

THE STATUS OF BACON IN GASSENDI'S *SYNTAGMA PHILOSOPHICUM* HISTORY OF LOGIC

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Abstract. One trademark of the early-modern period is the tendency to base logic on theory of mind, but so far, this topic has not received close attention. The aim of this paper is to bring some attention to this neglected topic by examining the reference to Bacon in the first part of Gassendi's *Syntagma Philosophicum*. The summary of the *Novum Organum* Gassendi gives in the *Syntagma* shows that he is acquainted with Bacon's perspective on science and that he intends to make use of it to emphasize the epistemic necessity of logic. Not only does he use Bacon's theory of idols to reveal the lack of consistency in Descartes' approach to prejudice in the *Meditationes*, but Gassendi also uses materials from Bacon to define logic in terms of the shaping of intellectual materials which are naturally in disorder. This investigation helps show that building a logic in the 17th century meant setting up a technique which is distinctive because it is applied to an internal, rather than an external, object. Prior to gaining power over external nature, man needs to be able to make use of his intellectual capacities, that is, to have a control over his own nature.

Keywords: History of Logic, Bacon, *Novum Organum*, Gassendi, *Syntagma Philosophicum*, Descartes, *Meditationes de Prima Philosophia*.

Introduction

In the 17th Century, many important philosophers, like Descartes, claim that syllogistic logic is question-begging and does not produce truth. Despite such complaints, the arts of invention are still being taught and researched. Moreover, the discussions about the capacity of formal reasoning to account for scientific discovery, as well as the debates over the reshaping of logic with rhetorical patterns illustrated by Ramus, do not show the lack of interest in logic they are generally taken to show. Logic is seen as a discipline whose legitimacy as a tool for discovery needs to be assessed, and such assessment involves attempts to make sense of the architectonic function traditionally attributed to this branch of knowledge by Aristotle, who sees logic as a set of propaedeutical rules for discourse, and by the Stoics, who treat logic as part of philosophy. So far, close attention to this early-modern attitude toward logic has not been paid.¹ Because history of logic is often conceived in terms of the birth and the development of modern and contemporary formal logic, which is independent of psychology in many respects, it is tempting to reduce the early-modern reformulation of logic to a mere replacement of logic by psychology of knowledge.² The purpose of this paper is to contribute to changing this view by considering the extent to which the reference to Francis Bacon in the *Syntagma Philosophicum* provides Gassendi with a tool for arguing of the epistemic necessity of logic.

It is true that during the early modern period, logic relies on an examination of the operations of the intellect. As a consequence, on the one hand, Bacon's *Novum Organum* is praised in history of logic textbooks as "the first modern attempt to formulate a doctrine of scientific

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method”³, and it is subject to criticism in so far as it does not “suggest any development of logic in that sense of the word which interests us”⁴, that is, in so far as it tends to neglect formal logic in favor of “the new study of a heuristic methodology”⁵ whose conceptual basis has to do more with psychological issues related to the human cognition than with strictly logical matters. On the other hand, Gassendi is commonly neglected by historians of logic: not only is he hardly ever mentioned in history of logic textbooks, but also the very few history of logic articles dealing with Gassendi’s work tend to provide only rough sketches of the theoretical program it contains. One interpretive option is to focus on the controversial aspects of this program. Gassendi can be presented as an opponent to Arnauld and Nicole; someone whose logical doctrine in the *Syntagma*, the *Institutio Logica*, conceptually diverges from the doctrine found in *La logique ou l’art de penser* despite being structurally similar to it.⁶ For instance, although Arnauld and Nicole disagree with Gassendi’s thesis that ideas are images of things, they do base their logic on a theory of ideas, like Gassendi, and they divide their logic into four parts, dedicated to the four operations of the mind: idea, judgment, reasoning and order. However, in this interpretive framework, the fact that *La logique* is a very well-established textbook, whose editorial success shows that something does happen in logic in the 17th Century, and the fact that this book deserves the attention of both historians and logicians⁷, seem to render insignificant Gassendi’s contribution to the logic of ideas. Another interpretive option is to emphasize Gassendi’s influence on Locke’s “way of ideas”⁸. Although considering Gassendi as a source of British empiricism makes his philosophy relevant from an archeological point of view, it does not pave the way for research on his approach to logic, in so far as in the tradition of British Empiricism, logic does not seem to have traditional features, because it is connected both to a semiology and to theory of knowledge issues. In light of this background, in order to make sense of Gassendi’s assessment of Bacon’s logic, it may be useful to provisionally bracket the complexities relating to the reception of Gassendi’s logic. I will concentrate on placing Gassendi in the general context of the history of ideas and cultural representations and will try to provide a historical reconstruction of the terms he uses in presenting the task of logic.

I will defend the claim that in his concern to weigh Bacon’s merits, Gassendi provides a justification for founding logic on a theory of mind in terms of technique. Bacon had contended that just as men entrusted with the task of transporting an obelisk to a celebration would use machines to help them, a mind eager to make discoveries and access truth will forge tools to help it grasp things.⁹ I will point out that Gassendi refers to this machine analogy in connection with an epicurean-oriented, critical assessment of the capacity of nature to give norms to logic. Through these images and in the course of this assessment, Gassendi intends to define logic in terms of the analysis of techniques which supply valid forms of thought, and he also tries to determine whether syllogism is really the only good technique. I will begin by describing the way Gassendi refers to Bacon in the *Syntagma*, and then try to show that Gassendi employs the figure of Bacon in his discussions of logic for two kinds of reasons: polemical reasons, in connection with Gassendi’s critical analysis of Descartes’ metaphysics, and conceptual ones.

The evaluation of Bacon’s logic

Bacon is mentioned in the first of the two books of the *Syntagma Philosophicum*. The first book of the *Syntagma*, “De Logicae Origine et Varietate”, is dedicated to history of logic, and a chapter on Bacon’s logic follows a set of eight chapters on the logic of predecessors like Zeno of Elea (chapter two), Euclid and the Megarics (chapter three), Plato (chapter four), Aristotle (chapter five), the Stoics (chapter six), the Epicureans (chapter seven), Lull (chapter eight) and Ramus (chapter nine). The chapter on Bacon’s logic comes before a chapter entitled “Logica Cartesii” (chapter eleven). In the last chapter of the second book of the *Syntagma*, “De Logicae

Fine”, Gassendi addresses the epistemological issue of the extent to which the empirical instantiations of logic he has evoked in the first book of the *Syntagma* have managed to achieve the goal of logic: the pursuit of truth thanks to the use of rules for thinking well, where “thinking well” encompasses imagining, judging, reasoning, and ordering thoughts well.¹⁰ In this framework, he refers to Bacon again and underlines the conceptual importance of Bacon’s logical project. In other words, Gassendi’s study of Bacon’s logic almost terminates a history in which the main thinkers of medieval logic, from Boethius to Ockham, from Averroès to Aquinas, are not considered individually, since they are all seen as simply perpetuating Aristotelian views about logic¹¹. In short, Gassendi adopts a non-technical approach to the history of logic; Gassendi does not comment on the progressive rediscovery of the Aristotelian corpus, even though such rediscovery plays a prominent part in the growth of medieval logic, nor does Gassendi remind the reader of the numerous logical developments introduced in the Middle Ages which, strictly speaking, make it impossible to identify Aristotelian logic and medieval logic. Gassendi oversimplifies medieval logic because he intends to focus on a scholastic *doxa* according to which Aristotle would be the inventor of logic¹². This approach enables him to shed light on non-Aristotelian forms of logic in Antiquity like those documented in Diogenes Laërtius’ *Lives and Opinions of Eminent Philosophers*. It also leads him to focus on Lull, Ramus, Bacon and Descartes, who all describe the divergences between their approaches and Aristotle’s. In these discussions, Gassendi underlines the value of Bacon’s work: it is physic-oriented and is also directed towards truth and a genuine knowledge of things¹³. Thus, Bacon’s almost final position in Gassendi’s history of logic is not just a matter of chronology: it also suggests that Gassendi thought that Bacon had provided one of the best options developed in the field of logic so far.

To see why Gassendi made such a valuation, it is necessary to look at the summary Gassendi gives of Bacon’s logic in the tenth chapter of “De Logicae Origine et Varietate”. There, it seems that the famous Lord Chancellor is remarkable because he tries to get a knowledge of nature¹⁴ using a new method, one based on a scientific, rather than a dialectical, approach to logic. That is, the logic Bacon advocates is useful in practice because it aims to extend knowledge, not just to systematize the presentation of knowledge¹⁵. Bacon develops his new logic in the second of the six parts of the *Instauration Magna*, his philosophical project, and Gassendi just reminds his reader of the titles of the other parts before focusing on the part that is most relevant for his purposes. Gassendi is acquainted with the diversity of Bacon’s texts, and refers to *De Augmentis*, *Parasceve*, *Historia Ventorum* and *Historia Vitae et Mortis*¹⁶, but he wants to focus on two other tasks: showing how logic (the only part of Bacon’s program for the advancement of logic that is complete) is pivotal in that program, and examining how Bacon’s thinking contributes to the field of logic in general.

Making use of a claim taken from Bacon’s *Distributio Operis*, Gassendi indicates that the differences between the *Novum Organum* and the teaching of conventional Aristotelian logic may be understood as differences as to the purpose of logic, the order of demonstration, and the starting-point of research. Gassendi stresses Bacon’s promotion of a non-dialectical use of topics, of a non-syllogistic pattern of reasoning, and he insists on the legitimacy of the doubts the Lord Chancellor casts on the capacity of the primary notions of the mind to provide solid principles. Gassendi gives two quotations in order to illustrate Bacon’s view. The first, which comes from the *Novum Organum*’s preface, affirms the necessity of rethinking the processes of the acquisition of knowledge.¹⁷ The second, which is an excerpt of the aphorism 97 of the first book of the *Novum Organum*, claims that nobody has ever undertaken this task so far.¹⁸ To choose these texts is to present Bacon as the herald of a new application of logic to science, on the assumption that the advancement of sciences requires a re-arrangement of the mind’s materials. Accordingly, Gassendi makes a very brief outline of the idols, following their order of exposition in Bacon’s

text, in order to make it clear that the conceptual tools needed to obtain solid knowledge are developed in view of a general criticism of the mind's spontaneous way of working.

The fact that Gassendi endorses an epistemological reading of Bacon's logic leads him to mention the theoretical and practical features of knowledge of nature in the *Novum Organum*, but it also prompts him to give a complete and precise account of the true induction forming process, which Bacon presents as the key to interpretation in the second book of his text. Gassendi begins with exposing the first logical steps of the Baconian induction, with enumerating the table of presence, the table of absence, and the table of comparison. He does not define these devices, but merely illustrates them with the Baconian example of the investigation of the form of heat. This reminds his reader of the different types of phenomena Bacon considers within the framework of the tables. Then Gassendi, having designed exclusion as a first attempt at interpreting nature, concludes his summary of Baconian induction by referring to the *Novum Organum* definition of heat in terms of expansive motion and to the ways of producing this form by quoting directly from Bacon's work¹⁹. After that, Gassendi lists the twenty-seven prerogative instances given in the second book of the *Novum Organum* as the second stage of the inductive procedure. That is, he presents them as practical guides which, like topics, enable one to seek out the most informative kinds of case and to avoid dead-ends. Except for the crucial instances, whose definitions he gives precisely, Gassendi merely lists all the prerogative instances and illustrates them all very briefly. However, unlike Bacon²⁰, he says nothing of the involvement of natural and experimental history in this process of interpreting nature²¹, and furthermore, he does not comment on Bacon's reflections on matter²². Also, rather than repeating Bacon's conclusion in the *Novum Organum* that logic is a way of pursuing natural philosophy, he ends his summary of Bacon's logic by alluding to the other aids to the understanding Bacon mentions in Aphorism 21 of the Second Book of his text, but without providing us with any details of these other aids. Because he wants to shed light on its logical structure, and because he wants to suggest that this book is characterized by its systematicity, Gassendi does not mention the fact that the *Novum Organum* remains unfinished.

Although Gassendi emphasizes that Bacon's logic is intended to enable one to engage with nature, when he assesses it in the end of "De Logicae fine", he does not concentrate on the fact that it is effective in the framework of an experimental physics. Instead, Gassendi's purpose is to determine the extent to which the *Novum Organum* is of help to the development of *his* logic, a logic defined as a means for imagining, judging, reasoning, and ordering thoughts well. Gassendi begins by saying that Bacon's theory of idols makes it possible to form new notions and ideas in so far as that theory is based on the rejection of prejudice. Then, he shows the merits of Bacon's theory of judgment, showing how it enables one to properly form axioms on the grounds of a methodical abstraction. He adds that Bacon's approach to reasoning is incomplete. According to Gassendi, Bacon's approach falls short in the following ways: in focusing on induction, Bacon forgot that syllogism is central to any act of reasoning, and Bacon also made a mistake concerning induction. While defending induction, Bacon did not acknowledge that the logical strength of an induction relies on a syllogistic kind of assumption: that all the instances that could have been enumerated have been enumerated and that it is not possible to find a counter-example.²³ In this passage, in his concern with testing the conformity between Bacon's approach to logic and his own understanding of the task of this discipline, Gassendi does not to elaborate on the status of experimentation²⁴ and so ends up only shedding some light on Bacon's logic. How can he do so and yet, at the same time, claim its importance? What does Gassendi's reference to Bacon stand for?

Using Bacon's logic as a tool to analyze Descartes' metaphysics

It is clear that Gassendi uses the *Novum Organum* as a key to make sense of Descartes' *Meditationes de Prima Philosophia*: in the first part of the *Syntagma*, not only does the chapter on Descartes' logic crucially involve a comparison between Bacon and Descartes, but Gassendi also points out that Descartes' work is inferior to the Lord Chancellor's work.²⁵ Gassendi's position is that Descartes is like Bacon, in so far as he attempts to set up a philosophy with new groundings and in so far as he intends to dissolve any prejudices against such a project. However, it is far from being certain that Bacon and Descartes share the same philosophical project²⁶. Thus, why is Gassendi concerned with presenting Descartes as an imitator of Bacon²⁷? When he describes "Descartes' logic", he begins by claiming that while Bacon turns to real things in order to make intellectual thought more perfect, Descartes does not even reflect upon things, but instead takes thought to be reliable enough to attain all by itself a perfect knowledge not only of bodies, but of abstract things like God and soul²⁸. Gassendi then adds a long passage directly copied from his *Disquisitio Metaphysica*²⁹ and whose function is to provide a sort of *compendium* of the *Meditationes*. Could his reference to Bacon provide Gassendi with theoretical reasons for his discussion of Descartes' metaphysics?

First, to posit the *Novum Organum* as a conceptual tool designed to assess the *Meditationes* amounts to minimizing the *Meditationes*' metaphysical scope. In doing so, Gassendi tackles an issue which is of big concern to those in Cartesian circles after Descartes dies. In this context, Cartesian philosophers are very eager to facilitate the circulation of Cartesian philosophy. One of the strategies they adopt is to give it the shape of a system, that is, to divide it into a logic, a physics, a metaphysics, and a morals, following the general pattern of Scholastic handbooks. But how can this strategy be successful, since there is no logic written by Descartes? There are two options. One is to take *La logique ou l'art de penser* to be Descartes' logic, and to insert a summary of this book in sort of scholastic-like presentations of Descartes' philosophy.³⁰ The second option is to label some Cartesian texts as "logic." As Baillet points it out in his *Vie de Monsieur Descartes*³¹, those who think that Descartes' logic is to be found in his published texts may want to refer either to the *Discours de la méthode* (that is his position and Poisson's, as is evident in his 1670 *Commentaires ou remarques sur la méthode de monsieur Descartes*), to the *Géométrie* (Van Schooten adopted this view in the framework of his Latin edition of this text), or to the *Meditationes* (that is Gassendi's view). Baillet also suggests that someone supporting the claim that Descartes' logic is located among his unpublished texts could resort to *De l'érudition*, an unfinished lost text Father Rapin refers to in his 1676 *Réflexions sur la philosophie ancienne et moderne et sur l'usage qu'on en doit faire pour la religion*. Such diversity of positions is somehow confusing, for it is not easy to understand how the seeds of Descartes' logic can be at the same time in the framework of his method and in the framework of his metaphysics. In any case, Gassendi, in putting the *Meditationes* in the light of the *Novum Organum*, provides his reader with some grounds for doubting that Descartes actually conducts a metaphysical project in this book. In a way, to give foundations to the search after truth, which is what Descartes is concerned to do in the *Meditationes*, is to accomplish the goal of logic as it is presented in the *Syntagma*, and as it is already illustrated by Bacon's project.

Second, Gassendi refers to the *Novum Organum* while commenting on Descartes because he thinks logic should rely on a theory of mind which can be opposed in many ways to Descartes' theory of mind. He reads the "logical principle" delivered by the *Meditationes* and according to which "all that I conceive of clearly and distinctly is true"³² in the light of this background. Gassendi sees the general rule for truth put forward in *Meditation Three* as a criterion of truth with which any reasoning has to conform. It is as if Descartes wanted to replace the metaphysical approach to truth presented by scholastic logics, an approach couched in terms of adequacy between language and reality, with an epistemological approach to truth according to

which what is contained in a clear and distinct idea can be affirmed. Still, Gassendi, unlike Arnauld and Nicole in *La logique ou l'art de penser*³³, takes this criterion to be irrelevant. According to Gassendi, Descartes is not very convincing when he tries to prove his rule of truth by saying that God exists, that God is not a deceiver, that God has put in us the idea of God, and that being the cause of everything He is also the cause of what is clear and distinct. Gassendi also complains that Descartes' reasoning is very confusing because he asserts both that it is reasonable to treat what is clear and distinct as true, and that it may happen that what seems to be clear and distinct is actually completely false.³⁴ In other words, according to Gassendi, Descartes' conception of clarity and distinctness in non-formal terms leads him to focus on what is merely a subjective experience, and furthermore, Descartes' attribution of an objective value to this potentially-misleading experience is contradictory. Gassendi had defended this thesis in the *Disputatio Metaphysica*, where his opposition to Descartes' attempt to find essential truths from within his own thought led him to reduce Cartesian metaphysics to a particular method of thought.³⁵ Now, the fact that Gassendi connects this claim to a comparison between the *Meditationes* and the *Novum Organum* shows that in Gassendi's eyes, not only is the reduction of metaphysics to a psychological logic problematical, but also the theory of mind which supports this operation is highly questionable. In the context of the modern approach to the problem of knowledge, to know something from the viewpoint of a subject amounts to forming ideas, that is, mental representations, about a thing, which are mechanically provoked by the perception of the thing and which can, under certain conditions, account for it. The truth-value of these ideas is addressed within metaphysical and logical research on the foundations of science and the basis of scientific discourse. In this framework, Descartes' project is problematical according to Gassendi: how can one argue, without a proper inquiry into their origin, that ideas, derived directly from the mind, are capable of giving access to both the world that surrounds us and the metaphysical principles that help structure the world? In the *Meditationes*, the part played by sensation in the forming of ideas is completely undermined. In addition to this, whereas Descartes considers the cognitive power of the mind and the mind's many ways of applying itself different fields of study, he does not even try to determine how thought is expressed by words. In doing so, he behaves like a dogmatic philosopher, that is, unlike Bacon, whose appeal to external things is praised by Gassendi. One could say that this set of assumptions formulated by Gassendi somehow gives a distorted image of Cartesian philosophy. In any case, it does show that Bacon's logic provides Gassendi with materials for his reflection upon what should be the starting-point of a genuinely scientifically productive logic. Accordingly, in the third part of this paper, I will examine the extent to which the reference to Bacon shapes the field in which Gassendi builds his own logic.

The use of Baconian materials: a way to shape logic

To report a precursor's opinions on a topic before tackling that topic oneself is in many ways to adopt a traditional philosophical writing style. But this way of writing is also very informative: it enables the reader to know the particular cultural and historical context from which an author's thought stems and, to a certain extent, it can help the reader understand how the author establishes the conclusions he reaches. The reference Gassendi makes to Bacon illustrates this phenomenon.

First, Gassendi's theory of ideas is at stake in his discussion of Bacon's logic. Gassendi points out that Bacon formulated a new theory of notions in reaction to a logic that takes its first principles on trust, and then he suggests that Descartes, in his search for solid principles, may have been thinking under the influence of Bacon. By directing his readers to Bacon's reaction and to a possible parallel in Descartes' thinking, Gassendi makes it clear that a detailed and precise

study of ideas within the field of logic is required. From Aristotle to Kant, a commonly held view is that logic is divided into the study of conception, judgment, reasoning, and sometimes method, in so far as these intellectual operations produce concepts, propositions, arguments, and even order. In this framework, the focus is usually on judgment, because it is a truth bearer, and on reasoning, whose valid forms are presented. In other words, ideas do not seem to be prominent since, unlike judgments, they pave the way for, but are not themselves taken to be, truth bearers. However, should somebody be ignorant of the rules one can use to correctly form mental representations, she cannot but make false judgments. To a certain extent, Bacon's efforts to clear the floor of the mind make it conceptually possible for Gassendi to focus on ideas in the first part of his *Institutio Logica*. There, in order to explain imagining well, that is, in order to give an account of how the true image of the thing is formed and is present to the mind³⁶, he needs to determine, for example, whether an idea formed by the senses is more perfect than an idea based on a description heard or seen at some point³⁷. In a way, he almost applies to ideas Bacon's treatment of the scholastic procedures for finding principles. In his concern with doing so, he does not confuse logic with psychology: once he has shed light on the materials the mind can legitimately make use of, he studies the formal conditions under which this use can actually be made.

Moreover, not only is Gassendi influenced by Bacon's critical empiricism, but he also shares the Lord Chancellor's view that the function of logic is to reinforce a mind whose spontaneous activity may prevent it from accessing truth. Accordingly, like Bacon, he addresses the problem of the capacity of nature to provide logical norms. This problem was raised by ancient philosophers when the Stoics and Epicureans established a dialectical connection between exterior nature and the internal nature of man. According to the Stoics, nature's benevolence toward man justifies giving assent to an evident thing present to the mind, since there is a natural harmony between him and true cataleptic representations, but nevertheless, it is necessary to follow the rules of dialectics and rhetoric in order to actually obtain truth. According to the Epicureans, who conceive of nature in non-teleological terms, canonic, which paves the way for philosophical doctrine, consists in the actualization of the mind's natural capacity to know things using sense-data. As a consequence, in this context, we find neither a theory of judgment nor a theory of reasoning. This is different from the Stoic tradition. So it seems that the Stoics and Epicureans offered two distinct paradigms for making sense of the forming of man's reason: according to one, a formal and a systematic set of rules is needed, but according to the other, nature is treated as the best guide in the search after truth and the art of logic is reduced to a mere adjuvant. Gassendi is very well acquainted with Epicureanism. Correlatively, in the beginning of the *Syntagma*, he makes use of the distinction between natural logic and artificial logic and he insists that the prestige of the Stoics' dialectic is exaggerated³⁸. To a certain extent, Gassendi's promotion of Bacon is consistent with this attitude, as his definition of logic as "the art of thinking well"³⁹ (*ars bene cogitandi*) makes it clear. The use of the adverb "well", which will be discussed by Arnauld and Nicole in the Second Discourse of *La logique ou l'art de penser*⁴⁰, is justified by the presupposition that thought (*cogitatio*) is the natural work of the mind and that the role played by logic is to force the mind into an orderliness it would not otherwise have had. As Gassendi later points it out, logic is like agriculture in so far as agriculture orders the growth of plants which otherwise would be left at random.⁴¹ To characterize logic as an effort to support the mind by strengthening what in its own nature thus enabling it to access truth is at the same time epicurean-oriented and Baconian, since Bacon also reflects upon the legitimacy of the intervention of nature in logic⁴².

Lastly, in his effort to define the task of logic, Gassendi makes use of the metaphor of machines, which plays an important part in the *Novum Organum*. As a matter of fact, Bacon

presupposes that the mind can be tooled up only on the basis of knowledge of its natural operations, and he puts forward many mechanical analogies in order to reinforce this claim. Gassendi's view is similar: according to him, reasoning is natural to the mind in the same sense as breathing and seeing are natural operations⁴³. In this view, the role of mechanism is to render more efficacious the processing of whatever raw materials naturally present to the mind. This similarity between Bacon and Gassendi may not be accounted for in terms of a direct influence of Bacon on Gassendi, although what Gassendi says about the *Novum organum* suggests that he knows this book firsthand. This similarity makes sense in itself as it gives access to the terms according to which logic was conceived of in the 17th Century. It is precisely because logicians think of techniques as means through which nature can be strengthened, not because they mix up logic and psychology, that they base their rules of thinking on theories of mind.

Conclusion

In my concern to try to understand the status of the Bacon chapter of Gassendi's history of logic in methodological terms, I have defended the hypothesis that this chapter enables the reader of the *Syntagma* to catch a glimpse of what building a logic could mean in the 17th Century. If logic gives order to intellectual materials which are naturally in disorder, then it is a technique which is peculiar in that it is applied to an internal object, not to an external one. Prior to gaining power over external nature, and even in order to achieve such an objective, man needs to be able to make use of his intellectual capacities, that is, to have a control over his own nature.

By raising the problem of technique here, I intend to call the attention to the beliefs and concepts which underlie and support some logicians' projects in the 17th Century. In doing so, I do not want to deny that early-modern logic is psychologistic; I just want to say that these logicians do not see themselves as dealing with the psychology of knowledge. In connection to this, the fact that Gassendi refers to Bacon's *Novum Organum* is significant in many respects. First, it sheds light on the fact that Bacon's logic is known in Europe in the 17th Century. Second, Gassendi's emphasis on Bacon's doctrine of idols and on Bacon's attempts to provide the mind with new tools contributes to the building of a standard 17th Century framework for thinking about logic. This use of the reference to Bacon is so widespread that it even touches Cartesian circles. For instance, Clauberg's *Logica vetus et nova* (1654, 1st edition) is based on a partially Baconian theory of mind in so far as it evokes the idols. In the *Praemium*, Clauberg does not account for error only in Cartesian terms, that is, by referring to the forming of prejudice during childhood (§17-80), since he also refers to the idols of cave (§91-93), of the marketplace (§83-86) and of the theater (§87-90).⁴⁴ A Cartesian, Clauberg also uses Baconian materials, acting as if it is possible to turn to both Bacon and Descartes in thinking about issues in the theory of knowledge and logic. Lastly, Gassendi's text, which makes room for Bacon in the history of logic, gives some perspective to the fact that contemporary history of logic textbooks hardly ever mention him and say almost nothing of Bacon. It suggests that this absence may be due to some change in the standards of historiography rather than to some intrinsic lack of relevance of Bacon and Gassendi to issues in logic.

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References

- ¹ Ashworth, E. J., *Language and Logic in the Post-medieval Period* (Dordrecht-Boston: D. Reidel Publishing Company, 1974), ix.
- ² Bochenski, I. M., *Formale Logik* (Freiburg, München: Verlag Karl Alber, 1956), 298; Kneale, W., Kneale, M., *The Development of Logic* (Oxford: Clarendon Press, 1962), 310; Risse, W., *Logik der Neuzeit* (Stuttgart/Bad

Canstatt, Frommann: Friedrich Frommann Verlag, 1970, vol.2), 30-47.

³ Kneale, W., Kneale, M., (1962), 309.

⁴ Kneale, W., Kneale, M., (1962), 310.

⁵ Kneale, W., Kneale, M., (1962), 310.

⁶ Michael, F., “La place de Gassendi dans l'histoire de la logique”, *Corpus* 20/21 (1992): 9-36.

⁷ Auroux, S., *La logique des idées* (Montréal-Paris: Bellarmin, Vrin, 1993).

⁸ Yolton, J., “Locke and the Seventeenth-Century Logic of Ideas”, *Journal of the History of Ideas* 16 (1955): 431-452 ; Michael, F., Michael, E., “The Theory of Ideas in Gassendi and Locke”, *Journal of the History of Ideas* 51 (1990): 379-399.

⁹ Bacon, F., *Novum Organum*, trans. M. Malherbe and J. M. Pousseur (Paris: PUF, 1986), 94-95.

¹⁰ Gassendi, P., *Syntagma Philosophicum (Petri Gassendi Opera Omnia in Sex Tomos Divisa Tomus Primus, 1658)*, 86-87.

¹¹ Gassendi, P., (1658), 56.

¹² Gassendi, P., (1658), 37.

¹³ “[...] logica Verulamii tota, ac per se ad Physicam, atque adeo ad veritatem, notitiamve rerum germanam habendam contendit.”, Gassendi, P., (1658), 90.

¹⁴ Gassendi, P., (1658), 62.

¹⁵ Still, it is true that in his concern with doing so, Bacon takes up issues which specifically belong to dialectics and in particular to dialectical theories of method. See Jardine, L., *Francis Bacon: discovery and the arts of discourse* (Cambridge: Cambridge University Press, 1974).

¹⁶ “Quod ex istis autem perfecit, Proemialibusque subiunxit, sola est Pars Secunda ; nisi quod primam supplere potest, quem egregium de *de dignitate et augmento scientiarum* Tractatum conscripsit, et de Tertia tum Parascevem quaedam, et simul Catalogum historiarum naturalium, experimentaliumque conficiendarum exhibuit ; tum ipse confecit paucas aliquas ; praecipueque *Historiam Ventorum et Historiam Vitae et Mortis*. “ Gassendi, P., (1658), 63. Neither is the *New Atlantis* mentioned nor are Bacon's moral texts.

¹⁷ “[...] nam restat, inquit, *unica salus ac sanitas, ut opus entes universim de integro resumatur*.“ , Gassendi, P., (1658), 63. The text put in italics is a quote taken from Bacon, F., (1986) 94.

¹⁸ “[...] atque idcirco queritur, quod *nemo adhuc tanta menti constantia, et vigore inventus sit, ut decreverit, et ubi imposuerit Theorias et notiones communes penitus abolere et intellectum abrasum et aequum ad particularia de integro applicare*.” Bacon, F., (1986) 63. The text put in italics is taken from Bacon, F., (1986), I 97, 157.

¹⁹ “*Si in aliquo corpore poteris excitare Motum ad se dilatandum, aut expandendum, eumque motum ita reprimere, et in se vertere, ut dilatatio illa non procedat aequaliter, sed partim obtineat, partim retundatur ; procul dubio generaris calidum*.” Gassendi, P., (1658), 64. See Bacon, F., (1986), 227.

²⁰ Bacon, F., (1986), II 32, 247.

²¹ Bacon, F., (1986), 10, 195 and II 14, 216.

²² Bacon, F., (1986), II 48, 313.

²³ Gassendi, P., (1658), 90.

²⁴ Bloch, O., *La philosophie de Gassendi. Nominalisme, matérialisme et métaphysique* (La Haye: Martinus Nijhoff, 1971), 51-52.

²⁵ Gassendi, P., (1658), 65 and 90.

²⁶ Lolordo, A., “Descartes ‘one rule of logic’: Gassendi’s critique of the doctrine of clear and distinct perception”, *British Journal for the History of Philosophy* 13 (2005): 51.

²⁷ “Is videlicet Verulamium ea in re imitatus est, quod novam quoque Philosophiam a fundamentis excitaturus, omne omnino praejudicium exuere inprimis voluit ; ac invento subinde quopiam Principio solidissimo, ipsi ut fundamento super-exstruere totam molem.”, Gassendi, P., (1658), 65.

²⁸ “[...] cum Verulamius auxilia a rebus ad perficiendam Intellectus cogitationem petierit, ipse omni rerum cogitatione ablegata censuit in ipsa cogitatione satis esse praesidii, ut Intellectus possit vi sua in omnium rerum etiam abstrusissimarum, hoc est non modo corporum, sed Dei etiam, ac Animae notitiam perfectam venire.”, Gassendi, P., (1658), 65.

²⁹ Gassendi, P., *Disquisitio Metaphysica*, trans. B. Rochot, (Paris: Vrin, 1962), 287b-289a, 76-80 ; Rochot, B., “Gassendi et la ‘Logique’ de Descartes”, *Revue philosophique de la France et de l'étranger* 145 (1955): 300-308.

³⁰ Ariew, R., “Descartes, les premiers cartésiens et la logique”, *Revue de Métaphysique et de Morale* (2006) :55-71.

- ³¹ Baillet, A., *Vie de Monsieur Descartes, Première Partie* (Hildesheim: Olms, 1972), 281-283.
- ³² Gassendi, P., (1658), 90.
- ³³ Arnauld, A., Nicole, P., *La logique ou l'art de penser*, 2nd edition (Paris: Vrin, 1993), IV 6, 317-318.
- ³⁴ Gassendi, P., (1658), 90.
- ³⁵ Gassendi, P., (1962), 210-211. See Bloch, O., "Gassendi critique de Descartes", *Revue philosophique de la France et de l'étranger* (1966): 223.
- ³⁶ "Bene imaginari; hoc est legitimam, ac veram cujusque rei imaginem animo praeconcipere, et quoties quampiam rem cogitamus, ad hanc hujusmodi illius imaginem attendere." Gassendi, P., (1658), 33.
- ³⁷ This is Rule X of the first part of Gassendi's *Institutio Logica*, (1658), 96.
- ³⁸ Gassendi, P., (1658), 52.
- ³⁹ Gassendi, P., (1658), 32-33.
- ⁴⁰ Arnauld, A. and Nicole, P., (1993), 27.
- ⁴¹ Gassendi, P., (1658), 33.
- ⁴² It is true anyhow that since Bacon is not an atomist the compatibility between his philosophy and the Epicurean philosophy remains limited.
- ⁴³ Gassendi, P., *Letter to Reneri September 6th of 1630*, VI, 37b, mentioned by Bloch, O., (1971), 36 footnote 36.
- ⁴⁴ Clauberg, J., *Logica Vetus et Nova*, trans.G. Coqui and J. Lagrée (Paris: Vrin, 2007), 47-49. Clauberg's silence on the idols of the tribe is probably due to the fact that he identifies it with Descartes' theory of prejudice presented in the first part of the *Principia Philosophiae*.