



ORDER: GOD'S, MAN'S AND NATURE'S

Ordering Knowledge by Methodical Doubt: Francis Bacon's Constructive Scepticism

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Methodical doubt is usually associated with Descartes. However, it is with Francis Bacon that its function and scope are first recognized – as a preliminary stage in the attainment of knowledge, and as an epistemological tool (a rule) for achieving true knowledge. In this paper, I follow the various steps of construction and use of Baconian doubt as it appears in the first book of the *New Organon*. I will argue that Bacon – in distancing himself from traditional scepticism – will come to conceive methodical doubt not only as a procedure for renovating knowledge, but more specifically as a prescriptive condition for identifying what 'mind' is required to pursue the aim of renovating knowledge.

1. *The new idea of scientific method*

The model for methodical procedure from Aristotle to Descartes, was demonstration.¹ In a demonstration a conclusion proceeds from premises by means of deductive rules of inference. The truth of the premises can be given, as in Aristotle, by 'intuition' (*epagogé*); and the truth of the conclusion derives by necessity (deductive inference) from the truth of the premises.

It is this conception of method, which had dominated scientific knowledge for almost two thousand years, that Bacon and the nascent experimental tradition of the seventeenth century made the target of their fiercest criticism. The new methodologists retained the view that a good method must make use of a compelling technique for assessing truth. They also agreed that nothing was more compelling than logic. Where they disagreed with deductive methodologists was how and where to look for truth, and consequently what kind of logic was best suited to achieve truth.

¹ For the various models of scientific method see McMullin, E., 'The Social Dimension of Science', in E. McMullin (ed.), *The Social Dimension of Science*, Notre Dame University Press, Notre Dame 1992; and also McMullin, E., *The Inference That Makes Science*, Marquette University Press, Milwaukee 1992.

Truth could not be given by intuition, according to the new methodologists: truth is something to be discovered. It cannot therefore appear in the premises of a demonstration (eg., in the form of an intuitive principle, or of an axiom). By being the goal of an inquiry, truth can only be the conclusion of a process of generalization from the particular. For this reason, they argued, the logical path to the discovery of truth can only be inductive.

However, simple induction is inadequate: as Bacon reminds us in *The New Organon*, "the sense by itself is a thing infirm and erring."² Observation and experiments are to be guided by some rules, in order not to lead us astray.³ The new method must then rely on 'true induction', which Bacon describes as the only way towards "a true lawful and lasting marriage between the empirical and the rational faculties" - a marriage that will restore science to its position of power and authority and will bring order to all the affairs of the human family.

How do we know that Bacon's 'new organon' is the right method for achieving truth? How can we trust Bacon that his method will fulfill its promises? Bacon does not simply make his new method an object of faith. Rather, he undertakes a preparatory work that provides him with arguments and reasons in support of his new method. These arguments and reasons are not viewed as part of a demonstrative chain of reasoning. They are rather conceived as 'provocative opinions' addressed to an

² Bacon, *The New Organon*, Bk.I, Aph.23; Spedding's ed. p.51. It has also been pointed out how the way in which Bacon identifies the idols of the mind has influenced the concept of 'ideology' proper of the Enlightenment, in particular the way in which this concept was used to label those intellectual systems which served the interests of a group rather than serving truth per se. See for ex., Barth, H., *Truth and Ideology* (1976), Berkeley: University of California Press, pp.22-26.

³ "the true method of experience on the contrary first light a candle, and then by means of the candle shows the way; commencing as it does with experience duly ordered and digested, not bungling or erratic, and from it educing axioms, and from established axioms again new experiments." Bacon, *The New Organon*, Bk.I, Aph.82; Spedding's ed. p.81.
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audience: Bacon's aim is to convince his King and a new generation of scholars of the 'attractiveness' of his view.⁴

Bacon's audience is not taken, however, at face value. For arguments to be effective – that is, persuasive – Bacon's audience needs to be educated. In view of this, the preparatory work is conceived in terms of two joint tasks: old minds are 'cleaned', and a new mind is 'built up' in their place. The two tasks must be undertaken since, Bacon believes, the old mind might well become an obstacle for the new to take over:

"For in a new matter, it is not only the strong preoccupation of some old opinion that tends to create a prejudice, but also a false preconception or prefiguration of the new thing which is presented. I will endeavour therefore to impart sound and true opinions as to the things I propose, although they are to serve only for the time, and by way of interest (so to speak), till the thing itself, which is the principal, be fully known."⁵

It is the joint pursuit of the two tasks of the preparatory work that sets the need for using methodical doubt: if we (the audience) are prepared to doubt old opinions and all the prejudices that inhabit our minds, we will be better disposed towards considering the possible virtues of the new method. Besides, if we (the audience) accept the challenge set by the method of doubt, Bacon is prepared to offer reasons ('true and good opinions') that will make doubting a plausible procedure. Were we to accept these reasons, it will then become relatively easy to free ourselves from received opinions and prejudices. Finally, with a mind as clean as that of an innocent child, we will be able first to consider and then, hopefully, to accept the new method, as well as the new science that this method will, arguably, bring about:

"the understanding [must be] thoroughly freed and cleansed; the entrance into the kingdom of man, founded on the sciences, being not much other than the entrance into the kingdom of heaven, whereinto none may enter except as a little child."⁶

⁴ The reason to address the King was to win his support; and the new generation of scholars had to be provided with effective reasons to fight the Aristotelians and their obsolete views.

⁵ Bacon, *The New Organon*, Bk I, Aph.115; Spedding's ed. p.103.

⁶ Ibidem, Aph.68; Spedding's ed. p.69.

It might be worth mentioning at this point (although I will return to this issue later) that Bacon's use of doubt appears from the start to be 'methodical' in at least two senses. The doubt is a *prescriptive* cure for the mind (first sense), and a condition for the adoption of the new method (second sense), as a cured mind will inevitably favour the new method. Therefore, prescribing the cure and adopting the new method are part and parcel of the very same strategy to achieve knowledge.

Baconian doubt does not only target the opinions and prejudices that infect the human mind. The senses are also addressed: they are taken to be responsible for producing a distorted picture of reality, when they are allowed to operate freely. The novelty of Bacon's view consists precisely in the double line of attack of his method of doubt: on one side, doubt is set against a mind distorted by fallacious opinions and prejudices; on the other side, it is meant to recover experience from a mind which trusts the judgment of the senses. Bacon develops at the same time a theory on the genesis of prejudice and a theory of perceptual error.

It must be noticed at this point that in recommending his new method Bacon describes himself as a 'guide', not as a judge.⁷ The new method cannot be demonstrated, in the same way in which the old method cannot be refuted.

Demonstrations and refutations belong to that kind of logic (Aristotelian, syllogistic) that Bacon intends to challenge.⁸ Likewise, the new method cannot be accepted from the start with a guarantee of certainty. Certainty, Bacon argues, cannot but be the result of a philosophical search, and it can never presuppose it - as Aristotelian logic would prescribe. The search for certain knowledge develops from a form of 'suspension of judgment', which, in the final part of *The Great Instauration*, is described in the following terms:

⁷ 'The honour of the ancient authors, and indeed of all, remains untouched; since the comparison I challenge is not of wits or faculties, but of ways and methods; and the part I take upon myself is not that of a judge, but of a guide.' Ibidem, Aph.32; Spedding's ed. p.52.

⁸ 'no judgement can be rightly formed either of my method or of the discoveries to which it leads, by means of anticipations (that is to say, of the reasoning which is now in use); since I cannot be called on to abide by the sentence of a tribunal which is itself on its trial.' See Bacon, *The New Organon*, Bk.I, Aph.35; Spedding's ed. p.52. And also: 'for confutations cannot be employed, when the difference is upon first principles and very notions and even upon forms of demonstrations.' See Bacon, *The New Organon*, Bk.I, Aph.35; Spedding's ed. p.53.

"Nor need anyone be alarmed at such suspension of judgment in one who maintains not simply that nothing can be known, but only that nothing can be known except in a certain course and way; and yet establishes provisionally certain degrees of assurance for use and relief until the mind shall arrive at a knowledge of causes in which it can rest."⁹

The suspension of judgment is not empty time. The mind is here incessantly confronted by arguments, reasons and operations of various kind, which should create the conditions for letting the idea of the new method enter, quietly, those minds "that are fit and capable of receiving it."¹⁰

In appealing to this idea of suspension of judgment, Bacon admits that his view comes dangerously close to that of traditional scepticism.¹¹ In Aph.67 Bacon reminds us of the sceptical doctrine of Acatalepsy (according to which knowledge of anything is impossible), introduced by the School of Plato.¹² Acatalepsy is not as radical a view as the position supported by Pyrrho and his followers, who claimed that we should suspend judgment in all things, and therefore we should avoid forming and maintaining any opinion whatsoever. The supporters of Acatalepsy, Bacon points out, only claim that nothing can be known as *true*: the suspension of judgment does not prevent us from holding probable opinions. Bacon appears to be more sympathetic towards this latter form of scepticism, although he firmly denies that the analogy with his own position goes any further than the initial stages:

"The doctrine of those who have denied that certainty could be attained at all, has some agreement with my way of proceeding at the first setting out; but they end in being infinitely separated and opposed. For the holders of that doctrine assert simply that nothing can be known; I also assert that not much can be known in nature by the

⁹ Bacon, *The Great Instauration*, 'Plan of the Work', Spedding's ed. p.32.

¹⁰ Bacon, *The New Organon*, Bk.I, Aph.35.

¹¹ It has been pointed out that Bacon, in his polemics against traditional philosophy and science, makes use of Pyrronian arguments. See on this Popkin, R., (1960) *The History of Scepticism from Erasmus to Spinoza*, who on this particular aspect refers to Mersenne, M. (1625), *La Verit  des Sciences*, Bk.I, ch.xvi (pp.205-18).

¹² Bacon refers here to the third period of Plato's Academy: the so-called 'New Academy' which started with Carneades of Cyrene, 219-179 B.C.

way which is now in use. But then they go on to destroy the authority of the senses and understanding; whereas I proceed to devise and supply help for the same."¹³

It appears that the purpose of Bacon's 'suspension of judgement' is not to destroy the authority of either the senses or reason. It is rather to show their epistemological limits, and then offer help to both.¹⁴ This 'help', as we have just read, cannot come from "the way which is now in use": this is how far Bacon's scepticism can go. A different 'course', which is offered by the new method, is what is needed to turn Bacon's view away from radical scepticism, and move it towards a more constructive position: the 'doubting attitude' of the mind, if correctly employed, should lead the mind towards certainties, rather than driving it away from them.

Before analysing the development of this 'doubting attitude' of the mind, it might be useful to summarize the features of Baconian doubt that have been identified so far. Firstly, Baconian doubt has two functions: one is to attack the old mind, the other to defend the new one. In order to make the shift from the old to the new possible, the mind must be cleared. In order to be cleared, the mind is to be guided: to possess a mind as innocent as that of a child is indeed a necessary but not a sufficient condition to pursue true knowledge. A clean mind left on its own will easily go astray, that is it will become once again subject to prejudice and opinions.

The appropriate guide for the mind is to be the new method. However, since the new method does not yet exist (it is, at this point, only what Bacon aims to discover), it is necessary to collect a number of reasons and of possible merits of the envisaged new method, which might justify the use of the latter as a plausible guide. If we find reasons to defend the new method, these very reasons give us ground to attack and get rid of the old method. So, it can be argued, the defensive function of doubt is a necessary condition for launching an attack on the old method.

Secondly, Baconian doubt has two targets: reason and the senses. The kind of reason attacked by the doubt is both that which is subdued to the wrong kinds of guide (opinions, prejudices, senses, etc.), and that which is free from any guide. Analogously, the senses are challenged both when they appear free to explore –

¹³ Bacon, *The New Organon*, Bk.I, Aph.37; Spedding's ed. p.53.

¹⁴ As we also read in *The Great Instauration*: "They [those schools of philosophy which held the absolute impossibility of knowing anything] did not provide helps for the sense and understanding, as I have done, but simply took away all their authority; which is quite a different thing - almost the reverse." See Bacon, *The Great Instauration*, Spedding's ed. p.32.

since in this situation they end up producing distorted judgments – and when they let a distorted mind to be their guide – since in this case they are presumed to be reliable when in fact they are not.

Finally, Baconian doubt relies on a double-sided strategy. It is negative and affirmative at the same time. The sceptical idea of the 'suspension of judgment' is used to convey this double-sidedness, by suggesting a basic argument of the following form:

nothing can be known (negative side)

if and only if

the old course and way are followed (affirmative side)

The new method finds its first defence in the attempt to overcome a scepticism of a conclusive, negative kind, that is that kind of scepticism which Bacon indicates as being itself an obstacle or, as we will see shortly, an 'idol' of the mind. In Aph.92 we read:

"By far the greatest obstacle to the progress of science and to the undertaking of new tasks and provinces therein, is found in this - that men despair and think things impossible."¹⁵

2. The 'preparatory' work in Book I of *The New Organon*.

Bacon emphatically declares that the task he sets himself in the first book of the *New Organon* is "to prepare men's minds as much to understand as to accept what is to follow", to bring the mind "into the right position, to give it a favourable aspect (...) towards what I am going to put before it".

The First Book is divided into two parts: a 'pars destruens' (the clearing of the mind from idols and false notions) and a 'pars construens' (the offering of positive reasons for the acceptance of the new method).

The destructive part consists of two critiques: the first is a critique of "natural human reason", that reason which, once left free to operate, becomes prey of idols, or false notions; the second is a critique of what Bacon defines "the strongholds and

¹⁵ Bacon, *The New Organon*, Bk.I, Aph.92; Spedding's ed. p.90.

defences of Idols"¹⁶, that is vicious demonstrations on one side, and philosophies and sciences which make use of those demonstrations on the other.¹⁷

In the constructive part Bacon suggests a number of reasons, which are aimed at building up a defence of the new method. They are presented in such a way that they appear to follow from the results gained from the destructive part: once falsehood and error are removed, the mind can then start considering the legitimacy of a change of method. The 'defence' of the new method is also therefore a cure or remedy: that is, a strategy for overcoming the 'suspension of judgment'.¹⁸

2.1 The destructive part: the critique of Idols.

The discussion of the Idols appears almost at the beginning of Book I of the *New Organon* (from Aph.39 to Aph.68). Before analysing in what sense the notion of doubt is central to this discussion, it might be useful to review some interpretations of the meaning of the term 'idol' in Bacon's work.

Why did Bacon choose the word 'idol' to represent the category of false opinions, prejudices, and the like? Paolo Rossi agrees with Ellis' interpretation, according to which 'idolum' literally means 'phantom', or 'spectrum', that is illusion or false appearance. Bacon surely derives the term from Plato's Republic: in the myth of the cave, as is well known, Plato describes the shadows (*eidola*) that are mistaken for real figures.¹⁹

However, Rossi also urges us not to neglect another crucial meaning of the term, namely the biblical one. For example, by recalling Withney, when Bacon accuses Plato of "grovelling on his own blind and confused idols", he appears to refer to idols as if they were a sort of "misguided worship".²⁰ Besides, Bacon often compares the

¹⁶ Bacon, *The New Organon*, Bk.I, Aph.69, Spedding's ed. p.70.

¹⁷ Demonstrations are said to be 'vicious' since they are affected by an erroneous use of sense impressions, taken to be reliable as such, and then used in the deduction of first principles. In what follows I will not concern myself with a discussion of this critique of the destructive part.

¹⁸ It must be observed that the reasons in favour of the new method, though presented as a consequence of the critiques which constitute the destructive part, are in fact what guides us towards the criticism itself. So, in a sense which will become apparent below, the constructive part is implicitly present in the destructive part, and used by the latter as a tool for criticism and guide towards it.

¹⁹ Paolo Rossi, *Francis Bacon*, pp.161-63.

²⁰ Withney, *Francis Bacon and Modernity*, p.38.

abandonment of idols to the state of purity and innocence required in order to enter the world of Heaven. This sounds akin to Jeremy's attack on false prophets, who "speak a vision out of their own heart, and not out of the mouth of the Lord."²¹ This would also explain the distinction suggested by Bacon between human 'idols' and divine 'ideas':

"There is a great difference between the Idols of the human mind and the Ideas of the divine. That is to say, between certain empty dogmas, and the true signatures and marks set upon the works of creation as they are found in nature."²²

Common to the various meaning and interpretations is nonetheless the feature that 'idola' are 'misleading guides' for the mind, and as such they are to be removed. In the *New Organon*, the Idols are categorized in four groups, of which I will only give a cursory description. The first category consists of the Idols of the Tribe: these are rooted in the human nature, and in the tribe or race of mankind. Human nature is like a distorting mirror, which, says Bacon,

"receiving rays irregularly, distorts and discolours the nature of things by mingling its own nature with it."²³

²¹ Jeremy, 23:16.

²² Bacon, *The New Organon*, Bk.I, Aph.23; Spedding's ed. p.51. It has also been pointed out how the way in which Bacon identifies the idols of the mind has influenced the concept of 'ideology' proper of the Enlightenment, in particular the way in which this concept was used to label those intellectual systems which served the interests of a group rather than serving truth per se. See for ex., Barth, H., *Truth and Ideology* (1976), Berkeley: University of California Press, pp.22-26.

²³ Bacon, *The New Organon*, Bk.I, Aph.41; Spedding's ed. p.54. Bacon offers examples of these 'distortions'. In Aph. 45 he says that the human mind is for its own nature inclined "to suppose the existence of more order and regularity in the world than it finds." This attitude is then responsible for the production of dogmas, fiction, and philosophical dreams. In Aph. 46, Bacon points out how the human mind, once it adopts a certain opinion "draws all things else to support and agree with it", which is the easiest route towards superstition. Imagination, the will and its passions, and the senses are also listed as being responsible for the emergence and proliferation of prejudice. The imagination is more easily seduced by things which "strike the mind simultaneously and suddenly" rather than letting themselves being searched upon slowly, and with patience (Aph.47). The will and its passions push us to believe as true what mostly pleases us (Aph.49) The senses are "infirm and erring" when left

The second are the Idols of the Cave, that originate from the nature of particular individuals and therefore depend on his or her education, habits, and circumstances of their growth (readings, admired authorities, and the various impressions which mark the mind).²⁴

The third are the Idols of the Market, that relate to "the intercourse and association of men with each other".²⁵ In particular, they derive from what is considered the essential tool for commerce and social exchange: language. Words, Bacon claims, are normally used according to vulgar understanding, and for this reason they are often responsible for misunderstanding and error in communication.²⁶

Finally, the Idols of the Theatre are those that penetrate the human mind via the various dogmas of traditional philosophy and the erroneous laws of demonstrations. Philosophical systems are like plays: they invent stories for the 'philosophical stage', that is stories which are "more compact and elegant, and more as one would wish them to be, than true stories out of history."²⁷ Philosophical systems, then, produce worlds of fiction, scenographies or dreams of reality.

In the process of describing the Idols, it is interesting to note that Bacon also suggests a further categorization that 'cuts across' the four categories. Idols, Bacon

without an appropriate guide, and this explains their "dullness, incompetency, and deceptions" (Aph.50). See Bacon, *The New Organon*, Bk.I, Spedding's ed. pp.56-57.

²⁴ It must be noted that Bacon is here offering a theory on the genesis of prejudice and perceptual error. See Musgrave

²⁵ See Bacon, *The New Organon*, Bk.I, Aph.53, and 55; Spedding's ed. p.59. Ibidem, Aph.43; Spedding's ed. p.54.

²⁶ The idols imposed by language are, according to him, of two main kinds: either words name things which do not exist (and as such they result in the construction of false theories), or they name things, which exists but they do so in a confused and abstract manner. In the latter case, the problem is yet more complex, since in the attempt to correct confusion and abstraction we use common language, which we have identified as being the very source of confusion and abstraction. See Bacon, *The New Organon*, Bk.I, Aph.60; Spedding's ed. p.61.

²⁷ 'And in the plays of this philosophical theatre you may observe the same thing which is found in the theatre of the poets, that stories invented for the stage are more compact and elegant, and more as one would wish them to be, than true stories out of history.' Bacon, *The New Organon*, Bk.I, Aph.62; Spedding's ed. p.63.

claims, can be either 'innate' or 'acquired'. This distinction is not set out in the first book of the *New Organon*, as it has already appeared in the 'Great Instauration':

"the idols, or phantoms, by which the mind is occupied are either adventitious or innate. The adventitious come into the mind from without - namely, either from the doctrines and sects of philosophers or from perverse rules of demonstration. But the innate are inherent in the very nature of the intellect, which is far more prone to error than the sense is."²⁸

Only the Idols of the Theatre are listed among the acquired one and as such they are considered to be, though with difficulty, eliminable. The other three classes of Idols are instead viewed as constitutive of the human mind, and by being so they can never be completely removed from it. Therefore, all we can do, proceeds Bacon, is

"to point them out, so that this insidious action of the mind may be marked and reprov'd (else as fast as old errors are destroyed new ones will spring up out of the ill complexion of the mind itself, and so we shall have but a change of errors, and not a clearance)."²⁹

The point of interest in this further classification of the Idols is that Bacon, by acknowledging the constitutive nature of most categories of idols, seems to surrender to a negative conclusion: if at least some idols cannot be removed from the human mind, true knowledge is an unattainable aim. The 'clean and innocent mind' which can be guided towards truth is only and yet another dream.

However, this is not the kind of conclusion that Bacon is prepared to subscribe to: his 'constructive scepticism' drives him in a different direction. The distinction between innate and acquired idols is, I believe, to be interpreted in the following manner. The theory of the Idols is a sort of phenomenological description of the genesis of error and prejudice. The function of this theory is not that of eradicating both error and prejudice. Bacon is aware of the fact that the 'cleaning operation' of the mind is more a regulative ideal than a concrete and attainable end. Instead, the function of the theory consists in pointing at the difference between two kinds of mind: a 'corrupted' mind vs. a 'renewed' one.

²⁸ *The Great Instauration*, 'The Plan of the Work', Spedding's ed. p.27.

²⁹ *Idem*.

A corrupted mind is passive, dogmatic, subject to opinion and unable to identify errors in any adequate manner. A renewed mind is critical, sceptical of opinions mistaken for truths and well equipped to recognize errors, their genesis and their dangers. A renewed mind is a mind capable to doubt (capable to make use of the doubt in a constructive and critical manner).

Bacon's doubt, according to this interpretation, appears then to be not only as a preparatory tool for knowledge, to be used in the preliminary stage of inquiry that precedes the actual search for true knowledge but to be then rid of once the mind has been appropriately prepared to undertake this search. It appears instead to be an essential condition for the search itself, as it defines the essential feature of the type of mind needed in that search.

I mentioned earlier that Baconian doubt is methodical in two senses: Bacon, I claimed, prescribes the doubt as a cure, and the cure itself leads to the new method. In the light of what has just been argued, we can now better understand what this double meaning of 'being methodical' amounts to in epistemological terms: Baconian doubt prescribes the correct 'route' towards knowledge (replacing the old method with the new), and it describes what the appropriate use of the mind is in order follow this route (replacing a dogmatic mind with a critical 'doubting' one).

2.2. Defending the new method: the 'arguments of hope'.

Having discussed the general structure and function of Bacon's methodical doubt, we can now see how this doubt is put to work – that is, we can show how the kind of critical mind that the method of doubt has identified and made possible plays its role in the constructive part of Book I.

In Aphorism 97 we read:

"if any one of the ripe age, unimpaired senses, and well-purged mind, apply himself anew to experience and particulars, better hopes may be entertained of that man."

From here onwards, Bacon begins a more direct and explicit defence of his new method. This is achieved by presenting the merits of the new conception and assessing their value on the basis of their success in correcting the vices and errors inherited from tradition. The 'better hopes' Bacon refers to in the passage above are not simply an article of faith. They rightly belong in the preparatory work, as clarified in Aphorism 92:

"I am not a dealer in promises, and wish neither to force nor to ensnare men's judgments, but to lead them by the hand with their good will."

Hope is to be the object of "conjectures" which make it "reasonable".³⁰ Hope is, therefore, for Bacon, the desired effect of a way of arguing, meaning a tool provided by a renewed or critical mind. In the remaining of this section a sampling of 'arguments of hope' will be presented and discussed, in order to exemplify the kind of work made possible and achieved by a mind instructed by Bacon's methodical doubt. Of each argument I will describe its structure and its argumentative strategy.³¹ Among the causes of the ill state of philosophical inquiry Bacon includes the lack of hope in the achievements of the sciences. One of the arguments he puts forward to persuade his audience that such despair is ungrounded appears in Aph.108:

"if many useful discoveries have been made by accident or upon occasion, when men were not seeking for them but were busy about other things; non one can doubt but that when they apply themselves to seek and make this their business, and that too by method and in order and not by desultory impulses, they will discover far more."

Structure of the argument: if chance can produce discoveries, and method is better than chance (because it can make as many discoveries as chance, but in a controlled manner), then method is to be favoured.

Argumentative strategy: we are prompted to compare chance and method, and forced to admit (= led to believe) that method is better.

Among the causes of the ill state of philosophy Bacon also lists the veneration for antiquity. In Aph.84 he tries to show that such veneration is wrong:

³⁰ 'And therefore it is fit that I publish and set forth those conjectures of mine which make hope in this matter reasonable.' Bacon, *The New Organon*, Bk.I, Aph.92; Spedding's ed. p.91.

³¹ For a discussion of the 'arguments of hope' see also Montuschi, E., 'Non-methodological Aspects of Scientific Method', *Proceedings of the International Advanced Research Workshop on 'Mind, Reality and Values'*, The Open Society Fund, Sofia 1997.

"And truly as we look for greater knowledge of human things and a riper judgment in the old man than in the young, so in like manner from our age (...) much more might fairly be expected than from the ancient times, inasmuch as it is a more advanced age of the world, and stored and stocked with infinite experiments and observations."

Structure of the argument: old is better than young; we are older than the ancients (we come after them); therefore we are better.

Argumentative strategy: Truth is the daughter of time, not of Authority.

In Aphorism 94 "a consideration of the greatest importance as an argument of hope" can be derived from past error and already trodden paths. In drawing an analogy from a government administered without wisdom, Bacon writes:

"if during so long a course of years men had kept the true road for discovering and cultivating sciences, and yet been unable to make further progress therein, bold doubtless and rash would be the opinion that further progress is possible. But if the road itself has been mistaken, and men's labour spent on unfit objects, it follows that the difficulty has its rise not in things themselves, (...), but in the human understanding, and the use and application thereof, which admist of remedy and medicine."

Structure of argument: course A has a certain aim a (progress and new discoveries). If A does not result in a, it means that there are difficulties either with the object a (the 'things' to be discovered) or with the subject (the human mind) who follows A. If it is the subject's fault (as Bacon seems to suggest later), then the subject is to be cured.

Argumentative strategy: an undesired result prompts us to look for its cause; once the cause is found, it is asked how this cause can be removed in order to remove the undesired result. The elimination of the cause is possible only if a different course is followed. If the different course removes the cause and then eliminates the undesired result, then it becomes 'reasonable' to hope in this different course.

The 'cause' in question rests on the fact that all the sciences, up until Bacon's time, had been dealing with one of the following two categories of individuals: the men of experiment and the men of dogma. The former are like ants: "they only collect and

use". The latter are like spiders: "they make cobwebs out of their own substance".³² Why not trying to put together the merits of each category of individuals and promote a 'middle way', Bacon suggests? The true philosophy would appear, then, to adopt the course of a bee. A bee "gathers its material from the flowers of the garden and of the field" (i.e., the equivalent of collecting natural histories and mechanical experiments), "but transforms and digests it by a power of its own" (i.e., the equivalent of the rational and critical power of the mind). The behaviour of a bee is to be the model for the new course.

Another 'argument of hope' is presented in Aphorism 109:

"Another argument of hope may be drawn from this - that some of the inventions already known are such as before they were discovered it could hardly have entered any man's head to think of; they would have been simply set aside as impossible."

We seem then entitled to hope that there might be many more discoveries and inventions kept hidden by nature, which are incomparable with anything already existing, and "lying entirely out of the beat of the imagination."³³

So far this does not appear properly as an 'argument' in favour of Bacon's new method. Bacon then proceeds by providing a supporting reason, as found in Aph.110:

"there is a great mass of inventions still remaining which not only by means of operations that are yet to be discovered, but also through the transferring, comparing, and applying of those already known, by the help of the learned experience (...), may be deduced and brought to light."

In other words, the new method, by making use of 'learned experience', that is experience guided by a just rule, will be able to tell the mind where and how to find the common 'intellectual' principle behind all inventions, past present and future.

Structure of the argument: first stage - some inventions I have been brought into light. I were unimaginable before their appearance. Therefore, what cannot be

³² Ibidem, Aph.95; Spedding's ed. p.93.

³³ Ibidem, Aph.109; Spedding's ed. p.100.

imagined today might as well become existent tomorrow. Second stage - the course which brought about I cannot account for the relation between firstly, the existence of the present inventions and their imagination, and secondly, their existence and the imagination of future inventions. The missing link is provided by the new method, meaning the method that makes use of 'learned experience'.

Argumentative strategy: once established the importance of present inventions, their condition of possibility and their power as exemplar, then it is suggested that both aspects of importance can be explained only by the use of the new method.

My final example of an 'argument of hope' is taken from Aph.114. Here Bacon tries to convey the belief that an attempt to act upon despair is still the best option:

"For there is no comparison between that which we may lose by not trying and by not succeeding; since by not trying we throw away the chance of an immense good; by not succeeding we only incur the loss of a little human labour."

Structure of the argument: pursuing X might produce the loss of a little x refraining from X might preclude the possibility of a big y; it is worth taking the plunge.

Argumentative strategy: a disparity is envisaged between a negligible present loss and a possible substantial future gain. Since it is known that the present loss is little, anything which we might gain as a result of our trying is still preferable.

Aph.129 provides further support to the same argument:

"if the usefulness of just one particular invention has so impressed men that they deemed superhuman the man who could secure the devotion of the entire human race through some benefit he brought, how much loftier will it seem to discover something that will enable all other discoveries to be readily made?"

Structure of the argument: if A has the effect a, X - which allows for A plus B,C,D, ... K - will have an effect aK.

Argumentative strategy: X is more powerful than A, because we can resort to X to produce A, but not viceversa. Therefore the philosophy which allows and promotes new discoveries is the one to be favoured.

3. A doubting mind for a better method: Bacon's anti-sceptical conclusions.

Once 'hope' in the new method has been given good arguments to rely on, the course of Bacon's doubt appears completed. It started by preparing the mind for the acceptance of this method: obstacles to true knowledge were identified and classified, and their dangers exposed. It then proceeded to persuade a well alerted mind that these obstacles are to set aside, or at least kept under strict control, in order for the mind to accept a new guide. In following this procedure, Bacon can argue in favour of the possibility of true knowledge, and against the negative conclusions of the radical sceptic.

Finally, in exercising its function, Baconian doubt identifies a new type of mind, or better, a new purpose and use for it. Our mind, as Bacon shows us, does not receive truth by intuition (as in the Aristotelian model). It must look for it instead. Truth, which becomes the sought-after result of an inquiry rather than being its premise, is looked upon as an object of conquest on the part of an inquiring mind.

There is no room for doubt in a demonstration. There is no task or function that doubt can display in a syllogism. Doubt belongs to that form of reasoning where a subject is able to challenge his or her beliefs, by challenging at the same time his or her epistemological tools of inquiry.

This, as we have seen, does not mean that the more we feel entitled to doubt the more we distance ourselves from knowledge (as traditional sceptics would have it). It means instead, at least in Bacon, that adopting a logic of discovery of truth is ipso facto adopting it critically, in a modern sense: by showing us how methodical doubt can be used, Bacon gave us a tool to imagine – as well as to justifiably hope – that attaining knowledge is indeed a possible task.