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**Chapter 8**

**The Ethics of Motion: Self-Preservation, Preservation of the Whole, and the ‘Double Nature of the Good’ in Francis Bacon**

**Silvia Manzo**

**Abstract** This chapter focuses on the appetite for self-preservation and its central role in Francis Bacon’s natural philosophy. In the ﬁrst part, I introduce Bacon’s clas- siﬁcation of universal appetites, showing the correspondences between natural and moral philosophy. I then examine the role that appetites play in his theory of motions and, additionally, the various meanings accorded to preservation in this context. I also discuss some of the sources underlying Bacon’s ideas, for his views about pres- ervation reveal traces of Stoicism, Telesian natural philosophy, the natural law tradi- tion, as well as late-scholastic ideas. Bacon assumes the existence of two kinds of preservation: self-preservation and preservation of the whole. The appetite through which the whole preserves itself overpowers individual appetites for self- preservation. In Bacon’s theory of motions, the primacy of global preservation – that is, the preservation of the whole – is evidenced by the way matter resists being annihilated, while self-preservation at a local and particular level is revealed through other kinds of motion. Bacon’s notion of appetite reﬂects a speciﬁc metaphysics of matter and motion, in which the preservation of natural bodies follows teleological patterns shared by both nature and humanity: the preservation of the whole is the highest goal, both in moral and natural philosophy. In this chapter, I argue that in Bacon’s natural philosophy different kind of things, including nature and humans, are ruled by patterns that are constitutive of correlated orders, neither of which is reducible to the other: there is no priority of the natural order over the moral, or vice versa. Thus, at a more general level, both are expressions of the same type of divinely imposed, law-like behaviour.

Translations from Latin are my own, except for Bacon’s works. Exceptions will be indicated. I would like to thank Marcelo Boeri for his helpful comments on an earlier version of this chapter.

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# Introduction

Francis Bacon’s conceptions of nature and man are grounded in the idea that their behaviours are motivated by a multiplicity of appetites. On this account, any physi- cal or moral state or event can be explained in terms of the particular appetites which give rise to them. The aim of this chapter is to focus on the appetite of pres- ervation, which lies at the core of his natural philosophy. Bacon posits two kinds of preservation, which, under particular circumstances, are antagonistic, although not necessarily so: self-preservation and preservation of the whole.1 In the introductory sections I will offer a survey of Bacon’s classiﬁcation of universal appetites, through which the correlations between natural and moral philosophy will be shown. In the following sections, I will deal with appetites in his theory of natural motions and with the various meanings of preservation therein. I will also indicate some of the probable sources of Bacon’s ideas.

# Universal Appetites and the ‘Circle Learning’

According to the ideal of learning envisaged in the *Instauratio magna* and already outlined in the early *Valerius Terminus* (c. 1603), particular sciences were supposed to form a ‘circle learning’, for their subjects were not entirely isolated, but related to each other on account of their common axioms (Bacon 1857–1874, III, 228– 229). This model was later further developed in *The Advancement of Learning* (1605) and *De augmentis scientiarum* (1623), where Bacon presented his classiﬁca- tion of the sciences. There he described ‘ﬁrst philosophy’ (which he also called ‘primitive or summary philosophy’, *philosophia prima*, or *sapientia*) as the univer- sal science, the ‘mother’ of the sciences and the ‘receptacle of axioms’. First phi- losophy embraced those common axioms that pervade and establish communication among all sciences. The various sciences were not like different lines which meet in one angle, but rather like the branches of a tree which converge into one stem, a stem which ‘hath a dimension and quantitie of entyreness and continuance, before it come to discontinue & break it self into Armes and boughes’ (Bacon 2000a, 76).2 The axioms gathered in ﬁrst philosophy, wrote Bacon, ‘are not peculiar to any of the particular sciences, but belong to several of them in common’ (Bacon 1857–1874, I, 540–541; IV, 337).3 Thus, in the same way that scientiﬁc theories depend upon the axioms of the particular science to which they belong, particular sciences as a whole rely on the axioms of ﬁrst philosophy. There is a common foundation which

1 Bacon uses the English words *conservation* and *preservation* conterminously, and the Latin *con- servatio.* I will use *preservation* to refer to all of them.

2 See also Bacon 1857–1874, I, 540.

3 See also Bacon 2000a, 77.

supports a complex tree of learning, and thereby guarantees continuity among the several sciences.

First philosophy provides the knowledge required to rectify or amplify the theo- retical claims of every science (Bacon 1857–1874, I, 540–541). Communication among sciences allows for their mutual collaboration, since they are able to illumi- nate each other by means of their speciﬁc theories. Although Bacon himself argues that the main, tripartite division of philosophy is into the divine, natural and human, he also claims that this division should not be understood to imply a complete isola- tion of the particular sciences. On the contrary, before any division takes place, there needs to be recognized a common stem, a universal science which acts as a unifying factor prior to epistemological differentiation.

It should further be added that this epistemological unity in diversity is corre- lated with the ontological unity in diversity which runs throughout Bacon’s philoso- phy. On the one hand, Bacon establishes a parallel between science and reality: he claims, for instance, that ‘it is the perfect law of the inquiry of truth, that nothing be in the globe of matter which has not its parallel in the globe of crystal or the under- standing’ (Bacon 1857–1874, V, 59; I, 772).4 On the other hand, and as will be shown below, he seems to believe that the objects of the various sciences, such as nature and man, are at the more general level governed by common laws imposed on them by God.5 This is the reason why individual sciences can illuminate each other, at least at the highest theoretical level.

Given these premises, it is easy to understand why Bacon thought that, in order to discover the appetites in human beings, moral philosophers should pay attention to the appetites of natural things. The following passage from *Valerius Terminus* introduces, perhaps for the ﬁrst time in his works, Bacon’s unwavering belief that natural bodies and human beings share similar appetites. By doing so, he distin- guished between four basic kinds of universal appetites which he labeled the ‘qua- ternion of good’:

So if the moral philosophers that have spent such an inﬁnite quantity of debate touching good and the highest good, had cast their eye abroad upon nature and beheld the appetite that is in all things to receive and to give; the one motion affecting conservation and the other multiplication; which appetites are most evidently seen in living creatures in the plea- sure of nourishment and generation; and in man do make the aptest and most natural divi- sion of all his desires, being either of sense of pleasure or sense of power; and in the universal frame of the world are ﬁgured, the one in the beams of heaven which issue forth, and the other in the lap of the earth which takes in: and again if they had observed the motion of congruity or situation of the parts in respect of the whole, evident in so many particulars; and lastly if they had considered the motion (familiar in attraction of things) to

4 This parallelism is also invoked explicitly in Bacon 1857–1874, III, 194: ‘Sed cum templum sanctum ad instar mundi, mundoque ipsi quantum ﬁeri potest parallelum et concentricum, fundan- dum sit, merito exemplar persequi oportet. Nam quod essentia dignum est id etiam dignum est repraesentatione’. See also Bacon 2004, 178–180. For references to the correlation between the material and the intellectual globes, see Bacon 1857–1874, I, 134; III, 584; III, 612.

5 The impact of the Fall of Adam on nature is another example of this correlation. Nature ‘falls’ with man, not because nature is rooted in the moral order, but because man and nature are corre- lated, a reﬂection of one another.

approach to that which is higher in the same kind; when by these observations so easy and concurring in natural philosophy, they should have found out this quaternion of good, in enjoying or fruition, effecting or operation, consenting or proportion, and approach or assumption; they would have saved and abridged much of their long and wandering dis- courses of pleasure, virtue, duty, and religion (Bacon 1857–1874, III, 229–230).

If moral philosophy may learn from natural philosophy, the opposite also holds: Bacon’s account of moral goods sheds light on his ideas concerning the appetites of natural bodies. In the sections of the *Advancement of Learning* and *De augmentis scientiarum* devoted to moral philosophy,6 and in particular to the ‘platform or nature of good’, he provides a more articulate and systematic template than the one introduced in the *Valerius Terminus*. Although these sections concentrate on moral matters, Bacon starts by classifying universal appetites and the moral appetites which appear to be instantiations of them. To the four kinds of good he now adds two important elements which will prove fundamental to determining the hierarchy of goods: the distinction between individual good and the good of communion and the distinction between active good and passive good.

Bacon contends that human and natural beings are endowed with universal appe- tites towards two kinds of good: ‘Every thing is endowed and imprinted with an appetite towards the double nature of good: the one, insofar as the thing is a whole in itself; the other, as it is a part of something greater. And the latter is worthier and more powerful than the former, for it tends to the preservation of a greater form’ (Bacon 1857–1874, I, 717; my translation).7 The ﬁrst kind of good is labeled ‘indi- vidual good or good of one’s own being (*bonum individuale sive suitatis*)’, which ‘we also call *particular*, *private* and *individual*’ (Bacon 1857–1874, I, 717, 726).8 It is worth noting that in the *De augmentis scientiarum* Bacon adds the legal term *suitas* in the phrase *bonum individuale sive suitatis* and modiﬁes its meaning, appar- ently for the ﬁrst time in the semantic history of this word. Originally, *suitas* was a Latin term used in inheritance law to denote the quality or right of being heir to a property.9 Bacon’s use of the word, however, does not retain the idea of the right to inherit, implied in its original meaning. The good pursued by the *bonum suitatis*, according to Bacon’s new understanding of *suitas*, is not a property received by inheritance. *Suitas* is instead identiﬁed with individuality, particularity and pecu- liarity.10 Hence *bonum suitatis* is the good belonging to an individual. What Bacon keeps from the original legal meaning is the mark of individuality, which he wants

6 On Bacon’s ethics, see Wallace 1967, 142–152 and Box 1996.

7 See also Bacon 2000a, 136.

8 In Bacon 2000a, 139 this kind of good is called *private or particular good.*

9 On the history of the term *suitas*, see Duro 1985. I could not ﬁnd any earlier uses of this term in the same sense as Bacon’s. As for its aftermath, Christian Wolff employs the same vocabulary in his classiﬁcation of good (and evil), which draws upon Bacon. See Wolff 1751, 91 and 131, #114.

10 See Duro 1985, 56. This semantic innovation has been ignored by translators of *De augmentis scientiarum*, who have just rendered the entire locution as *individual or self-good* (English transla- tion by Spedding, Bacon 1857–1874, V, 21) and *individuel* or *personnel* (French translation by Lasalle, Bacon 1799, 156) without pointing out the legal meaning of the term current in Bacon’s time.

to set in contrast to the *bonum communionis*, or *good communicative*, a good shared by a number of individuals (Bacon 2000a, 136).11

As individuals, things love themselves and strive for their own good, while as parts of a whole they look for the good of communion. This duality serves to estab- lish a primary hierarchy of the good, which Bacon ultimately retains in his later writings. The good of communion is, accordingly, the ‘greater and worthier’ (Bacon 2000a, 136). He grounds the pre-eminence of the good of communion in the assumption that the preservation of the whole is the greater good: the good of com- munion is preferred because it tends ‘to the conservation of a more general form’ (Bacon 2000a, 136). As examples of the predominance of the good of communion, Bacon provides cases of both natural and human beings. For instance, in order to prevent the existence of a vacuum, under certain circumstances dense bodies aban- don their individual appetite to move towards the Earth, and, as a consequence, they move upwards.12 In this case, the good of communion prevails over the individual good of dense bodies. In moral philosophy, the superiority of the preservation of public good is an ethical imperative according to which ‘the Conservation of duty to the publique ought to be much more precious then the Conservation of life and being’ (Bacon 2000a, 136). Finally, Bacon claims that, more than any other doc- trine, Christian religion recognizes the supreme status of the good of communion, from which it becomes evident that ‘it was the same God, that gave the Christian Law to men, who gave those Lawes of nature, to inanimate Creatures’ (Bacon 2000a, 136).13

Bacon then proceeds to classify individual kinds of good and subdivides them into passive and active, a distinction that ‘is also formed in all things’, and one, moreover, which echoes the distinction originally suggested in *Valerius Terminus* between appetites to receive (passive) and appetites to give (active) (Bacon 2000a, 139; Bacon 1857–1874, I, 722). Both kinds of good are ‘best disclosed’ in the appe- tites of all creatures to preserve and multiply themselves respectively (Bacon 2000a, 139; Bacon 1857–1874, I, 722; III, 229–230). Comparing individual types of good to the domestic ofﬁces in ancient Rome, Bacon claims that active good is similar to a *promus* (a steward), while passive good is like a *condus* (a storekeeper).14 From this classiﬁcation of individual kinds of good, Bacon derives another of his ‘rules of predominance’ (*canones praedominantiarum*), designed to introduce hierarchical divisions among the various kinds of good; in this case, active good is worthier than

11 It is also called the *good of Society* in Bacon 2000a, 140.

12 In Manzo 2013, I show that the rule of predominance of common good is in fact tacitly or explic- itly assumed by many medieval and early-modern thinkers in the debate on the existence of a vacuum. The same holds true, more speciﬁcally, in the case of Bacon. See also Manzo 2003.

13 Statements like this were seen as proof of Bacon’s sincere Christian faith. See, for instance, the case of the Catholic monk Jacques-André Émery (1732–1811), who included the entire ﬁrst chap- ter of Book 7 of *De augmentis scientiarum* in his compilation and translation of extracts from Bacon’s works related to religious issues (Émery 1798–1799, 15–25). On Émery’s vindication of Bacon as a Christian thinker against the Encyclopedists, see Mathews 1996, 371–372.

14 In the *Novum organum*, Book 2, Aphorism 50 (*modus quartus*), Bacon maintains that a lapse of time (*mora*) is ‘Promus et Condus Naturae’ (Bacon 2004, 434).

passive good. Again, he provides examples of the superiority of the active good both in nature and human beings, and relies on the testimony of the Holy Writ (Bacon 2000a, 139).

Active individual good is said to be a manifestation of the universal appetite of self-propagation and self-multiplication (‘effecting’ or ‘operation’ in *Valerius Terminus*), whereas the passive individual good is subdivided into ‘perfective’ and ‘conservative’. The former corresponds to the appetite for perfecting the form of the individual (which is equivalent to the appetite of ‘approach’ or ‘assumption’ in *Valerius Terminus*). Since it entails self-improvement, it is held to be the highest degree of the passive individual good (Bacon 2000a, 141; Bacon 1857–1874, I, 724). As for the passive individual good of preservation, Bacon deﬁnes it as ‘the reception and fruition of that which is agreeable to our natures’ (‘enjoying’ and ‘fruition’ in *Valerius Terminus*) (Bacon 2000a, 141; Bacon 1857–1874, I, 724). Through this appetite things tend to preserve themselves and to maintain their form by receiving that which is agreeable to their natures. This is in fact the appetite for self-preservation. Bacon remarks that, although this is ‘the most pure and Naturall’ pleasure of individuals, it seems to be the softest and the lowest (Bacon 2000a, 141; Bacon 1857–1874, I, 725). Finally, he deals with the good of communion (‘consent- ing’ or ‘proportion’ in *Valerius Terminus*) (Bacon 2000a, 142–145; Bacon 1857– 1874, I, 726–730). In the case of human beings, it embraces, on the one hand, the duties of every man as a member of society and, on the other, the speciﬁc duties that derive from one’s particular vocation.

It appears that Bacon’s classiﬁcation was particularly concerned with the differ- ences of degree among the individual good and the good of communion, and, at the same time, with the absolute pre-eminence of the good of communion. In fact, he acknowledges that although the active individual good has, in some cases, a resem- blance to the good of communion, this convergence must not be misunderstood. Some acts seeking for the good of one individual are indeed able to produce beneﬁts for others, but such acts are done with the aim of amplifying the individual’s own power and glory, the good of other people being outside their intended scope (Bacon 2000a, 140; Bacon 1857–1874, I, 723–724). Nevertheless, Bacon suggests that the good of communion can indirectly contribute to individual good, so that they are neither always nor necessarily antagonistic.

To sum up, in *The Advancement of Learning* and *De augmentis scientiarum* the four basic types of moral good are ranked according to two coexistent criteria: ﬁrst, the supremacy of the good of communion over the individual good; second, the pre- eminence of the active individual good over the passive individual good. The fol- lowing hierarchy, then, derives from both criteria: ﬁrst, the good of communion (i.e., preservation of the whole); second, the active individual good of self- multiplication; third, the passive individual good of self-perfection; and fourth, the passive individual good of self-preservation. As we can see, preservation lies at the top and at the bottom of this scale. Self-preservation is ultimately both distinct from and lower than the tendency to preserve human society and nature as a whole.

# Appetites and Motions

The ‘quaternion of good’ introduced in *Valerius Terminus* also appears in Bacon’s discussion about the appetites of bodies and in his classiﬁcations of motions. On his account, bodies, like human beings, move in order that they might reach certain goods or ends. Bacon’s concept of motion applies equally to action motivated by an appetite as it does to the appetite itself, that is, the tendency to move or be moved.15 This is the reason behind his use of such phrases as *motus et appetitus*, *motus et desideria*, or *motus*, *appetitus et virtutes activae*.16 In all his works, published both during his life and posthumously, there are several such classiﬁcations of motions. Bearing in mind that they show some discrepancies, in my reconstruction I will mainly concentrate on the most elaborated versions provided in *Novum organum* (1620) and *Abecedarium novum naturae* (c. 1622).17

To begin with, Bacon separates simple from complex motions. Simple motions are said to be the most universal motions of matter, while complex motions emerge out of their countless combinations. The number of simple motions classiﬁed in the two works vary from sixteen (*Abecedarium*) to nineteen (*Novum organum*). Bacon does not intend for his lists of simple motions to be a deﬁnitive and exhaustive enu- meration. On the contrary, he cautiously admits that he is offering tentative classiﬁ- cations of the most widespread motions, which perhaps might be modiﬁed by further research (Bacon 2004, 413). Both classiﬁcations, however, reduce the sim- ple motions to four basic appetites resembling the ‘quaternion of good’: *conserva- tio*, *exaltatio*, *propagatio* and *fruitio naturae suae*.18 Thus, simple motions turn out to be particular expressions of the basic appetites.

A particular body may be endowed with many simultaneous and even conﬂicting motions. The interactions among the appetites as well as their relative powers are extremely variable. Only the motion of *antitypia*, through which bodies resist anni- hilation, is regarded as invincible (*omnino adamantinus et invincibilis*, Bacon 2004, 414). In contrast, Bacon hesitates to ascribe the possibility of being conquered to the motion of connection (*motus nexus*), through which bodies resist the formation of a vacuum. The rest of the motions are said to rule and be ruled in proportion ‘to their strength, quantity, impact, and reach, as well as to the helps and hindrances which they come across’ (Bacon 2004, 415). For instance, stronger motions are held to be able to bind, bridle and control the weaker ones. Some motions reach further than

15 Jardine 1974, 112–113.

16 See Bacon (2004, 385, 413; 1857–1874, I, 560; 2000b, 191).

17 Lists of or allusions to the kinds of motions are to be found in Bacon (2004, 413; 1857–1874, III, 21–22, 26–27; 1857–1874, XI, 70–71; 2000b, 191; 1857–1874, I, 560; 1996, 36, 42; 108, 326).

18 See Bacon (2004, 412; 2000b, 196, 201, ff). Even if the lists of motions in *Abecedarium novum naturae* and *Novum organum* do not coincide, their discrepancies seem irrelevant since the motions lacking in *Abecedarium* can be subsumed under other motions enumerated there. As we shall see, what seems a more signiﬁcant discrepancy is the way Bacon relates each simple motion to the four basic appetites.

others; some of them are faster or last longer; some others, ﬁnally, nourish, strengthen, enlarge and quicken others (Bacon 2004, 413–414).

The coexistence of appetites in one body gives rise to mutual conﬂicts, which must be investigated in order to discover by what proportions and in what amounts an appetite dominates or surrenders, and in what ways and for what reasons one motion gives way to another. Bacon also urges his readers to collect ‘rules of pre- dominance’ from motions found in nature. In providing two instances of these rules, he introduces the distinction between the good of communion and the individual good, as well as the pre-eminence of the good of communion. The ﬁrst rule indi- cates a direct proportion between the extent of the good pursued and the force of the motion which belongs to it: the more common the pursued good, the stronger the motion. Bacon illustrates this rule by alleging that the motion of connection, which tends to avoid the occurrence of a vacuum and seek the good of the universe, is stronger than the motion of gravity, which is a particular instance of the motion of greater congregation by which dense and heavy bodies are drawn towards the mass of bodies of a similar nature. The motion of gravity affects, therefore, the good of dense bodies. Bacon provides concrete instances of the predominance of the motion of connection over the motion of gravity when he deals with the same rule in the sections of the *Advancement of Learning* and *De augmentis scientiarum* devoted to the ‘platform of good’. In the former, for instance, he argues that ‘*Water* and *Massie bodyes* move to the *Center of the earth*; But rather the*n* suffer a diuulsio*n* in the co*n*tinua*n*ce of Nature, they wil mooue upwards from the Center of the Earth: for- saking their dutye to the *Earth* in regard of their duty to the *World*’ (Bacon 2000a, 136).19

The second rule establishes that the degrees of predominance among appetites depend on the extent to which they seek the good: appetites which tend to the indi- vidual good ‘generally’ (*plerunque*) do not prevail over appetites which seek some form of the public good, except in small quantities (Bacon 2004, 416–417). In other words, the preservation of the more common form ‘almost in every case’ (*quasi perpetuo*) reduces to order all lesser appetites (Bacon 1857–1874, I, 717).20 Bacon argues, for instance, that iron moves towards the loadstone by ‘a particular sympa- thy’, and yet, ‘if it exceede a certayne quantity, it forsaketh the affection to the *Loadstone*, and like a good patriot mooueth to the *Earth* which is the Region and Countrye of Massie Bodyes’ (Bacon 2000a, 136).21 He regrets that this is not the case in civil affairs. Although the prerogative of the good of communion is ‘much more engraved upon man’, he recognizes that human beings do not always put aside their individual appetites for the beneﬁt of society (ibid.).22

19 See also Bacon (1857–1874, I, 717).

20 The phrase *quasi perpetuo* has no equivalent in the *Advancement*.

21 See also Bacon (1857–1874, I, 717; 2004, 416–417).

22 The acknowledgment of the possibility of exceptions to this rule of predominance (particularly denoted by the words quoted above, *plerunque* and *quasi perpetuo*) likely alludes not only to the exceptions manifested in human life, but also to preternatural facts. See Bacon (1857–1874, VI, 639–640; I, 497; III, 1829; 2000a, 63; 1996, 6; 98; 2004, 454–455).

At this stage, it is worth noting some of the differences between *Novum organum* and *Abecedarium novum naturae*, which conﬁrm the tentative character of Bacon’s classiﬁcation of motions*.* The latter text is far more systematic and consistent than *Novum organum* in ascribing sixteen simple motions to the four basic appetites. From this account, it is clear that the appetite of preservation is manifested in the motions of resistance (*antitypiae*), connection (*nexus*), liberty (*libertatis*) and conti- nuity (*continuationis sui*).23 In *Novum organum*, by contrast, even though the four basic appetites are just as clearly recognized as in the *Abecedarium novum naturae*, the scope of the appetite of preservation becomes greater and more blurred. The desire of preservation affects a larger number of simple motions, including some motions that the *Abecedarium novum naturae* associates with other basic appetites. Thus, in the *Novum organum* Bacon maintains, on the one hand, that ‘the motions of things tend either to the preservation and good (*conservatio et bonum*) of the universe, like *Resistance* and *Connection* (*antitypia & nexus*); or of greater wholes like motion of the *Greater Congregation, Rotation*, and *Horror of Motion* (*exhor- rentia motus*); or of special forms like the rest’ (Bacon 2004, 413; English transla- tion slightly modiﬁed). On the other hand, apart from the motion of *antitypia*, which is said to be common to all matter, Bacon contends that the motions of connection, liberty, hyle, greater and lesser congregation, continuity, horror of motion, ﬂight and magnetic motion ‘seek after the conservation of their nature (*naturae suae conser- vationem appetere*)’ (Bacon 2004, 403).

Although Bacon’s account seems to be lacking in consistency and precision, we can reach some preliminary conclusions. In contrast to moral appetites, the motions of bodies do not conﬂate the basic appetite of enjoyment of one’s own nature with the appetite of self-preservation. Indeed, in the *Abcedarium novum naturae*, enjoy- ment, that is, the appetite ‘whereby bodies seem to wish to enjoy and exercise their nature’, is held to occur when bodies ‘are neither placed under any necessity to preserve themselves (*se conservandi*) nor suffer from the desire to raise or multiply themselves’ (Bacon 2000b, 201). In this account, self-preservation seems to act as a condition of enjoyment rather than as the effect of it. Four simple motions are enu- merated as expressions of the tendency to self-enjoyment: royal motion (*motus regius*), motion of spontaneous rotation (*motus rotationis spontaneus*), horror of motion or motion of rest (*exhorrentia motus* or *motus decubitus*) and motion of trepidation (*motus trepidationis*) (Bacon 2000b, 201–203). This approach, however, seems to collide with the account in *Novum organum*, where rotation and horror of motion are held to desire the preservation of ‘greater wholes’ (Bacon 2004, 413).

Obscure as this may be, there is no doubt that the motion of *antitypia* entails a strong sense of preservation. Since the good of communion prevails in nature ‘almost in every case’, the appetite for preservation involved in the motion of *anti- typia* ‘subsists in every body’(Bacon 2004, 385). It seems, then, that self-preservation

23 Bacon 2000b, 192: ‘Itaque muniuntur corpora natura corpora ad conservationem ipsorum moti- bus quatuor predictis, tanquam armis defensiuis, quibus se tueantur ab annihilatione, a vacuo, a tortura, et a separatione’. The motions alluded to are *antitypia*, *nexus*, *libertatis*, and *continuatio sui*, respectively.

somehow gets absorbed by the universal tendency to preservation. In this regard, it might be said that all motions both blend with matter’s tendency to preservation and are instances of it.

Finally, Bacon’s theory of motions keeps the distinction between the common and individual good, but omits the duality of the passive and active good. Notwithstanding this, however, he was adamant to stress that matter’s resistance is active in character. Motions are presented as ‘active virtues’, at least in *Novum orga- num.*24 Their association with activity lies at the heart of Bacon’s deﬁnition of motion, as becomes particularly clear in his criticisms of late scholasticism. Bacon claims that the scholastics did not look for the true moving principles of things (*principia moventia rerum*), or the ‘physical genera’ of motions *through which* things are produced. On the contrary, they are said to have postulated useless ‘logi- cal genera’, that is, static principles of rest (*principia quiescentia rerum*) *from which* things come into being.25

It is difﬁcult, however, to understand exactly what Bacon means by ‘activity’ (and ‘passivity’) in the particular context of his account of motions. Apparently, the sense in which motions are active is not the same as that involved in the distinction between the active and the passive individual good, which, as we have seen, were associated very explicitly with giving and receiving, respectively. A possible key to grasping Bacon’s idea of activity as an attribute of motion can be found in his doc- trine of universal perception (a doctrine also found in Telesio). Century 9 of the *Sylva Sylvarum* introduces universal perception as follows:

It is certain, that all bodies whatsoever, though they have no sense, yet they have perception: for when one body is applied to another, there is a kind of election to embrace that which is agreeable, and to exclude or expel that which is ingrate: and whether the body be alterant or altered, evermore a perception precedeth operation; for else all bodies would be alike one to another (Bacon 1857–1874, II, 602).26

This passage suggests that bodies are passive in the sense that they perceive external stimuli. Perception is a necessary condition for local motion, ‘since no body when placed near another either changes it or is changed by it, unless a recip- rocal perception precede the operation’ (Bacon 1857–1874, I, 610; IV, 402). Through their perception bodies are able to respond actively to stimuli according to their particular appetites (‘there is a kind of election’). It seems that Bacon thinks of appetites as latent tendencies that, under certain circumstances, manifest themselves as ‘active’ motions: ‘compressions, extensions, erosions, separations and like pro- cesses are latent in dead bodies while in act and are perceived only after the result becomes manifest’ (ibid., III, 28; my translation). Thus, the activity that Bacon ascribes to motions might be understood in this particular sense.

24 Bacon 2004, 385: ‘Species precipuas Motuum siue Virtutum Actiuarum’.

25 See Bacon (2004, 105–107; 1857–1874, III, 19–21).

26 See also Bacon (1857–1874, I, 610–611; III,28; 2004, 290; 1996, 274).

* 1. **Preservation, *Antitypia* and Active Resistance**

The motion of *antitypia* plays a fundamental role in Bacon’s view of nature. It is undoubtedly the most powerful motion in nature. It has been suggested that Bacon took this term from Aristotle.27 However, the meaning of *antitypia* in Bacon’s phi- losophy extends back to Stoicism and Epicureanism.28 A deﬁnition attributed to early Stoicism characterizes body as that which possesses three dimensions and *antitypia.*29 Here *antitypia* denotes the resistance of bodies, and serves to distinguish incorporeal things from void, place and body. Bodies are thus physical entities endowed with something more than their basic geometrical properties: they possess resistance to penetration, which enables the four elements (ﬁre, air, water and earth) to retain their essential identity. Epicurean atomism posits that *antitypia* is an insep- arable attribute of matter, as opposed to *cessio*, ‘suppleness’, that is, the lack of resistance characteristic of void.30 In the Middle Ages, Walter Burley (1275–1344) maintained that the quantum of matter was imbued with a principle of resistance. This principle prevented two bodies from occupying the same place at the same time.31

By the seventeenth century, resistance (denoted by such different terms as *anti- typia*, *renitentia*, *resistentia* and *anteresis*) was widely considered to be a distinctive quality of matter by which it resisted penetration. Resistance distinguished impen- etrable matter from penetrable space. Particularly interesting to us is the use of this notion by Francesco Patrizi (1529–1597), whose work was known to Bacon. Patrizi’s account of matter and space in his *Nova de universis philosophia* (‘A New

27 Wolff 1910–1913, I, 176. Fowler (Bacon 1878, 523) refers to Aristotle, *Meteorologica*, II, 8,

368a3; III, 1, 370b18- 371, a25.

28 In this reconstruction of the ancient notion of *antitypia* I am indebted to Jammer 1997, 23–24 and Hahm 1977, 10–11.

29 Plotinus, *Enneades*, IV, I, 26; 28 (von Arnim 1903–1905, SVF II, 315); Galenus*, De qualitatibus incorporeis*, 19.483, 13–16 (von Arnim 1903–1905, SVF II 381). It is worth noting that doxo- graphic testimonies offer different Stoic deﬁnitions of body. Apart from the deﬁnition we have already presented, a narrower deﬁnition of body as extension in three dimensions (without *anti- typia*) was given by Arius Didymus (von Arnim 1903–1905, SVF II.357), Philo (von Arnim 1903– 1905, SVF II.358) and Diogenes Laertius (*Vitae*, VII.135). An alternative deﬁnition of body ascribed to the Stoics maintains that body is ‘that which either acts or is acted upon’. In fact, the notion of body as having *antitypia* was never attributed either to Zeno of Citium or Chrysippus. On both deﬁnitions, see Hahm 1977. On the doxographic controversies regarding the Stoic deﬁnitions of body and their ascriptions to members of early Stoicism, see Mansfeld 1978 and Falcon 2005, 51–54. Other historians suggest that the origin of the term *antitypia* should be looked for in pre- Epicurean Atomism. See Mansfeld 1978, 164.

30 Epicurus 1973, <24.49> 29; Plutarch, *Epistola adversus Colotem*, 1111e (1116d?); Sextus

Empiricus, *Adversus Pyrrhoneae hypotyposes*, III, 39, 126, 152; *Adversus mathematicos*, I, 21,

156; X, 221–223; 239–240; 257; XI, 226.

31 Burley used this argument to demonstrate the possibility of motion in a void. This doctrine, however, did not have followers in his time. It was delivered in his commentary on the *Physics*, published in 1501 in Venice. See Grant 1981, 34. For a general survey of impenetrability, see Grant 1978.

Philosophy about Everything’, 1591) merges Platonic and Stoic traditions. It attri- butes *antitypia* to matter, as one of its deﬁning properties. Since both matter and space are extended, Patrizi argues that *antitypia* allows us to distinguish matter from space.32 The resistance of matter is said to be produced by the ﬂuid element (*fluor*) which constitutes all matter in the universe. Since the condition of having been produced in space entails that bodies possess three dimensions, the fact of being constituted by material ﬂuid implies that bodies are endowed with resistance to penetration.33 The inﬂuence of Patrizi’s ideas on matter and space can be seen in Bacon’s unpublished and unﬁnished *Thema coeli* (‘Theory of the Heaven’, c. 1611). Here, Bacon criticizes Ptolemaic astronomy and introduces the notion of *antitypia*. He rejects the Aristotelian thesis that, since the heavens are made of a ﬁfth essence, they lack instability, compressions or any other kinds of motion characteristic of elementary bodies. On the contrary, in terms similar to Patrizi’s, Bacon maintains that, ‘wherever a natural body is set, there also is resistance (*antitypia*), and that in proportion to the body’ (Bacon 1996, 187).

According to Bacon, *antitypia* is a motion that subsists in every part of matter, and which expresses its desire of resisting annihilation. In an atomistic writing like *De principiis atque originibus* (‘On Principles and Origins’, c. 1612), *antitypia* is said to be one of the essential attributes of atoms (Bacon 1996, 253). Although his attitude towards atomism changed throughout his lifetime, Bacon always main- tained a corpuscularian theory of matter along with the idea that resistance to anni- hilation (expressed by such different terms as *antitypia*, *resistentia* and *virtus conservatrix*) was an essential property of matter, and correlated it with the con- stancy of matter’s quantity.34 It is introduced as the ﬁrst motion in both *Novum organum* and *Abecedarium novum naturae*. The deﬁnition of the motion of *anti- typia* in the *Abecedarium* reads as follows:

32 On Patrizi’s notion of space and natural philosophy, see Henry 1979, 562–566; Deitz 1997 and Edelheit 2009.

33 Patrizi 1594, fol. 78r: ‘Corporum vero antitypia, seu anteresis, seu dicas resistentia, unde nam fuerit? Trinam quidem dimensionem a spacio habent congenito, quod spatij primaevi, pars est quaedam. A lumine, ut sint vel lucida vel diaphana, vel etiam opaca, ut partim est ante demon- strabitur postea. A lumine, habent etiam calorem, a calore essentiam, et vires, et actiones. Antitypiam, a quonam habebunt? A re nimirum, quae resistentiam vel indere, vel inferre possit. Eam nos, ﬂuorem, seu humorem, nominamus. Veterum multi, dixere aqua’. Other early modern auhors also discussed *antitypia.* William Gilbert, for instance, brieﬂy mentions *antitypia* in the middle of an astronomical consideration in his posthumous work *De mundo nostro sublunare* (1651) – although it was not available to Bacon, who apparently only knew Gilbert’s *De magnete* (1600). See Gilbert 1661, 66: ‘Sic esto: ﬁt hic Aristotelis error, crinem sive mucronem cometae esse ﬂammam. Sit tantum luminis relatio ex refractione Solis… ut semper in adversum a Sole tendat: materiata tamen est illa via, quasi deﬂuvium cometae, et quasi fumus egrediens, in quo refringitur lumen Solis; quae etiam ex motu in posteriora moventis laberetur. quare constat in spatio illo quocunque cometarum mucronatorum, qui post Solis occasum videntur, nullam esse renitentiam, nullam *antitypian*, nullum corpus est igitur vacuum’. *Antitypia* reappears later in the works of many early modern natural philosophers, including Hobbes, Warner, Glisson, Gassendi, Malebranche and Leibniz.

34 On Bacon’s corpuscularianism and *antitypia* as an atomic attribute, see Manzo 2001.

The quantum of nature or universal sum of matter admits neither increase nor decrease; for a force and resistance (*vis et resistentia*) inheres in every portion of matter, be it ever so small (*vel minima*), with which it can defend itself against entire armies of things, and will not let itself be annihilated, since it both stands ﬁrm and takes up some space. It makes no difference what sort of form the portion may have acquired nor where it happens to be situ- ated; for this force rules not only in all matter but in all places, whether in the heights of the heavens or the bowels of the earth (Bacon 2000b, 191).35

The motion of *antitypia* entails not only that matter retains its mass, but also that it always occupies a place. Bacon remarks that scholastic philosophers recognized this motion, but only understood its consequences and not its cause. They called it the motion ‘to prevent the penetration of dimensions’ and expressed it through the axiom that ‘two bodies cannot be in the same place’ (Bacon 2004, 385). Every sin- gle portion of matter resists such agents as ﬁre, weight, pressure and violence, which try to destroy it. In doing so, matter frees itself like Proteus by changing its form, properties or place (Bacon 1857–1874, VI, 651–652). If transformations are not possible, it remains as it is but never reaches the point of becoming nothing or existing nowhere. Only God is endowed with the power to annihilate or create mat- ter. Both God’s omnipotence and matter’s power of resistance are expressed in the principle of the constancy of matter’s quantity:

That all things are changed, and that nothing really perishes, and that the sum of matter remains exactly the same, is sufﬁciently certain. And as it needed the omnipotence of God to create something out of nothing, so it requires the same omnipotence to reduce some- thing to nothing. Whether this be done by the failure of the preserving power (*virtus con- servatrix*), or by act of dissolution, is nothing to the purpose; it is enough that the decree of the Creator must necessarily intervene (Bacon 1857–1874, III, 22; V, 426–427).

*Antitypia* expresses the appetite of preservation in the physical world at its high- est level, since it looks for the greatest good of nature. Resistance to destruction inheres in every single portion of matter and prevails because it seeks the good of communion. Matter is unable to abandon this tendency in favour of another appe- tite, since this prerogative belongs to God alone. Although matter also possesses certain tendencies towards discord, destruction and chaos, the desire for preserva- tion and harmony prevails (Bacon 1857–1874, VI, 639–640, 649–650).36 For that reason, Bacon does not doubt that matter will ultimately resist annihilation. Since the motion of *antitypia* tends to the greatest good of the universe, that is, to the con- servation of matter’s quantity as a whole, the rest of the appetites yield to it.

An important aspect of Bacon’s account, at least in *De principiis atque origini- bus*, lies in his contention that *antitypia* is an active motion of matter. The nature of resistance had attracted the attention of late scholastic philosophers, who attempted to answer the question of whether resistance belonged to the category of passion or to that of action, or whether it was a kind of impediment.37 Jacopo Zabarella (1532– 1589), for instance, maintained that resistance did not belong to any more general

35 See also Bacon 2004, 385.

36 See Weeks 2007, 110–114.

37 See also Des Chene 1996, 49–51.

category, but has its own special status. Resistance was said to be ‘something priva- tive’, therefore, he argued, it belonged ‘to the genera of action and passion only by reduction’. Indeed, it was a privation of the action or of the passion caused by the form. The intensity of its resistance, however, depended on the quantity of matter. By this claim, Zabarella meant to reject the thesis advanced by Pietro Pomponazzi (1462–1525), according to whom resistance was neither a passion nor an action, but an impediment aiming to prevent an external subject from producing any action on the body in an absolute or a partial way (Zabarella 1966 [1607], 436D–442D).

Bacon is also concerned with this question, although he concentrates on a par- ticular kind of resistance, namely, matter’s resistance, and does not discuss it by referring to the Aristotelian categories, as Zabarella and Pomponazzi did. Indeed, it is precisely at this juncture that one of his most stringent criticisms of Bernardino Telesio’s natural philosophy appears.38 Bacon and Telesio (1509–1588) agree that the quantity of universal matter remains the same, but they provide different causes to support this claim. Telesio’s explanation of the constancy of the quantity of mat- ter is grounded in his general view of nature, where all natural phenomena derive from three principles: heat, cold and matter.39 Although they are introduced in oppo- sition to the Aristotelian triad – form, matter and privation –, some similarities between the two sets persist (Aristotle, *Metaphysics*, 1069b33). While Telesio’s notions of heat and cold seem to be related to what the Aristotelians intend by form, he nevertheless removes privation from the principles of nature.40 Matter is the pas- sive substratum which undergoes generation and change, caused by the operative principles (*principia agentia*) of heat and cold. Thus, Telesio thinks of matter as a passive principle, necessary but not sufﬁcient to enable the multiplicity of the natu- ral world. In contrast to heat and cold, matter is corporeal. The core of Telesio’s disagreement with the Aristotelians lies in his conception of matter. While for Aristotle prime matter is absolute potentiality and it becomes corporeal only after receiving a certain form, Telesio, by contrast, sides with the Averroist interpretation of matter, widespread among late scholastic philosophers, for whom matter was still conceived as a fundamentally passive being and corporeality was intended as an essential attribute of it.41

As for the ontological status of matter, Telesio’s theory has certain similarities with both Aristotle’s and Plato’s. On the one hand, he agrees with them that matter is almost a non-being, since it needs a form to become an actual being. Matter does not have a speciﬁc form but only corporeality; all its other attributes come from the

38 On Bacon and Telesio, see Giachetti Assenza 1980; Pousseur 1990; Margolin 1990.

39 In this exposition of Telesio’s approach to matter I am indebted to Schuhmann 1990, 116–120.

40 Telesio 1971 [1586], 65: ‘Nulla porro agendi, seseque generandi facultate, materia donata cum sit, et assidue a calore summam in tenuitatem, pene et in non ens agatur, et a frigore in angustius cogatur, maximeque densetur; nihil tamen eius moles, itaque nec mundo magnitudo imminui, augerive apparet unquam, quod si calori, frigorique illam, ut libet, efﬁgendi, disponendique, non, et efﬁciendi, et veluti novam creandi, neque immuendi, et in non ens agendi, donata est vis’.

41 On Averroism and its inﬂuence in late medieval and early modern natural philosophy, see the classic Maier 1966, 26–52 and Des Chene 1996, 97–109.

forms. On the other hand, insofar as it is a corporeal being, matter can nevertheless be considered a being in a certain respect. Moreover, Telesio adds that corporeality is what allows matter to subsist throughout the changes caused by heat and cold. Thus, on his account, matter is nothing but a corporeally inactive mass, which sub- sists throughout bodily changes. One consequence of material inactivity is the invariance of its quantity. Matter is neither able to generate nor to destroy itself. Heat and cold, the operative principles, are able to rarify or to condense matter to extreme degrees, but they can never create or destroy matter. From these premises, Telesio concludes that the mass of matter must preserve the quantity given to it by God.

For Bacon, the notion that the appetite of preservation was a passive virtue of matter derived from a great blunder of the Telesian system. Bacon’s response to Telesio’s claims about matter do not come as a surprise, however, if we pay atten- tion to the adjectives by which Telesio described matter: inert, lazy, as if it were dead, dark and invisible (Telesio 1971 [1586], 7–8). Indeed, Telesio does not describe the constancy of matter’s quantity by referring to matter’s resistance against annihilation, but rather by emphasizing the inability of heat and cold to increase or decrease the material quantum of the universe. It is also worth noting that, even if Telesio’s natural philosophy heavily relied on the concept of appetite – in fact, as we shall see, on the universal appetite of self-preservation – remarkably, his belief in the constancy of matter’s quantity was not explicitly correlated with material appetites.

In criticizing this aspect of Telesian natural philosophy, Bacon argues that, although Telesio is right in afﬁrming the constancy of matter’s quantity, he falters by conveying it ‘as passive, and as belonging to the modus of quantity (*ad rationem quanti*) rather than to form and action’.42 For that reason, Bacon sets up a distinction between establishing the constancy of matter’s quantity as a consequence of ‘the modus of quantity’ and establishing it as related ‘to form and action’. According to Bacon’s interpretation, in Telesio’s case, constancy is envisaged as a residual char- acteristic of matter, recognizable by the simple observation of the permanence of its quantity, and despite the eventual changes of volume. In Bacon’s case, the con- stancy of matter’s quantity is held to be the effect of an intrinsic, latent appetite of matter, the strongest of all material appetites, imposed on it since creation.

For we come across practically no error which is like that of not regarding this virtue implanted in matter as an active virtue, a virtue by which matter saves itself from destruc- tion, such that not the smallest portion of matter can be either overthrown by the whole mass of the world, or destroyed by the power and fury of all agents, or in any way annihi- lated and reduced to order, but it both occupies some place and keeps up resistance (*renitentia*) with impenetrable dimensions, and has a go itself at something in its turn, and does not give itself up; this then is no passive virtue but on the contrary by far the most powerful of all, completely unconquerable, and as it were nothing but fate and necessity (Bacon 1996, 259–260).

42 My translation of Bacon 1996, 258: ‘transmittit, ut passivam, & tamquam ad rationem quanti potius, quam ad formam & Actionem, pertinentem’.

# Two Kinds of Preservation

In view of the above, it might be suggested that in Bacon’s account there is a basic meaning of preservation, described in terms of appetite towards the maintenance of a given being. Bacon distinguishes between two kinds of preservation: self- preservation and preservation of the whole. In addition to the texts analysed so far, there are other works of Bacon which refer to this tendency towards self-preservation in all things. Such is the case with his interpretation of the myth of Pan, a deity which, according to the principles of his hermeneutics, represents nature. Pan’s abil- ity to provoke ‘panic terrors’ is interpreted by Bacon as a ‘very wise doctrine’ hid- den in the myth. Panic terrors allude to the fact that ‘nature endowed all living beings with fear and dread, through which they preserve their life and being, and avoid and drive away impending ills’.43

Self-preservation appears in the classiﬁcation of universal appetites as the private passive good, and is characterized as the ‘*fruicion of that which is agreeable to our Natures*’ (Bacon 2000a, 141).44 It is accomplished when animals obtain their food, human beings enjoy overall pleasures and the Earth receives solar beams.45 Passive preservation is therefore identiﬁed with pleasure and, as a result, ranked as the low- est degree of good. Pleasure is the effect of the appetite of self-preservation, although it remains a consequence rather than its principal aim. It is worth remembering, however, that the passive character of the appetite of enjoyment is only mentioned in Bacon’s account of the good where he deals speciﬁcally with moral philosophy. As we have seen, the separation of passive appetites from active appetites is not explicitly developed in Bacon’s theory of motions. As I have conjectured, however, this distinction might still be inferred from the seemingly related doctrine of univer- sal perception.

This understanding of preservation as self-preservation embedded in the particu- lar nature of each being can be traced back to the Stoic notion of self-preservation and summed up with the formula *omnis natura est conservatrix sui* (Mulsow 1995). This concept is understood as the agreement or conciliation of every being with its own particular nature. In this regard, self-preservation derives from the notion of *oikeiosis*, that is, ‘adaptation’ and ‘self-endearment’ as the ﬁrst impulse of all animate beings (Mulsow 1998, 193).46 A fundamental source of this conception is Cicero:

Every living creature loves itself, and from the moment of birth it strives to secure its own conservation; because the earliest impulse bestowed on it by nature for its life-long protec- tion is the instinct for self-conservation and the maintainance of itself in the best condition

43 My translation of Bacon 1857–1874, VI, 639: “natura enim rerum omnibus viventibus indidit metum ac formidinem, vitae atque essentiae suae conservatricem, ac mala ingruentia vitantem et depellentem.”

44 The Latin version in *De augmentis scientiarum* deﬁnes this appetite as ‘*receptio et fruitio rerum naturae nostrae congruentium*’ (Bacon 1857–1874, I, 724).

45 Bacon (1857–1874, I, 722; 2000a, 139; 1857–1874, III, 229).

46 See also Inwood and Donini 1999, 678–680; Boeri 2012, 2013.

possible to it in accordance with its nature… Every living creature therefore ﬁnds its object of appetition in the thing suited to its nature (Cicero 1951).47

Cicero’s account is also meant as a criticism of Epicurean ethics, and thus rejects the doctrine that the supreme good lies in pleasure. In contrast, it is held that the inclination to self-preservation entails the search for what is in conformity with a being’s individual nature, before the individual has ever felt pleasure or pain (*De finibus bonorum et malorum*, III, 5, 16). Indeed, according to Diogenes Laertius, the Stoics held pleasure to be a byproduct ‘which supervenes when nature all by itself has sought out and attained those things which are suited to its constitution’.48

The concept of self-preservation reappears, enriched with further nuances and implications, during the Renaissance, when it comes to occupy a central place in natural philosophy. Noteworthy for our purposes is Telesio’s reconﬁguration of self- preservation. A major innovation he introduced was the universalization of self- preservation: in his account, the appetite characterized not only animate, but also inanimate beings (which were excluded in ancient Stoicism).49 In his philosophy, self-preservation served as the grounding principle for three important ﬁelds: natu- ral philosophy, medicine and ethics. Like Bacon, Telesio linked self-preservation to pleasure and the enjoyment of one’s own nature. Thus, he claimed that ‘the indi- vidual operation preserves the being at the highest level and graces it with the great- est pleasure; this is not a pleasure of another thing, but it is the feeling (*sensus*) of self-preservation’ (Telesio 1971 [1586], 362).50

Telesio’s approach, however, differed from Bacon’s outlook in a signiﬁcant way, in that he did not center the dynamic of appetites on the common good as Bacon would. On the contrary, Telesio conﬁned the appetite of preservation to individual self-preservation to the point that he did not relate this particular impulse to the preservation of the whole. The omission of the common good is to be found in both his natural and moral philosophy. For instance, Telesio argued for an anti-vacuist position, but he rejected the widespread anti-vacuist explanation that nature abhors vacuum due to the fact that ‘universal nature’ sought the conservation of the uni- verse by subduing the ‘particular natures’ of bodies (Telesio 1971 (1586), 36–37).51 Where ethics was concerned, he viewed individual self-preservation – that is, the life of particular things – as the highest good (Mulsow 1995, 395; 1998, 402).

47 Cicero, *De finibus bonorum et malorum*, V, IX, 24: ‘Omne animal se ipsum diligit ac, simul et ortum est, id agit, se ut conservet, quod hic ei primus ad omnem vitam tuendam appetitus a natura datur, se ut conservet atque ita sit affectum. Ut optime, secundum naturam affectum esse possit… Ergo omni animali illud, quod appetit, positum est in eo, quod naturae est accommodatum’. See III, V, 16–17; III, VI, 20–22.

48 Diogenes Laertius, *Vitae*, VII, 85–86, quoted in Inwood and Donini 1999, 679.

49 Mulsow 1995 and 1998, 14–22. See Telesio 1971 [1586], 362: ‘Omnium spiritus, qualiscumque sit, entium, animaliumque reliquorum ritu se ipsum conservandi, propriamque operationem ope- randi, motus nimirum aedendi, seseque iis oblectandi, se ipsum omnino conservandi summe est appetens’.

50 See Clericuzio 1988, 39.

51 On particular and universal natures, with special reference to the debate on the vacuum, see Schmitt 1967 and Manzo 2013.

Similarities with Bacon’s account in the early modern natural philosophical con- text are also to be found in Girolamo Fracastoro (1478–1553), whose works attracted Bacon’s attention.52 In *De sympathia et antipathia rerum* (1545) (‘On the sympathy and antipathy of things’), Fracastoro claimed that the ﬁrst goal of everything was to exist and to preserve itself. The best way to achieve preservation was the ‘mutual connection (*nexus*) and contact’ among bodies, by which they could prevent the occurrence of a void, nature’s ‘greatest enemy’ (Fracastoro 1554, 23).53 In addition, a more speciﬁc strategy for preservation was accorded to the four elements, which were thought to move towards their speciﬁc places in the universe in order to ensure the preservation of their species. Fracastoro also admitted that the elements may be doubly regarded as individuals and as members of the universe (Fracastoro 1554, 24–27).

To Stoicism, Telesio and Fracastoro, we should also add the natural law tradition, which was particularly inﬂuential in shaping early modern views on self-preservation (albeit in a legal-moral context), and one with which Bacon was well acquainted.54 In this domain, Thomas Aquinas (1225–1274) was a fundamental source linking self-preservation to the natural law tradition.55 He established the opinion that natu- ral inclinations grounded the precepts of the natural law. The ﬁrst natural inclination of man, which he shares with all beings, is the appetite to preserve its being.56 Many sixteenth-century exponents of Reformation theology also considered the appetite of self-preservation to be one of the central teachings of natural law.57 This account reached English legal thought through the seminal treatise *Doctor and Student* (1575) by Christopher St Germain (1460–1540), text which Bacon knew very well:

the lawe of nature maye bee considered in two manners, that is to saye: generally and spe- cially. when it is considered generallye, then it is referred to all creatures, aswell reasonable and unreasonable. for al unresonable creatures liue under a certaine rule to them geven by nature, necessary for them to the conseruation of their being (Saint Germain 1575, 3r).58

The relevance of self-preservation in English legal thought is also attested to by the posthumously published *Methodus studendi*, one of the most relevant early modern legal methodical treatises, and one which Bacon may have known in its

52 For Bacon’s references to Fracastoro see for instance Bacon 2004, 314, 332; Bacon 2000a, 93.

53 Mulsow 1995, 394 claims that the Stoics also related self-preservation with the preservation of the boundaries of the universe against the surrounding void.

54 Stoicism was also part of this tradition. See Haakonssen 1992, 884–885. On Francis Bacon and natural law, see Mc Cabe 1964.

55 Thomas Aquinas’ view in this regard is very much in keeping with the Stoic tradition (see Boeri 2012, 214, note 31 and 217).

56 Thomas Aquinas *Summa theologiae*, Ia IIae, q. 94, 2: ‘Secundum igitur ordinem inclinationum naturalium, est ordo praeceptorum legis naturae. Inest enim primo inclinatio homini ad bonum secundum naturam in qua communicat cum omnibus substantiis, prout scilicet quaelibet substantia appetit conservationem sui esse secundum suam naturam. Et secundum hanc inclinationem, perti- nent ad legem naturalem ea per quae vita hominis conservatur et contrarium impeditur’. On the account of self-preservation in natural law theories, see Brett 1997, 96 and *passim.*

57 Van Drunen 2010, 134, 146, 161, 171.

58 On Thomas Aquinas’ inﬂuence on St. Germain, see Zuckert 2007, 28–29.

manuscript version.59 Its author, John Doddridge (1555–1628), lists the maxim ‘est le propertie de nature de preserver luy mesme’ (‘to preserve itself is a property of nature’) among the maxims that the law borrowed from ‘common use, custom and conversation among men, Colected out of the general disposition, nature, and con- dition of humane kinde’ and ‘observed out of human actions’ (Doddridge 1631, 161–162).

In addition, Edward Coke (1552–1634), the eminent jurist and Bacon’s contem- porary, went even further and included preservation in the very deﬁnition of natural law: ‘the law of nature is that which God at the time of creation of the nature of man infused into his heart, for his preservation and direction; and this is *lex æterna*, the moral law, called also the law of nature’. He also associated the preservation of society with the preservation of man: ‘whatsoever is necessary for the preservation of the society of man is due by the law of nature’ (Coke 1826, 21–22). Like Coke, Bacon argued for the identiﬁcation of preservation with natural law when dealing with the legal discussion of the *Post-nati*. The speciﬁc legal point is not our concern here. What does matter for the purpose of this chapter is the claim Bacon made according to which ‘our law is grounded upon the law of nature, and these three things do ﬂow from the law of nature; preservation of life… liberty… [and] the society of man and wife’ (Bacon 1857–1874, VII, 668). In 1621, shortly after his political fall, Bacon drafted a memorandum for an audience with the King, in which he asserted once again that natural law teaches man to strive for his own preserva- tion: ‘I would humbly pray his Majesty that whatsoever the Law of Nature shall teach me to speak for my own preservation, Your Majesty will understand it to be in such sort as I do nevertheless depend wholly upon your will and pleasure’ (Bacon 1857–1874, XIV, 237).

The second kind of preservation posited by Bacon is present in the idea that the preservation of the whole is the supreme aim of both natural and moral philosophy. It is also involved in certain axioms of ﬁrst philosophy belonging to physics, politics and theology. These axioms characterize the nature of preservation by highlighting its great power and action:

‘That which is able to preserve a greater form is more powerful in action’ is a rule in phys- ics; for the principles that the connection of things be not severed, nor a vacuum (as they called it) be created tend to preserve the structure of the universe, while the principle that heavy bodies congregate towards the mass of the Earth helps preserve the region of dense bodies. And thus the former motion subdues the latter. The same holds in politics, for whatever tends to preserve the state in its nature is more powerful than that which contrib- utes to the well-being of the particular members of the republic. The same holds in theol- ogy, for in regard to theological virtues, Charity, which is the most communicative virtue, excels all the rest (Bacon 1857–1874, I, 541–542, my translation).

Further mention of the universal inclination to the preservation of the whole is made in a political speech written by Bacon in 1603 to encourage and celebrate the

59 The *Methodus studendi* was published originally in 1629 as *The Lawyers Light* and in 1631 again as part of *The English Lawyer.* In this article, references will be given to the 1631 edition. On Doddridge, see Neustadt 1987, 42–48; Coquillette 1992, 37–38.

union of England and Scotland. There he argues for ‘a congruity between the prin- ciples of Nature and Politics’ (Bacon 1857–1874, X, 91). The political precept behind this congruity is that the laws which govern the state must mirror the laws governing nature (Bacon 1857–1874, X, 92). In this context the supremacy of the good of communion is introduced as the ‘fundamental law of nature’ ‘whereby all things do subsist and are preserved’. This law establishes that

every thing in nature, although it have his individual and particular affection and appetite, and doth follow and pursue the same in small moments, and when it is delivered and free from more general and common respects, yet nevertheless when there is question or case for sustaining of the more general, they forsake their own particularities and properties, and attend to conspire to uphold the public (Bacon 1857–1874, X, 91).

In order to illustrate the notion of natural law, Bacon repeats here the well-known examples of the iron’s attraction to the loadstone and of all heavy bodies’ attraction to the Earth. These examples of natural phenomena and other instances concerning human society are intended to show that the appetite of preserving the ‘more com- mon form’ and the public good does not consist in a passive reception of pleasure, as is the case with self-preservation. It is rather an internal response against indi- vidual and selﬁsh inclinations, and against the destructive tendencies of matter and man. This response demands a signiﬁcant effort, particularly when conﬂicting appe- tites affect free agents like human beings. Preserving society and the universe might imply the annihilation of human lives or cause the deviation of motions to a direc- tion contrary to the particular interests of natural species. Under such conﬂicting circumstances, if the individual obeys the rule that the good of communion should in the end prevail, then it must have an active determination to oppose those indi- vidual appetites which incline it to alternative courses of action.

The supremacy of the good of communion over individual good lies at the heart of Aristotelian and Thomistic ethics, particularly in the way it had been system- atized in late scholastic philosophical works. An inﬂuential expression of this doc- trine at the time can be found in the commentary on Aristotle’s *Physics* produced by the Coimbra theologians. When discussing the existence of void (with arguments that are quite similar to the ones elaborated by Bacon), the Coimbra commentary deals with preservation and the common good. It maintains both the existence of the universal appetite of preservation and the primacy of the common good. First of all, the commentary describes self-preservation as a universal tendency: ‘there is in everything a congenital appetite to protect and preserve itself’. By means of procre- ation, education, politics, books and other ways, ‘all perishable things strive to free themselves from destruction’ and endeavour to save themselves or to save their species.60 Bodies are endowed with a love of society and union (*mutuae inter se coniunctionis et societatis amor*). Relying on this assumption, a large number of phenomena are explained at both a micro and a macro level: Why do small particles

60 Conimbricenses 1594, 62: ‘constat ingenitum esse rebus omnibus sese tuendi et conservandi appetitum … Videlicet quia hunc in modum res omnes caducae ab interitu sese vindicare student’ (Part 2, Book 4, Chapter 9, q. 1, a. 3).

of water gather together in the form of a spherical shape? Why does nature abhor vacuum? And so on (Conimbricenses 1594, 62–63).

Although individual good is able to aim at a goal different from the common good, there is no doubt that the common good will subdue individual interests when necessary (Conimbricenses 1594, 67).61 This idea is conveyed in terms quite similar to Bacon’s:

every natural being strenuously attempts to preserve two things, that is, the common good of the whole nature and its own particular good. For, since every physical thing and being is something particular, if it is considered in itself, separated from the others, and, at the same time, belongs to the community of nature, insofar as it is a member of the universe, therefore, when it is considered from the former point of view, it strives towards its private good; when it is considered from the latter, it strives towards the common one. And the reason is that the nobler and more divine the common good is, the more vehement is the effort with which an individual being strives towards that.62

The Coimbra commentary illustrates this point by claiming that heavy bodies are able to move upwards by themselves in order to prevent the existence of a vacuum (Conimbricenses 1594, 67). As usual, it draws explicitly on Aristotle and Aquinas to give a stronger foundation to its arguments. It is however interesting to note that it also openly rests on Cicero when it argues that the part depends on the whole. Indeed, it reports the words of Crassus, a character from *De oratore* (Conimbricenses 1594, 63). At the beginning of Book 3, Crassus argues for the inseparability of *res et verba* in rhetorical discourse, by claiming that words cannot fall into place in a sentence, if *res* are taken away, but that *res* cannot have clarity, if words are sub- tracted. He later adds that no particular thing can subsist detached from the whole in which it takes part.63 This late scholastic conception of preservation thus merges Stoicism with the Aristotelian-Thomistic tradition.

Another inﬂuential source of this doctrine, speciﬁcally in the English milieu, is

*Of the Laws of Ecclesiastical Polity*, written by the Anglican theologian Richard

61 See Des Chene 1996, 171–177.

62 Conimbricenses 1594, 63: ‘unumquodque ens naturale ad duo conservanda obnixe contendere, nempe ad commune totius naturae, et ad suum proprium, ac peculiare bonum. Enim vero cum quaevis res Physica et ens quoddam particulare sit, si in se praecise spectetur; et simul etiam ad naturae communitatem pertineat, prout est totius universi membrum; ut quidem priori modo se habet suum privatum bonum expetit, vt posteriori commune. Quod commune quanto excellentius est, ac divinius, tanto ad ipsum vehementiori conatu aspirat’ (Part 2, Book 4, Chapter [9](http://dx.doi.org/10.1007/978-3-319-27641-0_9), q. 1, a. 3).

63 The commentary quotes these lines: ‘Ac mihi quidem veteres illi maius quiddam animo com- plexi plus multo etiam vidisse videntur, quam quantum nostrorum ingeniorum acies intueri potest, qui omnia haec, quae supra et subter, unum esse et una vi atque una consensione naturae constricta esse dixerunt; nullum est enim genus rerum, quod aut avulsum a ceteris per se ipsum constare aut quo cetera si careant, vim suam atque aeternitatem conservare possint’ (Cicero, *De oratore*, III, V, 20). For an English translation, see Cicero 1942: ‘And in my own view the great men of the past, having a wider mental grasp, had also a far deeper insight than our mind’s eye can achieve, when they asserted that all this universe above us and below is one single whole, and is held together by a single force and harmony of nature; for there exist no class of things which can stand by itself, severed from the rest, or which the rest can dispense with and yet be able to preserve their own force and everlasting existence’.

Hooker (1554–1600). The author presents the universal tendency to preservation in terms of ‘laws’ and posits the pre-eminence of the ‘law’ which binds things to seek for the common good over the law that is concerned with the individual good. Thus, according to Hooker, there is a ‘lawe’ that makes things to ‘tende to their owne perfection’ and, in addition, there is another law

which toucheth them as they are sociable partes vnited into one bodie, a lawe which bindeth them each to serue vnto others good, and all to preferre the good of the whole before what- soeuer their owne particular, as we plainely see they doe, when things natural in that regard forget their ordinary natural woont, that which is heavie mounting sometime upwardes of it owne accord, and forsaking the centre of the earth, which to it selfe is most naturall, euen as if it did heare it selfe commaunded to let the good it priuately wisheth, and to releiue the presente distresse of nature in common (Hooker 1593, 55)

# Conclusion

Bacon’s account of preservation in nature gives rise to a number of difﬁculties and questions. One has to do with the scope of preservation. As we have seen while commenting on a passage from *Novum organum*, he seems to hold that all motions have preservation as their aim: preservation of the universe, preservation of the spe- cies and preservation of one’s own being (Bacon 2004, 413). Thus, the universal scope of *antitypia* seems somehow to comprehend and blend all motions, as direct and indirect instances of matter’s preservation. This hardly ﬁts the scheme of the quaternion of good, which is conceived in terms of an exclusive disjunction, par- ticularly in *Valerius Terminus* and the *Abecedarium novum naturae*. In this frame- work not all, but only some motions tend to preservation.

Another question concerns the relationship between the preservation of the whole and the preservation of the parts, that is, the relationship between individual good and the good of communion. Does Bacon claim that self-preservation is nec- essarily ensured when the preservation of the whole is achieved? It seems that in the moral sphere Bacon would reply negatively, since at least in some cases, individual lives are sacriﬁced in favor of the conservation of society. Things are far more com- plex when the interests of antagonistic social groups are involved (e.g., wars, reli- gious strife and political factions).64

As for natural philosophy, we can assume that, because of its Protean faculties, matter can change its place and form every time it is forced by circumstances that endanger the constancy of its quantity. When form changes as a result of matter resisting its own annihilation, it might be assumed that the individual being is not preserved. As a matter of fact, in Bacon’s view the possibility of matter’s transmuta- tion is grounded in the constancy of its quantity. But the preservation of the whole does not ensure the preservation of its parts. Things are different in other cases. For

64 This question is beyond the scope of this paper. Bacon deals with such issues in, for instance, *An Advertisement touching a Holy War* (Bacon 1857–1874, VII, 28–30). On Bacon’s views on war, see White 1968, 86–90.

instance, if the water collected in a clepsydra does not move downwards in order to avoid the occurrence of a vacuum, the water does not change its form. The result is a transitory state in which water leaves aside its particular appetites. In this case, the appetite of preventing the existence of void, that is, the tendency to preserve the world’s cohesion, does not entail the destruction of the individual being. On the contrary, the individual being becomes indirectly preserved insofar as the cohesion of the world system is kept up. Only under certain circumstances does self- preservation collide with the preservation of the whole. In sum, despite the undis- puted supremacy of the good of communion, preservation of the whole and individual self-preservation are embedded in a wide range of relations, dependent upon speciﬁc situations in both nature and human society.

Interestingly, Bacon’s assumption that self-preservation and preservation of the whole, both in the human and the non-human realms, may entail on many occasions conﬂicts of interests and tensions indicates that there is an important contrast to the Stoic tradition. Stoics thought that individuals, being parts of the whole, coexist in perfect harmony both in their relation to other individuals and to the whole (Boeri 2009). Given that premise, they assume that the preservation of the whole ensures the preservation of individuals and, consequently, conﬂict does not play any role in their account. While in the optimistic Stoic approach the world is an essentially harmonic unity, in Bacon’s view the world is permanently threatened by opposi- tions, due to man’s fallibility and matter’s ‘contumacy’, both ultimately originated in the fall of Adam. As a result, in Bacon’s account of self-preservation and preser- vation of the whole, the existence of conﬂicts becomes essential.

Finally, I would like to resume the question of the relationship between the natu- ral and the moral orders in Bacon’s philosophy. Johann Mouton has claimed that Bacon’s theory of simple motions is fundamentally ‘moral’ in nature, since it is rooted in a moral theory of different classes of good (Mouton 1990). As a result of this reading, moral philosophy would be the foundation of natural philosophy. My study, in contrast, suggests that Bacon thinks of moral philosophy and natural phi- losophy as parallel orders that reﬂect each other. Neither moral philosophy nor natu- ral philosophy gets the upper hand, as if one were the foundation of the other. Different kinds of moral good correlate with different kinds of natural good. Both are grounded in common appetites and are expressions of the law-like behaviour that God imposed on them, a behaviour which pervades reality as a whole and dis- plays unity in diversity.

# References

Bacon, Francis. 1799. *Oeuvres.* Trans. Antoine de Lasalle, 15 vols. Dijon: Louis-Nicolas Frantin. Bacon, Francis. 1857–1874. *Works*, ed. James Spedding, Robert L. Ellis, and Douglas D. Heath,

14 vols. London: Longman (repr. Stuttgart-Bad Cannstatt: Frommann, 1961–1963).

Bacon, Francis. 1878. In *Novum organum*, ed. Thomas Fowler. Oxford: Clarendon.

Bacon, Francis. 1996. In *Philosophical studies c.1611–c.1619*, ed. Graham Rees and Michael Edwards. Oxford: Clarendon.

Bacon, Francis. 2000a. *The advancement of learning*, ed. Michael Kiernan. Oxford: Clarendon. Bacon, Francis. 2000b. *The Instauratio magna: Last writings*, ed. Graham Rees. Oxford:

Clarendon.

Bacon, Francis. 2004. *Instauratio magna part II: Novum organum and associated texts*, ed.

Graham Rees and Maria Wakely. Oxford: Clarendon.

Boeri, Marcelo D. 2009. Does cosmic nature matter? Some remarks on the cosmological aspects of Stoic ethics. In *God and cosmos in Stoicism*, ed. Ricardo Salles, 173–200. Oxford: Oxford University Press.

Boeri, Marcelo D. 2012. Innateness, universal reason, and self-preservation: Making room for Stoicism in John Locke. In *Oikeiosis and the natural bases of morality: From classical Stoicism to modern philosophy*, ed. Alejandro Vigo, 193–230. Hildesheim: Olms.

Boeri, Marcelo D. 2013. Natural law and world order in Stoicism. In *Nature and the best life: Exploring the natural bases of practical normativity in ancient philosophy*, ed. Gabriela Rossi, 182–223. Hildesheim: Olms.

Box, Ian. 1996. Moral philosophy. In *The Cambridge companion to Bacon*, ed. Markku Peltonen, 260–282. Cambridge: Cambridge University Press.

Brett, Annabel. 1997. *Liberty, right, and nature: Individual rights in later scholastic thought*.

Cambridge: Cambridge University Press.

Cicero. 1942. *De oratore, De fato, Paradoxa stoicorum, De partitione oratoria*. Trans. H. Rackham.

Cambridge, MA: Harvard University Press.

Cicero. 1951. *De finibus bonorum et malorum*. Trans. H. Rackham. Cambridge, MA: Harvard University Press.

Clericuzio, Antonio. 1988. *Spiritus Vitalis*: Studio delle teorie ﬁsiologiche da Fernel a Boyle.

*Nouvelles de la République des Lettres* 8: 33–84.

Coke, Edward. 1826. In *The Reports of Sir Edward Coke in thirteenth parts*, ed. John Henry Thomas and John Farquhar Fraser, volume IV, Parts VII–VIII. London: Joseph Butterworth and Son.

Conimbricenses. 1594. *In octo libros physicorum Aristotelis Stagiritae*, 2 vols. Lyon: Jean-Baptiste Buysson.

Coquillette, Daniel. 1992. *Francis Bacon*. Stanford: Stanford University Press.

Deitz, Luc. 1997. ‘*Falsissima est ergo haec de triplici substantia Aristotelis doctrina*’. A sixteenth- century critic of Aristotle: Francesco Patrizi da Cherso on privation, form, and matter. *Early Science and Medicine* 2: 227–250.

Des Chene, Denis. 1996. *Physiologia: Natural philosophy in late Aristotelian and Cartesian thought*. Ithaca: Cornell University Press.

Doddridge, John. 1631. *The English lawyer describing a method for the managing of the lawes of this land*. London: John More.

Duro, Aldo. 1985. Suità: Storia di un termine apparentemente ignoto. *Lexicon Philosophicum: Quaderni di Terminologia Filosofica e Storia delle Idee* 1: 41–53.

Edelheit, Amos. 2009. Francesco Patrizi’s two books on space: Geometry, mathematics, and dia- lectic beyond Aristotelian science. *Studies in History and Philosophy of Science* 40: 243–257. Émery, Jacques-André. 1798–1799. *Le Christianisme de François Bacon, chancelier d'Angleterre, ou: Pensées et sentiments de ce grand homme sur la religion*. Paris: Jean-Luc Nyon the Elder

and François Belin.

Epicurus. 1973. *Opere*, Graziano Arrighetti. Turin: Einaudi.

Falcon, Andrea. 2005. *Aristotle and the science of nature: Unity without uniformity*. New York: Cambridge University Press.

Fracastoro, Girolamo. 1554. *Liber unus de sympathia et antipathia rerum, Item De contagione*.

Lyon: Jean de Tournes and Guillaume Gazeau.

Giachetti Assenza, Valeria. 1980. Bernardino Telesio: Il migliore dei moderni. I riferimenti a Telesio negli scritti di Francesco Bacone. *Rivista di Storia della Filosofia* 35: 41–78.

Gilbert, William. 1661. *De mundo nostro sublunari philosophia nova*. Amsterdam: Lodewijk Elzevir.

Grant, Edward. 1978. The principle of the impenetrability of bodies in the history of concepts of separate space from the middle ages to the seventeenth century. *Isis* 69: 551–571.

Grant, Edward. 1981. *Much ado about nothing. Theories of space and vacuum from the middle ages to the scientific revolution*. Cambridge: Cambridge University Press.

Haakonssen, Knud. 1992. Natural law theory. In *Encyclopedia of ethics*, ed. Lawrence C. Becker and Charlotte B. Becker, 884–890. New York: Garland.

Hahm, David. 1977. *The origins of Stoic cosmology*. Columbus: Ohio State University Press.

Henry, John. 1979. Francesco Patrizi da Cherso’s concept of space and its later inﬂuence. *Annals of Science* 36: 549–573.

Hooker, Richard. 1593. *Of the lawes of ecclesiasticall Politie*. London: John Windet.

Inwood, Brad, and Pierluigi Donini. 1999. Stoic ethics. In *The Cambridge history of Hellenistic philosophy*, ed. Keimpe Algra, 675–738. Cambridge: Cambridge University Press.

Jammer, Max. 1997. *Concepts of mass in classical and modern physics*. Mineola: Dover.

Jardine, Lisa. 1974. *Francis Bacon: Discovery and the art of discourse*. London: Cambridge University Press.

Maier, Anneliese. 1966. Die Vorläufer Galileis im 14. Jahrhundert. In *Studien zur Naturphilosophie der Spätscholastik*. Rome: Edizioni di Storia e Letteratura.

Mansfeld, Jaap. 1978. Zeno of Citium. Critical observations on a recent study. *Mnemosyne* 31: 152–167.

Manzo, Silvia. 2001. Francis Bacon and atomism: A reappraisal. In *Late medieval and early mod- ern corpuscular matter theories*, ed. Christoph Lüthy, John Murdoch, and William R. Newman, 209–243. Leiden: Brill.

Manzo, Silvia. 2003. The argumentation on void in the seventeenth century: The case of Francis Bacon. *The British Journal for the History of Science* 36: 26–43.

Manzo, Silvia. 2013. The preservation of the whole and the teleology of nature in late medieval, Renaissance and early modern debates on the void. *Journal of Early Modern Studies* 2: 9–34.

Margolin, Jean-Claude. 1990. Bacon, lecteur critique d’Aristote et de Telesio. In *Atti del convegno internazionale di studi su Bernardino Telesio*, 135–166. Cosenza: Accademia Cosentina.

Mathews, Nieves. 1996. *Francis Bacon: The history of a character assassination*. New Haven: Yale University Press.

Mouton, Johann. 1990. The summary law of motion. In *Francis Bacon’s legacy of texts*, ed.

William A. Sessions, 139–150. New York: AMS Press.

Mulsow, Martin. 1995. Selbsterhaltung. In *Historisches Wörterbuch der Philosophie*, vol. 9, ed.

Joachim Ritter et al., 393–406. Darmstadt: Wissenschaftliche Buchgesellschaft.

Mulsow, Martin. 1998. *Frühneuzeitliche Selbsterhaltung: Telesio und die Naturphilosophie der Renaissance*. Tübingen: Max Niemeyer.

Neustadt, Mark. 1987. *The making of the instauration: Science, politics, and law in the career of Francis Bacon*. PhD Thesis, Johns Hopkins University.

Patrizi, Francesco. 1591. *Nova de universis philosophia*. Ferrara: Benedetto Mammarella. Pousseur, Jean-Marie. 1990. Bacon, a critic of Telesio. In *Francis Bacon’s legacy of texts*, ed.

William A. Session, 105–117. New York: AMS Press.

Schmitt, Charles B. 1967. Experimental evidence for and against the void: The sixteenth-century arguments. *Isis* 58: 352–366.

Schuhmann, Karl. 1990. Telesio’s concept of matter. In *Atti del convegno internazionale di studi su Bernardino Telesio*, 115–134. Cosenza: Accademia Cosentina.

St Germain, Christopher. 1575. *The dialoges in Englishe betweene a Doctor of Diuinitie and a student, in the lawes of Englande*. London: Richard Totell.

Telesio, Bernardino. 1971 [1586]. *De rerum natura iuxta propria principia libri IX*. Naples: Orazio Salviani (repr. Hildesheim/New York: Olms).

Van Drunen, David. 2010. *Natural law and the two kingdoms: A study in the development of reformed social thought*. Grand Rapids: William B. Eerdmans.

von Arnim, Hans F.A., ed. 1903–1905. *SVF: Stoicorum veterum fragmenta*, Vols. 1–3. Leipzig: Teubner. 1924. Vol. 4. Indexes by Maximilianus Adler. Leipzig: Teubner.

Wallace, Karl. 1967. *Francis Bacon on the nature of man: The faculties of the soul*. Urbana: The University of Illinois Press.

Weeks, Sophie. 2007. Francis Bacon and the art – nature distinction. *Ambix* 54: 101–129.

White, Howard B. 1968. *Peace among the willows: The political philosophy of Francis Bacon*. The Hague: Martinus Nijhoff.

Wolff, Christian. 1751. *Philosophia moralis sive ethica methodo scientifica pertractata. Pars secunda*. Halle: Ofﬁcina Rengeriana.

Wolff, Eugene. 1910–1913. *Francis Bacon und seine Quellen*, 2 vols. Berlin: Emil Felber. Zabarella, Jacopo. 1966 [1607]. De reactione liber*.* In *De rebus naturalibus*. Frankfurt: Lazar

Zetzner.

Zuckert, Michael. 2007. The fullness of being: Thomas Aquinas and the modern critique of natural law. *The Review of Politics* 69: 28–47.