

BACON'S *NOVUM ORGANUM*: “THE MARRIAGE BED BETWEEN THE MIND AND THE UNIVERSE”*

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Dan Garber's paper provides materials permitting to reply to an objection frequently made to the idea that the *Novum Organum* is a book of logic, as the allusion to Aristotle's *Organon* included in the very title of this book shows it is. How can Bacon actually build a logic, considering his repeated claims that he desires to base natural philosophy directly on observation and experiment? Garber shows that in the *Novum Organum* access to experience is always mediated by particular questions and settings. If there is no direct access to observation and experience, then there is no point in equating Bacon's focus on experience in the *Novum Organum* with a rejection of discursive issues. On the contrary, these are two sides of the same coin. Bacon's articulation of rules for the building of scientific reasoning in connection with the way the world is, illustrates his massive concern with the relation between reality, thinking and language. This concern is essential in the field of logic as it is constructed in the Early Modern period.

Keywords: logic, Aristotle, experiment, thought, language

«НОВЫЙ ОРГАНОН» БЭКОНА: «БРАКОСОЧЕТАНИЕ РАЗУМА И ВСЕЛЕННОЙ»

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В статье Дэниела Гарбера приводятся сведения, позволяющие ответить на возражение, часто выдвигаемое против того, что «Новый Органон» – это книга о логике, к чему подталкивает отсылка к "Органону" Аристотеля в названии книги. Как же Бэкон может построить логику, если он неоднократно заявляет о том, что желает основывать естественную философию непосредственно на наблюдении и эксперименте? Гарбер показывает, что в «Новом Органоне» доступ к опыту всегда опосредован конкретными вопросами и установками. Если нет прямого доступа к наблюдению и опыту, то нет смысла приравнивать сфокусированность Бэкона на опыте к отказу от дискурсивных вопросов. Напротив, это две стороны одной медали. Формулировка Бэконом правил построения научных рассуждений в связи с тем, как устроен мир, указывает на его глубокую озабоченность отношением между реальностью, мышлением и языком. Эта озабоченность имеет существенное значение для логики в том виде, в каком она сложилась в эпоху раннего Нового времени.

Ключевые слова: логика, Аристотель, эксперимент, мышление, язык

* [Bacon, 2004, p. 36]. I wish to thank Isabelle Gérardin for her help with the English language suggestions.



In “Bacon’s Metaphysical Method”, D. Garber addresses the concept of scientific method as it is articulated in the first twenty aphorisms of the second book of the *Novum Organum*. In this framework, once Bacon has exposed what he holds the scientific knowledge of nature to consist in, he gives an outline of the method he sets out for “interpreting nature”, as he puts it [*Novum Organum* II 26]¹, prior to illustrating it with the example of the investigations of the form of heat. So Garber focuses on the pages of the *Novum Organum* Bacon dedicates to the concept of induction. His purpose is to show that Bacon does not conceive this method as “a neutral and presuppositionless procedure for decoding all aspects of the world”, but as being “deeply intertwined with non-trivial details of his natural philosophy”. In other words, Garber is concerned with determining the reason why a method relies on already constituted elements of doctrine, if it has a propaedeutic role. He tackles the following issue: if the function of method is to make the building of a scientific knowledge of nature possible, what is the point in connecting it from the start with substantive assumptions about matter and body, that is, with the ingredients of nature? As Garber puts it, Bacon’s point is that “the investigation of nature can only take place if we make assumptions about what we are looking for, and what we are going to do with it, and these will involve assumptions about the nature and the aims of inquiry”. Garber calls “*methodical anticipations* or a *methodological a priori*” the assumptions brought to the method in the *Novum Organum*.

To begin with, Garber contributes to a welcome reappraisal of the *Novum Organum*’s legacy, with the choice he makes to focus on its second book. Why is that so? So far the *Novum Organum*, famously interpreted as promoting philosophical modernity, has often been included in history of philosophy narratives without being properly read. First of all, its being attributed a prominent part in the building of Early Modern philosophy has generally served as a means mean to overcome a historical tunnel vision singling out Descartes as the exemplary 17th-century author concerned with novelty within the field of philosophy. While this reading strategy of the *Novum Organum* obviously makes sense, it is also problematic in that it has neither been associated with, nor been grounded on attempts to provide a systematic and complete account of this book². This is not to say, indeed, that interpretive hypotheses about the content and the status of the *Novum Organum* within Bacon’s philosophical project, the *Instauratio Magna*, have not been put forward. For instance, light has been shed on the passages of book one of the *Novum Organum* where a case is made for the necessity to banish received ideas from the realm

¹ References to the *Novum Organum* are given in the text by book number and aphorism number.

² On the Idols of Baconian scholarship and the ‘Blind-spots’ in Bacon Studies, see [Jalobeanu, 2015].



of philosophical activity, and where the pursuit of knowledge is addressed as a process taking the form of regimens for the entire mind³. A representative illustration of this pedagogical side of the *Novum Organum* is provided by Bacon's celebrated doctrine of the idols, attributing the impediments to true science to the ill-ordered predispositions of the mind, the dogmas of the philosophers and the commonly accepted laws of demonstration. To be sure, a close consideration of Bacon's pedagogical writing style and of the full typology of the idols provided by the first book of the *Novum Organum* is, indeed, critical to an accurate understanding of what makes the originality of this work, taken as a whole: the will of its author to change his reader's way of thinking [Corneanu, Forthcoming]. However so far, this study has not been complemented with systematic investigations into the purpose and the structure of the second book of the *Novum Organum*. As such, the latter part of this book has been almost totally neglected, over nearly 400 years of Bacon scholarship. For instance, in the introduction of the most recent translation of the *Novum Organum* into French to this day (1986), while Malherbe and Pousseur, the translators, systematically detail both the content and the structure of the first book, they remain very allusive as regards the second book. Once they have claimed that this section is "essential reading", they do not elaborate on what makes it so [Bacon, 1986, p. 31]. They do emphasize that the conceptual unity of the *Novum Organum* can only be grasped if one has in mind that this work is structured according to a *destruens/construens* dialectics. As a matter of fact, Bacon calls the first book of the *Novum Organum* a *pars destruens* [*Novum Organum* I 115] because he believes that it is necessary to finish purifying and purging the mind before setting forth "the true way to the interpretation of nature" [*veram interpretandae Naturae viam*, *Novum Organum* I 69]. But in the presentation given by Malherbe and Pousseur, the dialectical continuity between the two books of the *Novum Organum* is not considered as such. Their sticking to chronological order as the paradigm according to which address the partition of the *Novum Organum*, prevents them from seeing it as an echo chamber. Malherbe and Pousseur only suggest that the second book of the *Novum Organum* contains the core of Bacon's methodology, without accounting neither for the complexity of the arguments nor for the variety of the concepts articulated in it. So in the end, the issues at stake in Bacon's "new logic" remain beyond reach⁴. While the phrase "novum

³ On this issue, see [Gaukroger, 2001] and a discussion of this book by [Corneanu, 2011].

⁴ In a 1620 Letter to King James I presenting the *Novum Organum*, Bacon claims: "The work, in what colours soever it may be set forth, is no more but a new logic, teaching to invent and judge by induction, (as finding syllogism incompetent for sciences of nature) and thereby to make philosophy and sciences both more true and more active" [Bacon 1874, pp. 119-120]. See [Cassan, 2021].



organum” is famous as a sort of philosophical catchword, what this catchword exactly applies to remains, to some extent, an open question, since the *Novum Organum* as a book still needs to be considered in its materiality, that is, as the articulation of a precise project within the span of a certain amount of pages and of words.

There is a second reason why a philosophical reconstruction of Bacon’s project in the *Novum Organum* is still a desideratum. It is not just that the *Novum Organum* has been examined as a barometer for the state of learning at a given time. Put differently, it is not just that this work has been considered mostly in the light of its contribution to philosophy, modernity, progress and so on, rather than from the viewpoint of its internal construction. It is also that the *Novum Organum* is an intrinsically puzzling book. Deliberately unfinished, divided into two books, respectively comprising 130 and 52 aphorisms, it is also unsystematic at first sight. It is a book hard to read. This difficulty is so deep that Bacon has often been accused of not knowing exactly what he is doing in the *Novum Organum*. This very critical assessment has taken two main shapes. First, the nature of Bacon’s project has been depicted as unclear. For instance, in a seminal paper, L. Jardine endorses the view that the *Novum Organum* attests to the scientific split personality of his writer. She underlines that in his book, in his efforts to undermine scepticism in the field of the knowledge of nature, Bacon resorts to two strategies: the building of experiments and the methodical description of phenomena, on the one hand, the search for the essential natures composing matter and the invention of procedures to define them, on the other hand. She sees these strategies as contradictory, even if Bacon does not present them as such in the *Novum Organum*, as he only does so in the *De Augmentis Scientiarum* [Book V, chap. 2]. While she emphasizes the philosophical productivity of this duality, she also takes it that there is no conceptual unity in the *Novum Organum*⁵. But this debatable claim is not the only way to call the *Novum Organum* into question. Another possibility is to contrast the iconic status of the book with the complexity and obscurity of its structure. G. Giglioni’s approach to the *Novum Organum* follows this path. In his view, the purpose of this book is clear: “it is a book about the conditions of legibility of the book of nature and the book of the mind, set out in order to prepare the mind to the practical task of getting oriented in a forest of ambivalent signs” [Giglioni 2009]. But as he understands it, this is nothing but a utopian project, an enterprise which “has something of the lost causes, of meandering lucubrations, castles in the air and compulsions to repeat”. Giglioni supports this statement by shedding a critical eye on the general line of argumentation articulated in the *Novum Organum*. Accordingly, he sees the stress put in this framework by Bacon on a diversity of prolegomena, as the expression of “taxonomic furor” rather than as the elaboration of materials composing a solid

⁵ [Jardine, 1985]. For a systematic discussion of this paper, see [Weeks, 2008].



edifice for knowledge. In other words, he does as if there was no point in researching the structure of the *Novum Organum*⁶. As a consequence, a big issue remains. What the *Novum Organum* is in its materiality, that is, as a book with a beginning, a middle and an end, still has to be elucidated.

Garber's insightful paper is very useful in that respect. One way to appreciate such usefulness is to remark that Garber's interpretation is indebted to Rees's reading of the *Novum Organum* in two ways, that it steps aside from it on one interesting aspect and that it permits to go one step further. First, Garber follows a suggestion made by Rees in his introduction to his translation of the *Novum Organum*. There, Rees points out that commentators have found few occasions for accounting for the second book of the *Novum Organum*. In his view, this "amounts to refusal to see Bacon's philosophy as it really is, and is almost like trying to produce a respectable account of Descartes' physics without understanding his metaphysics – not quite the same as *Hamlet* without the Prince, but getting on that way" [Rees, 2004, p. lxxvii]. Garber, who accounts for the method put forward in the *Novum Organum* by concentrating on the way it is worked out in its second book, shares Rees's concern, even if he does not deal with all the materials articulated by Bacon in this framework, especially the prerogative instances. Furthermore, Garber's remarks taken as a whole are based on the consideration of an issue already dealt with in part by Rees. The question at stake is: what entitles Bacon to illustrate the procedures he articulates in the second book of the *Novum Organum* with empirical data relying implicitly or explicitly on his ideas about matter and cosmology, since he has not previously accounted for such ideas? The reader is indeed warned by Bacon that he is not dealing "with the things themselves, but using them as examples" [*Novum Organum* II 41]. It is also true that if Bacon had decided not to include the examples based on his natural philosophy presuppositions, the *Novum Organum* would have been "as a historical document, a much poorer work" [ibid., p. lxxvii]. Nonetheless, in Rees's view, one can still come up with the question of the status one shall attribute to this set of natural philosophy ideas in the framework of the building of method.

In order to solve this question, Rees asserted that there is "a double-ness" to Bacon's philosophical enterprise:

In its first guise, Bacon's philosophy shows itself as a set of methodological recommendations together with a bold analysis of their implications for existing attitudes to knowledge and the institutions of knowledge. [...] In its second manifestation Bacon's philosophy comprehends a complete but provisional system of speculative science. This system of theories was, to use Bacon's own term, a body of "anticipations"; it was not

⁶ In Giglioli's view, one shall adopt an inductivist reading strategy to access the *Novum Organum*, since in this book, Bacon does not give a systematic account of the logic principles he resorts to, but provides his reader with a lot of data. See [Giglioli, 2021].



a product of the “legitimate” method but an elaborate guess at the kind of science the method was expected to create [Rees, 1996, p. 121].

In other words, for Rees a provisional system of speculative science can be found in the *Novum Organum*, as in many other Baconian works, and this system can be reconstructed with the help provided by all the materials accumulated in the *Instauratio Magna*. Accordingly, Rees claims about the second book of the *Novum Organum* “that Bacon has an agenda here, i.e. the promotion of a particular kind of theory-led research” [Rees, 2004, p. lxix].

But on this point, Garber, who gives this quote in his paper, disagrees with Rees. Like him, he researches why Bacon’s method does not start with a blank slate. But he does not share Rees’ reading strategy. As Garber asserts it in his paper, Rees never explains exactly what he means by “a particular kind of theory-led research and how it fits into Bacon’s larger experimental program”. Put differently, in Garber’s view, Rees basically does not make the case for the position he defends. According to Garber, when Rees comments on the *Novum Organum*, neither does he actually shed light on the concepts actually operating the connection between Bacon’s speculative philosophy and his methodological remarks, nor is he concerned with precisely reconstructing the use of this combination of matter theory and experimentalism, actually made by Bacon in his posterior works. This is not to say that the issue dealt with by Rees is not crucial to an accurate understanding of the presuppositions Bacon’s method is based on. On the contrary, Garber acknowledges that Rees’ hypotheses are really instrumental in accounting for Bacon’s eclecticism, as it is illustrated by his philosophical project taken as a whole, that is, in so far as the *Instauratio Magna* both offers a program for constructing a body of scientific knowledge with practical applications, and a speculative science involving a specific theory of matter, a specific theory of life and specific cosmological principles. But in Garber’s view, neither does a reconstitution of Bacon’s Renaissance intellectual and cultural horizon suffice to provide the reader with the key for reading the structure of the *Novum Organum* taken as a book with its own unity, nor does a consideration of the speculative scientific principles which underlie all of Bacon’s texts. Again, Garber does not deny that this interpretive approach may be fruitful in illuminating Bacon’s philosophical move in general. However, for Garber, this approach is also sterile if it goes with blindly applying to a precise text, the *Novum Organum*, massive hermeneutic categories such as the category of “theory-led research”. While additional explanation is needed as to how exactly this category is instantiated in this work, it is not provided. So in Garber’s eyes, Rees’ assertion that Bacon promotes “a particular kind of theory-led research” in the second book of the *Novum Organum*, basically dodges the issue. It does not help clarify the status that shall be attributed to the assumptions Bacon makes about nature in this framework. The term “theory” suggests that they are not derived



from observation and experiment using the method. But the moment, the place and the way this “theory” is constructed, are not accounted for. It is as if one had to take for granted that Bacon’s philosophy has the shape of a system, and as if there was no point in investigating the genesis of this system. These blind spots are problematic from an hermeneutic point of view.

Two major issues are at stake in this conclusion. First, from Garber’s paper, it becomes clear that the difficult fitting of Bacon’s assumptions about nature his method depends on, within his experimental program, singles him out as a non-systematic philosopher of the Early Modern period. The thesis put forward in the paper amounts to saying that, in the end, the conceptual distinction commonly made during the period between the preliminaries to a system and that very system, does not apply to Bacon’s philosophical project, the *Instauratio Magna*. By the same token, it reveals that a philosophy may have a non systematic shape and still be coherent.

Secondly, the paper provides materials permitting to reply to an objection frequently made to the idea that the *Novum Organum* is a book of logic, as the very title of this book shows it is. Indeed, in the Renaissance the term “organum”, which indicates the instrumentality of logic, is also commonly used in order to describe Aristotle’s logical writings: the *Categories*, *On Interpretation*, the *Prior Analytics*, the *Posterior Analytics*, the *Topics*, *On Sophistical Refutations*. In the light of this context, Bacon’s writing of a *Novum Organum* reveals that he intends to depart from Aristotle’s *Organon*, that is, to contribute to a renewal to logic as a discipline, beyond university. However, Bacon’s explicit conception of the *Novum Organum* as a book of logic has often been overlooked by scholars. The following objection has frequently been put forward: how can Bacon actually build a logic, considering his repeated claims that he desires to base natural philosophy directly on observation and experiment? One can reply to this objection on the basis of Garber’s paper.

The conclusion reached by Garber is grounded on the use he makes of Popper’s remarks on objective knowledge. This use is noteworthy. While Popper is famous for having oversimplified Bacon’s theory of induction, he is used here so as to emphasize the epistemic complexity of this project. Popper takes it that an observation is always preceded by a question, that is by something theoretical or speculative. As Garber puts it, “Popper’s point is that the investigation into nature can only take place if we make assumptions about what we are looking for, and what we are going to do with it, and these will involve assumptions about the nature and the aims of inquiry”. This point has a major implication as far as the interpretation of the *Novum Organum* is concerned: if there is no direct access to observation and experience, if such access is always mediated by particular questions and settings, then there is no point in equating Bacon’s focus on experience in the *Novum Organum* with



a rejection of discursive issues. On the contrary, these are two sides of the same coin:

Since the end of my logic is to teach and instruct the intellect not to batten on and embrace abstract things with the mind's fragile tendrils (as common logic does), but to slice into nature, and discover the virtues and acts of bodies, and their laws as they are determined in matter, in such a way that this science may emerge not just from the nature of the mind but from the very nature of things, it is no wonder that my text is everywhere shot through and illustrated with reflections and experiments on the nature of things by way of exemplifying my art [*Novum Organum* II 52].

The passage quoted above is the very beginning of the last aphorism of the *Novum Organum*. In this conclusive sequence, Bacon highlights that his articulation of rules for the building of scientific reasoning in connection with assumptions about the way the world is, illustrates his massive concern with the relation between reality, thinking and language. According to Aristotle in the treatise *On Interpretation*, which is the second book of the *Organon*, concepts, signified by words, signify things. In so far as this threefold account of signification determines the meaning, reference and truth of propositions, it shapes the theory of reasoning built in the *Organon*. We have suggested, in another paper, that similarly, Bacon's discussion of Aristotle's treatment of the semiotic triangle shapes the theory of reasoning he provides in the *Novum Organum* [Cassan, 2021]. Here, we will come up with a new suggestion: the deep connection of Bacon's method to aspects of his underlying view of nature, which is considered by Garber in his paper, is representative of the kind of work Bacon does in logic, in a period when logic is not reduced to a set of formal procedures, but also deals with material truth, on metaphysical grounds.

In the end, in "Bacon's Metaphysical Method", through a case-study, Garber shows that the emergence of experimental scientific practices within the framework of the scientific revolution of the Early Modern period, is based, in part, on a reshaping of metaphysics. Garber's concern with the connection of metaphysics with scientific disciplines is at the core of many of his works on important figures of the period, like Descartes [Garber, 1992]. Let us hope that his future research will include more investigations into Bacon's specific reconfiguration of metaphysics. Such research would complement the articles Garber has already written on Bacon's last projects in natural history, that is, on his Latin natural histories, on the *New Atlantis* and on the *Sylva Sylvarum*⁷. It would help us deepen our understanding of the many connections established between disciplines during the Early Modern period.

⁷ For instance: [Garber, 2014].



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