is based on the fact that Baglivi's medicine is "solidist" – and solidism is quasi systematically assimilated to iatromechanism for two reasons. First, solidism is opposed to the use of chemical principles in medicine: it would consider, first, that key components of the human body are solids, and not fluids, and, second, that every fluid or humor can be reduced to the motions of small, solid particles. Here, the solidists are opposed to the "humorists". Second, solidism is often related to the comparison between the human body and an automaton, since, apart from the water in hydraulic tubs, the components and the motor in an automaton are solids.

In what respect, then, is Baglivi a solidist? First, in his most famous study, *De fibra motrice*, Baglivi considers a cerebral membrane, the dura mater, to be a central motor for nervous motions: fluid circulation in the human body would be propelled in nerves by the contraction of the dura mater. It would mean that there would not be only one motor for the whole organism, but two: the heart, acting like a muscle, and the dura mater, essential for sensibility and locomotion. The dura mater is moved by a perpetual vibration, which is compared to the movements of a pendulum. As the spring of a watch, it is considered dependent on an "elastic virtue". It is not a simple membrane, but a complicated one, formed with three different ranks of fibers. The novelty of this system is not to give fibers a crucial role in the organism (Glisson, Steensen or Swammerdam had differently done so<sup>29</sup>). It is, however, first, to distinguish muscular fibers from membranous ones, and, second, to give to the second ones a key role in physiological processes, whereas they were often considered simple and inert sheath in comparison with the nerves. Furthermore, nearly every soft part of the human body, as viscera and vessels, would be a "production" of the dura mater; that is to say, would be formed by the intertwining of the dura mater.<sup>30</sup> This system could appear as solidist because traditionally it was a fluid, "the animal spirits," which was considered as the most central component, as the first principle of the sensory motor system.

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<sup>29</sup> See Glisson, for instance Glisson, *Tractatus de ventriculo et intestinis*, Amsterdam, 1677; Steno, *Elementorum myologiae specimen* (1667), in Troels Kardel (ed.), *Steno on Muscles*, Philadelphia, 1994; Swammerdam, "Proefnemingen van de particuliere beweeging der Spieren in de Kikvorsch", *Bybel der Natuure-Biblia Naturae*, éd. H. Boerhaave, p. 835-860.

<sup>30</sup> This presentation corresponds to the descriptions of Baglivi's works in the *Journal des sçavans* (1702, December the 11<sup>th</sup>), p. 1122 *sq.* and in the *Nouvelles de la République des lettres* (1704, November), article VIII, p. 559 *sq.*

[p. 178] As a consequence, for Baglivi, therapeutics, which traditionally focused on the humors and their diseases, had to be reoriented on the solids, which had been completely neglected. To illustrate this program, Baglivi wrote a *Dissertatio de anatome fibrarum, de motu musculorum ac de morbis solidarum*, and the *Canones de medicina solidorum*.<sup>31</sup> Later on, Bordeu in the *Encyclopédie* emphasizes this feature in Baglivi's medicine: it is Bordeu, who, for the first time to my knowledge, qualifies Baglivi as a "solidist" ("the attachment that Baglivi had for solidism, does not allow to doubt that he made efforts to apply it to the progression of disease"<sup>32</sup>). However, it would not be true to say that Baglivi puts the principles of diseases and the key of therapeutics strictly in solids. On the contrary, in his *De praxi medica*, he intends to build a history of the diseases "that spring from a disorder in the fluids," as well as a history of diseases that "spring from a disorder in the solids."<sup>33</sup> Along with the *Fibra motrice and morbosa*, he published a *Dissertatio circa saliva*, a *Dissertatio circa bilem* and a *Dissertatio circa sanguinem*, which easily prove that Baglivi did not give up medical works on fluids after the writing of his *De fibra motrice*. Lastly, in all these works, he emphasizes the balance between solids and fluids, which together maintain the movement in the human body. Thus, the idea that Baglivi is a "solidist" is particularly misleading – not to say erroneous: such a reading takes polemical labels at face-value, when they should be put back into their own institutional and intellectual context.

The third kind of argument, on which Grmek's analysis is based, has sounder foundations. It considers that for an iatromechanist, physics gives the general laws that living bodies follow and provides the first elements of physiology. In this sense, iatromechanism is opposed to iatrochemistry. For an iatromechanist, chemistry is reducible to the principles of mechanics and, in any case, is a much more obscure science than mechanics. Indeed, in the chapter on "false similitudes" (*De Praxi Medica*, book 1), Baglivi draws a clear line of demarcation between "those who argue from the mechanicks and upon divers rules of the mathematicks,"<sup>34</sup> and those, like Van Helmont, who use chemical analogies. In the first case, by understanding the human body with the help of mechanics, as Borelli or Bellini did, there is no false analogy, because the human body follows the laws of mechanics. Here, the recourse to a non-medical discipline, like mechanics, is understood not as a comparison, but on the model of an "application". All living bodies, as ensembles of solids and fluids, follow the laws of

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<sup>31</sup> See Baglivi *Opera omnia medico-practica et anatomica*, Lyon, 1710.

<sup>32</sup> Bordeu, article on « crisis », *Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers*, par une Société de Gens de lettres, ed. Diderot and d'Alembert, 1751-1772, t. 4, p. 477.

<sup>33</sup> PM, II, VII, § 1, p. 267.

<sup>34</sup> PM, I, VI, § 2, p. 36

hydraulics and statics. On the contrary, chemistry is perceived by Baglivi as a specific and empirical science. Its results are contingent on the kinds of bodies that it considers and not general enough to be applied without distinction to any kind of object. Chemical principles discovered in minerals cannot be transposed to plants and animals, which have their own [p. 179] chemical functioning. It is true, then, that Baglivi considered mechanics to be a fundamental science of bodies, whereas he considered chemistry to be an empirical science, often misleading in its application to medicine and, for the moment, far less instructive than physics. In his *De fibra motrice*, Baglivi compares the spring of a watch to the functioning of the dura mater in this perspective. This allows Baglivi first to show that there is no mystery in the spontaneity, regularity and continuance of the membranous motions and second, to demonstrate that the principles of physiological motions are essentially the same as principles of the motions of physical bodies, even if the first ones seem much more complicated than the second.<sup>35</sup>

However, even in this third meaning, we have to carefully handle the label “iatromechanism”. French scholars have sometimes believed that this word existed in the 17<sup>th</sup> century (or at the beginning of the 18<sup>th</sup> century), because it appears in a French translation of Baglivi’s *De praxi medica* published in 1851 by Dr Jean Boucher. The passage in eighteenth-century English is as follows:

*Those who argue from the mechanicks and upon divers rules of the mathematicks, relating to the saticks, hydraulicks, the force of heavy bodies, & conclude upon the structure of a living body; these I say reason justly... (we emphasize)*<sup>36</sup>

The Latin was:

Pariter *Mechanici philosophantes* a variis mathematicis praeceptis utpote Statices, Hydraulices, Momenti gravium, & reliquis hujusmodi ad structuram corporis animati, recte philosophantur...<sup>37</sup>

And the nineteenth French translation:

D’un autre côté, *les iatromécaniciens*, qui partent de divers principes mathématiques, ceux de la statique, de l’hydraulique, de la pesanteur, et qui veulent les appliquer à la structure du corps vivant ceux-là ont philosophiquement raison de le faire...<sup>38</sup>

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<sup>35</sup> We could find in Leibniz the proof of his interest (and even preference) for Baglivi’s conception of the membranes (that is to say, for the following ideas : 1/ the vibrations of the membranes as the « *impetum facientia* » of the human body, 3/ the sensitive importance of the dura mater, 2/ the fact that it is the membrane, not the nerve, which allows the sensitive perception (for instance for the view it would be the choroïde and not the retine). Leibniz found in this theory a possibility to reduce physiological processes to their “mechanical causes”. See the letter to Michelotti (1715), in Leibniz, *Opera Omnia*, studio L. Dutens, Fratres de Tournes, Genevae, 1768, II-2, p. 90-91.

<sup>36</sup> PM, I, VI, II, p. 36.

<sup>37</sup> *Opera omnia medico-practica et anatomica, editio inter quamplurimas emendatissima*, Venetiis, apud Gasparum Girardi, 1761, p. 9.

Whereas “*Mechanici philosophantes*” means those philosophers who applied the laws of mechanics to the “structure of animate bodies,” the “*iatromécaniciens*” are physicians who reason mainly (or, for some historians of medicine, even exclusively) on the basis of the identification between animate bodies and machines. Mechanical philosophers have no therapeutic concerns; their understanding of animate bodies is part of their *philosophia naturalis*. If, on the other hand, those who [p. 180] “argue from the mechanicks” are physicians only (as the prefix “iatro” indicates), and not natural philosophers, the relevance of their approach is indubitably in question: “philosophically”, it is interesting to apply mechanical laws to living structures; therapeutically speaking, it is another thing. By substituting the notion of “philosophers” for the notion of “physicians” (iatro-), the French translation conveys a negative representation of so-called mechanism.

“Iatromathematicians” initially meant an ancient sect of medicine in Egypt that was defined by its therapeutic use of Astrology. It is in this sense that Conring uses the term in 1687.<sup>39</sup> In nineteenth-century French history of medicine, the frequent identification of “iatromechanist” with “iatromathematicians” received a pejorative meaning, insofar as the terms referred to a dogmatic conception of medicine remote from practice and the complexity of physiology. The word became more frequently used at the end of the 18<sup>th</sup> century in the context of the emergence of vitalism, which depicts itself as opposed both to the iatromechanism or iatrochemistry and to animism. In other words, using these labels allowed physicians to show that, contrary to previous medical traditions, they did not belong to any philosophical “sect”, but found the principles of their own medicine on experiments and practice. In brief, such terms like “iatromechanism” and “iatrochemistry” were used as foil.

Those few remarks on the word “iatromechanism” indicate the importance of using it carefully. The history of its ideological and polemical uses remains to be done, but to my knowledge, the word “*iatromathématicien*” was coined by Haller. We can find it in the article entitled “Physiologie” in the *Supplément* to his *Encyclopédie*. Nevertheless, it seems to have a very specific meaning. Indeed, Haller reserves the word “*iatromathématiciens*” for the authors of the 18<sup>th</sup> century who applied their physical computations to the understanding of physiological processes, such as the speed of the fluids, the diameters of the vessels, the force of the muscles, and so on and so forth. In this case, information on physiological processes is simply a material described by other physicians – it is not first-person data for the author. It

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<sup>38</sup> *De l'accroissement de la médecine pratique*, trans. J. Boucher, *op. cit.*, p. 32-33.

<sup>39</sup> Hermanni Conringii, *In universam artem medicam*, Helmstadii, 1687, p. 68.

probably explains why the *iatromechanism* and *iatromathematism* were first identified with a current of thought that was remote from practice and experimentation. In this respect, Pitcairn and Michelotti are qualified by Haller as *iatromathématiciens*, whereas Bellini and Baglivi are not. Bellini's and Baglivi's concerns were probably too focused on anatomy, dissections and therapeutic consultations to qualify them as such. Indeed, there is a discrepancy between, on one hand, someone like Michelotti,<sup>40</sup> who did not practice medicine nor dissections by himself, but used his competency as a mathematician to help the physicians to better understand the functioning of the human body and, on the other hand, Baglivi, who as physician and a therapist did perform dissections and recommend them. For Haller, discovering the mechanical laws according to which animated bodies move, [p. 181] like Baglivi did, did not define the typical attitude of an iatromathematician. Now the question is: is it relevant today to approach seventeenth-century physicians through categories such as iatromechanist and iatrochemist? Those notions are usually used to denounce an alleged "reductionism" that no one can really find in the works of physicians of that time.<sup>41</sup>

Nevertheless, beyond the historiographical confusions surrounding the labels "iatromechanism" and "empirism", it remains difficult to connect Baglivi's theory on membranes to the strict observational induction that he utilizes for therapeutics. Such a difficulty was underlined by Grmek in the following way:

A strange conflict in [Baglivi's] writings is his acceptance of biomechanics doctrine as a guide for research work and his rejection of all speculative theoretical background in actual medical practice. He said that the iatromathematic physician must forget his theories when he appears at the bedside<sup>42</sup>.

If the notion of a "biomechanics doctrine" seems a little bit exaggerated, the following question remains: on what kind of theoretical foundations may Baglivi's *De praxi medica* rely? How does one utilize the physiological statements found in the *De fibra motrice* in the context of a therapeutics that is based on physicians' daily – and even lifelong – consultations?

To escape this difficulty, one may want to argue that Baglivi could have had two stages in his career: first, his therapeutic works and then, his works on solids partly, disconnected from his earlier practical interests. However, this is hardly possible as we have

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<sup>40</sup> See Pietro Antonio Michelotti, *De separatione fluidorum in corpore animali dissertatio physico-mechanico-medica*, 1721.

<sup>41</sup> On this matter, see our paper "Définir le vitalisme. Lectures de Claude Bernard, dans *Claude Bernard. La méthode de la physiologie*", in F. Duchesneau, J.-J. Kupiec, M. Morange (eds.) Paris, Éditions Rue d'Ulm, 2013, p. 133-155.

<sup>42</sup> M. D. Grmek, « Baglivi » in the *Dictionary of scientific biography*, *op. cit.*, p. 392.

already seen, specifically given the fact that Baglivi adds a number of passages to the second edition of the *De praxi medica* after the publication of the *De fibra motrice*. In addition, a more careful reading of the *De praxi medica* shows that Baglivi's apparent "empiricism" in the *De praxi medica* does not imply provisionally renouncing his theory. First, Baglivi alludes to his "Treatise on Fibers" as a complement to his practical work.<sup>43</sup> Second, when he addresses the issue of the causes of diseases, he expresses a conception of the human body that is roughly<sup>44</sup> consistent with his *De fibra motrice*:

The human body is a bundle of fibres variously interwoven and corresponding to one another, which are bended this way or t'other by the fluid that moves within, as by a spring: and from thence proceeds that great sympathy and united consent of the parts<sup>45</sup>.

Anyway, beyond those clues, and generally speaking, it seems more promising to suppose the consistency of Baglivi's works, rather than their incoherence.

### III. *Medicina prima and medicina secunda*

[p. 182] Baglivi's position becomes intelligible as soon as his use of the terms "empirics" and "rationalist" is elucidated. First, the occurrences of "empirics" in the *De praxi medica* indicate a certain equivocity of the term. On one hand, Baglivi is critical of the "Empiricks". This attitude seems to be common, as if the "Empiricks" were legitimately subject to mocking remarks and contempt.<sup>46</sup> For instance, Baglivi distances himself from the "Empiricks, who are all upon evident and sensible causes, and condemn the latent and internal causes."<sup>47</sup> Then, he criticizes the way that Empirics usually conceive of experience:

The Empiricks again, tho' they always glory in experience, never come to the right use of it; for besides that they set about it without light or method, they can't bear that tediousness of inquisition, that's requisite in tracing the effects of diseases, and deducing practical precepts from thence. 'Tis no wonder therefore that this stupid, cloudy, and erroneous way of experimenting, has given rise to that monstrous practice of the Empiricks<sup>48</sup>.

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<sup>43</sup> PM, II, V, § 6, p. 249.

<sup>44</sup> Even if here the spring is a fluid, not the elastic motion of the membranes.

<sup>45</sup> PM, II, IX, § 10, p. 307.

<sup>46</sup> On this negative connotation, see the semantic analysis of chapter 2 *supra*: in 17<sup>th</sup> and 18<sup>th</sup> centuries, an "Empirik" was mainly a Quack.

<sup>47</sup> PM, II, IX, § 2, p. 285 (see *De Praxi Medica* in *Opera omnia*, 1704, p. 206: "Neque quis putet nos hîc sustinere Empiricos, qui causas evidentes, & subjectas sensui perpetuo revolvunt, latentes vero atque internas propemodum despiciunt...").

<sup>48</sup> PM, II, II, § 1, p. 213 (see *De Praxi Medica* in *Opera omnia*, 1704, p. 167: "Empirici licet experientiam perpetuo jactent, illam tamen nunquam recte attingunt; nam praeterquam quod sine luce & method eandem aggrediuntur, tantam inquisitionis diuturnitatem non sustinent, quanta explorandis morborum effectibus, &

Opposing the “Empirics,” whose practice lacks method and judgment, and the “Rationalists,” who wrongly despise experience, is not original. We can trace such an opposition back to Galien. Baglivi’s originality is to promote another kind of empiricism, the “*Empirick* rational sect,”<sup>49</sup> which would be a synthesis of the two. In this matter, Baglivi uses the image of the bee, which one can find in Bacon: neither empirics, who, like the ant, “hunt up and down for experiments,” nor speculative physicians, who, like the spider, “spin all [their] threads out of [their] own body without gathering materials from abroad,” have the right attitude towards experience, which has to be collected with order and assimilated.<sup>50</sup> Baglivi refuses the opposition between reason and experience, since “reason” provides knowledge of future events from the knowledge of actual things – that is to say, reason constitutes the condition of the foresight on the basis of past events, which forms the essence of therapeutics:

[p. 183] Those who oppose reason to experience, whether Empiricks or Rational Physicians, seem to me to be all mad: For how can we make reason to act all the parts of a science, that, as all wise men ought to acknowledge, is acquir’d by tryal and use continu’d thro’ a long progress of time? And on the other hand, why should experience be only regarded, and reason turn’d out of doors? Here, by *reason*, I do not mean that power of the mind, which hunts the obscure parts of nature, and is call’d *invention*; for that belongs to *physicks*. I understand that Queen Reason, that is plac’d above all the rest, by which Physicians looks into the principles and causes of diseases, foretells their progress and event, and gathers futurities from what’s present<sup>51</sup>.

This equivocity of the term “empirics” appears clearly in the mid-18<sup>th</sup> century, in Diderot’s *Encyclopédie*: since everybody agrees on the necessity of experience – and, more exactly,

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exinde praeceptis practicis deducendis requiritur; unde nil mirum si ex stupido, nebuloso, ac prorsus erroneo experiundi genere, talis quoque Empiricorum praxis oriatur.)”

<sup>49</sup> PM, II, II, § 1, p. 211 (*De praxi medica*, in *Opera omnia*, 1704, p. 167: “... non ita si Empiricam [sectam] rationalem, sive Empiricam factam litteratam, methodo non casu inventam, ab intellectu faecundatam, & directam, & post diuturnam effectuum morborum explorationem ad veritatis culmen perductam; quam mehercule docti Viri semper laudarunt, & tanquam naturae consonam ad majora promoverunt).”

<sup>50</sup> PM, I, XII, § 5, p. 145. And as for Bacon, see *Novum organum*, in *The works of Francis Bacon*, *Facsimile-Neudruck der Ausgabe von Spedding, Ellis und Heath, London, 1857-1874*, Friedrich Frommann Verlag Bünther Holzboog, Stuttgart-Bad Cannstatt, 1963, Erster Band, I, § 95, p. 201.

<sup>51</sup> PM, I, I, § 12, p. 7-8 (*De praxi medica*, in *Opera omnia*, 1704, p. 4: “Qui rationem cum experientia conflictare volunt, nae illi omnes desipere mihi videntur tam Empiric, quam Rationales. Quomodo enim dici potest, omnes Rationi partes tribuendas esse ea in disciplina, quae, ut sapiens quisque fateri debet, longinqui temporis usu, ac periclitatione acquiritur? Aut respectum ad solam experientiam habendum esse, & nullo loco rationem esse numerandam; modo Rationis nomine, non illa vis animi intelligatur, quae obscura naturae investigans inventio, & excogitatio dicitur, & magis ad physicam pertinent: sed illa potius Domina omnium, & Regina Ratio, per quam consequentia videt Medicus, morborum principia, & causas conjicit, eorundem progressus, eventusque auguratur, & ex rebus praesentibus assequitur, ac prospicit futuras.)”

repeated experiences<sup>52</sup> – it is trivial or misleading to define the empirical position in medicine with regards to the role of experiences. What is at stake is the way that experience is defined, the way it is collected and the way physicians make use of it. Indeed, Jaucourt emphasizes the “ambiguity” of the idea of a practice entirely based on “*expérience*”.<sup>53</sup> “Experience” can mean either the routine of one physician (that is to say some obscure and equivocal opinions), or “the general experience” resulting from physical, chemical, anatomical discoveries and from particular observations of physicians at different times and places. This last meaning of “experience” should forbid one once and for all from simply opposing “Empiricists” praising experience and “Rationalists” despising it:<sup>54</sup> everything depends upon what kind of experience we are speaking of.

As a matter of fact, the relative disconnection between Baglivi’s nosography (or “history of diseases”) and his physiological discoveries is explicitly thematized in *De praxi medica*: Baglivi distinguishes a “*medicina prima*” from a “*medicina* [p. 184] *secunda*”. *Medicina prima* is “nothing else but a most exact description of the phaenomena of every disease, which make up their due and natural history.”<sup>55</sup> In other words, it is mainly medicine for which Baglivi proposes the strict empiricist program of the *De praxi medica*. Nevertheless, it is not reduced to the results of the consultations of one physician: first, as we have seen, it implies the works of two “colleges” of physicians, and, second, it rather notably involves *post-mortem* dissections. As for the *medicina secunda*, Baglivi understands “all that falls within the verge of physics,” and the “curative part,”<sup>56</sup> under this title. This part is “improv’d by other sciences and requires the utmost stretch of knowledge, method and reason.”

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<sup>52</sup> PM, II, II, § 2, p. 213, speaking critically of the observations of the Empirics: “These observations are like so many unsteady waves of fleeting Experience, made upon three or four cases, and not continued in a constant order through hundreds and thousands of patients, as the school of Coos did”.

<sup>53</sup> “Empiricism – practice entirely based on experience. Nothing seems more sensible than such a medicine, but do not let ourselves deceive by the word...” (I translate: “pratique uniquement fondée sur l’expérience. Rien ne paraît plus sensé qu’une telle medecine : mais ne nous laissons pas tromper par l’abus du mot ; démontrons-en l’ambiguïté avec M. Quesnai, qui l’a si bien dévoilée dans son ouvrage sur l’oeconomie animale”), article *Empirisme*, *Encyclopédie*, *op. cit.*, v. 5, p. 587.

<sup>54</sup> We do not mean that such an opposition is always useless, but only that it is enlightening in specific contexts, where the meaning of “experience” and the intellectual motivations of the opposition are made explicit. (See for instance, the Kantian theorization of “Empiricism”, chapter 2.) According to Sophie Roux, there is sometimes a confusion between the empiricism (as opposed to rationalism) and the experimentalism (a doctrine derived from the constitution of natural sciences), – see: “Was there a Cartesian Experimentalism in 1660s France?,” in Mihnea Dobre and Tammy Nyden (eds.), *Cartesian Empiricism*, Dordrecht: Springer, 2013), p. 48

<sup>55</sup> PM, II, II, § 1, p. 210.

<sup>56</sup> PM, I, V, § 4, p. 27.

*Medicina prima*, this part of medicine that is absolutely independent from the other sciences,<sup>57</sup> constitutes the basis of *medicina secunda*, but does not suffice to produce it. This way, Baglivi guarantees the necessity of the history of diseases as an autonomous discipline governed by its own rules and, in the same time, does not admit any insularity of medicine with regards to the other experimental sciences:

As for the *medicina secunda*, or the curative part, I must needs own, that it may be illustrated in several points by the knowledge of other sciences; especially those which bear any affinity to Physicks, or are look'd upon as retainers to it. Such are Chymistry, Botany, the Doctrine of Diet, exercise and the six not natural things, Experimental Philosophy, Anatomy, and other things of that nature which contribute very much toward the perfection of *method*, and a ready view of the indications of cure, even upon the minutest circumstances.<sup>58</sup>

What allows for the connection between medicine and other sciences is a conception of the human body as a natural body obeying the “laws of Nature,” whether it be in its natural state or in a morbid state. Just after the presentation of the *medicina secunda*, which requires “method and reason”, we read as follows:

Some may object against our project that some diseases are the irregular efforts of forlorn nature, endeavouring to throw off the peccant matter without any certain order or rule. But considering that an animated body is a complexion of animal, vital and natural actions, laid concordantly together, and depending upon certain principles subject to the laws of nature, that God has ordain'd; when these principles come through violence or error to depart from their natural state, what motions they put forth to retrieve their primitive state, will be such as are regulated by nature.<sup>59</sup>

This connection between a history of disease and the curative part of medicine related to other sciences is very original. Indeed, at the end of the 17<sup>th</sup> century, we can roughly distinguish between two attitudes toward the connection between medicine, as a practical science, and the sciences supposed to be partly [p. 185] under the jurisdiction of mathematics. Some (rare) physicians, like Kerckring<sup>60</sup> in Holland, or Sbaraglia<sup>61</sup> in Italy, who depicted themselves as *empirical physicians*, esteemed, accordingly to an Aristotelian division of the faculties of the human mind, that the art of healing, like politics, is a divinatory art governed specifically by “prudence” – or pragmatic reason–. That means principally that we cannot reach the certainty of mathematical results in medicine and that we cannot apply the exigency of speculative reason. In other words, it is not the same faculty in the human mind that governs medicine

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<sup>57</sup> PM, I, V, § 5, p. 28: “Now the infancy of Physick, which owes its first nourishment to the history of diseases, cannot be confounded and tyed up to the rules of other sciences, without demolishing the very foundations of the Divine art itself”.

<sup>58</sup> PM, I, V, § 5, p. 28.

<sup>59</sup> PM, II, I, § 2, p. 208.

<sup>60</sup> Theodor Kerckring, *Spicilegium anatomicum*, Amsterdam, 1670, prooemium, p. 2.

<sup>61</sup> See Sbaraglia, *De recentiorum medicorum studio dissertatio*, in Malpighi, *Opera posthuma*, Amsterdam, 1698, p. 258

and the sciences like physics and chemistry. This is the reason why the advances in the art of healing are disconnected from the discoveries realized in experimental sciences (even if anatomy is in question). To be empirical in those cases implies considering that there are no common repercussions, nor any continuity between medicine as a practice oriented towards therapeutic successes, on one hand, and philosophical knowledge of the structure of the human body through experimental or mathematical sciences, on the other hand. Opposed to this position, a great majority of physicians, be it under the influence of Galileo, Descartes or the “experimental philosophy” of the *Royal Society*, considered progresses in natural philosophy to naturally lead to progresses in medicine as an art of healing. This knowledge was generally based on anatomy (including the results of vivisections and compared anatomy), but was also often nourished by discoveries in physics or in chemistry. Even if the progression of the knowledge of the “inner springs” of the human body did not correspond to a true progression of the art of healing at that time, the connection between the two was perceived as just a matter of time: thanks to new physical knowledge, there *will be* some advance in the art of healing.<sup>62</sup> This last conception implies two presuppositions: 1/ animate bodies are governed by the general laws of nature, like every other natural body; 2/ it is possible to reach a certainty comparable to other disciplines in medicine.

Baglivi does not lend weight to any of these two positions. He does not hold the art of healing to depend simply on the progress of the experimental sciences, but he does not condemn others for making connections between these sciences and medicine. There is no gap between practice and theory (since the “curative part” of medicine depends on other sciences). That does not mean, however, that medicine is simply a branch of mathematics, understood as the architectonic science governing all the natural sciences. For these reasons, if Baglivi is not an “empirical physician” [p. 186] according to his own categories, he could be considered an “empiricist” according to our present-day label, mainly because he points out the importance of therapeutic observations irreducible to a physical knowledge of the human body, or to an anatomical inspection of lesions.

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<sup>62</sup> See for instance Nicolaus Steno, *Elementorum myologiae specimen*, in Troels Kardel (ed.), *Steno on Muscles*, p. 85, 87: “Our body is an organism composed of a thousand organs. Whoever thinks that its true understanding can be sought without Mathematical assistance must also think that there is matter without extension, and body without figure”, “And why would it not be permitted to hope for great things if Anatomy was transformed so that experimental knowledge would rely only on well established facts and reason accepted only what has been demonstrated, in other words, if Anatomy used the language of Mathematics?”

As for the theoretical basis of his *De praxi medica*, Baglivi esteems first that the best principles in medicine are common to all sects, according to what Seneca recommends in morality<sup>63</sup>:

Of the precepts for life and manners, those are the best which are publick and common, and universally acknowledg'd by all sectaries, whether Peripateticks, Academicks, Stoicks or Cynicks. The Physicians of this Age, ought to mind that saying of *Seneca's* concerning manners; for the precepts of practice that they give our now adays, are neither general nor common to each sect, namely, the Galenical, Chymical, Mechanical, etc. (as *Hippocrates's* Works are) but are chiefly confin'd to particulars, and not confirm'd by any History or matter of fact.<sup>64</sup>

Hippocrates, depicted as a “Methodist”, apparently provided the best possible medical synthesis for Baglivi, given his theory of “*laxum*” and “*strictum*,” or of relaxation and constriction – two “fundamental pathological phenomena” that would “reveal the dynamism due to the fibrillary structure.”<sup>65</sup> Such a consensual reference to Hippocratic therapeutics allowed Baglivi to introduce his own research on fibers and the recent mechanical discoveries of the Moderns, without appearing to be enlisted in the different modern “sects”:

In this our age [the methodick sect] begins to revive; for the coagulation and dissolution of the fluids, the tension and flaccidity of the solids, to which the moderns attribute the origine of all diseases, is exactly of a piece with the *strictum* and *laxum* of the methodicks; and the practice of the best physicians now in Italy is grounded on the hypothesis of structure and laxity mechanically explain'd; for the understanding of which you ought to read the writings of those learned physicians of *Naples, Rome* and *Pisa*, who have solidly recall'd physick to the mechanical standard.<sup>66</sup>

Therefore, Baglivi's medicine is based on an eclecticism supposedly inspired by Hippocrates<sup>67</sup> and on a few mechanical principles simply considered consensual advances. These minimal assumptions are not depicted here as a speculative commitment to mechanism. On the contrary, they are presented both as a modern adaptation of the Hippocratism required to found a therapeutics and as a rational exigency [p. 187] (“mechanical standard”). As a consequence, Baglivi saw no contradiction between the “Empiric-rational” attitude that he promoted in therapeutics and the mechanical foundations of his physiology. Nevertheless,

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<sup>63</sup> One could find the same kind of argument in Steno's geological treatise, *De solida intra solidum naturaliter contenta*, see *The prodromus to a dissertation on solids naturally contained within solids*, J. G. Winter (trans.), Hafniae, 1968, p. 145: “This, to avoid this reef also, I decided to press with all my might in physics for what Seneca often urges strongly regarding moral precepts; he states that the best moral precepts are those which are in common use, widely accepted, and which are jointly proclaimed by all from every school, Peripatetics, Academics, Stoics, and Cynics... Thus I do not determine whether particles of a natural substance can or cannot undergo change...”.

<sup>64</sup> PM, I, V, § 8, p. 31-32.

<sup>65</sup> François Duchesneau, *La physiologie des Lumières*, The Hague/Boston/London, Martinus Nijhoff, p. 126.

<sup>66</sup> PM, II, VIII, p. 269-270.

<sup>67</sup> See for instance, in *De praxi medica*, the distinction between acute and chronic diseases, or the distinction between several time-periods (birth, progress, or decline of the disease).

according to the *Praxis*, it is necessary to clarify the relationships between physiology and pathology, between therapeutics and physical knowledge in order not to convert the cooperation among sciences into a harmful confusion.

#### IV. Conclusion

In medicine, the adjective “empirical” has very specific, polemical, and often negative, meaning. In any case, it cannot be defined according to our present-day understanding of the “empiricist” epistemology. It is, nevertheless, possible to distinguish at least two kind of attitudes toward the role of “experiences” or toward the “experimental” nature of medicine among physicians: 1/ For those usually designated as “empirical physicians,” the practice of medicine cannot be based on the theoretical knowledge of the human body, nor expect to reach a certainty similar to the one accessible in sciences like physics or mathematics. According to them, there is a discrepancy between, on one hand, procedures of medicine as a practice and, on the other hand, methodological demands of natural sciences like physics. For someone like Sbaraglia, it means that medicine, as a practice, cannot be founded on anatomy, as the knowledge of the inner parts of the human body. Thus, such a position concerns not only the relationships between medicine and other sciences, but also the relationships between therapeutics and, what we would today call, “medical sciences”. 2/ Baglivi illustrates a second kind of attitude toward the role of experiences in medicine and its articulation with experimental – and fundamental – knowledge. Thanks to his original distinction between *medicina prima* and *medicina secunda*, Baglivi does not reduce medicine to the simple practical application of principles from natural sciences or of conclusions drawn from the anatomy of the human body. Nevertheless, he does not absolutely renounce discovering the causes of diseases, nor does he renounce building a sound knowledge of the structure and functioning of natural bodies, which he promotes notably through anatomical pathology and *post-mortem* dissections. Baglivi’s *De praxi medica* provides an interesting synthesis between Baconian methodology, what he calls Hippocratic “Methodism” and modern mechanical philosophy. Such a synthesis could be simplistically qualified as “empiricist” – *i.e.* a position that promotes observations and experimentations, ascribes to “reason” inductive operations while criticizing its creative and speculative powers and refuses to base pathology and clinics mainly on physiology. Beyond these conclusions however, Baglivi’s *De praxi medica* casts doubt on the relevancy of a sharp distinction between, on one hand, the so-called

“iatromechanism,” as assimilated to a branch of the old sect of the “dogmatic” and, on the other hand, “empiricism,” which is supposed to be free from any speculative ambition and to be based only on observations and memory. Why? There are at least four reasons: (a) Baglivi’s qualified positions on reason, on observation and on the articulation between therapeutics and natural philosophy show that none of these criteria is relevant to split physicians into “empiricists” and “rationalists;” (b) the importance of observations and inferences is never identified by Baglivi with an empirical or an empiricist position, notably because observations are useless without the predictive power of a methodic reason; (c) the promotion of a history of diseases based on reiterated observations is never seen by Baglivi as incompatible with the adoption of mechanical principles to account for the most general laws of animate bodies; (d) but above all, when present-day commentators and Early Modern physicians use the dichotomy between “empirical” and “rationalist” in order to discredit what they perceive as oversimplification or dogmatism, there is most often a third group at stake; a group which is depicted as the providential and intelligent – “*litteratam factam*”<sup>68</sup> – solution to sectarianism.

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<sup>68</sup> Baglivi, *De Praxi Medica in Opera omnia*, 1704, p. 167.