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Guido Giglioni

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Sorana Corneanu

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Francis Bacon on Motion and Power



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FRANCIS BACON
ON MOTION AND POWER

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Guido Giglioni • James A.T. Lancaster
Sorana Corneanu • Dana Jalobeanu
Editors

Francis Bacon on Motion and Power

 Springer

Editors

Guido Giglioni
Warburg Institute
London, UK

Sorana Corneanu
University of Bucharest
Bucharest, Romania

James A.T. Lancaster
Royal Holloway
University of London
London, UK

Dana Jalobeanu
Institute for Research in the Humanities
University of Bucharest
Bucharest, Romania

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Preface

This volume collects some of the papers delivered over the course of two colloquia on Francis Bacon held at the Warburg Institute in 2011 and 2013. The first colloquium, on ‘Francis Bacon and the Materiality of the Appetites: Science, Medicine and Politics’ (17–18 June 2011), gave participants an opportunity to engage in fruitful discussions on topics such as matter, desire and Stoicism in Bacon’s philosophy. The second, on ‘The Alphabet of Nature and the Idols of the Market: Bacon on Languages, Natural and Human’ (14–15 June 2013), focused on the notion of language in a variety of Baconian contexts (e.g., natural history, magic, rhetoric and moral philosophy).

From different angles, *Francis Bacon on Motion and Power* revisits some of the most controversial issues in Bacon scholarship today (on topics such as matter, experimentation and the nature of political organizations). It looks at Bacon as a complex figure, but one who was able to move with a certain ease across the universes of sixteenth- and seventeenth-century literature, science and philosophy, and it does so on three levels: by exploring the relationship between metaphysics and experimental knowledge in Bacon’s thought; by emphasizing the close intertwinement of the natural, moral and political aspects of his philosophy; and by highlighting his lifelong concern with the most pressing theological questions of the age (the status of natural theology, the possibility and the limits of a theologico-political order and the controversial value of pagan wisdom). Tying together these strands, *Francis Bacon on Motion and Power* ultimately highlights Bacon’s particular focus on the appetitive nature of reality, shared by both humans and nature, and placed, as he understood it, between the opposing forces of life and death.

Both colloquia were an integral part of the activities related to the European Research Council project ‘Medicine of the Mind and the Reconfiguration of Natural Philosophy: A New Interpretation of Francis Bacon’. This five-year research project

(2010–2014) was carried out by the editors of this volume in conjunction with the New Europe College (Colegiul Noua Europă) in Bucharest. We would like to thank the Warburg Institute and their staff for helping us to organize these colloquia, especially Catherine Charlton, Natalie Clarke, Jane Ferguson, Folake Ogundele and Anita Pollard.

Bucharest and London
September 2015

Sorana Corneanu
Guido Giglioni
Dana Jalobeanu
James A.T. Lancaster

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Chapter 1

Introduction: Francis Bacon and the Theologico-political Reconfiguration of Desire in the Early Modern Period

Guido Giglioni

Abstract Bacon's ideas on motion rested on an appetitive and acquisitive consideration of life in which nature was identified with a tendency to preserve order, virtue with the unceasing effort to expand the boundaries of life, and government with the art of maintaining and balancing power (reason of state). A remarkable outcome of this view was the opinion that, in a universe ruled by the principle of self-preservation, life appeared to be constitutively vulnerable, being always exposed to episodes of aggression and violence that originated in its own environs. In the teleological framework of Aristotelian metaphysics, by contrast, life was an indication of perfection, for it signalled the fulfilment of potentialities brimming with energy and knowledge. To be alive, for both Plato and Aristotle, meant to attain a higher degree of ontological perfection. For Bacon, to be alive meant to counter a deeper and stronger tendency to rest. Compared to Aristotelian and Platonic ideals of life as self-fuelling *activity*, Bacon shifted the emphasis away from the notion of spontaneous self-organization towards that of *reactivity*. From this point of view, he rightfully belongs to the early modern history of *conatus*, understanding by *conatus* the struggle to remain in existence and expand the scope and power of one's being. By elaborating an original theory of conative motions, Bacon adopted and reinterpreted some of the most controversial issues of Renaissance philosophy concerning both nature and politics (above all from Bernardino Telesio and Niccolò Machiavelli), and bequeathed them to a number of seventeenth-century philosophers eager to explore new ways of addressing life's puzzling tangle of desires, power and knowledge.

G. Giglioni (✉)

Warburg Institute, Woburn Square, London WC1 0AB, UK

e-mail: guido.giglioni@sas.ac.uk

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1.1 History, Medicine and Politics: The Disciplinary Coordinates of Early Modern *Conatus*

Why motion when everything could be eternally peaceful and immutable? If the paths of nature all drive inexorably to death, why indulge in seemingly superfluous detours? These are formidable questions which Bacon pondered throughout his career as both a philosopher and a politician with strong interests in medicine and history. In his philosophy, he laid bare a radically new view of motion, in which, departing significantly from the Aristotelian and scholastic approach, he explained motion not as a condition of partially unactualized potentiality, but as an actual tendency inbuilt in matter. Even more removed from Bacon's mind was any attempt to provide a mechanical and kinematic understanding of motion. He looked at motion as appetite, and this for him was the very essence of reality, its source of activity. His was a cosmos in which there was ceaseless motion and action, followed by knowledge and contemplation. This position was rather unconventional when compared to previous opinions. For Plato and Aristotle, for instance, motion was an accident, a reaction, a transitory state meant to end with either the full disclosure of intelligible reality (Plato) or the complete actualization of potential energy (Aristotle). Bacon, by contrast, thought that the dynamic and affective dimensions of reality were more original than the cognitive ones. Things first adjusted themselves to reality (all things, animate and inanimate, for everything, so Bacon assumed, was in the grip of desire); then they were able to contemplate reality (that is, if they ever reached the level of focus and the state of leisurely detachment required for contemplation).

In this respect, Bacon's ideas on motion rested on an appetitive and acquisitive consideration of life in which nature was identified with a tendency to preserve order, virtue with the unceasing effort to expand the boundaries of life, and government with the art of maintaining and balancing power (reason of state). A remarkable outcome of this view was the opinion that, in a universe ruled by the principle of self-preservation, life appeared to be constitutively vulnerable, being always exposed to episodes of aggression and violence that originated in its own environs. In the teleological framework of Aristotelian metaphysics, by contrast, life was an indication of perfection, for it signalled the fulfilment of potentialities brimming with energy and knowledge. To be alive, for both Plato and Aristotle, meant to attain a higher degree of ontological perfection. For Bacon, to be alive meant to counter a deeper and stronger tendency to rest. Compared to Aristotelian and Platonic ideals of life as self-fuelling *activity*, Bacon shifted the emphasis away from the notion of spontaneous self-organization towards that of *reactivity*. From this point of view, he rightfully belongs to the early modern history of *conatus*, understanding by *conatus* the struggle to remain in existence and expand the scope and power of one's being. By elaborating an original theory of conative motions, Bacon adopted and reinterpreted some of the most controversial issues of Renaissance philosophy concerning both nature and politics (above all from Bernardino Telesio and Niccolò Machiavelli), and bequeathed them to a number of seventeenth-century philoso-

phers eager to explore new ways of addressing life's puzzling tangle of desires, power and knowledge.

It is therefore important to make clear from the beginning that Bacon's new science of motion was not influenced by Aristotelian physics or the recovery of Archimedean mechanics, nor did it embrace in any way the mathematizing vision of nature that was taking shape at the time. Rather, his new science drew inspiration from the disciplines of history, medicine and politics, as is evident from his reinterpretation of both *conatus* and *conservatio*. Bacon was fully aware that the parcelling out of power, happening on many levels at the time, dovetailed with a view of life characterized by the atomizing of drives and interests. Crucially, in the self-preservative framework of natural organizations, embraced by authors as diverse as Machiavelli, Telesio and Bacon (and later Spinoza), the emphasis was on the 'self'. As a collective enterprise, the survival of the whole depended on myriad material selves adjusting to each other and discovering ways of coexisting together. 'Dionysian' (i.e., human) desire was confronted with the ravenous hunger of 'cupidinous' (non-human) desire, to use Bacon's categories of emblematic philosophy (see Chap. 7 in this volume). This was a momentous shift, both in metaphysical and theological terms: belief in an original unity of nature was being radically questioned, while the assumption that reality corresponded to one intelligible template of divine origin began to lose intellectual appeal once compared with a new world of economic expansion and political conflict. In this sense, as I argue in the rest of this introductory chapter, the self-preservative model of reality characteristic of Bacon's philosophy was of a distinctively theologico-political character.

1.2 The Power of the Idols

One of the most original and characteristic lines of inquiry that defines early modern philosophy, from Machiavelli to Spinoza, is the investigation of that unique constellation of reasons and conditions that make desire, power and language inextricably intertwined in human lives. Bacon came up with a particularly successful term to denote that entangled knot of imagination, appetite and manipulation: *idolum*, that is, a 'phantom' or a 'spectre', a distorted representation of reality induced by expectations and passions, and capable of crippling man's abilities to express and communicate his opinions and thoughts. As tokens of the lustful and idolatrous nature of human beings, *idola* signalled for Bacon the constitutively delusional character of desire. From the 'films' (εἰδωλα) of the ancient Atomists, endlessly released from all natural beings, to Calvin's effigies of blasphemous worship (Calvin's *Treatise on Relics* had been translated into English in 1561), *idolum* possessed a long, chequered history as a technical term in philosophy. *Idolum* was idol (of both amorous and religious devotion), figment of the imagination and object of unrestrained desire. Bacon appropriated the term to signify that the object which one might take for reality could in fact be an image of nature refracted through the prism of human desire. In a culture that, from Henry VIII to Elizabeth I, had witnessed official acts

of iconoclasm and popular attacks against images (from statues to paintings, from stained-glass windows to rituals, from ballads to plays), the ‘idoltrous eye’, to use Michael O’Connell’s phrase, had become a pervasive concern, one that helps to explain specific attitudes and fears towards reality. It was a culture that was profoundly uneasy with *idola* because of their blasphemous, erotic and artistic implications. Religious iconoclasm, Petrarchism and the recovery of pagan imagination all helped create an atmosphere of anxiety fuelled by a perceived rift between appearance and reality (O’Connell 2000; Phillips 1973; Collinson 1986).

Against this background, it was the Democritean sense of *idola* which prevailed in the way Bacon developed his theory of idolatrous representation. Lucretius had insisted that the myriad phenomena in our lives impeached the credibility of the senses (*violare fidem quasi sensibus ... quaerunt*), but he likewise blamed the projections superimposed by the mind onto reality (*opinatus animi quos addimus ipsi*, in *De rerum natura*, IV, 463–465). For Lucretius, as well as for Bacon, to desert sensory evidence and chase the dreams of the mind was tantamount to violating the primordial bond of trust between things (*violare fidem prima*, which Bacon rephrased as *commercium mentis et rerum*) and therefore to uprooting the very foundations of life and safety (*convellere tota | fundamenta quibus nixatur vita salusque*, IV, 505–506). Bacon adopted some characteristic themes from Lucretius, and devised an ontology of dynamic realism opposed to the fleeting constructions of deceiving appearances incessantly being fashioned by the human mind. He defined motions as real appetites constitutive of things, while rejecting idols as wish-fulfilling desires that were wholly incompatible with reality.

There is no doubt that *idolum* is a keyword in Bacon’s philosophical language, both in Latin and in English. Depending on the context, it variously taps into the resources of mythology, emblematic literature, poetry and rhetoric. This is an aspect of Bacon’s philosophizing that has often been undervalued, dismissed as ‘literary’ and not sufficiently ‘philosophical’, or worse, not ‘scientific’. Due to a host of reasons (rhetorical, ideological and propagandistic), the normalization of Bacon’s thought and vocabulary started very early in the seventeenth century (Giglioni 2013a, 2014b). Marialuisa Parise, in the final chapter of this volume, reports the significant testimony of Antoine de Lasalle (1754–1829), who in 1799 complained about Bacon’s decision to use the word *idolum*. That word, in Lasalle’s opinion, was an infelicitous choice, for it referred at once to mistakes, prejudices and delusions (‘une erreur, un préjugé et un fantôme de l’esprit ou une idée fantastique, ne sont pas précisément la même chose’, in Lasalle 1799–1800, IV, 103–104, and Parise in this volume). In fact, Bacon’s *idolum* is a word that captures very well that most elusive combination of desire, imagination and language. *Idola* testify to the constant threat of delusional apprehensions of reality, imbued with lust and expectation. Above all, they bring to the fore the awareness that Bacon had of the power of language, as both a historical and a social artefact. It was precisely because of this intertwinement of desire, imagination and language that, according to Bacon, philosophy should become mythopoetic and explore the most ancient testimonies of the original productivity of nature. Not by coincidence, as we will see in the next section, philosophy was symbolized by Orpheus in Bacon’s thought.

1.3 ‘Orpheus’s Theatre’, or What Bacon Meant by Philosophy

What is philosophy for Francis Bacon? Its primary meaning coincides with the experimental attempt to preserve the life of natural bodies, what in the *Sylva Sylvarum* he called the ‘great secret of preservation of bodies from change’. In this work, the investigation was remorselessly experimental. Permanence of life could be achieved by denying access to air, by preventing a body from being assimilated by other bodies, and by restraining parts from moving within the same body (Bacon 1857–1874, II, 384). In *De sapientia veterum* (1609), the question of the preservation of life had already taken on metaphysical overtones: ‘by far the most noble work of natural philosophy (*opus naturalis philosophiae longe nobilissimum*) is the very restoration and renewal of perishable things (*ipsa restitutio et instauratio rerum corruptibilium*)’ (Bacon 1857–1874, VI, 647–648). Both works (*Sylva Sylvarum* and *De sapientia veterum*) and both approaches (the experimental and the mythographic) confirmed the theoretical and practical difficulties involved in the attempt (*experimentum*) to preserve life. Since Bacon recognized that this aim could not be achieved due to the rudimentary state of technology, in *De sapientia veterum* he introduced a secondary meaning of philosophy, related to the preservation of social bodies:

this concern for public affairs (*rerum civilium cura*) takes place in due order after the attempt to renew the mortal body has been assiduously made and in the end it failed (*post experimentum corporis mortalis restituendi sedulo tentatum et ad extremum frustratum*, Bacon 1857–1874, VI, 648).

To provide a universal model of philosophy (*philosophiae universae imago*), Bacon referred here to the fable of Orpheus – ‘an extraordinary man, of a truly divine nature, expert in all kinds of harmony, capable of attracting and winning over everything by using pleasant means’. And since Orpheus’s labours represented the hard work of knowledge, they were even superior to Hercules’s labours, traditionally taken as a symbol of virtue and fortitude. The story as recounted by Bacon is divided into two main parts: the first concerned Orpheus’s ability to convince the infernal deities (*Manes*), through his singing and playing, to bring back to life his wife Eurydice; the second described the effects that his music had on natural beings:

through the sweet sound of his lyre and his singing, he first drew to himself all kinds of wild animals, in such a way that they were sitting around him, as if in a theatre (*in more theatri*), all attentive to the harmonious sounds of his lyre, all behaving kindly and meekly with each other, having divested themselves of their previous nature, oblivious of their anger and ferocity, without being led to act precipitously by the urges and rage of inordinate desire (*stimuli et furores libidinis*) and no longer bothered to satiate their voraciousness or to chase after preys. And this wasn’t all, for the force and the power of his music was so great that it moved even woods and stones, so that they too moved and arranged themselves in an orderly and proper fashion around him (Bacon 1857–1874, VI, 647).

By representing philosophy as Orpheus, Bacon highlighted the role that an accurate and patiently acquired knowledge of nature played in prolonging the effects of

life and postponing death (as signified by the bringing back of Eurydice to life). Knowledge of the innermost desires of nature (the motions of matter) and control of human desires (passions) were complementary plans of action in Bacon's philosophical programme:

Orpheus's singing is of two kinds: one is directed to placate the infernal deities, the other to attract animals and woods. The former refers in the most apposite way to natural philosophy, the latter to moral and political philosophy. And the reason is that the most noble work of natural philosophy is by far the very restoration and renewal of perishable things, and – at a lower level – the preservation of bodies in their state (*corporum in statu suo conservatio*), and the delaying of dissolution and putrefaction (*dissolutionis et putredinis retardatio*). And if this goal can ever be achieved, certainly it can only be done by refining the temperaments of nature in the most appropriate way, as if through the harmony of the lyre and by following accurate rhythms and measures (Bacon 1857–1874, VI, 647–648).

This, however, was for Bacon the most difficult thing to achieve, especially because human beings were often overwhelmed by the urge to satisfy their material pleasures in an immediate way. For this reason, they directed their philosophical efforts away from nature and concentrated on the refinement of their culture:

Being therefore unable to accomplish such a momentous task (*tantae rei fere impar*), and understandably sad for this reason, philosophy turns itself to human affairs (*vertit se ad res humanas*). By resorting to persuasion and eloquence, philosophy instils love for virtue, justice and peace into the soul of human beings. In doing so, it brings people together and sees to it that they accept the rule of the laws, submit to power and forget the untameable passions (*affectus indomiti*), while following and obeying precepts and disciplines. After that, buildings are built, cities are founded, fields and gardens are kept with trees, so much so that not without a reason stones and woods are said to be drawn and moved. And this care for civil matters (*rerum civilium cura*) takes place in due order after the attempt to renew the mortal body has been assiduously tried, in the end with no success; and since the unavoidable necessity of death appears increasingly more evident to the eyes of human beings, this encourages them to pursue eternity through their merits and the glory of their name (Bacon 1857–1874, VI, 647–648).

It is certainly possible to interpret the secondary meaning of philosophy for Bacon as a solution for political order. In fact, both the primary and the secondary meanings of philosophy are political. Bacon writes of philosophy like a Lord Chancellor, but *pace* William Harvey, who came up with this famous quip, we can now say that that remark loses its originally sarcastic tone, and we are ready to accept the idea of a chancellor-philosopher who held a political view of the universe (Aubrey 1958, 130). The two meanings of philosophy as the activity that aims at preserving the life of both natural and social bodies derive from the ontological core of Bacon's philosophy, that is, appetite or desire. As will be argued in many of the contributions to this volume, appetite is for Bacon natural and social at the same time. A passage from his early work *Valerius Terminus*, written around 1603, illustrates this point with flair and ingenuity: the universe, encompassing both the natural and the human worlds, is ordered according to four principal appetitive forces – the 'quaternion of good':

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 pleasure of nourishment and generation; and in man do make the aptest and most natural division 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 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 discourses of pleasure, virtue, duty, and religion (Bacon 1857–1874, III, 229–230; cf. Bacon 2000a, 135–53).

The ‘appetite that is in all things to receive and to give’, the motions through which individual things situate themselves within the whole system of the universe and, finally, the appetitive tendencies that keep the cosmos together according to the hierarchical divisions of being, all these motions form the structure which organizes the natural and social life of things. In essence, what Bacon is saying is that if moral philosophers concentrated more on natural appetites, they would have a better view of ‘pleasure, virtue, duty and religion’, which cover the domains of, respectively, the natural, moral, political and religious. If we also keep in mind that the four appetitive directions indicated by the ‘quaternion of good’ are ‘fruition’, ‘operation’, ‘proportion’ and ‘assumption’, a number of significant combinations can be extrapolated: fruition is to pleasure and nature, as operation is to virtue and ethics, as proportion is to duty and politics, as attraction is to ‘assumption’ (i.e., ascent to spiritual perfection) and religion. In Chap. 8, the reader will find a perceptive commentary on this important excerpt by Silvia Manzo.

The relationship between the ‘quaternion of good’ and the two levels of philosophical commitment (Plan A: preservation of natural life; Plan B: preservation of social life) also sheds light on Bacon’s ideas about politics and the exercise of power. From what has already been noted about Orpheus’s failure to control the appetites of life, it is apparent that Bacon had a rather disillusioned and pragmatic view of human mores. He certainly saw all efforts directed to the betterment of the human condition, including the enforcement of ethical codes and social norms, as an integral part of the mind’s progress – although, in the end he fell back on the domain of ethics as a better solution, once his programme to reform natural philosophy encountered insurmountable obstacles (mainly of a technological nature, as already noted). Put otherwise, since the great instauration could not be fulfilled in the near future, and the task of finding a means to perpetuate material life indefinitely escaped man’s power, human beings needed at least to aim at a life that was in accordance with standards of moral action and physical well-being, so as to promote health, freedom from danger and collaboration with fellow human beings.

Here is where Bacon reveals his knowledge of Machiavelli quite well. As I am going to show in the following two sections, two ‘Machiavellis’, as it were, can be traced in his works: a historical Machiavelli who in different ways, and depending on the contexts and the readers, was setting the terms of the contemporary political debate; and a symbolic Machiavelli who, starting already in the sixteenth century, was synonymous with an instrumental and opportunistic view of rationality. The

second kind of Machiavellism is still very popular today. The Oxford English Dictionary defines this meaning as pertaining to a behaviour that is ‘unscrupulous, duplicitous, astute, cunning, scheming’. In primatology, the ‘Machiavellian intelligence hypothesis’ assumes that advanced cognitive processes depend on the complexities of social adaptations. Despite their differences, the two meanings of Machiavellism are somehow related, and can shed light on Bacon’s twin notions of material desire and political ingenuity. Here I am conflating, of course, the historical and historiographical dimensions in the reception of Machiavelli’s work, but I am doing so in order to elucidate the complexity of Bacon’s idea of material desire, in both nature and society. Bacon certainly had no knowledge of primatology, but he read Machiavelli, and was clearly Machiavellian in thinking that the roundabout ways of desire were already at work in the most elementary components of nature, way before affecting the behaviour of apes.¹

1.4 Matter and Desire

In his recent *Metamorphoses of the City*, Pierre Manent has underlined a few interesting parallels between the rise of the new science of motion in the early modern period and the ways in which Machiavelli and Hobbes redefined the meaning and scope of human action. For Machiavelli, according to Manent, motion itself (the ‘irrepressible movement of human things’), and not some allegedly eternal paragon of justice and goodness, became the very norm of political action: ‘what for the ancients was the limit of reason – namely, motion that eludes reason – becomes for Machiavelli, and after him for the moderns, the principal fact that a more ambitious or more resolute or daring reason must grasp’ (Manent 2013 [2010], 205–206). As will become increasingly apparent in the course of this volume, Bacon shared with Machiavelli this view of motion, with the difference that, before Hobbes, Bacon felt the urge to theorize about natural motion in order to shed more light on the nature of political action, and, unlike Hobbes, he thought that knowledge of political motion – acquired both directly as a politician and indirectly through the study of history – could help humans understand the puzzling nature of physical motion. Manent suggests that early modern political philosophy was characterized by a consideration of ‘power and freedom’ as ‘two aspects or expressions of motion’ (Manent 2013 [2010], 206). This point, too, is particularly evident in Bacon’s philosophy, where, as we will see, an irrepressible ‘motion for freedom’ (*motus libertatis*) is constantly reacting – in every corner of the universe, down to the smallest particle of matter – to all forms of external coercion, from the pressure that the atmosphere exerts over a bubble of air to the vexations that rulers impose on their people.

¹On the ‘Machiavellian intelligence hypothesis’, see Byrne and Whiten 1988; Whiten and Byrne 1997. On the early reception of Machiavelli’s works in the European culture, see Anglo 2005.

In the specific field of natural philosophy, Bacon looked at matter as an infinitely pliable substratum throbbing at all time with a finite number of structural motions. In a bold metaphysical move, he defined motion in terms of desire, while describing the natural world, down to its smallest constituents, as everywhere pervaded by ineradicable tendencies to act. As a result, motions were deemed to follow patterns of appetitive response: struggle for freedom, resistance to oppression, war against enemy forces, factions, alliances and reconciliations. This also meant that nature was everywhere political, since motion was a manifestation of desire. In Bacon's opinion, the mechanisms of self-control and self-sustenance that underlay all material aggregations in nature, from stones to human communities, were the result of complex adjustments among conflicting systems of motion. He thought that freedom, in particular, and the preservation of freedom in ways that were not self-destructive represented a crucial aspect of nature. Given these premises, Bacon showed no interest in a mechanical understanding of the universe, such that motion could be simply seen as an instance of local displacement, reducible to the set of spatial relations that bodies establish with their immediate surroundings. In Bacon's ontology, motions were real and they induced physical changes of state and place. Indeed, motions were forces and actions imparted by actual vital principles (Gigliani 2013a, 29–38).

Through its motions, matter displayed inner tendencies of contraction and expansion, of coercion and freedom, of fear and expectation. Bacon described the cosmos as shaped according to degrees of density and rarefaction which divided natural beings into 'two great families of things', organized according to dichotomous lines of development: 'sulphureous and mercurial', 'inflammable and not inflammable', 'mature and crude', 'oily and watery' (Bacon 1857–1874, II, 459–460; Bacon 2000b, 188–190; Rees 1975). This means that the various levels of consistency in matter depended on the intensity of its desires. In a universe always on the brink of disintegration, one of the most profound desires was the 'appetite of union':

It is certain that in all bodies there is an appetite of union, and evitation of solution of continuity; and of this appetite there be many degrees; but the most remarkable, and fit to be distinguished, are three. The first in liquors; the second in hard bodies; and the third in bodies cleaving or tenacious (Bacon 1857–1874, II, 437).

Under the heading 'appetite of continuation in liquids', Bacon's description of a bubble of air in the *Sylva Sylvarum* is a feat of observational dexterity and experimental ingenuity. Why do bubbles of air in water rise to the surface and remain for a while in the form of hemispheres surrounded by a thin film of water? The answer is because air and water are caught in force fields created by their opposing desires: while water goes to great lengths to push the air away from its domain, air resists by curling up and taking on the best shape that is physically possible in those circumstances:

Bubbles are in the form of an hemisphere; air within, and a little skin of water without: and it seemeth somewhat strange, that the air should rise so swiftly while it is in the water; and when it cometh to the top, should be stayed by so weak a cover as that of the bubble is. But as for the swift ascent of the air, while it is under the water, that is a motion of percussion from the water; which itself descending driveth up the air; and no motion of levity in the air.

And this Democritus called *motus plagae*. In this common experiment, the cause of the inclosure of the bubble is, for that the appetite to resist separation or discontinuance (which in solid bodies is strong) is also in liquors, though fainter and weaker (Bacon 1857–1874, II, 346–347).²

Likewise, the ‘sudden generation and perishing of sounds’ reveal in the air ‘a secret and hidden appetite of receiving the sound at the first’, which its ‘other gross and more materiate qualities’ try then to suffocate (Bacon 1857–1874, II, 436). Furthermore, the appetite of union brings to the fore the various forces of attraction that pervade bodies, from specific preferences (‘the touch of somewhat that is tangible’) to utter ‘indifference’ (‘a more indifferent appetite to follow another body’):

all solid bodies are cleaving, more or less; and they love better the touch of somewhat that is tangible, than of air. For water, in small quantity, cleaveth to any thing that is solid; and so would metal too, if the weight drew it not off. And therefore gold foliate, or any metal foliate, cleaveth: but those bodies which are noted to be clammy and cleaving, are such as have a more indifferent appetite (at once) to follow another body, and to hold to themselves. And therefore they are commonly bodies ill mixed; and which take more pleasure in a foreign body, than in preserving their own consistence (Bacon 1857–1874 II, 438).³

Indeed, in some bodies the appetite of union is so strong that they are even ready to give up the identity of their own consistence. In passages like these, Bacon discloses a perception of reality that is intriguingly chemico-political. This aspect is even more evident when we examine those material appetites in which the tendency to union becomes so strong that cohesion is the result of forced annexation. Bacon was no doubt convinced that matter’s desires testified to the predatory nature of life. The simplest phenomena revealed an aggressive attitude that stemmed from elementary tendencies to self-preservation embedded in matter. Bacon provided some experimental evidence of this behaviour in the *Sylva Sylvarum*: ‘open air’ is ‘ever predatory’ (Bacon 1857–1874, II, 446), and it ‘preyeth upon water, and flame and fire upon oil’ (377); spirits ‘prey and consume the juice of the body’ in which they reside (437); ‘the spirits of the wine do prey upon the roscide juice of the body, and inter-common with the spirits of the body, and so deceive and rob them of their nourishment’ (362); exercise ‘maketh the spirits more hot and predatory’ (440).

Given these premises, the possibility that the universe may end in complete anarchy is always present. Nature works as a force field where a general disposition to union battles complementary tendencies to disaggregation. Every time conflict, opposition or resistance breaks out, the ‘government’ of the spirits in a particular body is dissolved. As a result, ‘every part returneth to his nature or homogeneity’, as ‘in an anarchy’ (Bacon 1857–1874, II, 452). Unsurprisingly, Bacon considered violent motion to be ‘the most common’ motion, so much so that matter as a whole was

²The sphere ‘is the figure that saveth the body most from discontinuance: the same reason is of the roundnesse of the bubble, as well for the skin of water, as for the air within; for the air likewise avoideth discontinuance; and therefore casteth itself into a round figure’. See also Bacon 1857–1874, II, 378; Bacon 1996b, 142.

³For related motions, see Bacon 1857–1874, II, 847 (motion of consent); 355, 367 (within the human body); 356 (motion of attraction and sympathy).

like an animal which felt constantly hunted, ‘upon pressure, searching all ways’, and testing ‘by way of proof’ how to get out of countless situations of stress (‘deliverance’). Violence in the deepest recesses of matter was not always visible, audible or felt, because, especially in solid bodies, it was very ‘subtile’:

For whensoever a solid body (as wood, stone, metal, etc.) is pressed, there is an inward tumult in the parts thereof, seeking to deliver themselves from the compression. And this is the cause of all violent motion. Wherein it is strange in the highest degree, that this motion hath never been observed nor inquired; it being of all motions the most common, and the chief root of all mechanical operations. This motion worketh in round at first, by way of proof and search which way to deliver itself; and then worketh in progress, where it findeth the deliverance easiest (Bacon 1857–1874, II, 342).⁴

Bacon’s lexicon relating to motion, both in Latin and in English, is particularly rich: *appetitus*, *conatus*, *desiderium*, *motus*, *nixus*. He approached appetite as a force diffracted in a plurality of motions capable of shaping matter and its innumerable parts in countless different ways. Considered as forces, motions were multiple and hierarchically different, some of them being more important than others. In this respect, one might say that, in his study of matter and motion, Bacon evolved from a morphological to a dynamic consideration of atomism, while unambiguously discarding the Aristotelian definition of motion as the actualization of a potentiality. He certainly never embraced any mechanical or kinematic explanation of motion.

Insofar as the Aristotelian concept of matter was concerned, Bacon confronted the ontologically elusive status of the material appetite in peripatetic metaphysics (the subject of Chap. 2 by D.C. Andersson). Scholastic philosophers had long maintained that matter, being constitutively devoid of qualification, was always striving for a form that could, from time to time, define its nature. For matter to acquire a form, however, was tantamount to eradicating its previous condition, a process which seemed to imply a fundamental tendency to self-destruction within matter itself. On the other hand, why should a form bring matter to perfection, when in fact forms appeared to be transient and matter eternally persistent in its function of ultimate substratum? Moreover, as some Renaissance authors had already pointed out (Giordano Bruno and Giulio Cesare Vanini, for instance), matter could have within itself all the forms it needed. These were lines of argument that Bacon put to the test in an attempt to overcome the principles of peripatetic cosmology. He thought that indefinite permanence was ontologically preferable to a process of actualization in which a given potential needed to be constantly fulfilled and perfected. Indeed, matter’s desire for form could be interpreted – as in fact a later Baconian, Francis Glisson (1599?–1677), did – as a legitimate desire for change and a better ontological condition (Glisson 1672, 84–96). In other words, restless matter, agitated by motions and propensities of all kinds, contained the preconditions for an evolutionary understanding of life. In Bacon’s opinion, matter was capable of sorting itself into forms, precarious as they might be, by unfolding its constitutive appetitive drives, rather than following pre-established lines of development. Unlike the

⁴See also Bacon 1857–1874, II, 391: ‘the motion of the minute parts of any solid body (which is the principal cause of violent motion, though unobserved,) passeth without sound’.

immaterial and motionless patterns of Platonic and Aristotelian metaphysics, Bacon's forms were templates of activity through which the primal desires of matter adjusted to each other while enacting the fundamental laws of nature established by God at the moment of creation. Knowledge of the ultimate appetites of matter could therefore lead human beings to the transformation of matter and, through matter, they could change all aspects of reality (*materiae ipsius conversio et transformatio*, Bacon 1857–1874, III, 20).

Here it is worth mentioning that Bacon's account of material appetites was influenced by at least three important developments in the world of early modern philosophy: the recovery of Stoic thought, especially through the mediation of Justus Lipsius (1547–1606), the great editor of Seneca and Tacitus⁵; the philosophy of Bernardino Telesio (1509–1588), who, through his reading of Galen (in particular, *De placitis Hippocratis et Platonis*), had retrieved decisive elements of Stoic metaphysics⁶; and finally Lucretian Epicureanism. These were all authors and traditions which shared in a definition of life as driven by ingrained tendencies to self-preservation. In line with Stoic, Epicurean and Telesian assumptions, and in a way drawing eclectically on their different traditions, Bacon, too, explained motion as a form of desire, enlivening matter from within. One of the most dramatic consequences to result from his understanding of life in terms of appetitive motion – and, significantly, in a manner similar to Telesio, Stoicism and Epicureanism – was the elusive role left to the soul, in both the natural and human worlds.

First of all, as desire preceded knowledge in ontological terms, attractive and repulsive tendencies were thought to be more original than the cognitive basis of animal selfhood. Bacon presented the relationship between motion, life and soul as a real problem, 'infinitely material in Nature' (Bacon 1857–1874, II, 381), a problem which could not be dismissed as a merely verbal dispute.

Secondly, Bacon's insistence on appetite inevitably involved a complementary emphasis on the moment of satisfaction, seen as a possible end to the condition of strained unbalance affecting all the parts of matter. Paradoxically, as we will see in this Introduction and several chapters over the course of this volume, Bacon often looked at rest as the end result of an appetitive tension, while hinting at a pervasive fear of death in nature triggering a number of important vital reactions. This was a further element of originality with respect to Aristotle's material appetite, for Bacon took desire and its power in literal terms. In his hands, the metaphorical appetite for forms, which, according to the Aristotelians, could be used analogically to think about the ontological attributes of matter, became real hunger, signalling a condition of ontological deprivation at the very core of nature, a diffuse pressure which kept the universe in a constant state of quivering tension.⁷ Precisely because Bacon's matter pulsed with the energy of desire, of all the various states of appetitive restlessness, anxiety and disquietude were the dominant conditions. As he argued in the *Novum organum*, the universe as a whole was trapped in a situation of 'eternal

⁵ On Bacon's Tacitean Stoicism, see Giglioni 2012b.

⁶ See Giglioni 2010.

⁷ On Aristotle's desire, see Pearson 2012.

captivity’, where immobility was perceived as preferable to any attempt to initiate new motions (Bacon 2004, 410–412).

In the list of original motions examined by Bacon in the second part of the *Novum organum*, Motion 19, the last in the series, is the paradoxical and oxymoronic motion through which nature aims at ending all motions (*motus exhorrentiae motus*); that is to say, the motion directed at recovering the original condition of rest (Bacon 2004, 394). Motion 19 can therefore be called the ‘motion of death’. In Bacon’s cosmology, this motion was on an ontological par with lifeless nature (*demortua natura*) and inanimate spirits (*spiritus mortuales*), key aspects of nature investigated by Bacon in *De vijs mortis* (written sometime in the 1610s) and his *Historia vitae et mortis* (1623). When understood as a propensity to unchanging equilibrium, death could therefore be seen as more original than life, for life is a temporary reaction, a motion of resistance to a primal urge towards quiescence. In less dramatic terms, but still in line with the terminology and the categories of Bacon’s philosophy, we can say that self-preservation is the end of all natural operations, but that it is self-preservation of a conservative tendency. It is an overarching mechanism of self-sustenance in which particular states of affairs are supposed to be indefinitely perpetuated, rather than being seen as a progressive and creative process.

At this point some readers may have recognized a series of uncanny resemblances with Freud’s *Todestrieb* or *thanatos* (‘death drive’). Like Bacon, who found the ultimate meaning of motion in the desire to restore an original condition of balance, Freud characterized drives as tendencies to rest. He elaborated this most controversial point in the famous essay *Beyond the Pleasure Principle*, written in 1920, after the First World War: ‘This conception of drives sounds strange, for we have become accustomed to seeing drives as the key factor pressing for change and development, and now we are supposed to see them as the direct opposite: as the expression of the *conservative* nature of organic life’ (Freud 2003 [1920], 76–77). Some may find my way of juxtaposing Bacon with Freud unorthodox. However, when the comparison is contextualized within the long-term history of life and death (and this volume focuses on an important moment within this history), it takes on unexpected implications. At the end of this introductory chapter, I will expand on the reasons why this is significant in this book, with its particular emphasis on motion and power. For the moment it is worth reminding ourselves that in elaborating his theory of death drives Freud had acknowledged his debts to past philosophers and poets (above all, Plato and Shakespeare). Like Bacon, Freud knew quite well the heuristic power of mythopoia.⁸

⁸Unlike nature, history does make leaps. I have addressed the question of a long-term history of life and death (precisely in its Baconian terms) from the Renaissance down to Jean-Baptiste Lamarck, in Giglioli 2013d. A historian who has found the comparison between Bacon and Freud alarming and out of place is one of the anonymous referees for this volume. I take the opportunity of this footnote to thank both referees for their stimulating and helpful comments on this Introduction.

The idea of rest as the end of the self-preservative efforts of nature has crucial consequences with respect to Bacon's account of matter, life and soul, for the problematic status of the soul in Bacon's philosophy is closely related to his view of material appetites. More importantly, if matter has – quite literally – appetites, then the question becomes whether Bacon can be regarded as a downright materialist. This is a very delicate point, which needs to be addressed by contextualizing the problem from both a historical and textual point of view. In the passage from the *Sylva Sylvarum* quoted above, while investigating several 'secret processes of nature' which seemed to involve the operation of the soul, Bacon made clear that this was not 'a question of words', but 'infinitely material in nature' (Bacon 1857–1874, II, 381).⁹ The field of nature described in the more than one thousand experiments which form the body of the *Sylva Sylvarum* is undoubtedly a continuum of energy made up of different degrees of corporeal reality, from 'materiate' to 'immateriate' substances. Here it is important to specify that 'immateriate' is synonymous with 'invisible' rather than 'immaterial', and it denotes a level of corporeal subtlety and smallness that cannot be perceived by the human senses. Sound, for instance, is 'one of the most hidden portions of nature' and is 'a virtue which may be called incorporeal and immateriate; whereof there be in nature but few' (436). For this reason, in his approach to the study of nature, Bacon recommended that the investigator's attention should alternate from 'things immerse[d] in matter' to 'immateriate, or less materiate' ones.¹⁰ When 'incorporeal' is understood as 'invisible', it is even possible to study the material conditions of incorporeal (that is, imperceptible) nature, as Bacon suggested on many occasions. Bodies can be resolved into their constitutive indiscernible motions, capable of combining and recombining themselves in infinitely different ways. Bacon, however, is no materialist in a post-Cartesian and post-Lockean sense. As is aptly demonstrated by Sorana Corneanu in Chap. 9 ('Francis Bacon on the Motions of the Mind'), besides 'tangible' and 'invisible' bodies, Bacon included in his philosophical system a sphere of veritable incorporeal beings in the strict ontological sense of the word (minds, angels and God) and he assumed that there were specific areas where the incorporeal interacted with the corporeal (Giglioni 2013b, 202–205).

Rather than using the word 'materialism', I would therefore speak of 'materiality' when referring to Bacon's philosophy. Because of his attention to the material aspects of natural and human experience, Bacon's contribution to philosophy can be characterized as a sophisticated critique of 'impure' reason, for his model of rationality is tainted as it were with the marks of desire, interest and profit. In this sense, although reason itself is not material for Bacon (as it would be for a genuinely Stoic or Hobbesian thinker), it is nevertheless perennially confronted with matter: the matter of unruly appetites in nature and the matter of instrumental causes in ethics

⁹ Interestingly, the Oxford English Dictionary records one of the meanings of 'materiality' – 'the quality of being relevant or significant' – as characteristic of the legal discourse.

¹⁰ Bacon 1857–1874, II, 390: 'I practise as I do advise; which is, after long inquiry of things immerse in matter, to interpose some subject which is immateriate, or less materiate... to the end that the intellect may be rectified, and become not partial.'

and politics. Bacon's philosophical experience is therefore defined by the material nature of desire, deeply and disquietingly involved in the life of both nature and humans: as greed, it fuels the economy; as passion, it animates society; as motion, it constantly unsettles the state of nature; as need, it propels power; as lust, it perverts religion. Above all, desire is remorselessly material because it is the ultimate and insurmountable condition of life, and what is most alarming of all is that desire, being blind and un sentient, is more primal than knowledge (see Chap. 7 in this volume). In Bacon's philosophy, perception and knowledge come after desire. In this sense, the materiality of the appetites is a further confirmation of the constitutively political tenor of Bacon's thought.

The title of one of the two colloquia held at the Warburg Institute in 2011 and 2013 from which this volume originates was 'Francis Bacon and the Materiality of the Appetites'. Inevitably, one of the topics that recurred most frequently during discussions was the question of whether or not Bacon can be viewed as a materialist thinker. A number of disclaimers, caveats and qualifications were raised at the time, invoking the principles of anachronism and hindsight. When posed in the brutal terms of one of the many 'isms' that afflict the study of history, the question of Bacon's materialism sounds undoubtedly naïve and ill-informed, and this for various reasons. The principal one is that materialism as a philosophical current is shaped by precise historical and cultural assumptions. In this respect, Bacon is not a materialist in the same sense as Democritus and Lucretius, or Darwin and Marx. And yet Bacon wrote of the 'materiate' states of nature and of the 'infinitely material' weight of philosophical inquiries concerning the soul and the 'invisible' dimensions of nature (Bacon 1857–1874, II, 381). While not a materialist, Bacon was nevertheless fully aware of the *material conditions* that determine the exercise of human thinking and its development. Indeed, he argued that thinking depended on the 'matter' of human experience, in all its multifarious forms. In the middle of the *Advancement of Learning* (1605), in introducing the branch of knowledge which deals with 'the APPETITE and WILL OF Man', he resorted to a simile:

In the handling of this science, those which haue written seeme to me to haue done as if a man that professed to teach to write only exhibit faire copies of Alphabets, & letters ioyned, without geuing any precepts or directions, for the cariage of the hand & framing of the letters (Bacon 2000a, 133).

In subjects concerning moral and political issues, Bacon blamed philosophers for having written in the abstract, confining themselves to 'a certaine resplendent or lustruous masse of matter chose to giue glory either to the subtilty of disputacions or to the eloquence of discourses' (134).

To qualify this point further, I would say that in Bacon's philosophy materiality should be understood in at least two senses, one ontological, the other empirical. In an ontological sense, human thinking requires a pre-existent matter (*materia* in the sense of *silva*, i.e., 'material') in order to start and process its activity. There is no way that thinking can place itself outside of its own prejudices (i.e., *idola*) or in a vacuum devoid of already-provided information (i.e., *historia*). Pure intellect and pure reason are concepts that are foreign to Bacon's philosophy. In fact, since the

Cartesian model is the one that prevailed in the end, these are the notions which have contributed most to Bacon's *sfortuna* in the history of metaphysics. In an empirical sense (with respect to the natural history of human thought), to say that thinking depends on pre-existent matter means for Bacon that knowledge and action are constitutively political, both in the world of nature and in that of human beings. The covetous and acquisitive character of natural beings, regardless of whether animate or inanimate, makes the whole field of nature an arena of competitive and riotous individuals (Giglioni 2012a, 2014a).

Whatever the meaning one wishes to attach to Bacon's adjectives 'materiate' and 'immaterial', we cannot downplay the importance that the concept of matter had in Bacon's philosophy, for it was only through a correct interpretation of the corporeal processes of nature that he could justify, from a theoretical point of view, a programme of universal reformation involving both knowledge and institutions. Advocating an experimental understanding of material phenomena, Bacon described matter as a real being, different from both the Aristotelian entity, whose ontological import was by definition extremely feeble, and the more or less hypothetical construction based on the application of mathematical and logical models (the new philosophies of nature). The science of the schools – Bacon wrote in *Cogitationes de natura rerum* ('Thoughts on Nature'), composed sometime before 1605 – 'devises (*figit*) its matter as fictitious (*commentitia*), universal and indifferent to any form' (Bacon 1857–1874, III, 19).¹¹ By contrast, as a real condition of natural and human action, matter denoted for Bacon both the pneumatic force of desire and the tangible effects produced by it in nature. In Bacon's cosmos, natural beings were driven by self-interest and lust for power already extant at the atomic level, manifesting their hunger and greed in the original furrows and folds of pliable matter. In being ruled by their desires, they had already committed the sin of idolatrous self-worship in their primal responses, chasing after delusions and being easily manipulated by the appearances of things. This was the grim foundation on which Bacon's political view of life rested.

1.5 Self-Preservation and the Theologico-political Order of Life

As argued in the previous sections, permanence and stability were central concerns of Bacon's philosophy, both in physics and politics. Philosophy for him meant the search after plausible and feasible ways to transform life (both natural and artificial) into a long-lasting – possibly everlasting – enterprise. In doing so, Bacon demonstrated that he was responding in a very original way to Telesio's ideas in physics and to Machiavelli's theories in politics. The classic definition of reason of state, as specified in Giovanni Botero's *Della ragion di stato* (1589), underlined the

¹¹ On Bacon's views about matter, see Rees 1977; Pérez-Ramos 1988; Gaukroger 2001, 166–192; Giglioni 2013d, 45–49.

importance of procuring the means of preserving and enlarging power and dominion over people.¹² The shift was indeed momentous: from a view of politics grounded in the assumption that nature's paragon of perfection constituted the norm of political rule (a rule that was modelled upon ideals of justice and equity), recent events in the European world, both military and economic, were increasingly validating a consideration of political life as a steady-state balance, precariously dependent on varying circumstances and prudent measures of action (De Mattei 1982; Viroli 1992, 252–257; Tuck 1993; Keller in this volume).

More specifically, the emergence in sixteenth-century Italy of principalities and tyrannies out of the city-republics of the medieval past created the material and intellectual conditions that transformed the exercise of political power into a fully-fledged art of civic prudence, premised on practice (*usus*) and experience (*experientia*). Statedmanship became the ability to read concrete situations and derive general maxims from the myriad particulars and accidents of individual lives. In a world in which 'so many unexpected things can happen' and 'circumstances do not permit living a completely virtuous life' (Machiavelli 1988 [1532], 39, 55), the best rulers and men of action were the ones who decided their course by relying on the close observation of contingent and historical forces. In this, early modern theories of statecraft mirrored the new reality of monarchies and principalities. A novel political order emerged during the sixteenth and seventeenth centuries, an order in which the sovereign state was assuming an increasingly central role (Hirschman 2013 [1977]; Tuck 1993). In England, the period was marked by popular and aristocratic dissent, religious factionalism and the intensification of political tensions – between the Monarchy and the Parliament and between religious and civil authorities. Bacon's philosophical work cannot be understood unless it is contextualized within this situation of political and religious restlessness.

In recent years, the field of study known as 'political theology' has become a subject of intense debate and scholarship, intersecting various fields within philosophy, the history of philosophy and political theory (see Agamben 2005 [1995], 2009; Hammil and Reinhard Lupton 2012; Critchley 2012). In this chapter, my use of the phrase 'theologico-political' goes back to Spinoza and the title of his famous work, the *Tractatus theologico-politicus* (1670), which here I am taking as a rather conventional *terminus ad quem*. The starting point, which is especially relevant for a discussion of Bacon's ventures into the domains of theologico-political inquiry, lies in a complex tangle of historical, social and intellectual premises that consolidated between the Middle Ages and the Renaissance. At the risk of simplifying a very complex matter, it can be said that several factors at the time helped to transform the terms of philosophical, political and theological debate. They involved: the gradual dissolution of the approach to philosophical research known as the 'double-

¹² See Botero 1948 [1598], 55: 'Stato è un dominio fermo sopra popoli; e Ragione di Stato è notitia di mezi atti a fondare, conservare, e ampliare un Dominio così fatto. Egli è vero che, se bene, assolutamente parlando, ella si stende alle tre parti sudette, nondimeno pare, che più strettamente abbracci la conservatione'. On Botero's *ragion di Stato*, see Firpo 1948, 1975, 2005, 57–82; Baldini 1992; Keller 2015.

truth' theory, which markedly modified the relationship between the transmission of knowledge, censorship and power; the rise of a distinctively medico-political view of nature, in which environmental pressures were deemed to play a fundamental role in shaping the physiognomy of human communities; the gradual demise of the understanding of life in terms of teleological drives transparent to the laws of the intellect (an understanding that we may loosely characterize as Platonic and Aristotelian); and, finally, the emergence of a new representation of nature, interpreted as boundless appetitive energy (*conatus*), unsteadily and precariously regulated by a brutal struggle for survival where all the parts of nature were involved. Later on, during the seventeenth century, this view of *conatus* became more or less mechanized and more or less reconciled with the power of chance, both in natural philosophy and politics. Looking at the long-term history of *conatus*, from the end of the Middle Ages to the Enlightenment, works such as Averroes's *Destructio destructionum* (written around 1180, but rediscovered in Italy during the Renaissance), Machiavelli's *Il principe* (1513) and Telesio's *De natura rerum* (1565, 1570, 1586) represent the beginning of a crisis in political theory which reached its climax with Hobbes, Locke and Spinoza. Of course, my use of the label 'theologico-political' will inevitably evoke the name of Leo Strauss (1899–1973) and Carl Schmitt (1888–1985).¹³ In the final analysis, though, the context I intend to reconstruct here concerns a number of sixteenth- and seventeenth-century authors who were interested in finding new ways of governing desire, whether through the political use of the popular imagination (Renaissance Averroists), by strategic manoeuvring in the field of politics (Machiavelli) or by radically reinterpreting virtue as the expansion of a natural force (Telesio). In all these instances, the aim was not to reconnect with an original standard of natural perfection sanctioned by either intelligible fulfilment or divine authority, but to strive after more realistic goals such as the preservation of individual and communal existence, prolongation of life and protection from harm. For many observers in the early modern period, these ends could be obtained by postponing the immediate gratification of needs and desires and by using circuitous means to reach a reasonably stable agreement among contrasting forces.

In the *Tractatus theologico-politicus*, Spinoza defined individual natural right (*naturale ius uniuscuiusque*) as a prerogative that extended 'as far as everyone's desire (*cupiditas*) and power (*potentia*)'. He stated that no one was obliged by natural right 'to live according to someone else's whim (*ex alterius ingenio*)', but that everyone was 'the defender of his own freedom' (Spinoza 1925–1987, III, 11; Spinoza 1999 [1670], 72). In this sense, by appealing to natural rights and laws (*ius et institutum naturae*), Spinoza meant to emphasize the importance of natural laws for the blossoming of individual lives (*regulae naturae uniuscuiusque individui*, in Spinoza 1925–1987, III, 189; Spinoza 1999 [1670], 504). The emphasis here was on nature, power and individuals. Between the sixteenth and the seventeenth centuries,

¹³ On Strauss, see Zuckert and Zuckert 2014; on Schmitt, see Meier 1998 [1994]; on Schmitt and Strauss, Meier 1995 [1988]. On the interplay of political philosophy, medicine and history in Machiavelli, see now Gaille-Nikodimov 2004.

various authors tried to triangulate the principle of universal reason with the demands of individual virtue and private interest. Machiavelli maintained that the true cunning of reason lay in making a virtue of the brutal necessity of blind appetites; Telesio argued that appetites and passions followed the self-organizing law of universal sentience; Bacon demonstrated that the appetite for the greater good trumped all other appetitive drives at work in both nature and society; Hobbes pointed out that the clash of the infinite acquisitive tendencies unfolding in innumerable individuals could be curbed by the rational appetite for self-preservation and security. In Spinoza's triangulation, in a way that has some elements in common with Bacon, desire (*cupiditas*) was reconciled with both nature and God. It was a theologico-political equation in that the sphere of individual self-interest and the domain of the greater good were premised on an original interpretation of the relationship between God and nature. There was no ontological gulf between the life of nature and its divine archetype. Nature was the manifestation of God's power as well as the converging of infinite individual centres of power.

For Telesio, Bacon and even Spinoza, the laws of reason (*leges rationis*) could never clash with the laws of appetite (*leges appetitus*); the principles of sound mind (*leges sanae mentis*) were not supposed to hamper the appetitive drives of nature (*appetitus impulsus*); and the path of right reason (*ductus sanae rationis*) should not coerce the force of the passions (*affectuum impetus*) (Spinoza 1925–1987, III, 189–190; Spinoza 1999 [1670], 506–508). The main lines in Spinoza's argument are worth summarizing here. Firstly, nature was identified with God, a step that was reminiscent of the most radical forms of Renaissance naturalism: 'It is certain that nature, when it is considered in the most general sense, has a sovereign right over everything it can (*ius summum habere ad omnia quae potest*), that is, the right of nature extends as far as its power (*potentia*), for the power of nature is the power of God (*naturae enim potentia ipsa Dei potentia est*), who has sovereign right over everything'. Secondly, in a move that, at first glance, seems to contrast with what has just been said, Spinoza identified the power of nature (*universalis potentia totius naturae*) with the collective power of all individuals (*potentia omnium individuorum simul*). The most striking consequence was that 'every individual' had 'sovereign right over everything it can':

Since the supreme law of nature states that every single thing strives to persist in its own condition as much as it can (*in suo statu, quantum in se est, conetur perseverare*), with no consideration for any other thing, but only for itself, it follows that every individual has sovereign right over this behaviour, that is, to exist and to act as is determined by nature (Spinoza 1925–1987, III, 189; Spinoza 1999 [1670], 506).

Thirdly, after identifying nature with God and with the totality of all individual natural forces, Spinoza concentrated on the infinite modes of the one substance (*Deus sive natura*) and their appetites (*cupiditates*). The shift is startling, but it reminds us of similar argumentative strategies in Telesio and Bacon: 'we do not recognize any difference between human beings and all other individuals of nature'. At the level of the original constituents of reality, as in Bacon's philosophy, appetite was both individual and impersonal. Nature's cohesion resulted from lines of force

that were determined by the particular interests of innumerable individuals. Above all, as in Bacon, appetite was pre-animal and pre-human:

Nature is not defined by the laws of human reason (*leges humanae rationis*), which are only directed at what human beings consider their true interest (*verum utile*) and their preservation (*conservatio*), but also by infinite other laws which have in view the eternal order of nature as a whole. Of this order, man is a little part (Spinoza 1925–1987, III, 190–191; Spinoza 1999 [1670], 508).

The reason why I am insisting on Spinoza here is that the Bacon-Hobbes-Spinoza line is usually ignored or dismissed as irrelevant to understand the evolution of seventeenth-century thought, for Bacon's vital *conatus* has nothing to do with Hobbes's and Spinoza's kinematic *conatus*. This line needs to be reconsidered (Giglioli 2016). Without giving in to unfounded fears of Renaissance animism, one should follow the dots which connect Renaissance Galenism and Stoicism to Telesio and Machiavelli and then to Bacon, Hobbes and Spinoza. By looking at Bacon as a philosopher who took full advantage of the intellectual resources contained in the traditions of history, medicine and politics, we can then trace his contribution to the early modern natural history of medical and political self-preservation.

In *From Politics to Reason of State* (1992), Maurizio Viroli chronicled the early modern transformation of politics from a form of civil philosophy dealing with the idea of the common and universal good (the utmost desirable thing among human beings in their mortal life) to politics as reason of state, described as the art of preserving power by regulating human appetites through financial and military means. Referring to Italian political writers such as Francesco Guicciardini (1483–1540), Alessandro Piccolomini (1508–1579), Giovanni Botero (1544–1617) and Trajano Boccalini (1556–1613), Viroli detected a significant new trend: 'Deprived of practical relevance for the conduct of government affairs, removed from the educational curriculum of civil man, diminished from its rank as most excellent human discipline, politics gradually lost its identity' (Viroli 1992, 247). It was a long and gradual process which can be summed up by saying that, between the fifteenth and the seventeenth century, jurists, lawyers, theologians and policy makers grew less confident in the force of reason in political matters and more open to the reasons of force.

In the emergence of the new theologico-political order between the sixteenth and seventeenth centuries, Machiavelli's *Il principe* represents a turning point which can be read as a dispassionate *historia* of the life and death of political entities. States were not replicas of ideal constitutions, grounded in divine principles, but a mixture of natural and artificial creativity. This was particularly evident in the case of new dominions: 'like all other natural things that are born and grow rapidly, states that grow quickly cannot sufficiently develop their roots, trunks and branches, and will be destroyed by the first chill winds of austerity' (Machiavelli 1988 [1532], 23). Machiavelli argued that, within the spectrum of appetitive energy, republics had more 'vitality' than principalities, for it was very difficult to obliterate their liberties. The 'motion for freedom' and the 'motion of resistance', to use Bacon's phrases, represented the very soul of republican politics and, within the theologico-

political art of preserving the life of human communities, they were a major variable, to be dealt with by using prudence if one wanted to avoid the extremes of appetitive lawlessness and economic inertia.

It is in the context of the early modern theologico-political order that the natural, ethical, political and theological dimensions of Bacon's notion of the good come to fore. As Silvia Manzo argues in her chapter in this volume, they signify four kinds of *conservatio*. As such, they represent the four cardinal directions of his thought, for Bacon's philosophy as a whole can be seen as a meditation on the different degrees of appetitive energy which hold the universe together, from a speck of dust to God. The energy of natural appetites spreads in four directions: preservation of individual lives (where 'individual' can even refer to a single particle of matter); preservation of the life of the mind (what Bacon called *cultura animi* or medicine of the mind, i.e., the sphere of rational action sandwiched between the domains of ethics | virtue and politics | duty); preservation of the state, that is, the life of the commonwealth; and finally, preservation of the bond between nature and Grace, by restoring the pristine condition of blissful activity that the Creator had imparted to His creation. In the end, the contrast between *cupiditas* (self-interest) and *caritas* (unrestrained disposition for universal good), which is a recurrent theme in Bacon's philosophy, finds its resolution in a distinctively Baconian theologico-political plan, where prospects of physical and social health meet with widely diffused soteriological expectations.¹⁴

Bacon gave specific recommendations on how to pass from one level of preservation to the next, and – even more urgently from a political point of view – how to secure this series of transitions without resorting to brutal violence. Unsurprisingly, the great majority of these transitions focused on the capacity to control the appetites of nature, that is to say, on 'superinducing' forms on matter, prolonging life, devising directions for mental discipline and managing unruly desires through persuasion. The most difficult issue to address, though, was how to curb appetites without extinguishing the life of natural and social bodies. A fundamental conundrum confronted the early modern theologico-political thinker: if the parts of the body politic were deemed to pursue their own appetites, cohesion in both the natural world and the human commonwealth was always at risk. Self-interested appetites had to be harnessed into a scheme of action defined by farsighted supervision and broad self-preservation, for atomic *conatus* was inevitably destructive in the long term, even when concentrated on the immediate preservation of its own particular good. The solution lay, therefore, in letting individual appetites act as if they were pursuing their own partial good when in fact they were contributing to the well-being of the whole. But what kind of agent could have the cognitive scope and the power to secure such a level of universal preservation? Only God, it seemed to Bacon, could be such an agency.

¹⁴This characteristically Baconian tradition of political theology has been masterfully studied by Charles Webster in his *The Great Instauration* (Webster 2002 [1975]). On early modern *cultura animi* in England, see Corneanu 2011. On Bacon's theological views, see two recent studies: McKnight 2006; Matthews 2008.

Bacon's philosophy was constitutively theologico-political in that the handling of desire – desire that involved the primordial impulses of material particles as much as God's will – called for the establishment of communities that had the ability to control natural and social appetites, while subject, as any other thing in nature, to the dominion of divine will. The problem was that this model, which Bacon aptly represented in the *New Atlantis*, run the risk of being based on a colossal delusion, indeed, of being the ultimate *idolum*, where patterns of human action were projected onto both insentient nature and the unfathomable divine will. This, for instance, was the conclusion that both Hobbes and Spinoza reached respectively in their *Leviathan* and *Tractatus theologico-politicus* when they openly rejected any form of unfounded teleology. For both thinkers, *conatus* could only imply a mechanical arrangement of causes and effects, while God's will had no role in the preservation of natural and political bodies. The case was different with Bacon. As James A.T. Lancaster and Vera Keller convincingly argue in their contributions to this volume (Chaps. 10 and 11), Bacon's universe was constitutively ethical and political for the very reason that its underlying metaphysics hinged on a theory of motion as appetite. Indeed, precisely because Bacon thought that desire was the ultimate cause of being, his account of *conatus* rested on the existence of a ubiquitous appetite, insatiable and not yet enervated by a mechanical organization of the whole universe, as it was for Hobbes and Spinoza.

Once Bacon's philosophical contribution is situated in the larger context of early modern political theology, it thus becomes evident the extent to which *conatus* and *appetitus* represent the metaphysical underpinnings of this view. Three elements, in particular, are the key variables of this picture: life, chance and desire (or Pan, Cupid and Dionysus, to use elements of Bacon's emblematic and mythopoetic worldview). As I have already suggested, several medical, political, meteorological and geographical features coalesced at the time to lay the foundations for a new vision of natural and political reality. During the sixteenth and the seventeenth centuries, there were still lingering influences coming from the pre-modern astro-medical view of the cosmos, in which life was seen as a force determined by celestial bodies and innate heat, primordial moisture and material spirits. This meant that individual bodies were constituted in such a way that they uniformly reacted to external pressures and stimuli, such as climate, environment and food. In a universe that was increasingly perceived as being in a constant flux ('things could change' was, in Machiavelli's opinion, the supreme maxim for a ruler), chance came to prominence as a powerful force of transformation. It should not come as a surprise, then, that *fortuna* had a central place in Machiavelli's theory of political self-preservation: 'No government should ever believe that it is always possible to follow safe policies. Rather, it should be realized that all courses of action involve risks: for it is in the nature of things that when one tries to avoid one danger another is always encountered' (Machiavelli 1988 [1532], 23; 84). The hazardous and aleatory character of life becomes even more evident when we associate the vital manifestations of nature to desire, for raw desire, in Bacon's account, was blind and refractory to knowledge. As we will see, Spinoza would sum up this point in clear terms by claiming that human beings did not desire (*conari, velle, appetere, cupere*) some-

thing because they judged that it was good, but, precisely the opposite, they judged something good because they desired it (Spinoza 1925–1987, II, 148). In doing so, they were displaying the genuinely conative and appetitive essence of nature. Before Spinoza, though, Bacon had already rejected final causality as one of the most deleterious *idola*. If life, in its most elementary manifestations, had a tendency to preserve itself, through battling all sorts of external constraints and accidental events, strategies of power maintenance needed to be the mainstay of political ingenuity. Indeed, in a universe dominated by the logic of *conservatio*, ‘preservation’ was more important than ‘perfection’. As Bacon made clear in his *Apology Concerning the Earl of Essex* (1604), nature had implanted in all creatures two kinds of ‘sympathy’, ‘the one towards perfection, the other towards preservation’:

That to perfection, as the iron contendeth towards the loadstone: that to preservation, as the vine will creep towards a stake or prop that stands by it; not for any love to the stake but to uphold itself (Bacon 1861–1874, X, 156; see Anderson’s chapter in this volume at p. 148).

In the fragment *On the True Greatness of the Kingdom of Britain to King James*, written between 1603 and 1608, Bacon expanded on the question concerning the growth and preservation of states by strengthening the medical subtext: preserving the well-being of the body politic was not the same as expanding its life. As was the case with individual health, the general soundness of commonwealths (what in that speech he had called ‘surety’) depended on ‘preservation, happiness, and all other points of well-being’ (Bacon 1861–1874, VII, 49).

This preservative, preventative and prophylactic understanding of political conservation betrayed, however, a pessimistic and concerned attitude towards both life and power: if the effort was all about keeping power and surviving, it meant that, at a deeper level, there was a stronger tendency to lose power and die. In this case, too, Machiavelli’s recommendations on ‘how principalities can be governed and maintained’ were particularly influential (Machiavelli 1988 [1532], 6). In *Il principe* rulers were instructed by following historical examples about the various ways of seizing, consolidating and preserving power, regardless of one’s virtue or glory, through annexations, colonizations, invasions, oppressions, alliances, assassinations, conspiracies, factions, civil strife, resistance, pressures, protests, seditions, riots, rebellions and insurrections. Most of all, the book recommended that the ruler who wished to maintain his power had to be prepared ‘to act immorally’ when it became necessary’ (55; 68), which made other reprehensible and shameful actions politically convenient (‘Wanting to annex territory is indeed very natural and normal’; ‘destroying cities is the only certain way of holding them’, 13; 18). As we will see, the physical process of ‘antiperistasis’ (understood as an opposition of forces that maintains a system in a state of counterbalanced equilibrium) played a key role in Bacon’s physics and politics of appetites. It was a mechanism that had already been described in Machiavelli’s economy of power, where opposite tendencies in political life needed to be kept in a stable tension (‘anyone who enables another to become powerful, brings about his own ruin’, 14).¹⁵

¹⁵On ‘antiperistasis’ in its physical and ethical meanings, see Chaps. 3 and 7 in this volume.

The antiperistaltic tensions of matter confirm the thesis of the inherently political nature of Bacon's universe. Atomic tendencies pervaded all parts of matter, in a continuous interplay of primal reactivity and self-preservation, resistance and compliance. After all, Bacon never refrained from pointing out the many correspondences between natural philosophy and political thinking. In the *Brief Discourse Touching the Happy Union of the Kingdoms of England and Scotland*, written around 1603, he stated that there was 'a great affinity and consent' between 'the rules of nature' and 'the true rules of policy':

the one being nothing else but an order in the government of the world, and the other an order in the government of an estate. And therefore the education and the erudition of the kings of Persia was in a science which was termed by a name then of great reverence, but now degenerate and taken in ill part: for the Persian magic, which was the secret literature of their kings, was an observation of the contemplations of nature and an application thereof to a sense politic; taking the fundamental laws of nature, with the branches and passages of them, as an original and first model, whence to take and describe a copy and imitation for government (Bacon 1857–1874, X, 90).

The best political solution for Bacon rested on a unique combination of metaphysics (as knowledge of forms) and magic (as production of forms). This may sound like a return to the classical and medieval belief in the natural foundations of politics, with the aggravating circumstance that now the art of government was tethered to magic. But Bacon's metaphysics presupposed an ontological account of desire in which natural forms, far from being pristine instantiations of intelligibility, were regarded as lasting concretions of harnessed and 'superinduced' appetite. Precisely because of the interdependence of natural and social propensities, it was in the domain of politics that the correspondence between the appetites of nature and the appetites of the soul was at its most evident. 'Ciivile states', Bacon explained in the *Advancement of Learning*, used 'the predominante affections of *fear* and *hope*' to impart consensus and order to riotous communities: 'For as in the gouernemente of states, it is sometimes necessarye to bridle one faction with another, so it is in the gouernemente within' (Bacon 2000a, 150). And at an even deeper level than the human soul, Bacon thought that material nature was originally seditious and factious. The restoration of Persian magic, which he championed as a union of wisdom, religion and politics, assumed that parallel instantiations of desire occurred in the realms of both nature and polity, so that the operative knowledge of magic did in fact facilitate the union of metaphysics and politics. A 'reformed' magic, as advocated in the *Sylva Sylvarum* and displayed in the *New Atlantis*, was an integral part of this project (Bacon 1857–1874, II, 378).

Because of the relationship between forms and appetites, the extent to which Bacon's philosophy represents a radical departure from teleology and intentionality in the classical, Aristotelian sense becomes even more apparent. Bacon rejected the scholastic notion of actualization, understood as a process of ontological fulfilment in which higher levels of determination and intelligibility (i.e., the immaterial forms) were deemed to implement conditions of higher perfection in the cosmos, conditions that were inscribed in the system of the universe from the very beginning. By contrast, Bacon advocated a view of the cosmos in which the effort for

self-preservation was the rationale behind all operations, including knowledge, in both the natural and the human world. For this reason, reactivity and survival prevailed over spontaneity and predetermination. In keeping with loosely Stoic and Telesian categories of change, Bacon described the urge to self-preservation (*desideria corporum conservandi se*) as a primordial mechanism in nature (Bacon 2004, 386). He looked at matter as continuously in the process of pursuing what was conducive to a condition of stability, while rejecting everything that might jeopardize that condition. In a scenario in which nature and humankind were held to have lost the condition of original perfection – a scenario that, in Bacon’s opinion, was the hallmark of post-lapsarian reality – the most reasonable and convenient strategy lay therefore in preserving and perpetuating the ontological status quo, rather than exploiting potentials for teleological improvement allegedly embedded in nature. Far from promoting ascent towards greater levels of actuality and rationality through intellectual self-knowledge, Bacon recommended that humans attempted to recover what could still be salvaged of the original perfection of nature. This was all the more consistent with a view of reality portrayed as a battlefield of myriad antagonistic and mutinous principles, each of them keen on securing its own self-preservation.

Bacon’s understanding of natural and political ‘security’ recognized the fact that desire was by its very definition marked by a sense of ontological loss, dissatisfied and unfulfilled, always in the process of going beyond itself. The shift from particularity to universality was therefore inscribed in the system of nature, for the coveting part could survive only if the whole preserved itself. In the sixteenth century, Girolamo Cardano (1501–1576) had already distinguished three meanings of ‘preservation’ (*conservatio*), which depended, firstly, on the hierarchical divisions of being (‘the most important part’); secondly, on the principle of universal cohesion (‘the whole’); and finally, on individual survival (‘self-preservation’) (Cardano 2009, 36). Tommaso Campanella (1568–1639), who knew Cardano’s work, but preferred to follow Telesio on this matter, later expanded the scope of Telesian self-preservation in nature by devising an all-encompassing theory of political and theological *conservatio* (Gigliani 2013c). As already pointed out, the greatest difficulty facing all early modern attempts to elaborate plausible accounts of self-preservation, both natural and political, was how to justify the transition from individual interest to the general good. How could particular things, be they natural or human, be persuaded that true self-preservation lay in the survival of the whole, and not in their own individual *conservatio*, however important their role in the system might be? Hierarchically speaking, the whole – and the general good, for that matter – was always superior to private interest. Bacon recognized that this principle was a ‘fundamental law of nature’,

whereby all things do subsist and are preserved; which is, That every thing in nature, although it have his private and particular affection and appetite, and doth follow and pursue the same in small moments... yet nevertheless when there is question or case for sustaining of the more general, they forsake their own particularities and proprieties, and attend and conspire to uphold the public (Bacon 1857–1874, X, 91).

To illustrate further the ambivalent nature of desire, let us focus for a moment on the specific example concerning the pattern of rebellion and restoration. These were

tendencies that, in Bacon's universe, lay bare the most original urges in matter. On the one hand, nature was always ready to react to any change that might alter its original state, and in doing so, it dissipated part of its vital resources; on the other, nature went, without fail, to great lengths in order to restore the original state of affairs. The double nature of desire – reactive and inertial at the same time – thus stressed the very roots of life and death, a subject of perpetual fascination for Bacon. Irrepressible reactivity seemed to testify to the existence of vital drives shaping the very fabric of matter; whereas the tendency to go back to the original condition of being could be interpreted as foreboding the final victory of death. At a deeper level, though, the opposite was true: reactivity was resistance to any form of vital imposition, while restoration meant the recovery of true life; that is to say, resistance was never futile in Bacon's universe; indeed, it was symptomatic of 'instauration', of the fact that the process of recovering the lost life was under way. This applied to all operations in matter, at both a macro- and a micro-level, and, on the larger cosmological scale, to the very history of the universe, which displayed an entangled network of theological and political reasons.

The question then becomes what true life was for Bacon. In the end, his explanation of the way in which natural desire was tamed into a force of social and political progress rested on a theological framework. The vicissitudes of desire in the created world reflected a course of action that was originally enforced with the creation of the world. In *Valerius Terminus*, Bacon distinguished three stages in the relationship between God and human beings, depending on the presence of God, the 'removing and estranging' from God's presence as a result of the Fall and, finally, humankind's return to God (Bacon 1857–1874, III, 217–218). In the *Confession of Faith*, the flow of time was divided into three epochs – 'three times (if times they may be called) or parts of eternity':

The first, the time before beginnings, when the Godhead was only, without the being of any creature: The second, the time of the mystery, which continueth from the time of creation to the dissolution of the world: And the third, the time of the revelation of the sons of God; which time is the last, and is everlasting without change (Bacon 1996a, 112).

Bacon's natural philosophy, rich in political implications, was patterned upon a theological template, in that the origin of the physical world coincided with the biblical narrative in the book of Genesis, while the final 'instauration' was clearly connected to the end of time, 'everlasting without change', where the close interdependence between desire and motion came again into view.

This is an important point that may help us shed more light on the defining features of Bacon's model of theologico-political rationality. If unruly appetites were supposed to permeate both nature and society, how could there be any room for a stable organization of human affairs? More than 30 years ago, in his influential *The Passions and the Interests*, Albert Hirschman suggested three possible solutions to this problem: by repressing, harnessing or pitting appetites against appetites (Hirschman 2013 [1977]). Machiavelli, Bacon and Spinoza, to mention three early modern authors involved with the same problem, believed that repression could never be a long-lasting solution. Machiavelli certainly advocated the harnessing of

desires by following oblique paths of action, an ability that for him was often rewarded by political success ('lucky astuteness', *astuzia fortunata*; Machiavelli 1532 [1988], 34). Indeed, devious control was enabled by the very indigent nature of desire, for, he argued, human beings were 'so much dominated by immediate needs' that they could be easily manipulated (Machiavelli 1532 [1988], 62). In Hirschman's account, Spinoza represented the thinker for whom *cupiditas* needed to be held in check through cupidinous means, for, as he famously declared in his *Ethica*, 'we do not yearn for, want, strive after or desire anything because we judge it to be good, but, on the contrary, we judge something to be good because we strive after, want, yearn and desire that thing' (Spinoza 1925–1987, II, 148, 170). In Bacon's case, the theological side of the matter was more relevant, for his Great Instauration was meant to occur within a context of cosmological and religious transformations. From this point of view, it is safe to say that for Bacon all the individual components of nature conspired unknowingly to the good of the whole as part of the universal plan of salvation. Diversions and detours were the circuitous byways of development through which the riotous character of the appetites could find a form of final pacification. *Tanquam aliud agendo*, 'as if one were doing something different', was indeed Bacon's political motto: precisely because the motions of matter (in the domain of nature) and the motions of the mind (in the domain of virtue) were free, all that was perceived as coercion needed to be transformed into a willed course of action. He pointed this out clearly in the *Advancement of Learning*:

Another precept [to induce change in one's life and the life of other people] is, that the mind is brought to any thing better and with more sweetnesse and happinesse, if that wherevnto you pretend be not first in the intention but *Tanquam aliud agendo*, because of the Naturall hatred of the Minde against necessity and Constraint (Bacon 2000a, 152).

Given his view of natural motions as atomic appetites, his rejection of nature's purposiveness as a figment of the idolizing intellect and, finally, his belief that self-preservation, and not self-actualization, was the mechanism ruling all natural actions, Bacon provided an explanation of the natural and moral order in which the reconciliation of individual interest and universal good depended upon the unintended consequences of infinite self-centred motions (atomic motions) and, most of all, on the providential cunning of a divine reason.

1.6 An Overview of the Chapters in This Volume

Francis Bacon on Motion and Power is a book which aims to provide a unified view of Bacon's thought by focusing on the notion of desire. Its various chapters investigate this topic from different angles, thus offering a multi-faceted account of one of the most important topics in Bacon's metaphysics. In Chap. 2, on 'Appetites, Matter and Metaphors: Aristotle, *Physics* I, 9 (192a22–23), and Its Renaissance Commentators', Daniel C. Andersson interprets the renowned scholastic maxim concerning matter's desire for form (*materia appetit formam*) against the

background of sixteenth- and seventeenth-century commentators. The central question is whether matter is in fact allowed to strive for a form (which is a condition that is ontologically superior to its own nature), or whether it instead yearns after a state that is more appropriate to its hierarchical rank. In both cases, the crux of the argument lies in the assumption that the exertions of matter cannot be defined as proper desire, for the way in which matter is shaped by a form is already determined by the original plan of being. Indeed, would matter go so far as to desire the extinction of its current form in order to become able to aspire to better forms? As argued, among others, by Giulio Cesare Vanini (1585–1619), this could mean that matter strived after its own destruction. Here again, we don't need to invoke the principles of Freud's metaphysics (*eros* and *thanatos*, life and death drives) to have a glimpse into the destructive potential of desire. As showed by Andersson, even the sinuous debating of early modern scholastics and their tiptoeing around the question of matter's desire for forms (not to mention the very limits of language, with its tendency to resort to paradoxes and arguments *per absurdum*) is a clear indication that desire, despite Aristotle's defence of animal and rational ὄρεξις, maintains a disquieting relationship with its material roots. Indeed, a number of sixteenth- and seventeenth-century interpreters of Aristotle identified a lingering aporia in the kinship between appetite and matter: while a form cannot desire itself because form means perfection and perfection has overcome the condition of want, matter cannot desire what it does not have because that would amount to such a radical change that it would lead to matter's very destruction.

When seen against the background of early modern Aristotelian metaphysics and physics, the paradoxical nature of material motion as a tendency in the cosmos which transforms action into inertia becomes even more evident in Bacon's case. Chapter 3, 'Lists of Motions: Francis Bacon on Material Disquietude', provides both a diachronic and synchronic study of the Baconian system of natural motions. It traces the emergence, in Bacon's various works, of multiple lists of primal appetites in matter which function as the backbone of his physics. Wedged between predatory life and restful death, disquietude represented for Bacon the defining characteristic of nature. In his many forays into the field of natural history, he tried to put to test the motions he had been identifying and cataloguing in his various lists throughout his life. A large number of experiments were devoted to the study of vital motions and motions towards death in all kingdoms of nature – among minerals, vegetables and animals – providing further evidence of Bacon's lifelong interest in the phenomena of decay and permanence.

Speaking of experiments, Newton was not the only one who, according to the legend, relied on the good offices of apples to promote an experimental knowledge of nature. In Chap. 4, entitled 'Bacon's Apples: A Case Study in Baconian Experimentation', Dana Jalobeanu shows how a fruit as simple as an apple could be turned by Bacon into an open-air laboratory, where experimenters were able to observe the innermost processes of nature unfolding before their eyes. The essay contains a detailed discussion of Bacon's experiments and observations concerning fruit preservation and it confirms that, even at the level of natural history, Bacon was

preoccupied with issues of duration and transience in nature.¹⁶ As underlined by Jalobeanu, a large part of the experimental investigations included in *De vijs mortis*, *Historia vitae et mortis* and *Sylva Sylvarum* concentrated on finding ways – both theoretical and technological – to extend, possibly forever, the life of natural beings, at the most primordial level, the level, that is, of material appetites. Among the substances that could disclose new information on how to preserve life in natural and artificial bodies, Bacon's attention was particularly caught by the behaviour of quicksilver. Jalobeanu shows how Bacon did not hesitate to consult ancient sources and the most recent literature on natural magic and secret knowledge in order to prevent the process of decay. The attention she devotes to Giambattista della Porta's *Magia naturalis* ('Natural Magic', whose first edition was published in Naples in 1558) as a source of both confrontation and inspiration in Bacon's experimental pursuits is especially refreshing. In *Magia naturalis*, Bacon found extensive discussions about the nature of putrefaction and a number of technological devices designed to arrest this process. Furthermore, Della Porta's search for 'universal preservatives' such as soft amber, quicksilver, distilled spirit of wine and cold acted as a catalyst for Bacon's programme of natural experimentation. Jalobeanu quotes a passage from Della Porta which must have resonated with Bacon: distilled wine is 'free from all putrefaction whatsoever: wherefore all things that are drenched in this kind of liquor, if the vessel be carefully closed up, must needs last unputrefied even for a whole age, nay for all eternity' (Della Porta 1658, 134).

Bacon's concern with the interplay of death and life in nature and, more specifically, in man, is the subject of Chap. 5 by Marta Fattori, on '*Prolongatio Vitae* and *Euthanasia* in Francis Bacon'. By focusing on his recommendations concerning the possible uses of euthanasia in both the *Advancement of Learning* and *De augmentis scientiarum* (1623), Fattori shows the lengths to which Bacon went to discover a means to postpone the moment of death, but also a means to make that moment less painful. By comparing views about life advocated by such diverse philosophers as Telesio, Bacon and Descartes, she demonstrates how central the issue of the prolongation of life was in both the Baconian and Cartesian medical frameworks. For both approaches, the need to elaborate new techniques for extending the course of life was more urgent than therapy and prophylaxis. In Bacon's account, both the euthanasia of the body (*exterior*) and the euthanasia of the mind (*ad animae praeparationem*) were integral components of his lifelong inquiry into the boundaries of natural life, part of which was his crucial experiment to restore mortal life indefinitely, *experimentum corporis mortalis restituendi* (Bacon 1857–1874, VI, 648).

In his endeavour to extend the limits of life, Bacon looked at the material spirits of the body as the principal carriers of the vital functions. Chapter 6, 'Francis Bacon's Flux of the Spirits and Renaissance Paradigms of Hybridity and Adaptation', is a nuanced account of Baconian spirits within the context of contemporary literature. Here Miranda Anderson investigates processes of mental embodiment and extended vitality in nature, a cluster of themes that she examines by referring to 'the human mind's propensity to extend itself into bodies and into the world' (p. 000).

¹⁶On Bacon's experimental method, see now Jalobeanu 2015.

Many authors at the time, in such disparate fields as poetry and philosophy, medicine and theatre, theology and politics, sought to explain how constant fluxes of spirits cemented bonds and relations among otherwise disconnected natural beings. Spirits were seen as providing the glue between natural and social constructions, inanimate and animate conglomerates, bodies and souls, perceptions and appetites, representations and reality, parts and wholes, individuals and communities. Given the natural and political character of desire in Bacon's philosophy, this study in the hybrid and adaptive nature of life represents an indispensable contextualization in this volume. In particular, with respect to the central issues of mutability and decay, Anderson compares Bacon's views with texts by Edmund Spenser (1552–1599), Helkiah Crooke (1576–1648) and William Drummond (1585–1649), in which changeability and metamorphosis were interpreted in positive terms as a way for matter to expand and perpetuate its life, and not as an inconvenience which could lead living beings to death and loss of identity. Furthermore, insofar as they were the most variable beings in the universe, human animals had the advantage of being the most flexible and supple creatures, capable of adjusting themselves to countless environmental variations. 'Men', Bacon declared in a passage from the *Sylva Sylvarum* quoted by Anderson, 'should accustome themselues, by the light of Particulars, to enlarge their Mindes, to the Amplitude of the World' (Bacon 1627, 74). In presenting human nature as the most adaptive and hybrid reality in the universe, Anderson characterizes it as the most 'extended', in both the material and the social world. From this point of view, she traces intriguing connections between Bacon's 'human extendedness' and early modern reinterpretations of Stoic οἰκείωσις.¹⁷

By facilitating the passage from material to social aggregations, spirits also played an important role in mediating between nature and morality. Chapter 7, entitled '*Cupido, sive Atomus; Dionysus, sive Cupiditas: Francis Bacon on Desire*', explores the boundaries between natural and human desire, and asks whether it is in fact possible to draw a line within the continuum of appetitive energy. It is interesting to note that especially on this delicate matter Bacon was keen on using the hermeneutical apparatus of Renaissance mythography. Indeed, his ventures into the territories of mythological and symbolic thinking can be seen as a further instance of his distinctively inductive approach to reality. In Bacon's philosophy, induction was the process through which universal principles of knowledge and action were drawn from the particulars of history, taking here 'history' as the inquiry into objects of both natural and human productivity. As such, induction applied to nature as well as to culture. Cultural induction was the method applied by Bacon in mythographic investigations, as is particularly clear in *De sapientia veterum*, a few sections of *De augmentis scientiarum* and the unfinished fable on Cupid and Heaven. Two general assumptions underlie Bacon's method of cultural induction. The first intimates that God created the world in such a way that reality was reflected by the senses – as both natural organs and repositories of historical information in languages and insti-

¹⁷ On the significance of the early modern revival of Stoic οἰκείωσις, see Giglioli 2011. For a detailed overview of early modern theories of spirits and effluvia, see Parigi 2011.

tutions. The second assumption suggests that the domain of human affairs (*res humanae*) was better suited than nature to be reformed by knowledge, for nature, still affected by the consequences of the original sin, resisted any attempt to restoration through technological means (Bacon 1857–1874, VI, 627). It is to Bacon's use of natural and cultural induction to understand the character of desire that Chap. 7 turns its attention.

In Chap. 8, entitled 'The Ethics of Motion: Self-Preservation, Preservation of the Whole and the "Double Nature of the Good" in Francis Bacon', Silvia Manzo takes as her starting point the 'quaternion of good' based on the four principal tendencies to give, receive, order and assimilate. Manzo focuses on the motion of resistance (*antitypia*), as the principal force striving to preserve the reality of matter and the union of the cosmos. She shows how the cosmological dimensions of desire in Bacon's universe facilitated the transition from the sphere of natural activity into that of moral philosophy. This chapter is also a timely reminder that jurisprudence and legal practice permeated Bacon's philosophical inquiries and shaped his solutions to the question of appetitive unrest.

In Chap. 9, 'Francis Bacon on the Motions of the Mind', Sorana Corneanu sheds much needed light on the ethical and theological aspects of Bacon's thought. She expands the meaning of motion in Bacon's philosophy to include mental operations (the 'motions of the mind'), as well as the myriad other motions emanating from a hierarchically ordered array of incorporeal natures. In an original and convincing way, she shows how Bacon shared with a number of contemporary physicians, natural philosophers and divines a view of *spiritus* as an instrument of the rational soul, where the latter is understood as an incorporeal substance, individually created by God. Bacon's need to distinguish between the body (corporeal) and the soul (incorporeal) did not derive, as was the case with many early modern authors, from an urge to demonstrate the immortality of the soul, but from the attempt to elaborate an integrated view of medicine and natural philosophy, with the aid of which the new philosopher, trained as a skilled interpreter of nature, might cure both the diseased body and the unbalanced mind. Bacon's insistence on the difference between corporeal and mental motions is particularly evident in his discussion concerning the dissimilarities between the soul of animals and the soul of humans: while largely subscribing to the Telesian model of the double soul (material and immaterial), Bacon also seems to have had in mind a belief that was characteristic of a certain strand of Renaissance Averroism, in which human beings were deemed to be endowed with a double soul (i.e., the material faculty of representation and the cognitive faculty, the latter seen as the highest level of sentient capabilities granted to humans, a prerogative which was out of reach for non-human animals).

Chapter 10 by James A.T. Lancaster, on 'Francis Bacon on the Moral and Political Character of the Universe', elaborates on the social aspects underlying natural appetite, and is an articulate discussion of the way in which Bacon justified shifting between the domains of nature and politics by expanding the scope of moral action in the universe. Lancaster argues that Bacon meant to elaborate a theory (*thema*) of the universe in which all natural phenomena manifested signs of moral and political intelligibility. Moreover, by underlining the theological arguments

underpinning the idea of a postlapsarian rebellious matter, Lancaster also introduces a key variable in this volume and its overall inquiry into the nature of appetitive drives. While he acknowledges the relevance of the theological argument, he also makes clear that the so-called ‘summary law of Nature’ (*lex summaria Naturae*) was not completely perverted by the Fall. If that were the case, the cosmos would have never been able to resist the tendency to disorder. By contrast, nature was allowed to enjoy a condition of ‘revocation’, as Bacon called this state in his *Confession of Faith* (Bacon 1996b, 108–109). The effects of original sin on the general economy of material appetites were visible, for instance, in the way in which individual tendencies to self-interest and self-preservation had become stronger when compared to their appetitive counterpart in the domains of material union and cohesion.

The question of the political cohesion of commonwealth is the theme of Chap. 11. ‘A More Perfect Union: Bacon’s Correspondence of Form and Policy’ is a subtle analysis of the characteristic intertwinement of natural and political categories in Bacon’s philosophy. Its author, Vera Keller, examines the relationship between the study of nature and the principles of political expediency. She stresses the important role played by political doctrines dealing with the notion of reason of state in shaping Bacon’s attitude towards scientific progress and political stability. She rightly argues that the ‘advancement of empire’ runs parallel to the ‘advancement of learning’, understanding by ‘empire’ the equivalent of the Latin *dominium*. ‘If the application of the study of nature to policy helped make the policy more durable, certain and universal’, she writes on page 263, ‘conversely, the application of policy to the study of nature could make natural philosophy better able to negotiate contingency, probability and particularity’. Above all, she points out that the same tension between inconstancy and durability which is the hallmark of Bacon’s view of nature in his natural philosophical writings is likewise at work in his considerations about ‘policy’, where particulars and contingencies are familiar subjects of the reason of state. Significantly, Keller shows how the term ‘policy’ during Bacon’s time did not necessarily mean ‘government’ or ‘civil science’, but more often than not denoted the practice of political realism. In other words, it was frequently used as a synonym for ‘reason of state’. Finally, she describes in detail the typical tangle of ‘policy’ and ‘prudence’ as a ‘moral and epistemic grey area’ in which the boundaries between wisdom and cunning were easily blurred.

In this way, by comparing the natural order with human policy, we come back to the specific issue in Bacon’s philosophy which at the beginning of this Introduction I have called Orpheus’s predicament: since postlapsarian nature is no longer responsive to the call of man’s intellect, and slow progress in technology means that nature will remain unresponsive for a long time, Bacon convinced himself that the transformation of reality could only begin with the betterment of human societies and empires. Bacon’s physics assumes that natural bodies can be built by relying on the knowledge and manipulation of the motions of matter. Likewise, his political views understand polity as resulting from the knowledge of the basic appetites of human nature. However, since Bacon realized that, for the time being, the knowledge of

natural forms was technologically too rudimentary, he decided to apply the study of nature to the domain of policy, so as to strengthen human empire through the knowledge of natural boundaries. In her chapter, Keller sees a ‘matter theory of politics’ at work in Bacon’s thought. She argues that, in order for natural philosophy to be transformed into a public and collective enterprise, Bacon went to great lengths to show how success required humans to bring natural and social appetites together, by reconciling individual interests, so as to turn them towards a greater, more universal good: ‘by publique designation, though not by private endeavour’ (Bacon 2000a, 61).¹⁸

The final chapter of the volume, Chap. 12, is devoted to a lexicographic and intellectual analysis of one of the most successful linguistic innovations in Bacon’s works: *idolum*. Its author, Marialuisa Parise, concentrates on the way in which this crucial term was rendered into English, French and Italian during the seventeenth, eighteenth and nineteenth centuries. ‘Bacon’s *Idola* in Vernacular Translations: 1600–1900’ demonstrates that translations are not anodyne linguistic transactions, but influential enterprises fraught with cultural and ideological assumptions. Parise’s most significant contribution to the theme of this volume, however, is to show how English, French and Italian translators struggled to make sense of Bacon’s *idola* at both a linguistic and a conceptual level. While Bacon chose a term that, in the philosophical and Latin theological tradition, combined the delusions of the imagination (*idolum* as *phantasma*) and the dangers of blasphemous worship (*idolum* as idol), Peter Shaw (1694–1763), Lasalle and Antonio Pellizzari (1747–1845) encountered great difficulty in dealing with the semantic density of this word, a clear sign that, already by the eighteenth century, the philosophical lexicon was evolving in different directions. It also means that some of the original cultural accretions of εἶδωλον | *idolum* were no longer perceived by readers such as Shaw, Lasalle and Pellizzari, and that to them Bacon’s ‘idols’ simply signified a distortion of the cognitive and representative functions.

1.7 A Desire to End

As mentioned at the beginning of this Introduction, Bacon regarded the power of the idols as perilously intertwined with the primeval energy of desire and the role that this played in creating unintended premises and consequences in the various domains of human life. As a result, knowledge was unavoidably opaque for Bacon, for the motions of sense perception and the motions of the mind were subject to more elementary motions of self-preservation. What is more, the interplay of desire, inadvertence and delusion affected every part of nature, not only the human minds. The political consequences were significant. Despite the fact that the postlapsarian degradation of nature had exacerbated the self-serving movements of blind appetite,

¹⁸The literature on Bacon’s political philosophy is vast. Here see: White 1968; Epstein 1977; Weinberger 1985; Martin 1992; Faulkner 1993; Peltonen 1992; Wormald 1993; Peltonen 1996; Zagorin 1998, 129–220; Solomon 1998; Van Malssen 2015; Keller 2015.

the tension towards the greater good originally instilled by God at the creation continued to govern the life of the universe. It did so, however, without exercising a direct control on individual desires and minds, but following the circuitous and oblique paths of a theologico-political order. Knowledge in nature and among human beings remained therefore shadowy and biased, being constantly distorted by the urge of desire. With the exception of God, in Bacon's universe nothing had the privilege to enjoy clear and distinct ideas.

As both a politician and a philosopher, Bacon was painfully aware that a theologico-political management of appetites was the only viable solution to cope with the expanding gulf between desire and knowledge, private interests and the common good. The traditional view that moral and political action needed to rest on the safe foundation of the highest good (*summum bonum*) was becoming increasingly less tenable. In 1668, at the age of 77, Jan Amos Comenius (1592–1670), the celebrated Moravian theologian and educational reformer, began his book *Unum necessarium*, devoted to 'what is necessary to know in one's life, death and after-life', with a quotation from Plato's *Alcibiades posterior* (146DE): *omnes scientiae, si absit optimi scientia, obsunt potius quam prosunt habenti*, 'all kinds of knowledge, if knowledge of the highest good is missing, cause more harm than benefit to their possessors' (Comenius 1974 [1668], 73). At a time when Tacitean and Machiavellian ideas were shaping contemporary political discourse, and reason of state dovetailed with absolutism, Comenius decided once again to stress the Platonic notion of the political good as the crowning manifestation of human rationality in the form of just laws and rightful constitutions. By 1668, however, the political fortunes of Plato's *optimi scientia* – the knowledge of the highest good – were dramatically on the decline. It was a philosophical crisis of vast proportions, in which the power of knowledge to control appetites (be they natural, individual or collective) had been dramatically questioned, with unprecedented theoretical force. In Bacon's political philosophy of matter and motion we witness the emergence of this radical development in philosophy.

Void, hunger, death: these were the principal motivations in Bacon's universe. In this volume, they are explored from various different angles. Andersson shows how Bacon reacted to the standard – loosely Aristotelian – view of material desire as an insatiable condition of ontological deprivation and unquenchable hunger for form and definition. Both Anderson and Corneanu highlight the countless conditions of appetitive imbalance that prompt continuous exchanges between spirits, minds and bodies in Bacon's world. Manzo reminds the reader that, in this world, desire at all levels has a cosmological foundation. Fattori points out Bacon's long interest in the role that death and decay could play in the material universe. Fruits and flowers, as Jalobeanu argues in her chapter on experimental inquiry, were for Bacon privileged specimens for investigating the 'inception of putrefaction', that subtle and shifting threshold separating life from death. As she rightly observes, '[a] fine line has to be drawn between maturation and putrefaction, and it is the role of experiments to do so' (p. 109). Because of the emphasis on the conservative and quiescent nature of desire, Bacon's contemporaries and immediate successors, with only a few exceptions, failed to take into consideration his ideas about motion and

matter. The original hypothesis of motion as an irrepressible urge to return to a previous state was hardly liable to be mechanized. After all, it took more than two centuries for notions such as entropy, adaptation and homeostasis to become acceptable notions in scientific discourse.

As already hinted in a previous section of this Introduction, someone who made a fascinatingly original use of these notions was Sigmund Freud. In his essay *Beyond the Pleasure Principle* published in 1920, Freud went back to ideas of Eros ‘evoked by poets and philosophers’, to the ‘majestic Ἀνάγκη’ of the Greeks and to Plato’s *Symposium*, and characterized pleasure as the end of a tension: ‘these processes are invariably triggered by an unpleasurable tension, and then follow a path such that their ultimate outcome represents a diminution of this tension, and hence a propensity to avoid unpleasure (*Unlust*) or to generate pleasure’ (Freud 2003 [1920], 45; and *ibid.*, 60, 84, 90, 97). Freud thought that this fact accorded well with the hypothesis that ‘the life process of the individual leads for intrinsic reasons to the equilibration of chemical tensions, that is, to death, whereas union with the living matter of a different individual *increases* these tensions, introduces new vital *differentiae* as it were, which must then be “lived out”’ (95). He referred to Gustav Fechner’s *Einige Ideen zur Schöpfungs- und Entwicklungsgeschichte der Organismen* (‘Some Ideas on the Origin and Evolutionary History of Organisms’), in which the German philosopher and physicist had advocated the existence of a tendency to stability in organic phenomena, interpreting pleasant and unpleasant states of perceptions as associated with conditions of, respectively, stability and instability. Within the ‘realm of the drives’, by investigating tendencies such as the compulsion to repeat (which seemed to be ‘more primal’, ‘more elementary, more deeply instinctual than the pleasure principle’), Freud thought he had identified ‘a universal attribute of drives – and perhaps of all organic life’, according to which a drive ‘might accordingly be seen as a powerful tendency inherent in every living organism to restore a prior state, which prior state the organism was compelled to relinquish due to the disruptive influence of external forces’; he saw this tendency ‘as a kind of organic elasticity, or, if we prefer, as a manifestation of inertia in organic life’ (55, 61, 71, 76). In all these situations, Freud detected ‘a universal characteristic of drives to restore a prior state’ (97, 100).

Significantly, Freud recognized in a footnote the possibility that ‘similar suppositions as to the nature of “drives” have already been expressed on numerous occasions’ (Freud 2003 [1920], 250). Bacon certainly did so, especially in his *Novum organum*, as this book intends to demonstrate. Freud’s most speculative conclusion had something paradoxical in it and sounded tragic (‘disturbing’, as he himself described it): ‘all living matter dies for reasons that are intrinsic to it’ and, if ‘every living thing dies – reverts to the inorganic – for *intrinsic* reasons’, then ‘we can only say that *the goal of all life is death*, or to express it retrospectively: *the inanimate existed before the animate*’. Appetitive drives were ‘detours on the path of death’. Freud questioned a certain way of interpreting the process of self-preservation as a result of ‘self-assertion’ and ‘dominance’, the ‘baffling’ notions of an ‘inherent drive towards perfection’ and of the organism ‘striving to endure in defiance of the

whole world'. Interestingly, he ended his discussion by rehearsing atomistic patterns of reasoning: 'germ-cells', which contain within themselves 'the full gamut of inherited and newly acquired drives', provide matter with 'potential immortality' or a 'semblance of immortality', while 'in reality perhaps signifying merely an extension of the dying process'; 'when living matter *became* living matter, it was sundered into tiny particles that ever since have endeavoured by means of the sexual drives to become reunited' (78–81, 83–84; 97).¹⁹

Freud was well aware of the tentative character of his theorizations. He described the hypothesis in terms of 'Stygian darkness' – 'unquestionably more myth than scientific explanation'. Bacon, too, as I argue in Chap. 7, had recourse to myth – Cupid and Dionysus – to shed more light on the puzzling and contradictory nature of appetite. Freud resorted to the mythological forces of Greek *Ἀνάγκη* to elaborate his theory of death drives and to explain the constant tendency in the 'nervous life in general' to reduce 'inner stimulative tension', 'to maintain it at a steady level, to resolve it completely' (Freud 2003 [1920], 94–95). Unlike Freud, though, Bacon envisaged an ideal situation – both cognitively and operatively – in which 'satisfaction and appetite' were perpetually 'interchangeable' (Bacon 2000a, 52). This situation was represented by the Great Instauration, such that desire was never stifled by satiety, but rather constantly reinvigorated by cycles of self-fulfilling energy. Both metaphysically and theologically, both ethically and politically, the deepest meaning of *instauratio* (renewal and regeneration) suggested the triumph of life over death. Appetitive quiescence, the restoration of the original flow of energy, then turns out to be the highest level of desire and activity, which alone can offer true respite from mental and physical tension. In the *Confession of Faith*, this form of appetitive quiescence was presented as 'the time of the revelation of the sons of God', the time that was 'the last' and 'everlasting without change' (Bacon 1996b, 112).

And in such difficult and complicated matters, like Freud, I can only ask for the poet's help:

Then gin I thinke on that which Nature sayd,
 Of that same time when no more *Change* shall be,
 But stedfast rest of all things firmly stayd
 Upon the pillours of Eternity,
 That is contrayr to *Mutabilitie*:
 For, all that moveth, doth in *Change* delight:
 But thence-forth all shall rest eternally
 With Him that is the Good of Sabaoth hight:
 O that great Sabbaoth God, graunt me that Sabaoths sight.
 (Edmund Spenser, *The Faerie Queene*, Canto VIII, unperfit, II)

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¹⁹On the medical and biological origins of the 'death' drive, see Giglioni 2013d.

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Chapter 2

Appetites, Matter and Metaphors: Aristotle, *Physics* I, 9 (192a22–23), and Its Renaissance Commentators

Daniel C. Andersson

Abstract By exploring the world of pre-modern and early modern scholastic Aristotelianism, this chapter outlines one of the likely metaphysical backgrounds against which Bacon developed his views on material appetites. By material appetites, he meant a set of original tendencies in nature, inherent in every part of matter. When we take into consideration the context of late scholastic and Aristotelian philosophy, Bacon's position emerges out of an exceedingly variegated landscape of philosophical solutions, a true *sylva sylvarum* of conceptual differences, deliberate borrowings and tacit accretions. As someone who during his philosophical apprenticeship must have waded into the dense forest of Aristotelian arguments in translations and commentaries, Bacon was acquainted with the distinctive Aristotelian unease about material appetite. As is well known, in Aristotle's metaphysics matter is presented in terms of inert substratum. Furthermore, while Aristotle argued that appetite might denote life at both an inanimate (ἄφροσις) and animate (ὄρεξις) level, no form of intentional and 'orektic' teleology could be assigned to inanimate nature given the unintentional character of natural purposiveness. Through elaborating an original notion of material appetite, Bacon overcame classic scholastic objections and redefined traditional ontological divisions between matter, unsentient drive and conscious desire.

2.1 Introduction

In an unpublished manuscript from around 1612, entitled *Descriptio globi intellectualis* ('A Description of the Sphere of the Mind'), Francis Bacon expressed great hopes that the innermost motions in matter, which he called the appetites of nature (*passiones et desideria naturae*), might become a subject of philosophical

D.C. Andersson (✉)
Wolfson College, Oxford OX2 6UD, UK
e-mail: daniel.andersson@wolfson.ox.ac.uk

and scientific investigation.¹ In his opinion, celestial observation was to benefit greatly from the study of these natural tendencies in matter. It looks, then, as though Bacon was interested in finding the way to unify the sublunary and the superlunary worlds, a common cosmological concern among natural philosophers and astronomers in the years after Copernicus's *De revolutionibus orbium caelestium* ('The Revolutions of Celestial Spheres', 1543). Since what Bacon meant in that passage sounds quite different from what most sixteenth-century Aristotelians would have understood by the term *appetitus*, in this chapter I intend to sketch out the contours of Renaissance *appetitus* by examining a set of contemporary Aristotelian taxonomies and to suggest a historically plausible reason behind the emergence of these taxonomies.² My account is rooted in a number of institutional concerns rather than in a mere examination of pre-modern and early modern doctrines. It is also rooted in questions of exegesis.

Although today we tend to think of 'appetite' as a term and a notion that pertain to the domains of physiology and psychology, Aristotelians of every ilk thought and spoke of appetite in much broader terms. In some versions of Aristotelian anthropology, a number of concepts appeared to bear on epistemological matters, although many peripatetics wished to dismiss those concepts, or at least delimit their scope, for, in their opinion, they did not provide an appropriate or true warrant for knowledge.³ This was a particularly problematic issue with respect to forms of religious enthusiasm, which claimed to be able to produce reliable knowledge, in terms of prophecy and edification.⁴ It was, however, a much wider problem within the Aristotelian tradition, for the question about appetites underlay the fleshly nature of humanity and concerned the extent to which a range of affective and therefore bodily properties might in fact have some non-trivial and non-contingent role in an account of human understanding. It also represented a problematic issue for those – a large class, indeed – who wished to elaborate an amalgam of Christian philosophical belief and Aristotelian thought. To this end, many later discussions took the works of Thomas Aquinas (1225–1274) as their starting point. This was made possible by the central role that the notion of the immaterial soul played in his philosophical account. It should also be borne in mind that, in this context, the notion of appetite presented a range of significant links with Aristotelian views concerning the imagination.⁵

¹Bacon 1996, 112: 'nos in hac ipsa historia Caelestium, ad nostram normam facta et congesta, spem per se ponere veritatis circa caelestia inveniendae; sed multo magis in observatione communitium passionum et desideriorum materiae in utroque globo'.

²For a recent example in which the unity of the Aristotelian tradition is taken seriously with respect to perhaps the most fundamental discipline of the arts course (logic), see Dvořák and Novák 2007 (thanks to Paul Richard Blum for discussing this work with me).

³Compare the discussion of Kant's transcendental illusion by Smith 1995 (3–4) and Grier 2007.

⁴For a discussion of the relationship between edification and knowledge, see Andersson 2009a ('Appendix: On Edification').

⁵The most recent synthesis is Hasse 2010. More relevant to the current enquiry is Des Chene 1996, 202 and Leijenhorst 2002, 197–198. More specialized studies include: Aertsen 1996; Barnett 1935; Matula 2002; Wallace 1967.

An account of *appetitus* cannot, however, stop here. It is particularly to be observed that in the Aristotelian tradition the notion of appetite is part of an overall teleological view of matter, in which matter exists for the sake of something else. It is certainly an intriguing question to decide whether the previous sentence would make equal sense if we substituted the word ‘nature’ for ‘matter’, and in order not to settle this question I float between the two formulations. It is an equally intriguing question to what extent one should rather talk merely about a hylomorphic view of matter rather than a teleological one, since the discourse on teleology demands a set of assumptions that could be foreign to some sixteenth-century Aristotelians. It is by reason of teleology that in this chapter I deal with the notion of appetite not merely in cognitive and physiological terms, but also as a property of matter. Indeed, the chapter will almost solely be concerned with this last point. Hylomorphism is a word to be treated carefully since it is not found in Aristotle or any of his Renaissance commentators. While there is no one doctrine of hylomorphism, failure to recognize this fact has made scholars foist a doctrine onto ‘the scholastics’ with deleterious results. This notion of material appetites (for the time being I use the singular and the plural formulation interchangeably) derived ultimately from Aristotle’s *Physics* (which has been hitherto my main research interest) and, to a lesser extent, from his *De anima*. An issue that connected both treatments in Renaissance philosophy, however, is the ontological status given to appetite. The question I would like to address is the extent to which appetite was deemed to be ‘really’ in matter (*realiter*, or *in quidditate*, and other such phrases are used), or whether the attribution was metaphorical in kind.⁶

I will start by examining the ways in which the translations of key passages in Aristotle gave the illusion that there was in fact a stable entity known as *appetitus*. I will then explore some of the problems associated with ascribing appetite to matter in a range of early modern Aristotelian thinkers. Particular attention will be paid to the issue of the metaphorical or otherwise nature of the concept. The challenge posed to this tradition by Avicenna (c.980–1037) will also receive brief treatment. While this chapter is concerned only with Aristotelian viewpoints, it acknowledges the presence at the time of other accounts and taxonomies of appetite, of which, perhaps, the most important was the Stoic. Transmitted, among others, through a passage from Cicero’s *De officiis* (I, 36), we find a view opposing non-rational movements of the soul (placed in the *appetitus*) and rational movements (*cogitationes*).⁷ The Stoic view of appetites as twisted opinions that could, given the appropriate philosophical therapy, be straightened up, as if they were mere cognitive states, was widely derided. Moreover, as Philipp Melanchthon (1497–1560) had pointed out, the Stoic position seemed to mingle different categories of striving and

⁶On hylomorphism in scholastic contexts, see now Brower 2014 and Ward 2014.

⁷For a recent discussion on whether the Stoic model of appetite and the bipartite soul may have been influenced by the superficially similar Platonic account, see Bonazzi 2007, 115–116. In this chapter, I leave aside Plato’s position on appetite; for all the various twists and turns in his works, it is fair to say that he remains more hostile to the notion of *rational* appetite than Aristotle.

appetition.⁸ A related Stoic theory, also handed down by Cicero (*De finibus*, V, xi, 24), placed a stronger emphasis on the principle of self-preservation. These were the categories that Melanchthon inherited from late-medieval scholasticism.

In addition to their relevance for the history of early modern philosophy, material appetites also represent an important topic within the history of science, for they can be seen as one of the vehicles through which paradigms of mechanism and vitalism battled throughout the seventeenth and eighteenth centuries. In a famous letter to Jakob Thomasius (1622–1684) by Leibniz (who certainly did not ‘free’ himself from a theory of material appetites), we read of how the talk of the *novatores* regarding nature could oddly sound very similar to the language of the schoolmen: matter desires form, nature does nothing in vain, and other such metaphorical phrases (Leibniz 1926 [1663–1685], 14–24). Leibniz’s critique has become entrenched in undergraduate textbook orthodoxy: Steven Shapin, in a sprightly work on the scientific revolution, surveys the seventeenth-century critique of such metaphors (Shapin 1996, 29). This in turn has led to the question of whether or not the *novatores* simply replaced God with nature. Historians now tend to show how this or that *novator* did not in fact free himself entirely from a more traditional notion of causation or teleology (Osler 2001). This all has been very productive in terms of scholarship, but sometimes it has directed too much attention to what I consider to be the use of scholastic teleology as the straw man of the situation. One recent scholar has even gone so far as to say that Thomas Aquinas can be seen as arguing against a notion of immanent teleology (Carlin 2012).

In this chapter, I don’t intend to underestimate the power of possible animistic thinking. This possibility was frequently advertised in popular contexts rather than in the more rarefied world of university scholasticism. Like prime matter (which shall reappear at the very end of my story), material (or natural) appetite cannot be seen with the naked eye. Both concepts were dependent on metaphors, analogies or examples to be persuasive. Such a figural half-life left material appetite either liable to new developments or vulnerable to attacks. To be sure, one can see this appetite as an essential part of Aristotelian teleology: since Aristotle’s distinction between rational and irrational desires depended upon a specific view of human flourishing that was grounded in nature, it was essential for appetites to be modelled along the lines of a corresponding entity in nature. Regardless of whether it is correct to describe Aristotle in these terms, one cannot deny that this attention towards ways of reconciling natural and rational appetites was a key factor in prompting later Christian Aristotelians to adopt the notion of natural appetite according to the peripatetic tradition.

Another large omission here is the view about appetite in Duns Scotus (1266–1308) and his sixteenth-century followers. As is well known, Scotus rejected the Aristotelian Thomist view of intellectual appetite as a defining characteristic of human nature. The notion of *appetitus elicited*, the superadded Scotist form of appetite *qua* material appetite, only finds its way into mainstream commentaries on

⁸Melanchthon’s charge is that the Stoics ‘miscuerunt appetitiones naturales, affectus tactum comitantes et motus cordis’. See Melanchthon 1542 [1540], 116^v–117^r.

Aristotle's *Physics* in the seventeenth century, where one can certainly find instances of its discussion (and refutation).⁹ This, however, is the topic for another study.

2.2 An Appetite for Philology

Just as textbooks can often be very revealing about the common assumptions that shape a particular age – indeed, more so than technical and specialized literature – so a philosopher's tags and *bon mots* are sometimes as telling as his entire work. The Aristotelian dictum that matter desires form just as a woman desires a man is generically Aristotelian. One compendium of Aristotelian philosophy published in 1605 bluntly states that *appetitus* is ὄρεξις (Hocker 1606, 245). Indeed, not so long ago, a translator of Aquinas, Eric D'Arcy, decided to use the English word *orexis* to translate *appetitus* (Aquinas 2006 [1964–1976], XX, xix). Within Aristotle's *Physics*, however, this equivalence, conceptually appealing as it may be, is hard to find. In Aristotle's original Greek, the only reference to ὄρεξις in relation to the purely inanimate world of spheres, matter and form comes at 253a, but there the argument is framed following the account provided in *De anima*, where *mens* and *appetitus* are considered to be responsible for locomotion. More significant for the present discussion is the passage at *Physics*, I, 9 (192a 16–25), where the famous gendered similitude occurs. Here Aristotle uses both verbs ἐφίεσθαι and ὀρέγεσθαι to denote propensity. Given its role as both a conceptual and a linguistic matrix, the passage is worth quoting in its original Greek. This will help us follow the evolution of its exegesis in a series of Latin versions, from the Middle Ages to the early modern period:

Ὅντος γάρ τινος θείου καὶ ἀγαθοῦ καὶ ἐφετοῦ, τὸ μὲν ἐναντίον αὐτῷ φαμεν εἶναι, τὸ δὲ ὁ πέφυκεν ἐφίεσθαι καὶ ὀρέγεσθαι αὐτοῦ κατὰ τὴν αὐτοῦ φύσιν. Τοῖς δὲ συμβαίνει τὸ ἐναντίον ὀρέγεσθαι τῆς αὐτοῦ φθορᾶς. Καίτοι οὔτε αὐτὸ αὐτοῦ οἶόν τε ἐφίεσθαι τὸ εἶδος διὰ τὸ μὴ εἶναι ἐνδεές, οὔτε τὸ ἐναντίον (φθαρτικὰ γὰρ ἀλλήλων τὰ ἐναντία), ἀλλὰ τοῦτ' ἔστιν ἡ ὕλη, ὡσπερ ἂν εἰ θῆλυ ἄρρενος καὶ αἰσχρὸν καλοῦ· πλὴν οὐ καθ' αὐτὸ αἰσχρὸν, ἀλλὰ κατὰ συμβεβηκός, οὐδὲ θῆλυ, ἀλλὰ κατὰ συμβεβηκός.

Before moving to some samples of Latin translation, it may be useful to start with a contemporary English translation. Here I am using the version by Jonathan Barnes:

For admitting that there is something divine, good and desirable, we hold that there are two other principles, the one contrary to it, the other such as of its own nature to desire and yearn for it. But the consequence of their view is that the contrary desires its own extinction. Yet the form cannot desire itself, for it is not defective; nor can the contrary desire it, for contraries are mutually destructive. The truth is that what desires the form is matter, as the female desires the male and the ugly the beautiful – only the ugly or the female not in itself but accidentally (Aristotle 1984, I, 328).

⁹ See, for instance Collegium Sancti Thomae Complutensis 1692, 173–174; De San Augustín 1697, sig. D4r.

The *Physics* was translated in the 1260s by William of Moerbeke (1215/35–c. 1286), a Flemish Dominican whose work soon eclipsed the earlier version – the so-called *translatio vetus* – by the twelfth-century scholar James of Venice. Sometimes, as in the 1609 edition of Walter Burley (1275–1344), both the Moerbeke translation and the one by John Argyropoulos (1415–187) appear contiguously, encouraging the reader thereby to be more attentive to questions of philological precision.¹⁰ Burley starts with the Argyropoulos’s text (reproduced here from the 1609 edition):

Nam cum sit quoddam divinum et bonum ac appetibile, alterum ipsi contrarium esse dicimus. Alterum suapte natura affectat atque appetit ipsum. Illis autem evenit ut contrarium interitum appetat suum, et tamen fieri nequit ut aut forma seipsam appetat, quippe cum non indigeat sui, aut contrarium, cum contraria mutuo seipsa corrumpant. Sed hoc est materia perinde appetens illud atque si femina marem et turpe appetat pulchrum. Verum non est per se, sed per accidens turpe, nec <per> se femina, sed per accidens.

He then adds William of Moerbeke’s translation:

Existente enim quodam divino et optimo et appetibili, aliquod quidem contrarium esse ipsi dicimus. Aliud autem quod natum aptum esse appetere et desiderare ipsum secundum ipsius naturam, quibusdam autem accidit contrarium appetere suam ipsius corruptionem, et neque ipsum, suis ipsius possibile est appetere speciem, propter non esse indigens, neque contrarium. Corruptiva enim sunt adinvicem contraria, sed hoc est materia, sicut si foemina masculum, et turpe pulchrum, verum non quod per se turpe, sed secundum accidens (Burley 1609, c. 120).¹¹

The first thing to note about the Greek passage is the common root shared by the verb ἐφίεσθαι (‘to desire’) and the adjective ἐφειτός (‘desirable’). For reasons of consistency, one should perhaps translate ἐφειτόν with a word that has the same root as the one used for ἐφίεσθαι. This is what Moerbeke did, and the words he used (*appetibile* and then the infinitive *appetere*) did allow the Latinate reader to think of an *appetitus* in nature. Argyropoulos, by contrast, while maintaining that ἐφειτόν should be linked with the well-established scholastic idea of an appetite in nature (by translating it as *appetibile*), broke the rule of consistency and decided to translate ὀρέγεσθαι as *appetit*, for he felt that ὀρέγεσθαι, too, needed to be translated with *appetere*. It could also be that he considered the coupling of the two infinitives to be a mere doublet denoting the act of striving.

¹⁰For an instance of competing translations generating confusion in the reader rather than understanding, see Martin 2008, 170. On Argyropoulos, see now Matula 2006.

¹¹I have left out the *vetus* translation on grounds of impact. It may instead be useful to quote here the nearly identical translation used by Jacopo Zabarella in his commentary: ‘Existente enim quodam divino et bono et appetibili, aliud quidem contrarium ipsi dicimus esse, aliud autem quod natura aptum est appetere, et desiderare ipsum secundum suam ipsius naturam, quibusdam autem accidit contrarium, appetere suam ipsius corruptionem, attamen neque ipsum, suam ipsius possibile est appetere formam, propterea quod non est indigens, neque contrarium, corruptiva enim sunt sui invicem contraria, sed hoc est materia, sicut si foemina masculum, et turpe pulchrum, verum non per se turpe, sed secundum accidens, neque foemina, sed secundum accidens’ (Zabarella 1601, sig. Mm1’).

To find more evidence about this point, I turn to Francesco Vimercati (1474–1570). Here is how he translated the passage in question:

Cum enim divinum quiddam sit et bonum et expetendum, aliud quidem contrarium ei esse dicimus, aliud quod natura sua ipsum expetat atque desideret. Illis autem accidit, ut suum ipsum interitum contrarium expetat. At neque se ipsa expetere potest forma, quandoquidem non eget, neque contrarium, cum vicissim se se contraria interimant. Sed hoc est materia, perinde ac si marem foemina et quod turpe est, pulchrum; at nec turpe, nec foemina per se, sed ex accidenti (Vimercati 1567, fol. 34^r).¹²

The word *appetitus* and its various verbal cognates do not feature in this text at all. What Vimercati, a careful and intelligent translator, has done, however, is to preserve the link between the third in the list of the adjectives ‘θείου και ἀγαθοῦ και ἐφετοῦ’ and the first of the two verbs ‘ἐφίεσθαι και ὀρέγεσθαι’, by using the words *expetendum* and *expetere*. In doing so, Vimercati adopted (as was often the case) a distinction he found in the commentary of Simplicius (c. 490–c. 560), a Platonist commentator of Aristotle who became particularly influential during the Renaissance. There, while it is used for inanimate things, ὄρεξις denotes desire in animate things (Simplicius 1882, 250–252). These are both instances of what Vimercati called *appetitus*.¹³ He was sufficiently sensitive to questions of textual fidelity to note that it is ‘philosophi nostri’ (i.e., *recentiores*, and not Aristotle himself) who made the divisions in the appetite. For Vimercati, ἐφῆσις was the correct term for natural appetite. On the whole, his care went unheeded, but his distinction about ἔφῆσις and ὄρεξις was observed (and indeed probably copied) by the equally sensitive Giulio Pace (1550–1635), a pupil of Jacopo Zabarella (Aristotle 1629, sig. D1^v).

If we turn to the way in which Joachim Périon (1498/9–1559) translated the passage, a related set of problems occurs. Here is how Périon rendered the text:

Nam cum sit divinum quiddam quod et bonum et expetendum est, alterum ei contrarium esse dicimus, alterum quod suapte natura eius cupiditate ducatur. Illi vero concedere coguntur contrarium interitum suum appetere. Atqui nec forma seipsa appetere potest, quoniam sui non indiget, nec contrarium suum. Contraria enim se ultra citroque interimunt. Sed materia est quae formam ita desiderat, ut marem foemina, et res turpis pulchritudinem: hoc tamen interest, quod ea quae turpis est non per se, sed aliena vi, et per aliud, quemadmodum nec foemina per se, sed per aliud concupiscit (Aristotle 1552, sig. B4^v).¹⁴

Périon has broken the connection between the source and the activity of appetition. He has done so by using the phrase *cupiditate ducatur* to replace ἐφίεσθαι και ὀρέγεσθαι, without using any adjective cognate to *cupio* or *duco* in the earlier part

¹²I decided not to consider here Isaac Casaubon’s 1590 edition and translation of Aristotle’s works (Aristotle 1590) because too little original intellectual effort went into the translation, and the text was ripped off from his father-in-law, Friedrich Sylburg (1536–1596), editor of many classical texts for the Wechel printing firm in Frankfurt. See Hotson 2007, 58–59, relying on Glucker 1964.

¹³Vimercati 1567, fols 34^v: ‘omnia etenim, etiam inanima, natura in id feruntur, ut esse velint, et perpetuari, quorum appetitum ἐφῆσιν in rebus inanimatis, ὄρεξιν in animatis, inquit Simplicius nominari’.

¹⁴For Périon as a translator, see Cranz 2006 [1975]. For comments on Iacobus Ludovicus Strebæus (Jacques-Louis d’Estrebay, 1481–1550?), see Andersson 2013.

of the sentence. Perhaps a certain resistance to the language of appetite may be behind his decision to use the words *cupiditas* and *desiderare*. However, given Perion's marked humanist and literary approach to translation (*explanator verborum, non rerum sum*, 'I elucidate words, not notions', he famously declared), it would be unwise for us to push much in the way of philosophical significance in his choices. These variants may be merely elegant *variationes*.

2.3 An Appetite for Philosophy

Three centuries of translational attempts divide William of Moerbeke from Périon and they all bring to the fore the complexity of the Aristotelian notion of the material appetite for form. If the most philologically attentive among the Renaissance interpreters betrayed their concerns about the way in which Aristotle and his Latin translators had dealt with the linguistic aspects underlying his theory of appetite, philosophers, too, had their own large set of doubts concerning the meaning of material appetite. As already noted, a simple tag – in this case, *materia appetit formam* – may in fact carry with it a significant amount of philosophical assumptions and historical information. We might say that the 'bastard' character of the human thinking about matter – an issue originally voiced by Plato in his *Timaeus* (52B) – influenced the way in which Aristotle addressed the question of the alleged desire in matter towards the form, emphasizing the contested reality (and the related metaphors) of the material appetite.

We turn now to a series of works published in the sixteenth and early-seventeenth centuries. The printing in Paris of Jean Buridan's works in 1509 provides us with a convenient starting point to explore the fortunes of the phrase *materia appetit formam*.¹⁵ Buridan (c. 1295–after 1358) seems to make a non-metaphorical use of the dictum about matter's natural appetite for form. The discussion is encased in a set of questions concerning the nature of void.¹⁶ The specific issue involves the relationship between motion in a vacuum and the resistance caused by a medium. Here we find a fascinating extension of the usage of the principle that matter has an appetite for form, as if the accent were placed on the *materia appetit* rather than on the *appetit formam* of the Aristotelian dictum. Between the Middle Ages and the Renaissance, this shift allowed the emergence of worldviews with quite un-Aristotelian foundations. Appetite, in the Buridanian model, becomes a physicalist form of resistance to motion. And yet it remains difficult to determine the level of onto-

¹⁵ See Thijssen 1988, I, 58–81, for a discussion of the textual problems.

¹⁶ Buridan 1509, fol. 75^v: 'et iterum oportet imaginari ibi aliam causam resistentie et retardationis, quia in quocunque loco vel ubi celum fuerit est sibi naturale et conveniens, ideo appetit ibi esse sicut materia appetit formam quam habet per modum delectationis, ut dicitur in primo libro. Quamvis etiam per modum desiderii appeteret ad ubi, sicut materia aliam formam, et ita appetitus ad ubi quod habet est quaedam resistentia motui ad alterum ubi'.

logical commitment underlying the dictum, whether it is an illustrative example, a model, an analogy, or a pure metaphor.

In the Renaissance, an author who tackled the issues of whether matter desires form was Alessandro Achillini (1463–1512), the Bolognese philosopher influenced by both Averroist and Ockhamite tendencies. In his work on Aristotle's *Physics*, first published in 1512, he discussed the matter by focusing on the relationship between actuality and potentiality (Achillini 1568, sigs P4^{r-v}). To assume that prime matter was pure potentiality had become a dominant view in the schools, especially where Thomism had a stronger influence. This position was usually contrasted with a set of thinkers (often Scotist) who instead ascribed some kind of actuality – attenuated as it may be – to prime matter. This is the background against which Achillini stressed the particular relationship between the potentiality of matter and its alleged appetite:

Matter has a natural potentiality that is indifferently disposed towards two contraries, for, as Averroes stated in his commentary on Aristotle's *Physics* (Book 2, Com. 48), the preparation in the passive powers is indifferent with respect to two contraries, with the difference that, of these contraries, the one which is good, and indicates perfection and the end, is desired in a natural way (*naturaliter appetitum*), the one which is not good, and is of such a kind that is a privation, is not naturally desired (*non est naturaliter appetitum*). Hence the difference between natural power and appetite is clear, for potentiality concerns the form and not the privation. For this reason, we said that the appetite of matter presupposes potentiality, potentiality presupposes privation, and privation presupposes matter. However, these orders are according to the intellect.¹⁷

It should also be added that this tendency varied from one religious milieu to another. For instance, the Flemish Franciscan Frans Titelmans (1502–1537), author of a vastly influential handbook of natural philosophy, the *Compendium philosophiae naturalis* ('Epitome of Natural Philosophy', 1530), wondered in what way matter could be said to desire a form, leaving aside the question of whether such a form was supposed to be absent or present (Titelmans 1558, sig. B6^r).¹⁸ According to Titelmans, God had implanted in all rational creatures a rational appetite, that is, a will through which they were able to pursue those things which might contribute to their preservation and avoid those which could harm their being. Indeed, at an even more primordial level, God had endowed all natural things with a desire for self-preservation, through which they developed a form of attachment towards what they perceived as akin to their nature and shunned what they felt contrary to it. For

¹⁷Achillini 1568, sig. P4^v: 'Ad tertium. Naturalis potentia materiae est aequalis ad duo contraria, dixit enim Averroes 2 phys. com. 48 praeparationem in potentiis passivis esse aequalem ad duo contraria, sed illorum contrariorum illud quod est bonum, perfectio et finis est naturaliter appetitum, illud vero quod non est bonum, cuiusmodi est privatio, non est naturaliter appetitum. Ex hoc patet differentia inter potentiam naturalem et appetitum, quia potentia respicit formam et non privationem; ideo diximus appetitum materiae praesupponere potentiam, potentiam praesupponere privationem, privationem praesupponere materiam. Isti tamen ordines secundum intellectum sunt'.

¹⁸Guillaume Rouillé (1518–1589), a humanist bookseller of Lyon, who specialized in student editions in compact format, was not the first publisher of his work, which had originally appeared over twenty years earlier. For a full discussion of the distinctive flavour that characterized the intellectual and religious environment surrounding Titelmans's works, see Andersson 2009b.

instance, when a stone was in its natural place, it was at rest and remained in that place without being forced. If, however, it was detained in a different place, it strived with all its energy to go back to its natural dwelling, ready to rush there as soon as the impediment was taken away. For Titelmans, this desire was the mark of an imperfection constitutive in all natural things and signalled their incessant striving towards perfection. The real shock, however, comes in Chap. 7 of his *Compendium*. It is a shock which is engineered by alluding to the metaphorical language of the gendered tag: matter desires form, just as woman desires man. By reversing the roles, Titelmans asserted that it was the form that would desire matter, since he thought that there was an inbuilt capacity in nature to love and improve the condition of those things that were lower in the scale of being. This principle led Titelmans to reconsider the status of the soul. By introducing a distinction between material and non-material forms, he avoided the otherwise deeply uncomfortable position of saying that the rational soul desired the body, a view made plausible by the allegedly Augustinian thesis that souls love the bodies in which they reside (Pseudo-Augustine, in *Patrologia Latina*, 40, 789; Knuuttila 2004, 218). Titelmans's overall vision bears the traces of a distinctively Franciscan approach to philosophy that dates back to Bonaventure (1221–1274), an approach in which one's reading of the natural world is closely linked to the 'affective' aspects of theology. In their commentary on Aristotle's *Physics*, by contrast, the Jesuit theologians of the University of Coimbra, better known as the *Conimbricenses*, dealt with the same topic in a way that did not mention love at all (Coimbra Commentators 1602, sig. N4^r; the whole set of commentaries was published between 1591 and 1606).

The same question is addressed by Crisostomo Javelli (1470/72–1538), a Thomist based in Bologna, in a rather different way. Javelli intended to distinguish his position from both Avicenna and Pietro Pomponazzi (1462–1525). On the one hand, he criticized Avicenna for having resolved any kind of appetite into the notion of form. In Avicenna's metaphysics, a material appetite was a *contradictio in adiecto*. This discussion can be found in Question 25 of Javelli's commentary on Book 1 of the *Physics*.¹⁹ He rejected the consideration of material appetites in terms of superadded qualities or forms, a point that fitted very well with the general Thomist framework, in which material appetite was very close to matter itself.²⁰ On

¹⁹Javelli 1568, sig. Xx5^r: 'Et intendit [sc. Avicenna] negare desiderium a materia simpliciter accepta, id est, seclusa forma. Et si debet hoc desiderium concedi, non erit nisi ratione formae iam existentis in materia, quae virtutibus suis movet ad consequendam perfectiones suas secundarias, ut forma ignis levitate movet ignem sursum, sed hoc desiderium proprie non est materiae, sed formae, vel rei compositae'.

²⁰Javelli 1568, sig. Xx5^v: 'Sed si advertis invenies Avicennam non intellexisse verbum Philosophi, quia nescivit rationem et naturam desiderii naturalis. Arbitratus est enim ut patet in dicto suo quod sicut appetitus est virtus et qualitas addita essentiae animalis, qua movetur animal in bonum sibi conveniens, sic appetitus naturalis sit forma aut qualitas, aut virtus addita rei, qua naturaliter, id est, sine praecognitione, tendat in bonum suum ut ignis levitate ascendit, lapis gravitate descendit, et sic secundum Avicennam, levitas est appetitus naturalis in igne, gravitas in lapide. Et quoniam in yle praecise sumpta non est cognitio, nec est aliqua virtus additas yle, qua moveatur ad formam, ut ad perfectionem suam, dixit se non intelligere verbum Philosophi'.

the other hand, Pomponazzi (with whom Javelli had famously clashed over the question of the immortality of the soul) had made the opposite mistake of reducing appetite to a transient form of matter.

Franciscan scholasticism, Thomistic Aristotelianism and Pomponazzi's Alexandrinism are only three of the many strands that contributed to defining the reappraisal of Aristotle's philosophy during the Renaissance. The position of the Paduan philosopher Francesco Piccolomini (1523–1607), to add yet another perspective, emerges out of a more eclectic Peripatetic tradition, less religiously committed than the positions of either Titelmans or Javelli, in their different ways (Kraye 2002). While Javelli was the chief regent of the Dominican *Studium* in Bologna, Piccolomini taught for a long time at the University of Padua, a university whose *cursus* had always been characterized by the strong influence exercised by natural philosophy and medicine. This is obviously a decisive difference of an institutional kind. Another difference with respect to Javelli is that Piccolomini's work shows clear signs of Platonic undercurrents (as already acknowledged by Pietro Ragnisco, the great nineteenth-century historian of Paduan Aristotelianism). The proposition 'matter desires form' sounded to him like a rather dubious statement. In his opinion, matter's appetite was not properly a motion, but rather the process through which forms were educed out of the potentiality of matter and individual composites generated. Matter was therefore said to have an appetite for form insofar as it tended to fill an original condition of ontological deprivation (Piccolomini 1628, sig. Ppp3^r). When we turn to Jacopo Zabarella (1533–1589), the influence of the humanist tradition on standard scholastic arguments is even more apparent. His commentary on Aristotle's *Physics* is a successful synthesis between his keen passion for the philosophical reasoning displayed in Aristotle's works and the philological concerns of Vimercati and Johann Ludwig Havenreuter (1548–1618), whom I suspect is dependent on Vimercati. Zabarella framed his discussion within the context of the history of philosophy and, in particular, within an account concerning the Platonic origins of the notion of appetite. This, as we have seen, was already present in Piccolomini. Relying on Plato's *Symposium*, Zabarella enumerated three prerequisites for the manifestation of appetitive drives in nature: an object of desire (the *appetibile*), an appetitive subject (the *appetens*) and a state of privation in the subject, seen as the cause triggering the process of desire.²¹

Outside the confines of scholastic philosophy, the philosophical reception of Julius Caesar Scaliger's work is still a story that needs to be told, though it seems noteworthy that he became more popular among seventeenth-century philosophers than among those of his own age. Indeed, anyone who wishes to read two books that may help him understand Renaissance philosophy should read – in addition to Goclenius's *Lexicon philosophicum* (1613) – Scaliger's *Exotericae exercitationes* (first published in 1557). His leftfield views on our dictum *materia appetit formam* demand our tarrying. 'Ridiculous, not to say absurd': this is how he summed up the

²¹ Zabarella 1601, sig. V6^r: 'Primo enim oportet adesse aliquod appetibile, et habens rationem boni. Deinde aliquid, a quo appetatur. Tertio debet istud appetens esse privatum et carens illo bono, ideo enim appetit, quia caret, et haec omnia ex Platone in Convivio colliguntur'.

whole discussion about the allegedly appetitive nature of prime matter. The notion that a stone is somehow endowed with an instinct that prevents it from moving upwards got short shrift from Scaliger: ‘The matter of a stone desires another, more noble form: if this is the case, all kinds of matter would be stimulated to desire either human or celestial matter’. Scaliger used the evidence collected from natural history to strengthen his refutation that matter is upwardly mobile, pointing out the commonplace that donkeys give rise to hornets, and men to worms (Scaliger 1557, 91^v).²² Would that the Peripatetics came right and said: worms are superior to men! Matter has no capacity to choose forms. He who made matter, formed also its forms: he wanted each to acquiesce in each. He did not implant in matter an appetite for change, only an appetite for perfection. And each part (*quaelibet pars*) of matter achieves that perfection and completion under any form (*sub qualibet forma*), while matter taken as a whole is perfected under all forms (*tota sub omnibus*). Therefore, there is no need to assume that matter lusts after change, for in fact it cannot lose or receive anything.²³ Here we see the radical anti-Aristotelian making bedfellows with a more pious critique.

Scaliger’s critique was read by various seventeenth-century philosophers. Indeed, according to a *bon mot* by Gabriel Naudé (160–1653), his book was read more than Aristotle. Giulio Cesare Vanini (1585–1619) copied out the curious point that ‘individuated matters are parts of one matter’ as a way of attacking the principle of corruption.²⁴ He then proceeded to copy out the rest of the passage from Scaliger – Vanini’s general plagiarism was noticed as early as 1709 in Johann Moritz Schramm’s *De vita et scriptis Vanini* (Schramm 1709, 96–97) –, scarcely altered and without acknowledgement. The phrase about individuated matters worried Daniel Stahl (1589–1654), who explained it in the following way: even if a particle of matter in an individual thing belongs to a complex ontological setting that is constitutively multi-layered (in such a way that one layer corresponds to a level of matter for this stone, another to another level for that stone, another for this man, that man and so on), all the various particles do not have each per se all forms. Prime matter, because it is a certain whole made from those particles, does have all forms (Stahl 1663, 322–323). Stahl refused to accept the Scaligeran notion that appetite betrayed ontological deprivation (*appetitus suboles privationis*). The fact is that Scaliger’s interest in the analysis of the material appetite (or rather its deficiencies)

²²On Scaliger as a natural philosopher, see Lüthy 2001.

²³Scaliger 1557, 92^v: ‘Qui materiam condidit, formasque illas condidit: voluit suae quanque cuique acquiescere. Neque posuit appetitum in materia mutationis, sed perfectionis tantum. Perficitur autem sub qualibet forma quaelibet pars, et tota sub omnibus. Non est igitur ei opus mutatione: nihil enim potest vel amittere vel recipere’.

²⁴Vanini 1615, 27–28 : ‘Sed Scholasticorum caterva, perplebeia quidem apud me, licet senatoria apud alios, sic insurgit: Materia appetit formam, ergo et corruptionem. Consecutio probatur, quia non potest desiderari finis, nisi ad hunc media necessaria exoptentur. Medium vero pernecessarium ad novae formae consecutionem primevae corruptio est. O acutos homines! Scholares meos doceo, et subtilissime, materiam non appetere formas: nam appetitus dicit privationem. Materia autem omnes formas habet, hae namque materiae individuatae partes sunt materiae primae, quae una est’. On the issue of Vanini and his sources, see the evidence presented in Corvaglia 1933.

was born out of a certain sort of Aristotelian corpuscularianism, or at least, a desire not to impose metaphysical strictures onto the analysis of matter. By contrast, Stahl drew the conclusion that anything which has the receptive potentiality for form, as if for its own perfection, also had an appetite for form. Just as interestingly, Stahl completely excised from his discussion Scaliger's rather persuasive argument modelled upon the phenomenon of spontaneous generation. Perhaps it was too persuasive.²⁵

Coming closer to Bacon's own philosophical milieu, I can only hint at two significant cases. In 1613, while Bacon was deeply involved in developing his plans for the 'Great Instauration', the future Archbishop of Canterbury, Gilbert Sheldon (1598–1677), was a student at Trinity College, Oxford, following the arts course. His student notes on material appetites have survived, courtesy of a bequest of one of his archiepiscopal successors, Thomas Tenison (1636–1715), he himself a follower of Bacon's philosophy.²⁶ These notes manifest a tendency that we have already noted, that is, a disinclination to pursue logical arguments and a greater focus on the metaphysics of matter per se (to the extent that these two can be distinguished). At the end of the section dealing with the question of whether there is an appetite for forms in prime matter, Sheldon wrote out three queries (*dubia*). One was drawn from cosmology, a fashionable pursuit at this period in Oxford; another was a quibble about perfection; the third shows evidence for the continuing centrality, at even a very basic level of instruction, of the problems caused by the gendered simile (which here, however, was not to be pushed too hard).²⁷ By contrast, the English mathematician and contemporary of Bacon's, Walter Warner (1557?–1643) would already have found much that was unsettling or irrelevant in the pre-suppositions of Sheldon's tutors. His manuscript notes on appetite in animals show no engagement with the topic of the metaphorical nature of appetite, and this is partly due to the fact that his interests might be described as more straightforwardly empirical, and rooted in the question of how to explain sensitive appetite and animal

²⁵For an instance of this crabby natural historical observation imported into a more philosophical context, see Liceti 1618, sig. LII^r (where Scaliger is explicitly mentioned).

²⁶Lambeth Palace Library, London, MS 826, fols 20^r–22^r.

²⁷Ibid., fols 21^v–22^r: 'Ob: Si materia appeteret formam, hoc esset, ratione suae imperfectionis, at forma non potest perficere materiam, cum materia sit aeterna; forma est caduca. aeterna non perficitur a caduco, et diuturniora sunt perfectiora.

Sol: Diuturniora in eodem genere sunt perfectiora, atque caeteris paribus: sed materia et forma non sunt paria.

Ob: Natura caeli non appetit formam, materia contenta est illa quam habet forma: et appetitus e[st] carentia, neque potest habere praestantiorem formam.

Sol: Est appetitus, atque hoc appetitu appetit formam: Desiderii, atque hoc appetitu non appetit formam.

Ob: si appetit formam, ergo vel appetitu naturali, vel animali: dices naturali. Appetit materia formam sicut femina virum: at illa appetit appetitu animali: ergo materia prima appetit animali appetitu.

Sol: similitudo non currit 4 pedibus: sed in hoc consistit; sicut femina appetit virum, ut imperfectum perfectum; ita materia appetit formam, ut perfectum perfectius'.

motion.²⁸ This is also evidence that, as soon as the authors move away from the ontological manufacture of *appetitus* based on the familiar array of phrases and expressions taken from *Physics* and *De anima*, they also become less convinced of the all-powerful force surging between different orders of ensoulment and materiality. In this case, there is no discussion of material appetite at all.

By the time we get to a Spanish Jesuit teaching in Prague, Rodrigo de Arriaga (1592–1667), and to his widely-read *Cursus philosophicus*, first published in 1632, a few years after Bacon's death, we find out not only that he was explicit about the metaphorical nature of matter's appetite, but that he also expressed the strongest doubts whether such an appetite could be said to desire substantial forms at all.²⁹ The *Cursus* represents something of a high point in the tradition outlined in this chapter. In it, Arriaga dealt with the objection that prime matter does often desire forms, precisely those forms that it does not have. He countered this position (already dismissed, as we have seen, by Scaliger) by introducing a distinction between desiring substantial forms in a 'determinate' way (*determinate*) (which matter does not do), and desiring either this or that particular form (*disiunctive*) (which it does). This distinction (an innovation, it seems, introduced by Arriaga) was then argued using both *a priori* and *a posteriori* reasoning. According to the former, matter desires form on the ground that form completes (in respect of its substance) matter, which in itself is incomplete. Any substantial form, however, is able to make prime matter complete in a perfect way, therefore there cannot be said to be any desire for any specific form. Arriaga was also impatient with the idea that the degree of perfection of a form should be relevant for the differential appetite of matter.³⁰ The *a posteriori* argument focused on notions of 'perfection' and the empirical impossibility of finding in nature a desire for a more perfect form, for this would be the same as assuming that a form desires its own destruction.³¹

Within the Jesuit environment, Arriaga's position on material appetite became canonical.³² Along with Book 1, Chap. 2 of Avicenna's *Book of Healing* (*al-Shifa*), he was often cited as an opponent of the thesis that matter may have a desire for

²⁸ British Library, London, Add. MS 4395. See Prins 1992.

²⁹ Arriaga 1632, 252a: 'Materia prima non potest habere appetitum, naturaliter loquendo, respectu formae substantialis per modum desiderii. Patet, quia naturaliter non potest carere forma, ergo illam non potest respicere ut absentem, ergo nec desiderare'. For Arriaga, see Knebel 2009 and Sousedík 2009.

³⁰ Arriaga 1632, 252b: 'Quod autem aliae sint aliis perfectiores, non efficit eas diversimode appeti a materia: nam maior perfectio habet se omnino per accidens in ordine ad complementum substantiale materiae'.

³¹ Ibid.: 'appeteret etiam destructionem propriae formae (si non esset rationalis) quod est absurdum: quis enim dicet, materiam primam esse violentam sub forma equi, appetereque equi destructionem, quae sequitur ad receptionem formae rationalis, quam appetit per te in particulari ut forma equi perfectiorem? Ergo materia prima non appetit per modum desiderii aliquam formam in particulari ut determinate, sed aliquam disiunctive'.

³² For a selection of Jesuit treatises, see: Saenz de Aguirre 1672, sig. E3r; Ruedhoffer 1732, sig. L1v. On Jesuit philosophy, I have been guided chiefly by Blum 1999 and by subsequent conversations with the author.

forms. To my knowledge, Telesio and Bacon do not appear at all in this kind of literature. They do not exist even as sparring partners. This is certainly the result of institutional indifference towards philosophical outsiders, but it is not the only reason. The scholastics, writing with a clarity and a style that was instantly recognizable and intelligible across all Europe, did not engage in a critique so radical as to fail, or refuse, to engage with the arguments in detail. This, by contrast, is often the case with exponents of radically new positions. Bacon, for instance, had simply no interest in trying to tell his readers ‘in what sense’ matter may have an appetite of its own, nor did he try to specify its precise relation to another range of closely related concepts.

2.4 Conclusion

In this chapter, by focusing on a particular locus of Aristotle’s *Physics* (I.9, 192a2 2–23) and its reception among several representatives of Renaissance Aristotelianism, I have dwelt on some of the questions brought to the fore by that exegetical legacy. More specifically, I have suggested that there were two principal ways in which the tradition of early modern Aristotelian commentary evolved with respect to the dubious status of material appetite. There was either a frank engagement, prevalent among the Jesuits, with the notion of final causes and their possible interpretation in terms of metaphorical shifts from the domain of ontology to that of epistemology, or an understanding of matter’s appetite as a natural ‘promptitude’ or ‘facility’ issuing from the very essence of matter, seen as a defective entity, in constant need of being fulfilled and qualified. The latter interpretation seemed particularly strong among Paduan philosophers, but it rested on a set of thoroughly orthodox views concerning the mutual conceptual implications among matter, potentiality, potency, privation and appetite.

Moreover, it is worth asking, by way of recapitulation and, perhaps, development, whether the question of material appetite among Renaissance Aristotelians was of an ontological or epistemological nature, that is, whether the assumption of tendencies and proclivities in matter depended on the actual behaviour of material beings in nature or was rather an attempt of the human mind in its struggle to come to terms with patterns of teleological adaptation in nature. I am inclined to think that it was a murky mixture of both. The result of the division of labour between these two approaches might explain, I contend, some of the puzzlement that the notion of material appetite aroused among early modern philosophers. The philological difficulties involved in manufacturing a coherent doctrine of material cupidity out of Aristotle’s pithy words and some of his commentators (especially Simplicius) contributed to increase the problematic status of the similitude between matter and woman and helped create a diffuse sense of scepticism about Aristotle’s statements in the *Physics*.

Sometimes, late-scholastic worries concerned the kind of role that material appetite might play in any explanatory account of nature; at other times, the worry

turned into overt rejection and questioned whether such a thing as appetite may exist at all in matter. Tussles over the epistemological and the ontological roles of material appetites revealed the larger issue of whether it was at all legitimate to presuppose in nature a teleological force, manifesting itself at different levels of organization in the world. The result was a process of momentous redefinition within the confines of early modern Aristotelianism. Material appetites, substantial forms, final causes, prime matter: all began to be subjected to a type of scrutiny that led people interested in the epistemological side of the problem to question its metaphysical side. All of the various attempts to distinguish the logical (*rationaliter*) from the ontological level (*realiter*) with respect to the specific arguments concerning material appetite show that this concept was highly unstable.

During the sixteenth and seventeenth centuries, material appetite became a particularly unstable notion due either to specific institutional circumstances (such as disputes between Scotists and Thomists), or rather, to follow an important suggestion by Charles Lohr, to the way in which Jesuit metaphysicians recombined divergent positions (Lohr 1988, 584–638). Outside the realm of scholasticism, one could take the reality of the material appetite very seriously and (as Leibniz saw) foist the notions held by the *novatores* about the autonomy of nature onto the dry doctors with all their metaphorical talk of matter ‘desiring’ form and so on. Yet within scholasticism, there was, as I hope I have shown, a sustained and subtle attempt to use the contested Aristotelian tag about material appetite to think through the problems of metaphor and reality, logical and ontological divisions, metaphysical and physical boundaries, even if sometimes they deliberately ducked the opportunity to do so. This reflects something of the difference in approach between the scholastics and their critics, such as Bacon. For the scholastics, an important point in their enquiry was the creation of a discursive community in which problems could legitimately result from the way philosophers used their words, doing philosophy with tweezers and not a hammer. Here one sees most closely the connection with the impetus towards words in the humanistic commentaries and the joy taken in discussing translation problems. It is in this sense that one can see Goclenius as rooted in the humanistic tradition of joyfully explaining words as much as he was in the characteristic scholastic attitude directed to semantic disambiguation, though admittedly the fusion of the humanist and the scholastic currents by 1600 weakens the historical force of this point (Goclenius 1980 [1613]). Telesio’s account of appetite is based in this tradition of sustained thought about the precise degree of fit between reality and the logical edifice constructed to describe it. Leibniz, who knew more about scholasticism than Bacon, saw the connections between these notions of matter, causation and appetite at a rather general level, as is proved by his letter dated 29/30 April 1669 to Jakob Thomasius, where he lumped Heinrich Agrippa von Nettesheim, Tommaso Campanella and Julius Caesar Scaliger in the same camp (Leibniz 1926 [1663–1685], 22). Bacon would have done the same. Certainly, the contextual approach of the present chapter hopes to have shown, pursuing a *via negativa*, that the Aristarchan principle of Baconizing from Bacon produces mere lard.

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Chapter 3

Lists of Motions: Francis Bacon on Material Disquietude

Guido Giglioni

Abstract Francis Bacon compiled several lists of primary motions throughout his intellectual career in an effort to map out all the basic forces of nature. Of these lists, the one comprising nineteen appetitive tendencies in *Novum organum* (1620) can be taken as the most accurate and the one that reflects Bacon's mature thinking on the subject. When we consider the way in which he divided the primal tendencies of matter according to motions of reaction (trepidation, resistance, freedom, union and assimilation) and motions of quiescence (rest, death and immobility), it becomes evident that, besides providing methodological and epistemological directions, Bacon intended to lay the foundations for a new physics – a physics of desire (*conatus* or *nixus*) – centred on the interplay of life and death. In this chapter, I argue that the place of death in nature and human life was a central concern of Bacon's, for the success of his Great Instauration depended upon finding reliable ways to secure states of indefinite permanence in nature.

3.1 Motion as Power

In the *Novum organum* (1620), Bacon intimated that a natural history of the principal motions of matter (*materiae primae passiones ac desideria*) should accompany the 'history' of bodies (Bacon 2004, 38). More precisely, Bacon presented a view of nature in which matter was deemed to be ruled by eighteen different appetites for life that were incessantly battling against one deeper appetite for death. It is a fascinatingly speculative section in Bacon's famous work, with resonances of Stoic and Epicurean materialism. And yet, in traditional accounts of Bacon's philosophy, this part of the *Novum organum* tends to be expunged or diluted, so that methodological directions for the study of nature can still be rescued from the choking coils of evil

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G. Giglioni (✉)

Warburg Institute, Woburn Square, London WC1 0AB, UK

e-mail: guido.giglioni@sas.ac.uk

metaphysics. It is an interpretative strategy that began very early on. A 1676 abridgment of the *Novum organum* in English by Marius D'Assigny (1643–1717), 'Bachelor in Divinity', compressed the long Aphorism 48 of Part 2 into a few words (Bacon 1676, 32; Giglioni 2013a, 44). In fact, from *Filum labyrinthi* and *Comentarius solutus*, written around 1608, to *Novum organum* and *Sylva Sylvarum* in the 1620s, Bacon consistently engaged in a methodical and analytical inquiry into all possible forms of motions, listed according to varying orders of classification. The purpose was to assess their effects on matter in the most accurate way.

In *De sapientia veterum*, an original work of emblematic philosophy published in 1609, Bacon had used the story of Deucalion and Pyrrha, the only two people to survive from the flood sent by Jupiter, to argue that the primordial motions of matter were in fact the original sources of life in nature, both in its inanimate (minerals) and animate (animals and plants) condition. According to the story, Deucalion and Pyrrha recreated the whole human race by throwing stones over their heads. In the fable 'Deucalion, sive restitutio' ('Deucalion, or Renewal'), Bacon explained that the survivors had originally misinterpreted the meaning of the phrase *ossa matris* ('the bones of the mother') contained in the oracle's response, for they referred the bones in question to the remnants of their parents, when in fact by bones they should have understood the most elementary constituents of the earth, that is, the motions of matter:

The fable seems to reveal a secret of nature (*arcanum naturae*) and to correct a common mistake of the human mind. For human beings, because of their inexperience, think that renewal and restoration of things can arise from their own mortal remains and from rotting matter (like the phoenix from its own ashes). In fact, this is not the case at all, since this kind of material exhausted its energy and cannot effect the creation of new things. For this reason, one should go back to more universal principles (*principia magis communia*, Bacon 1857–1874, VI, 661–662).

By 'more universal principles', Bacon meant the motions of matter, understood as tendencies – true appetites and desires – embedded in nature. Of these tendencies, the principal one was the motion towards self-preservation. By pursuing all that was conducive to life and reacting against things and situations that were harmful, nature was capable of creating increasingly complex aggregations of matter. The human mind, in turn, could retrace these first stages in the formation of material reality by disassembling natural bodies along the lines of their constitutive motions (*motus et nixus corporum compositi, decompositi et complicati*, Bacon 2004, 382). In so doing, an immense field of opportunities and transformations lay open to the mind and its operative functions.

3.2 Some Precedents

Bacon thought that knowledge of the primordial motions of matter, the *naturae simplices*, was the key to unlock the most recondite secrets behind the production of nature's works (*universa operum penetralia*). These motions were like the letters of

the alphabet, which, taken by themselves (*per se et separatim*), meant nothing (*nihil significant*) and were of no particular use (*nec alicuius usus sunt*), but, once combined with each other, could enter ‘the composition and structure of any discourse’ (Bacon 2004, 180). From this point of view, it would be more correct to say that Bacon’s philosophy contained a metaphysics of motions rather than of substances. When seen in this light, his ‘atomizing’ understanding of nature, centred on a limited number of original motions capable of producing all material phenomena and bodies, stands out as quite original. There were certainly several significant precedents for this view. One need only think of a variety of atomist, Stoic and scholastic thinkers, or, to mention some individual philosophers, Girolamo Cardano (1501–1576) and Bernardino Telesio (1509–1588). All of them, in various degrees, can be seen as possible sources of inspiration. Bacon’s synthesis, however, rests on an innovative approach and a coherent framework.

In his attitude towards atomism, Bacon moved from an understanding of atoms in terms of actual substances to one that would be more correctly described as ‘functional’, in that the dynamic aspect of matter became more important than its particulate structure. The seamless and pliant continuum of matter owed its endless specifications to the variety of motions involved in the various processes of material differentiation. Bacon had certainly read of this kind of dynamic atomism in Lucretius’s *De rerum natura* (*assiduus variusque motus*, II, 97; *motus materiai multimodi*, III, 855; *cunctarum exordia rerum eterno percita motu*, III, 31–33), where the infinite interconnectivity of motions (*semper motus connectitur omnis*) had been described as the original condition of nature. All the differences in the universe, even human freedom, had emerged from this state (II, 251–260). The atomic units which constituted Bacon’s alphabet of nature were therefore the actual motions of matter. After all, the image of the letters, limited in number but liable to create infinite words, was also Lucretian in tone (I, 196–198; 824–826; 913; II, 688–694; 1014).¹ In this case, too, Bacon accentuated the dynamic elements in the analogy. Significantly, Lucretius had spoken of *genitales motus* (II, 228), *primordia motus* (II, 253) and *motus clandestini et coeci* (II, 27–28), motions that could not be perceived by the human senses and yet were responsible for all natural processes in the universe. In this sense, the highest level of rest (*summa quies*) was in fact a mere appearance: while the core of nature was in perpetual motion, the invisible motions escaped sense perception (*sensus*).² In Lucretius’s philosophy, the will and the senses represented the most complex level of organization created in nature by the original motions of matter (*motus materiai*) and its unremitting state of agitation (*error*).

¹*De rerum natura*, II, 308–314: ‘non est mirabile, quare, | omnia cum rerum primordia sint in motu, | summa tamen summa videatur stare quiete, | praeterquam siquid proprio dat corpore motus. | Omnis enim longe nostris ab sensibus infra | primorum natura iacet; quapropter, ubi ipsa | cernere iam nequeas, motus quoque surpere debent’.

²*De rerum natura*, II, 132–139: ‘Scilicet hic a principiis est omnibus error. | Prima moventur enim per se primordia rerum; | inde ea quae parvo sunt corpora conciliatu | et quasi proxima sunt ad viris principiorum | ictibus illorum caecis impulsa cidentur, | ipsaque porro paulo maiora lacessunt. | Sic a principiis ascendit motus et exit | paulatim nostros ad sensus’.

Compared to Democritus, Epicurus or Lucretius, Bacon emphasized the role of motion in differentiating matter into a wide variety of phenomena. In this sense, one can even count Bacon's philosophy among the examples of atomistic revival that took place during the early modern period, provided that the meaning of atomism is reoriented according to that of force and motion, from which 'principally proceed arefaction, colliquation, concoction, maturation, putrefaction, vivification, and most of the effects of nature'. Bacon argued that, of the invisible constituents of nature (i.e., spirits, positions of parts in a body and motions), 'the motions of the minute parts of bodies, which do so great effects... have not been observed at all; because they are invisible, and incur not to the eye; but yet they are to be deprehended by experience' (Bacon 1857–1874, II, 381). This research programme was clearly outlined in *Sylva Sylvarum*, Century 1, Experiment 98, where the inquiry concerning the 'secret processes of nature' was linked to one's ability to shed light on the 'subtlety of the motion':

The knowledge of man (hitherto) hath been determined by the view or sight; so that whatsoever is invisible, either in respect of the fineness of the body itself, or the smallness of the parts, or of the subtlety of the motion, is little inquired. And yet these be the things that govern nature principally; and without which you cannot make any true analysis and indication of the proceedings of nature (Bacon 1857–1874, II, 380).

Lucretian motifs are especially evident in Bacon's annotations concerning the nature of motion scattered in the *Comentarius solutus sive pandecta, sive ancilla memoriae* ('A Loose Memorandum or Digest, or a Handmaid of Memory'), a collection of observations and remarks begun around the summer of 1608: 'To the person who examines the matter closely there is no other motion than the local one, that is, the one that can be perceived by the senses. Rest, too, is understood, either according to its own nature or in an accidental sense, as a balanced restraining of motion (*libratio vel cohibitio motus*, Bacon 1857–1874, XI, 68).

In the field of natural motions, Bacon acknowledged a certain similarity between his system of material appetites and current scholastic accounts of motions, with their subdivisions into natural and violent motions, motions from within (*motus ex seipso*) and from without (*motus aliunde*), motions directed to avoiding a vacuum and those aimed at reconnecting with their natural places. Bacon, however, rejected these traditional divisions in that, rather than shedding any light on the causes of motions (which were 'principles, sources, causes and forms', that is, 'the appetites and passions of any kind of matter'), they simply considered the effects of motion (Bacon 1857–1874, III, 21). For this reason, he decided to relegate the scholastic distinctions concerning natural motions to the domain of pointless subtleties (*subtilitates*) and trendy debates (*populares sermones*) (Bacon 1857–1874, III, 21).³ With respect to the Stoic view of matter as a substratum pervaded by constitutive tendencies to self-preservation, the similarities between Bacon's natural philosophy and Stoicism are closer, for the Stoic universe in its entirety, including the very processes of knowledge and language, could be interpreted at the time as a contin-

³ See also *Historia naturalis et experimentalis*, in Bacon 2007, 132.

uum of material extension, characterized by levels of greater or lesser condensation and rarefaction. Greater rarefaction (and therefore greater vitality) corresponded to a higher degree of rationality, that is, the ‘spirit’ (*pneuma*). Likewise, the various levels of condensation and rarefaction were determined by tendencies inherent within matter, namely, appetites and desires. The principal appetites in the Stoic cosmos were those towards self-preservation (*conservatio*), adaptation (*conciliatio*) and resistance (*antitypia*) (Giglioli 2011b). Another characteristic that Bacon’s philosophy shared with the materialistic monism of the Stoics was the belief in an original agreement between the physical and the moral dimensions of reality. It goes without saying that this point has important consequences for the way in which Bacon addressed several issues in moral philosophy and the treatment of the passions (see Chaps. 7, 8, 9, and 10 in this volume).

The Stoic concept of motion as a desire for self-preservation witnessed a significant revival during the Renaissance among philosophers who were looking for possible alternatives to the predominant Aristotelian framework and did not want to resort to the Timaeic template adopted by various late Platonists. In *De subtilitate naturae* (1550), for instance, Cardano identified seven primary motions in nature: abhorrence of a vacuum, impenetrability, heaviness and lightness, heavenly rotations, attraction, voluntary and violent tendencies (Cardano 2004, 66, 200; Cardano 1663, III, 360b, 391ab). They were an attempt to explain the original source of natural phenomena by detecting their underlying motions. Among the ‘moderns’, however, it was Telesio who, in Bacon’s opinion, had done the most to provide a plausible and coherent account of motion as inner vital tendency.⁴ Even in the particularly severe *Redargutio philosophiarum* (‘Refutation of Philosophies’), written around 1608, while reviewing the limits and faults of numerous philosophical worldviews, both past and present, Bacon extolled Telesio’s achievements: ‘in our age, marked by the presence of minds with no passion (*frigida praecordia*), at a time when wits have been worn out by religious issues, there have been those who have produced new systems (*novae fabricae*) of natural philosophy’. Telesio, Bacon went on, was one of them, who ‘took the stage and put on a new play (*fabula*)’; and although the play ‘did not meet any success’, the subject remained ‘plausible’ (Bacon 1857–1874, III, 571; see Deleule 2009).

Bacon’s view of heat and cold as tendencies inherent in matter, always eager to expand their respective spheres of influence and waging war against each other, is an idea that he had derived from Telesio’s *De rerum natura iuxta propria principia*, published in different editions in 1565, 1570 and 1586. Likewise, Bacon’s notion of ‘pneumatic bodies’ as material substances pervaded by an unremitting activity has crucial links with Telesio’s concept of *spiritus*. Telesio had defined the spirit as a tenuous and nimble substance, capable of responding to the action of external forces by contracting and dilating itself (Telesio 1965–1974 [1586], III, 16). More than anything else, however, Bacon followed Telesio’s ideas concerning appetite

⁴See, for instance, *Sylva Sylvarum*, in Bacon 1857–1874, II, 370: ‘the best of the novellists’. On Telesio’s influence on Bacon’s natural philosophy, see Giachetti Assenza 1980; Pousseur 1990; De Mas 1990; Sciacaluga 1997.

(*appetitus*), perception (*sensus*) and self-perception (*sensus sui*). According to Telesio (and Bacon fully agreed with him on this point), nature was ruled by a host of appetites directed to the self-preservation of nature as a whole. These appetites were able to sense and assimilate all that could promote the survival of natural beings, while at the same time perceiving and shunning any threat to their integrity. By adopting the general outline of Telesio's physics, Bacon reinterpreted in an original way the latter's account concerning the principal passions of natural beings, including the spirit of non-human and human animals – an account that can be found in the final book of *De rerum natura* (in the 1586 edition) – and turned it into a system of micro-physics of natural appetites, extended to every single part of matter (Telesio 1965–1974 [1586], III, 340–346).

Finally, Bacon adopted from Telesio the approach of looking at vital processes in terms of conflicts between opposite tendencies. Both philosophers regarded the spirit inside material bodies as something that was always in the process of escaping, driven by its primal desire to reach the sky and the sun, its natural abode; on the other hand, all material, 'tangible' bodies were trying hard to keep spirits inside and to assimilate them. This conflict lay at the core of all natural changes. If there is a point on which Bacon distanced himself from Telesio, this is perhaps the accentuated physicalism of the latter, for Bacon thought that the way in which Telesio had explained the complex processes of animal formation through the system of motions (*regimen motus*) was quite superficial (*satis leviter et inscite*) (Bacon 2004, 434). The fact remains, though, that, as a whole, Telesio's naturalism represents one of the most important sources of Bacon's philosophy.

3.3 Matter in a State of Constant Trepidation

Bacon shared with Telesio the view that the study of nature demanded a close scrutiny of the principal tendencies to self-preservation displayed by matter. As already noted, the primordial appetites of matter were for Bacon like the letters of the alphabet, that is, the original elements from which all natural phenomena could be reconstructed, on both a cognitive and an experimental level. Bacon thus encouraged philosophers to examine these phenomena as specifications, more or less qualified, of general appetitive drives that permeated nature in its entirety (*rerum appetitus et inclinationes*). These appetites, in turn, emanated from the tendency to self-preservation that coursed through every single part of the material universe (Bacon 1857–1874, III, 20, 22). He described natural bodies as the result of compositions and divisions of a limited number of original motions (*simplices, primitivi et fundamentales*), inherent in matter, which he called 'desires' or 'appetites'. In this respect, motions, like bodies, instantiated the atomistic principle that visible and sensible reality derived from the combination of a given number of original elements: 'bodily motions (*motus*) and tendencies (*nixus*) are no less composed, decomposed and

intertwined than the bodies themselves' (Bacon 2004, 382).⁵ Bacon's natural philosophy presupposed the existence of complex combinations of forces, described as 'knots' (*nodi*), 'thongs' (*turmae*) and 'tribes' (*tribus*) of propensities (Bacon 1857–1874, III, 18). Already in the *Comentarius solutus*, he had remarked that elementary motions were always in the process of combining with each other to form more complex aggregations of motions (*nodi et globi motuum*) and described 'how they concur and how they succede and interchaung in things most frequent' (Bacon 1857–1874, XI, 69). More than anything else, though, Bacon's attention was directed towards the dynamic components of these bodily aggregations. In a sense, as part of the material reality of nature, bodies resulted from motions and from their innumerable ways of relating to each other. The true code of nature was therefore represented by the alphabet of the primordial appetites of matter, and not by the traditional repertoire of forms, atoms and *minima naturalia*.

The appetitive motions of matter could be seen as opposed, complementary or parallel to each other. Some were 'invincible' and 'unconquerable', like the 'motion of resistance', others less powerful but nonetheless very tenacious, like the motions of 'congregation' and 'continuity'. There were motions that were directed to a specific target ('private'), and motions that were of a far-reaching scope ('public'). This is the reason why, for instance, the motion of connection was stronger than the motion of gravity, for the former aimed at the preservation of the natural system in its entirety, while the latter affected only its parts (Bacon 2004, 414, 416).⁶ This view had significant repercussions in the field of technological applications. If a natural philosopher managed to uncover the principal appetitive tendencies underpinning all material processes, he could reproduce natural phenomena depending on the extent to which he was able to stimulate, delay and release the different natural motions according to time and external circumstances. For this reason, in the *Novum organum* Bacon defined motion as the principal key for human transformations of nature: 'The only thing human beings can do when they intend to produce works is to move natural bodies closer to or farther from themselves; all the rest is accomplished by nature from within' (Bacon 2004, 64). In the *Sylva Sylvarum*, he insisted that human beings could transform nature by directing motions in appropriate ways, as was evident in the field of medicine, where physicians 'should ingeniously contrive, how by motions that are in their power, they may excite inward motions that are not in their power, by consent' (Bacon 1857–1874, II, 367).

Bacon presented his account of the original motions or appetites of matter as one of the greatest achievements of his philosophy. He claimed that all previous investigators of nature, including Democritus, had often privileged the nature of bodies (*principia corporum*) and had therefore failed to pay due attention to the far more important causes of motion (*principia motuum*, also called *principia moventia*). This for Bacon was a point of the utmost importance, all the more so because the

⁵ See also *Cogitationes de natura rerum*, in Bacon 1857–1874, III, p. 22. On Bacon's view of material motion as appetite, see Giglioni 2010; Giglioni 2011a, 61–75.

⁶ On gravity as 'appetite of union of dense bodies with the earth', see also *Sylva Sylvarum*, in Bacon 1857–1874, II, 354.

inquiry into the motions of matter had fundamental practical consequences: ‘those who aim at works (*opera*) base the study of nature on the contemplation and examination of motion’ (Bacon 1857–1874, III, 18, 19). This is a view that recurs frequently in Bacon’s writings:

we should look for the appetites and the inclinations of matter. They are the source of this large variety of effects and changes, which we see in works both of nature and of art (Bacon 1857–1874, III, 20).

The amelioration of the human condition – perhaps chief among the ‘works’ pursued by Bacon – depended therefore on a closer inspection of matter’s motions:

it is most certain that the simpler the motions discovered by man are, the greater his power becomes, the freer it grows from the constraints imposed by matters considered in their specific properties (*speciales*) and in their stages of development (*praeparatae*), and the more, finally, this power is turned into new works (Bacon 1857–1874, III, 22).

The discovery of the ultimate motions of nature, Bacon continued, would give man ‘the true fetters of Proteus’, that is, the ‘stimuli and the constraints’ through which natural philosophers could induce actual changes in matter (*materiae ipsius conversio et transformatio*, in Bacon 1857–1874, III, 20).⁷ By contrast, the dispassionate and aestheticizing worshippers of nature, who resolved nature into mere abstractions, focused all their attention on what Bacon called the ‘inert principles of things’ (*quieta rerum principia*, sometimes also called *principia mortua*) – that is to say, the principles that inform us about the nature of the elements which ‘make up things’ – and not on those principles ‘whose power (*vis*) and process (*via*) shape things’, as if the object of investigation should be ‘the anatomy of nature’s corpse’, and not ‘the faculties and virtues of living nature’.⁸ From this point of view, Bacon believed that practitioners in the field of ‘mechanic arts’ had promoted a view of matter that exercised a corrupting effect on the way in which human beings were supposed to look at the relationships between bodies and motions. This had led to a kind of physics in which the interaction of material particles was understood only in terms of composition and separation.⁹

In pointing out how, up to his time, natural philosophers had privileged the search after ‘static’ principles (*quiescentia principia*), seen as essences ‘from which’ (*ex quibus*) other properties derived, Bacon believed that the ultimate motions of things (*moventia principia*), ‘through which’ things were made, had remained hidden to humankind.¹⁰ This point was fully articulated in the *Novum organum*, where Bacon defined motions as the true ‘schematisms’ of nature and the law governing all active

⁷ On Proteus in Bacon’s works, see Pestic 1999; Pestic 2008; Pestic 2010.

⁸ Bacon 1857–1874, III, 19. Here the language used by Bacon clearly resonates with echoes from Petrus Severinus’s *Idea medicinae philosophicae*. See Severinus 1571, 172–173, 292.

⁹ Bacon 2004, 102: ‘Inficitur autem Intellectus humanus ex intuitu eorum, quae in Artibus Mechanicis fiunt, in quibus corpora per compositiones aut separationes ut plurimum alterantur; ut cogitet simile quiddam etiam in natura rerum universali fieri’.

¹⁰ Bacon 2004, 104: ‘multo adhuc maiore cum malo fit, quod quiescentia rerum principia, ex quibus, et non moventia, per quae res fiunt, contemplantur et inquirant. Illa enim ad sermones, ista ad opera spectant... Innuunt enim illud, *Hucusque*, et non, *Quomodo*, vel *Ex quo fonte*’.

processes (*lex actus*). Because of the prevailing (wrong) approach to nature, ‘every most subtle meta-schematism, which is commonly called alteration, while in fact it’s a movement of displacement through material corpuscles (*latio per minima*), escapes human attention’ (Bacon 2004, 86–88). It is for this reason that Bacon rejected the Aristotelian and scholastic classification of the motions of nature into local motion, alteration, growth and decrease (*latio, alteratio, augmentatio* and *diminutio*), for they were extrinsic qualifications of bodies centred on spatial attributes, unable to provide any glimpse into their innermost nature.¹¹ These descriptions did not reveal anything ‘about the appetite of the bodies (*corporum appetitus*), or the activity (*processus*) of their parts’; they were ‘measurements’, which simply indicated when, in a superficial manner, motion signalled to our senses that ‘the situation had changed’ (Bacon 2004, 104). By contrast, the ‘actual genera of motion’ were real tendencies, such as the appetite for mutual contact (*appetitus contactus ad invicem*), the appetite for recovering the original dimensions of a body (*appetitus se recipiendi in naturalem suam dimensionem, vel tensura*) or the appetite for joining with the bulk of matter that is of a similar nature (*appetitus congregationis ad massas connaturalium suorum*).¹²

The distinction between the ‘quiescent’ and ‘living’ principles of nature was clear in the already mentioned *Comentarius solutus*. This manuscript can be seen as a true *silva*, understood, in Bacon’s own terms, as *Carta Mater*, that is, an original matrix of thoughts and words, where Latin alternates with English, figures with emblems. In the *Comentarius*, Bacon also began to outline his ‘legitimate inquiry about motion’. The analysis started with the usual division into dynamic and static foundations of reality: ‘while the inert principles of things have to do with words, the moving principles, and motion itself, deal with works’; ‘the kinds of motions well divided and described are the bonds of Proteus’ (Bacon 1857–1874, XI, 68–69). The ‘charter of the articles’ (*carta articulorum*) outlined the main points of his inquiry:

First to inquire the severall kyndes or diversities of mocion.

Then what bodyes or subjects are susceptible of ever kynd and what not, and what have them in strength and what more obscurely, and what have them more familiarly and what more rarely.

Then the comparisons of the forces of every mocion and which is predominant one over the other, and which is absolute and never falsified (Bacon 1857–1874, XI, 69).

¹¹ Bacon 2004, 104: ‘ista mere popularia sunt, et nullo modo in Naturam penetrant: suntque mensurae et periodi tantum, non species motus’.

¹² Contrary to a ‘logical’ description of natural motions, Bacon advocated a ‘physical’ understanding of them: ‘si quis (exempli gratia) observaverit inesse corporibus appetitum contactus ad invicem, ut non patiantur unitatem Naturae prorsus dirimi, aut abscindi, ut vacuum detur; aut si quis dicat inesse corporibus appetitum se recipiendi in naturalem suam dimensionem, vel tensuram, ut si ultra eam, aut citra eam, comprimantur, aut distrahantur, statim in veterem sphaeram et exporrectionem suam, se recuperare et remittere moliantur; aut si quis dicat inesse corporibus appetitum congregationis ad massas connaturalium suorum, densorum videlicet versus Orbem Terrae, tenuiorum et rariorum versus ambitum Coeli: haec et huiusmodi vere Physica sunt genera Motuum’ (Bacon 2004, 106).

When we peruse Bacon's works on natural philosophy, we cannot help noting the high degree of accuracy and determination with which, throughout the course of his philosophical career, he devoted himself to the task of identifying and classifying the motions of nature. The best exemplification of this attitude is to be found in various 'lists' of material motions, compiled by Bacon in different phases of his life. In *Filum labyrinthi*, written before 1608, Bacon divided the different motions of matter according to the dichotomy of agitation (*agitatio*) and displacement (*latio*). He described the former as a 'motion without a limit' and 'all absorbed in its own activity', the latter as a 'motion aiming at a term' and 'wandering' (Bacon 1857–1874, III, 627). He then divided agitation into gentle (*placida*) and disquieting (*inquieta*) unrest, displacement into local motion and corporeal motion. Under the rubric 'local motion', he included motions of connection (*motus nexus*), of collision (*motus plagae*), motions for freedom (*motus libertatis*) and motion of matter (*motus hyles*), then motions towards mass (*motus ad massam*), of friendship (*motus amicitiae*), of flight (*motus fugae*) and antipathy (*motus antipathiae*). 'Corporeal motion' was then subdivided into seventeen further motions: motion involving the persistence of being (*motus subsistentiae*), also known as the motion of the absolute existence of being against any possible manifestation of nothingness; motion of wholesomeness (*motus integritatis*), which resists any union with foreign bodies; motion of control, also called royal motion (*motus cohibitionis sive regius*), all intent on avoiding the embrace of any new form; motion of maturation and perfection (*motus maturacionis*); motion of contraction (*motus contractionis*); motion of relaxation (*motus relaxationis*); motion of internal separation or 'factionous' (*motus separationis in se sive factionis*); motion of separation towards a different nature or 'motion of exile' (*motus separationis in aliud sive exilii*); motion of great and deep separation or 'motion of anarchy' (*motus separationis altae et magnae sive anarchiae*); motion of fibres and of any corporeal tissues that derive from them (*motus applicationis et resistentiae secundum fibras*); motion of adherence (*motus tenacitatis sive adhaerentiae*); of mixture (*motus receptionis in se, sive mistionis*); of assimilation (*motus generationis Jovialis, sive assimilationis*); of impression (*motus generationis Saturniae, sive signaturae aut impressionis*); of imitation (*motus generationis fictae, sive excitationis et imitationis*); of fermentation and infection (*motus fermentationis, infectionis*); motion of gentle metamorphosis (*motus metamorphoseos placidae*), such as processes of distillation and sublimation; and finally motions of destructive metamorphosis (*motus metamorphoseos destruentis*), like the transformation of worms into flies (Bacon 1857–1874, III, 628–631).

The attention to detail and the almost obsessive precision with which Bacon deconstructed and recomposed the primordial phenomenon of motion testifies to the importance that he assigned to the dynamic aspects of nature. This careful enumeration of motions is more than a simple list. It brings to the fore a rich phenomenology of natural life, organised according to propensities and desires. In *Cogitationes de natura rerum* ('Thoughts on Nature'), written around 1605, the division was mainly concerned with motions of resistance or 'apparent rest' (*falsa quies*), continuity (*appetitus continuitatis*), violence (*motus violentus*), attraction and aversion (*consensus*) (Bacon 1857–1874, III, 25–31). In *Phaenomena universi* ('Phenomena of

the Universe'), composed around 1611, Bacon distinguished between motions of condensation, rarefaction and succession (*motus successionis*), which corresponded to the motions traditionally associated with abhorrence of a vacuum, and motions which signal a release from tension (*motus receptionis a tensura*) (Bacon 1996b, 36, 46, 48). Finally, in the *Sylva Sylvarum*, Bacon identified sixteen principal 'passions of matter', that is, material dispositions resulting from sixteen related causes: suppleness; appetite to continuity and discontinuity; contraction and extension; quantity of spirits; nature of spirits (whether native or common air); nature of native spirits (whether eager or gentle-natured); emission or detention of spirits in bodies; dilation or contraction of spirits in bodies; collocation of spirits in bodies (e.g., whether 'coacervate' or 'diffused'); rarity or density of the tangible parts; equality or inequality of the tangible parts; digestion or crudity of the tangible parts; the nature of matter (whether sulphurous, mercurial, watery or oily); disposition of tangible parts in length or transversally, more or less inwardly or outwardly; porosities or occlusions in the tangible parts; and finally position of pores (Bacon 1857–1874, II, 618).

It is in the *Novum organum*, however, that, as already said, we find the most accurate and systematic analysis of matter's 'desires'. Here Bacon brought the number of structural motions in matter to nineteen. Considered as the fundamental appetites of matter, they represented the true letters of nature's alphabet. The account is contained in the long Aphorism 48 in the second part of the work, embedded in a broader discussion concerning the 'instances of wrestling'. It is one of the most overtly metaphysical sections in Bacon's whole oeuvre. Here natural phenomena are scrutinized according to the categories of 'predominance' (*praedominantia*) and 'pliability' (*cessio*, or *succumbentia*). The choice of 'wrestling' as a heuristic category to interpret the phenomenon of material motion was not accidental: placed between overpowering and yielding tendencies, tension and resistance can be seen as the defining characteristics of Bacon's physics, and it is certainly no coincidence that he resorted to the example of wrestlers to clarify the notion of motion as power: 'if, in the course of a fight, one of the wrestlers is lying on the ground, and he is held there, with his arms and legs immobilized, or otherwise blocked, and yet he tries very hard to get up, the effort (*nixus*) is no less powerful, even though it does not lead to any real result' (Bacon 2004, 416).¹³

3.4 The Nineteen Motions of Life

The first of the nineteen constitutive motions of matter discussed in the *Novum organum* is the motion of resistance (*motus antitypiae*), which extends to all material components of the universe. By means of this motion, matter opposes all

¹³The same image of the immobilized wrestler can be found in *Cogitationes de natura rerum*, in Bacon 1857–1874, III, 25. See also *Historia naturalis et experimentalis*, in Bacon 2007, 134: 'Strife and friendship' (*lis et amicitia*) are the 'stimuli of motions' and the 'keys of works'.

attempts to be annihilated from external forces, for it prefers to change the disposition of its parts or their form rather than be destroyed (Bacon 2004, 384).¹⁴ The second motion – the already mentioned motion of connection (*motus nexus*) – prevents bodies from splitting up when they find themselves in a condition of mutual enjoyment (Bacon 2004, 384).¹⁵ Unlike the motion of friendship and union (see *motus congregationis*, the next in order), which represents a positive tendency to unite with other beings and to share their life, the motion of connection is a manifestation of the natural fear of empty spaces which pervades the fabric of matter (Bacon 2004, 396). The third motion, the ‘motion for freedom’ (*motus libertatis*), refers to those natural phenomena in which matter successfully reacts to all sorts of pressures and coercions, and re-establishes its original conditions prior to any attempt to be changed or overcome by external power. In the *Sylva Sylvarum*, the motion for freedom is described as ‘motion upon pressure’ and ‘motion upon tensure’, and it occurs ‘when any body, being forced to a preternatural extent or dimension, delivereth and restoreth itself to the natural’ (Bacon 1857–1874, II, 343). Bacon points out that the motion for freedom should not be mistaken, despite any apparent resemblance, for the motions of resistance and connection, for in this case the end of a pressure does not result from resistance, and the release of tension is not induced by a greater connectivity among the parts of matter (Bacon 2004, 384).¹⁶ The fourth motion, the ‘motion of matter’ (*motus hyles*), differs from the motion for freedom in that, while the latter avoids expansions and contractions at all costs and is driven to restore the original consistency of matter, the former stimulates bodies to yearn for (*appetere*) ampler dimensions and new spheres of action. For Bacon, the actions caused by heat and cold are typical instances of *motus hyles*. Take water, for example: any attempt to compress water results in its subsequent rebellion against the attempt (*recalcitrat*), and it goes to all lengths to reinstate its previous condition (*vult fieri qualis fuit*), evidence that there is a natural motion for freedom. However, if a sudden and deep fall in temperature occurs, water meekly accepts (*sponte sua et libenter*) being condensed into ice (following, in this case, the law of *motus hyles*). The ‘motion of matter’, however, does not have the last word, for if the temperature continues to drop and remains consistently at a very low level, ice will take on the form of a crystal and the matter in question will lose its ‘freedom’ to change back into water (Bacon 2004, 388).¹⁷ In nature, too, freedom comes at a price.

The ‘motion of continuity’ (*motus continuationis*), the fifth motion in the series of material appetites, needs to be distinguished from the motion of connection for,

¹⁴There is no destruction of matter in Bacon’s universe. See *Historia vitae et mortis*, in Bacon 2007, 346: ‘Nullus est rerum interitus’.

¹⁵See also *Historia densi et rari*, in Bacon 2000b, 124; *Sylva Sylvarum*, in Bacon 1857–1874, II, 635.

¹⁶See *Historia et inquisitio prima de sono et audito*, in Bacon 1857–1874, III, 659. In *Historia densi et rari*, the ‘motion for freedom’ is said to be composed of two stages, i.e., *motus contractionis* and *motus restitutionis* (Bacon 2000b, 120–122, 156–158).

¹⁷On *motus hyles*, see also *Historia densi et rari*, in Bacon 2000b, 86, 96.

unlike the connective tendencies that affect all bodies in the universe, the motion of continuity is more specific and aims at preventing the formation of interspersed vacuums within individual bodies (Bacon 2004, 390). Motion number six, which Bacon calls ‘motion for the sake of profit, or motion of want’ (*motus ad lucrum, sive motum indigentiae*), inheres in those bodies that find themselves unwillingly cohabitating with bodies of a different nature, sometimes even hostile to them. When the opportunity presents itself, the former abandon this uncomfortable arrangement and join bodies that are of a friendlier disposition. Here Bacon mentions the example of paper, which is unsympathetic towards the air by which it is surrounded and for this reason ‘willingly’ (*libenter*) imbibes water and other types of fluid bodies in order to expel the air that has already penetrated its pores. One can advantageously arouse the *motus ad lucrum* every time mild processes of bodily dissolution (*aperturae et solutiones corporum*) need to be put in place (Bacon 2004, 390).¹⁸ It is a movement that also occurs in a number of meteorological phenomena, every time ‘tangible bodies have no pleasure in the consort of air’ and ‘endeavour to submit it into a denser body’ (Bacon 1857–1874, II, 349). In the *Sylva Sylvarum* Bacon refers to the motion for profit (or ‘from destitution’) to explain the origin of putrefying processes, which occur when the spirits enclosed in bodies ‘are unquiet to get forth and congregate with the air’ (Bacon 1857–1874, II, 451).

Motions seven to nine are motions of aggregation (*congregatio*) and association (*coitio*). Motions towards a ‘greater aggregation’ take place in those bodies that tend towards levels of higher concentration (*motus congregationis maioris*), for instance when heavy bodies gravitate towards the centre of the earth and light bodies move towards the sky. They look like Aristotle’s natural motions of the elements, but with the difference that the tendency to greater concentrations of homogeneous matter is a motion that is ‘feeble and delicate’, often overwhelmed by other motions of a stronger nature, while for Aristotle the motions inherent in the four elements were powerful and structural tendencies. Motions towards lesser concentrations of matter (*motus congregationis minoris*) are complementary to those towards greater concentrations. This kind of motion takes place when the homogeneous parts within a body freely decide to split from the heterogeneous ones and form peaceful aggregations among themselves. For Bacon, these motions should not be mistaken for either the more general motions of lightness and gravity, or those of destitution and profit, from which the former differ quite markedly. The reason is that the tendency towards homogeneous matter is not caused, as in the case of the motion of destitution and profit, by the presence of hostile natures or uncomfortable situations, which urge a body to choose the lesser evil; on the contrary, bodies of similar nature are willing to unite together (Bacon writes that the union occurs *maiore cum delectu*, ‘with a greater choice’) and they do so without being coerced by the situation. In other

¹⁸ Here it may be worth recalling the Stoic definition of *indigentia* as *libido inexplibilis*, discussed by Cicero in *Tusculanae disputationes* (IV, ix, 21–22). In the same place, Cicero reported the subtle distinction advanced by some Stoics between *libido* (as desire of predicates that are said of one or more things, for instance, desire of *having* riches) and actual *indigentia* (as desire of things themselves, of riches in this case).

words, the motion for profit determined by a condition of penury is negative, the one towards lesser concentrations of matter is positive. Bacon, however, seems to suggest that these motions of congregation should be kept within certain limits, to avoid that they may trigger a tendency to ‘putrefaction’, for, in Bacon’s opinion, putrefaction results from ‘aggregation of homogeneous substances’. The result is a succession of ‘forms’, in which a previous arrangement is superseded by a new one through aggregations of particles of the same nature (*ipsa coitio ad homogeniam*, in Bacon 2004, 394–396; Bacon 2000a, 136).¹⁹

Motions number nine and ten represent two exemplary cases in which matter exhibits a tendency towards lesser concentrations of substance: the ‘magnetic motion’ (*motus magneticus*) and the ‘motion of flight’ (*motus fugae*). The latter is the motion through which a body moves away from other bodies in a decisive way and with no hesitation. Motions of flight are particularly evident in all ‘antiperistaltic’ reactions, in which large masses of matter pervaded by heat and cold chase and avoid each other like battling armies that constantly deploy strategies of attack and flight (Bacon 2004, 400). The motion of ‘antiperistasis’, whereby forces of opposite natures constantly surround and shun each other, is contrasted with the tendency towards dilation that is based on ‘embracing’ other substances (*per amplexum*): ‘Just as bodies open themselves up from every corner to favourable and friendly substances, and move towards them, in the same way, when they meet hostile and inimical things, they flee away, by contracting and withdrawing into themselves’ (Bacon 2000b, 152). Bacon considered the process of antiperistasis as further evidence that the appetitive drives of matter were more important than its bodily differences: ‘that oil does not mix with water depends not so much on the difference in lightness, but on their mutual aversion (*malus ipsorum consensus*)’ (Bacon 2004, 400).²⁰

The next motions, from the eleventh to the thirteenth (of assimilation, stimulation and impression), are ‘diffusive’ motions. Bacon calls the motion of assimilation (*motus assimilationis* or *motus multiplicationis sui*) ‘motion of simple generation’ (*motus generationis simplicis*), for it affects the ‘homogeneous’ parts of matter, that is, those parts of matter which have not yet taken on the specific form required by acting as organs in plants and animals. Through the motion of assimilation, ‘homogeneous’ bodies transform other bodies, different from them, into their own nature, like fire that turns combustible matter into a larger amount of fire, or air that extracts further air from water. Bacon does not rule out that even cases of apparent juxtaposition (*accretio*), like layers of tartar around the teeth, can in fact be explained as phenomena of actual assimilation, for the tendency to assimilation extends to all

¹⁹On motions of dilation through the ‘embracing and meeting’ of friendly bodies, see *Historia densi et rari*, in Bacon 2000b, 116. On processes of putrefaction, see *Historia vitae et mortis*, in Bacon 2007, 348; *Historia densi et rari*, in Bacon 2000b, 80; *Sylva Sylvarum*, in Bacon 1857–1874, II, 453–457, 612. In the *Essayes*, Bacon compares the feeling of friendship among human beings to the motion of union that ‘strengthneth and cherisheth any Naturall Action’ (Bacon 1985, 84).

²⁰On antiperistasis see Clagett 1941, 79. A later Telesian who wrote on antiperistasis is Tommaso Cornelio. See Cornelio 1683 [1648].

bodies (*inesse corporibus omnibus desiderium assimilandi*, in Bacon 2004, 402).²¹ In the *Sylva Sylvarum*, the motion of assimilation is compared to that of ‘maturation’, and both are described as two different forms of ‘concoction’ (or ‘digestion’). Processes of assimilation are forms of complete ‘subdual’ (*absolute conversion and subaction*) and manifest themselves especially in the bodies of living beings and metals, where the nourishment is transformed into the body of the assimilating substance: ‘induration by assimilation appeareth in the bodies of trees and living creatures: for no nourishment that the tree receiveth, or that the living creature receiveth, is so hard as wood, bone, or horn, etc, but is indurated after by assimilation’ (Bacon 1857–1874, II, 377, 615).

In the *Novum organum*, the motion of ‘stimulation’ (*motus excitationis*) is closely connected to that of assimilation, for, like any tendency to assimilation, all states of arousal are ‘diffusive, communicative, transitive and multiplicative’. The difference is that the two kinds of motion act in different ways:

The motion of assimilation proceeds, as it were, with power and authority, for it orders and forces the assimilated matter (*assimilatum*) to change and transform itself into the assimilating principle (*assimilans*). The motion of stimulation, on the other hand, proceeds as if it were introducing itself in an artful, stealthy and cunning way. It limits itself to attracting the thing to be stimulated (*excitatum*) and disposes it in a favourable manner towards the stimulating principle (*excitans*) (Bacon 2004, 402).

Assimilation and stimulation, Bacon continues, also differ in an ontological sense, in that the former affects the matter of bodies and the latter influences their forces (*virtutes*). In such natural phenomena as the magnetization of iron, the spreading of poison within a body, the leavening of bread, fermentation of beer and the curdling of milk into cheese, the transformation occurs through the ‘pliability’ (*cessio*) of the ‘aroused’ material rather than through the force of the stimulating principle (Bacon 2004, 404).²² Another motion that can be said to be akin to that of assimilation is the ‘motion of impression’ (*motus impressionis*), which is the thirteenth motion in the list. Among the ‘diffusive’ motions, this is the most ‘subtle’ and takes place in all those cases – transmission of light, percussion of sounds and magnetic forces – when the ‘first mover’ (*primum movens*), which initiated the process of impression, spreads its influence throughout the change it initiated (Bacon 2004, 406).

Bacon calls the fourteenth motion – a motion that requires deeper investigations (*valde abstrusus*) – the ‘motion of configuration or position’ (*motus configurationis aut situs*). By this motion, he means the characteristic tendency that all bodies have to position themselves in a certain way in the space which surrounds them. The fifteenth motion, called the ‘motion of passing through’ (*motus pertransitionis*) or the ‘motion through passages’ (*motus secundum meatus*), refers to natural actions that

²¹ The motion of assimilation is also examined in *Historia vitae et mortis*, in Bacon 2007, 314–316; *Historia densi et rari*, in Bacon 2000b, 118; *Sylva Sylvarum*, in Bacon 1857–1874, II, p. 614.

²² See also *Historia densi et rari*, in 2000b, 108. In the *Sylva Sylvarum*, the motion of imitation is grouped under the category of *motus excitationis*. See Bacon 1857–1874, II, 619 (motion of ‘excitation to imitate’).

take place through bodies or channels. The ‘royal’ motion (*motus regius*), also called ‘political’ (*motus politicus*), occurs within a body in which some of the parts rule over the others, establishing what looks like a true government (*regimen et politia*). The following motion, the seventeenth, consists in a ‘spontaneous motion of rotation’ (*motus rotationis spontaneus*), through which ‘bodies that enjoy motion and find themselves in a favourable situation, love their own nature, follow themselves and not others, and as it were strive to embrace themselves (*tanquam proprios petunt amplexus*)’. This means that bodies in motion which enjoy their own activity continue to move through an incessant circular motion, while bodies at rest that love their actual condition persist in their state of rest (Bacon 2004, 406–410).

The last motions in the series – motions eighteen and nineteen – play a crucial role in Bacon’s system of natural appetites. The ‘motion of trepidation’ (*motus trepidationis*), like the ‘motion of resistance’ (*motus antitypiae*), keeps the material universe in a condition of continuous tension and alertness:

In a way, this is the motion of eternal captivity, which occurs every time bodies, depending on their nature, find themselves in a situation that is not favourable to them, and yet the situation is not completely uncomfortable. These bodies are in constant trepidation, always restless, unhappy with their condition, and yet they are not so bold that they wish to change their status. This motion can be seen in the heart of animals and in the mechanism of pulsation, and it is necessarily present in all those bodies which persist in ambivalent situations like these, poised between advantages and disadvantages, and, being pulled in different directions, they try to free themselves; but then again, they suffer a setback. And yet, despite the unsuccessful attempt, they keep trying (Bacon 2004, 410–412).²³

Like the motion of trepidation, the motion which concludes the series – the ‘motion of rest’ (*motus decubitus*), also called the ‘motion of aversion towards motion’ (*motus exhorrentiae motus*) – is closely related to the motion of resistance (the first in the series), through which matter resists any external attempt to be destroyed. For Bacon this seems to be an indication that a condition of immobility was the original state of matter. As a result, matter strongly opposes any change in general, and when change happens, matter’s immediate reaction is to restore the initial situation (following the ‘motion for freedom’). Strictly speaking, as Bacon points out, this oxymoronic motion of rest should not be even called ‘motion’ (*cui vix nomen motus competit*):

By virtue of this motion, everything that reaches a high level of condensation, abhors motion. Indeed, the only appetite in this case is the appetite not to move; and although these bodies are stimulated and provoked to motion in countless ways, they nevertheless stick to their nature as much as they can. If they are forced to move, they always seem to act in such a way that they recover their rest, return to the previous condition and do not move any longer. To this end, they certainly prove to be nimble and they fight with rapidity and swiftness (as if they could not suffer any delay). We can only have a partial image of this motion, however, for, as a result of celestial influences (*subactio*) and their processes of transforma-

²³The motion of trepidation is at work every time a sound is produced in nature. See *Sylva Sylvarum*, in Bacon 1857–1874, II, 394, 405 and 416: ‘in this you must distinguish that there are two trepidations: the one manifest and local; as of the bell when it is pensile: the other secret, of the minute parts’, and ‘the local helpeth the secret greatly’.

tion (*concoctio*), not only is every tangible body unable to reach the highest level of condensation, but it also has a certain quantity of spirit mixed with itself (Bacon 2004, 412).

Bacon's material universe is a world in constant transformation: 'In the bodies that surround us (*apud nos*) there is no true rest', he insists in the *Novum organum*, 'neither in bodies taken as a whole, nor in their parts, but only in appearance' (Bacon 2004, 416). An imperceptible pulsation (*invisibilis quidam tumor et partium pulsatio*), characterized also as 'percussive palpitation' (*palpitatio percussiva*), stirs every single particle of matter, explains Bacon in *Historia densi et rari* (Bacon 2000b, 94). Paradoxically, all forms of change that are visible in matter result from a condition of constant trepidation stemming from a profound aversion to motion and from a desire for rest and immobility inherent in nature. As is particularly evident in the case of spirits, every transformation and vital process is only an attempt – most fail in the long term – to break the 'eternal captivity' of inert matter. In distributing the principal motions of nature under the general category of 'wrestling' according to the forms of victory and submission, Bacon endorses a view of nature in which activities of resistance, freedom, coercion, search after profit, penalty, want and flight prevail, to mention only a few of the patterns that bring to the fore the natural disquietude of matter. All motions indicate a situation of impatience and frustration, in which ineradicable drives towards freedom are constantly hampered by parallel tendencies to restore the original *status quo* of matter. After all, this should not come as a surprise, if we think that the principal tendency in nature is described by Bacon as the appetite to go back to an initial condition of equipoise.

Appetere, to desire, and its associated terms denoting endeavour, effort and striving (*nixus, conatus, desiderium*) are key words used by Bacon to explain the behaviour of natural beings. The first nine motions are closely related to the tendency to self-preservation through which bodies protect their being by deploying strategies of resistance, freedom and union. The following 'diffusive' motions of assimilation, stimulation, impression, magnetism and antiperistasis promote the expansion and dissemination of life throughout the universe. The motions ranging from the fourteenth to the seventeenth (the 'motion of configuration or position', 'motion of passing through', 'royal motion' and 'spontaneous motion of rotation') describe the ways in which various kinds of material aggregates give rise to more or less stable organizations. The eighteenth motion, the motion of trepidation, epitomizes the universal condition of material bodies, oppressed by a sense of inner and outer imprisonment, and yet unable to break completely free. The most original appetite, however, is 'Motion 19', the tendency to go back to an initial condition of stasis and rest. This certainly represents a surprising and frightening outcome. Indeed, it is so frightening that nature itself shudders at this possibility by displaying an unremitting motion of 'trepidation'. In the constant battling that divide tendencies to overcome from tendencies to yield, the appetite for death, understood as the ultimate, natural surrendering, runs in fact deeper than the appetite for predominance. The paradox of Baconian dynamics is that the most original motion is the motion-

towards-no-motion. In *Novum organum*, Bacon deals with it while describing the ‘torpor of bodies’:

it cannot be denied that tangible bodies contain different levels of sluggishness (*pigritia*) and some aversion (*exhorrentia*) for local motion, to the point that, if they are not stimulated, bodies prefer to remain in the situation in which they are rather than to strive for a better condition (Bacon 2004, 394).

In the case that there were no stimulation and incentive to action, nature would remain frozen in a state of perpetual immobility. This is precisely what, at the end of his discussion concerning the nature of material motions, Bacon means when he refers to the formidable ‘motion of aversion towards motion’ (*motus exhorrentiae motus*). And yet the other eighteen appetites all seem to presuppose various forms, more or less overt, of ‘resistance’ to immobility and, in the final analysis, to death. Bacon’s physics of appetitive motions of matter leaves therefore several crucial questions open: can we look at Bacon’s lifelong efforts to make material reality indefinitely persistent (*duratio corporum*) – which after all remains one of the principal desiderata of his Great Instauration – as something different from soliciting death? Is it legitimate and sensible to promote the plan of recovering nature’s original perfection (*restitutio*) by invoking the ‘death’ of matter? Should we not consider nature’s resistance to ‘immobility’, as is consistently displayed by the eighteen vital motions, a futile activity, if all this fervour is inexorably destined to end in failure (i.e., Motion 19)? In other words, how can Bacon justify and explain the reality of the eighteen appetites for life? A possible answer to these questions should be looked for in the tendency to resist. In a world that seems to be held in ‘eternal captivity’, a constant condition of resistance seems to be the ultimate solution. One might ask how futile this resistance is. In the final section of this chapter, I address these questions by giving a more metaphysical and theological edge to the discussion.

3.5 Motion 19: Life and Death in Bacon’s Philosophy

The questions with which I ended the previous section can be rephrased by following a theological route. As I have already asked in the introductory chapter to this volume, why at a certain point was change introduced into reality when everything could have remained eternally the same? In other words, why did God create the world? And why is there life rather than absolute rest? It seems that in Bacon’s philosophy, in both his theological views concerning creation and redemption and in his natural philosophical speculations about the relationship between life and death, change stands out as a major issue. This point can also be addressed by exploring the way in which, in Bacon’s philosophy, the plane of divine action – Grace – intersects for a moment with the plane of material action – Nature – through God’s creation of the human soul and His plan of salvation.

In the *Confession of Faith*, published posthumously in 1641 and probably written sometime during the 1610s, Bacon positioned the act of divine creation in that particular phase in the history of the cosmos which he called ‘the time of the mystery’ (see Lancaster 2015, 136–143). God created the world, but His creation would not stand ‘one moment’ without ‘a Mediator’. Creation was therefore closely intertwined with redemption, for the defilement of the divine work by human sin was planned even before God decided to create the universe – ‘the Lamb of God was slain before all worlds’:

God is so holy, pure, and jealous, as it is impossible for him to be pleased in any creature, though the work of his own hands; So that neither Angel, Man, nor World, could stand, or can stand, one moment in his eyes, without beholding the same in the face of a Mediator; And therefore that before him with whom all things are present, the Lamb of God was slain before all worlds; without which eternal counsel of his, it was impossible for him to have descended to any work of creation; but he should have enjoyed the blessed and individual society of three persons in Godhead only for ever (Bacon 1996a, 107).²⁴

Within this theological framework, created nature is ‘nothing but the laws of the creation’, a set of ‘constant and everlasting laws’. They ‘now remain and govern inviolably till the end of the world, began to be in force when God first rested from his works and ceased to create; but received a revocation in part by the curse, since which time they change not’ (Bacon 1996a, 108). These laws are characterized by four ‘changes or times’:

The first, when the matter of heaven and earth was created without forms: the second, the *interim* of every day’s work: the third, by the curse, which notwithstanding was no new creation, but a privation of part of the virtue of the first creation: and the last, at the end of the world, the manner whereof is not yet revealed (Bacon 1996a, 108).

The principal stages of creation are therefore four: the creation of matter; the six days of creation, that is, the creation of forms; the Fall; and, finally, a new creation at the end of the world. In Bacon’s view, the interplay of creation and redemption means that, although there remains a chasm between Nature and Grace, there is still a chance that the two ontological levels of natural normativity and moral spontaneity may communicate with each other. God ‘made all things in their first estate good, and removed from himself the beginning of all evil and vanity into the liberty of the creature; but reserved in himself the beginning of all restitution to the liberty of his grace’ (Bacon 1996a, 108).

Bacon’s metaphysical and theological views portray God as a source of uninterrupted activity. He may have rested during the ‘first Sabbath’, when He fulfilled his first creation. At the level of Grace, however, through providential interventions of new creative acts – miracles – ‘God worketh still, and resteth not from the work of redemption, as he resteth from the work of creation: but continueth working till the end of the world; what time that work also shall be accomplished, and an eternal

²⁴For the biblical meaning of ‘jealous’, see the Oxford English Dictionary: ‘said of God: Having a love which will tolerate no unfaithfulness or defection in the beloved object’. The image of the slain lamb is in Revelation, 13, 8: ‘the book of life of the Lamb slain from the foundation of the world (*in libro vitae agni qui occisus est ab origine mundi*)’.

sabbath shall ensue' (Bacon 1996a, 108). Seen within the overarching plan of salvation and Grace, God's activity after the first Sabbath coincides with the mystery of predestination. From the point of view of nature, God's sabbatical period corresponds to activity ruled by natural laws. These laws regulate natural motions, that is, the material appetites that govern the productions of natural forms. Natural motions result from God's initial creative act and are a surrogate of His original direct intervention. In fact, even these original motions of matter foreshadow the 'eternal Sabbath' at the end of the world, when the final outcome will be absolute rest, for the deepest motion in nature, according to Bacon, is the fear of motion, that is, the tendency to resist change and to restore the initial state of rest. In this sense, indefinite permanence and eternal rest are the defining characteristics of Bacon's world, respectively in the kingdom of nature and in the kingdom of Grace. In the domain of nature, *demortua natura* – inanimate everlasting nature – is the foundation of life; in the domain of divine Grace, the final Sabbath is the foundation of creation.²⁵ The human soul, through Christ's incarnation, represents the only possible link between the two worlds. In the history of nature and humanity the real, effective and productive union between the human mind (*spiraculum*) and material life (*aura*) happened once with God's incarnation (Giglioni 2013b). In the meantime, the whole material universe – the *globus materiae* – is recovering from the incident of mortal sin, quivering with tremors of fear and spasms of energy induced by the situation of the 'eternal captivity'. Only at the end of the world, with the fulfilment of the Great Instauration, the three universes – *materia*, *intellectus* and *deus* – will be realigned with each other once again, at 'the time of the revelation of the sons of God; which time is the last, and is everlasting without change' (Bacon 1996a, 108). True rest and perfection could only be in God, not in the world of natural and human desire, always caught up in the vicissitudes of time and matter. This means that, also at the level of the physics of material appetites, Bacon's solution to the question of change and permanence rested on a theologico-political arrangement.

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²⁵ On Bacon's notion of *demortua natura*, see Giglioni 2005.

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Chapter 4

Bacon's Apples: A Case Study in Baconian Experimentation

Dana Jalobeanu

Abstract This chapter investigates a specific case of Baconian experimentation, that is, a series of controlled experimental trials Bacon undertook in order to study the processes of maturation and putrefaction. The results of these trials were repeatedly used by Francis Bacon in his writings to illustrate the motions of spirits enclosed in matter. In this chapter, I reconstruct some of Bacon's experiments with apples placed under different circumstances and conditions, as recorded in *Historia vitae et mortis*, *De vijs mortis*, *Novum organum* and *Sylva Sylvarum*. I argue that they help reassess several problematic aspects concerning Bacon's attitude towards the experimental knowledge of nature. Firstly, they offer a paradigmatic situation in which one can explore Bacon's creative and critical handling of sources. Secondly, they show Bacon at work as an experimenter who carefully and accurately observed, recorded and imagined interesting experimental set-ups and variations of experimental parameters, while displaying an interest in experimental methodology and the limits of experimental procedure. Finally, Bacon's apples are a good way of exemplifying the multiple uses and functions experiments play in his natural and experimental histories.

4.1 Introduction

References to experiments and trials made with apples and other fruits are numerous in Bacon's works, particularly in the posthumous *Sylva Sylvarum* (1627). They appear in no less than 37 of his so-called 'experiments' distributed in eight of the ten parts ('centuries') of the work. They refer to the study of various phenomena and

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D. Jalobeanu (✉)

Institute for Research in the Humanities, University of Bucharest,

Dimitrie Brandza str. 1, Bucharest, Romania

e-mail: dana.jalobeanu@celfis.ro; <https://irhunibuc.wordpress.com/>

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processes, such as maturation and putrefaction, preservation, conservation and induration. In these experiments, apples and other fruits are placed in different milieus and containers; sometimes, they are enclosed in earthen jars, in boxes, or bottles, sometimes buried in the ground, placed in ‘conservatories of snow’ or immersed in water, honey, or vinegar. In other cases, apples are simply placed in hay, straw, chalk or sand, or said to be coated in wax, hung in smoke, or immersed in quicksilver. Each time, the ‘experiment’ signifies the investigation of the effects produced on fruit by external conditions and the lapse of time. In some cases, this is supplemented by a comparative evaluation of the results of several such ‘experiments’. In one of the most detailed of such experimental accounts, formulated in Century 4 of *Sylva Sylvarum*, the procedure is described in full:

There were taken apples, and laid in straw; in hay; in flour; in chalk; in lime; covered over with onions; covered over with crabs; closed up in wax; shut in a box, &c. There was also an apple hanged up in smoke (Bacon 1857–1874, II, 446).

The lapse of time recorded in this case amounts to one month. In the list of experiments that follow, Bacon gives a quite detailed description of what happens to each of the apples ‘after a month’s space’. We learn that the apple covered in wax was ‘as green and fresh as at the first putting in’, that it maintained its ‘first freshness and moisture’ while the others were more matured, not only when compared with the waxed apple, but also with ‘another Apple, of the same kind, that lay of it self’ (i.e., not enclosed or buried in any of the substances indicated). By contrast, ‘the apple hanged in the smoke, turned like an old mellow apple, wrinkled, dried, soft, sweet, mellow within’, while the apple kept in straw looked ripe, but not as much as those kept in hay (447). Other experiments throughout the *Sylva Sylvarum* make reference to apples kept for a month in quicksilver, snow, water, vinegar and honey. A different, but related line of experimentation involves burying apples under earth for varying amounts of time. See, for example, Experiment 377:

An orange, lemon and apple, wrapt in a linen cloth, being buried for a fortnight’s space four foot deep within the earth, though it were in a moist place and a rainy time, yet come forth no ways mouldy or rotten, but were become a little harder than they were; otherwise fresh in their colour; but their juice somewhat flatted. But with the burial of a fortnight more they become putrefied (467).

Mark, again, the quite thorough description of the results: the external appearance and taste of the fruits after one month in the ground, and the variation of these results after doubling the time elapsed.

In other examples, apples are first placed in sealed containers before being subsequently buried in the ground, placed in deep wells, or covered in ice or ‘conservatories of snow’. In this case, the ‘body is left to itself for a good while, armed and defended in the meantime against any external force’ (434–435).¹ As a result,

¹This is one of the seven modes of operation (*modi operandi*) presented in the *Novum organum* under the name ‘multi-purpose instances’ (*instantiae polichrestae*). The multi-purpose instances are said to ‘promote practice’ (Bacon 2004, 445). They also formalize the order which one should follow when operating upon bodies in an experimental process. The fourth mode of operation is called a ‘lapse of time (*per moram*)’. Bacon provides the following definition of it: ‘Lapse of time

changes in the appearance of the fruit after a given time are said to be the sole effects of particular 'motions within' it (*motus intestini*). These are the motions of the 'spirits' enclosed in matter. Of course, for Bacon spirits are at the origin of all changes and alterations; they are the agents of motion and the motive power behind everything that occurs in nature. They produce processes called concoction, maturation and putrefaction. These processes are then reduced to motions, such as a 'calling forth of the spirits of the body outward', a 'spreading' of the spirits 'more smoothly' (what is commonly known as maturation), or the action through which the spirit is 'digesting in some degree the grosser parts' of the enclosing body, part of what is commonly known as putrefaction (Bacon 1857–1874, II, 446). In fact, these processes are phases of a continuous motion of alteration: a motion which begins with assimilation (when the apple is still on its branch) and continues towards putrefaction (when the spirits, after spreading evenly inside the apple and 'digesting' some of its matter, tend to fly out and, in this attempt to escape, produce disordered motions and 'swellings' inside the fruit). Apples are a recurrent example in Bacon's attempts to illustrate these processes, and references to experiments with apples are to be found in *De vijs mortis* (c. 1611–1619), in the *Historia vitae et mortis* (1623) and even among the prerogative instances of the *Novum organum* (1620).

Take, for example, the apple coated in wax from the experiment discussed above. In the *Sylva Sylvarum* it is used to compare the effect of external agents upon a controlled process of maturation. By isolating the apple in wax and thus 'entrapping' its spirit, one can delay the process of maturation. After a month, therefore, the apple is 'as green and fresh as the first putting in', because 'all exclusion of open air (which is ever predatory) maintained the body in his first freshness and moisture' (Bacon 1857–1874, II, 446). On the other hand, in *De vijs mortis* the results of the same wax coating are described after a different lapse of time, when the fruits have already begun to putrefy. As a result, the enclosed apples become 'moist and as if they were macerated and suffused with a watery sweat' (Bacon 1996, 309). This quite thorough description of the 'beginnings of putrefaction' seems to suggest more than just chance observation. It indicates repeated experimentation, attention to detail and, perhaps, even the development of a methodology specially designed for the study of natural processes that are extremely complex and difficult. The question then becomes whether Bacon really performed these experiments with apples. Repeated experiments recorded in his writings seem to suggest a positive answer. The problem, however, is more complicated, for many of the experiments described by Bacon come not from actual practice, but from his readings. This is the case, for instance, of a paragraph in the *Historia vitae et mortis*, which seems to summarize the results of a newly discovered technique, namely, the isolation of fruits in such a way that 'predatory air' cannot reach them:

Fruits such as pomegranates, lemons, apples, pears, and the like, and flowers such as the rose and lily keep for a long time when sealed in earthenware pots; yet the ambient air still

is what I call it when any body is left to itself for a good while, armed and defended in the meantime against any external force. For when extraneous and extrinsic motions stop, then do the ones working within show and perfect themselves' (435).

interferes by carrying and insinuating its inequalities through the sides of the pot, as is obvious in heat and cold, so that it is best if the pots be well sealed to bury them below the grounds as well. No less effective is to put them if not underground but under water, provided that the water be out of the light as well, and in domestic cisterns; but if you put them under water it is better to use glass rather than earthenware pots (Bacon 2007, 167).²

This is indeed a summary of many observations and repeated trials; only it is a summary whose development is not to be found in Bacon's writings, but in Book 4 of Giambattista della Porta's *Magia naturalis* (1558), Chaps. 7 and 8.³ There, Della Porta (1535–1615) compares various ways of preserving apples and other fruits in earthenware pots buried under ground, placed in dust, chalk, or in water cisterns. Alternative means of preservation that are discussed by Della Porta, sometimes complete with descriptions of experimental set-ups and methodology, include the use of snow and ice, wine, honey, quicksilver and amber. Meanwhile, in describing these experiments, Della Porta himself refers rather to books than to actual practice. Many of his recipes for preservation and delaying putrefaction come from a well-respected source of information: the tradition of husbandry.

The critical and creative way in which Della Porta handled this classical tradition in his *Magia naturalis* has been only partially investigated (Orsi 2005). In Bacon's case, even a limited investigation is still missing. This is partly due to the long lasting influence of the verdict formulated more than a century ago by James Spedding, Robert L. Ellis and Douglas D. Heath, the nineteenth-century editors of Bacon's works. In his introduction to the *Sylva Sylvarum*, Spedding claimed that 'Porta's *Natural magic* supplied Bacon with almost all he says of the changes which may be produced in fruits and other vegetable products by peculiar modes of cultivation' (Bacon 1857–1874, II, 328). Spedding treated Bacon's borrowings from Della Porta as simple 'transcriptions' of recipes and experiments, sometimes deceptively attributed to 'one of the ancients'. It is only recently that scholars have questioned Spedding's verdict and begun a more thorough investigation of this process of borrowing and 'transcribing'.⁴ And although Bacon's reading of Della Porta has

² Versions of the same can be found in the *Sylva Sylvarum*, Experiments 343, 379 and 624–629.

³ Della Porta's *Natural Magic* was a sixteenth-century bestseller and remained extremely popular throughout the seventeenth century. The first edition, in four books, was published in Naples in 1558 and was almost immediately translated into Italian (1560), French (1565), Dutch (1566) and German (1612). Della Porta published a second, augmented edition in twenty books (Naples, 1589), including in it a substantial amount of his own experiments with plants and fruits, together with experimental endeavours dealing with optics and magnetism. The second edition of Della Porta's *Natural Magic* was also translated into Italian (1611), French (1606), English (1658) and German (1680). On the differences between the first and second edition see Balbiani 2001. In this chapter, I will refer to the Latin edition published in Frankfurt in 1591 and to the English translation (anonymous) published in 1658. Unless otherwise stated, all quotations in English come from Della Porta 1658, and the Latin quotations come from Della Porta 1591.

⁴ Although Graham Rees has contested this verdict as early as 1981, it is owing to recent interest devoted to techniques of reading, writing and the tradition of common-places that Bacon's own methods of 'research' have become the focus of more thorough investigations. On Bacon's methods of common-placing, see Vine 2008, 2011; Yeo 2014; Stewart 2013. See also Rees 1981. On Bacon's handling of classical sources, more generally, see Giglioli 2012; Jalobeanu 2008, 2012; Rusu 2013.

attracted in the past few years a certain amount of attention, much more remains to be done before one can have an accurate picture of Bacon's complex and sophisticated ways of using *Magia naturalis* as a sourcebook of experiments.⁵

My purpose in this chapter is to point out that Bacon's 'borrowings' from Della Porta and his handling of recipes and experiments is both historically complex and philosophically interesting. First, I will demonstrate that Bacon used Della Porta's *Magia naturalis* in a liberal and creative manner, as a source-book of experiments. Then I will show that Della Porta was not the only source of experiments and recipes when it comes to Bacon's own experiments with apples. Other ancient and modern sources found their way into his notebooks, 'calendars of problems' and eventually into his published writings. In particular, I will discuss the striking similarities between Bacon's handling of experiments with fruits and Hugh Platt's study of the same subject. My general claim in this chapter is that such a contextual reconstruction of Bacon's experiments on apples is crucial for understanding two related problems. Firstly, it offers important insights into the critical and creative way in which Bacon handled his sources, insights that can bring further clarification to the much-debated relationship between reading, experimenting and recording, on the one hand, and developing and imagining new experiments, on the other. Secondly, by understanding how Bacon used books of husbandry, natural history and natural magic as sources for his experimental activities, we can begin to understand how Baconian experimentation developed: from the first stages of selection, critical reading and testing of received recipes to the more creative stages of articulating experiments, constructing experimental 'series' of trials and formulating hypotheses.

The first two sections of this chapter are devoted to tracing the sources of Bacon's experiments with apples, as well as to discussing the critical and creative ways in which he read and interpreted them. In the third section, I will provide arguments for a more general claim, namely, that, despite borrowing primary materials and sometimes fully developed technologies, Bacon did in fact perform some of the experiments he recorded in his writings. Finally, the last section of my chapter is dedicated to examining the various uses to which Bacon put his apples. He set up his experiments with apples to illustrate the motions of the spirits enclosed in matter as well as to classify and define natural processes (such as maturation and putrefaction). They also provided a simplified laboratory model for the study of more complex problems, such as the prolongation of life.

⁵For a more general assessment of Bacon's reading of Della Porta see Rusu 2013. Recent studies have discussed several 'experimental' aspects of Della Porta's *Magia naturalis*. See Borelli 2014, Jalobeanu and Pastorino 2014.

4.2 Dealing with Sources: Commonplaces, Criticism and Creativity

Sylva Sylvarum contains a good number of recipes for the preservation of fruits, though sometimes these are simply abbreviated transcriptions of ancient and modern sources. Such, for example, are Experiments 627, 628 and 655, which deal with how to preserve grapes so that they will ‘continue fresh all winter long’.⁶ One suggestion is to hang them ‘cluster by cluster in the roof of a warm room’; another emphasizes that ‘it is reported’ that the preservation of the stalk ‘helpeth to preserve the grape; especially if the stalk be put into the pitch of elder, the elder not touching the fruit’. Another recipe reads:

Take grapes and hang them in an empty vessel well stopped; and set the vessel not in a cellar, but in some dry place; and it is said they will last long. But it is reported by some they will keep better in a vessel half full of wine, so that the grapes touch not the wine (Bacon 1857–1874, II, 535).⁷

Some of these recipes are formulated as reports relying on other people’s testimony, while others are written in more tentative terms, as if implying that readers are called to try them themselves, verifying in this way the received report. In yet other cases, Bacon gives a list of recipes, written in terms which seem to suggest a previously attempted trial, such as the following list:

The conservation of fruit would be also tried in vessels filled with sand, or with powder of chalk; or in meal and flour; or in dust of oak wood; or in mill (534).

Similar recipes are recorded in the *Historia vitae et mortis*, where a list consisting of sand, chalk, meal and flour is supplemented with other substances, such as wax and plaster, resin, snow and ice, salt water, oil, wine, various ‘liquors’, honey, spirit of wine and quicksilver (Bacon 2007, 169). The language in which such recipes are recorded in the *Historia vitae et mortis* and *Sylva Sylvarum* differs substantially: where the latter merely gives the recipe and suggests a trial, the former offers results and comparative evaluations of the recipes, for instance:

Bodies hung in wine, oil, or lees keep for a long time, *but much longer* in honey, and spirit of wine, but some say that they keep *longest* of all in quicksilver (Bacon 2007, 169, emphases added).

⁶These examples belong to a particular class of experiments in the *Sylva Sylvarum* called ‘promiscuous experiments’. See Bacon 1857–1874, II, 542.

⁷Compare this passage with the following one from Pliny, *Historia naturalis*, XV, 18 (in Philemon Holland’s translation): ‘And more particularly, for Grape bunches they would be gathered with a foot or heele from the old hard wood... then be hung up within a great new earthen vessel well pitched; with the head or lid thereof thoroughly stopped and plastered up close, to exclude all aire... Some againe there be who keepe Grapes together with their braunch, after the same manner in plaster; but so, as both ends of the said braunch, after the same sticke in the head of the sea-*Onion Squilla*: and others let Grape-clusters hang within hogheads and pipes having wine in them: but so, as the grapes touch not the wine in any case’ (Pliny and Holland 1601, 441).

In the *Sylva Sylvarum*, moreover, we can find a further generalization of the same list of recipes. The following observation is recorded in the middle of a theoretical discussion about conservation and putrefaction: 'bodies in shining amber, in quick-silver, in balms... in wax, in honey, in gums and (it may be) in conservatories of snow, &c. are preserved very long' (Bacon 1857–1874, II, 589).

Did Bacon perform these experiments? Did he actually place apples and other fruits under different conditions, comparing the results, as some of the recorded experiments seem to suggest? Or was he simply systematizing in these 'experiments' received recipes and observations recorded in earlier books? The answer cannot be a simple one. On the one hand, none of the recipes recorded in the *Sylva Sylvarum* or *Historia vitae e mortis* is 'new': all the conditions, substances and suggested trials recorded by Bacon can be found in other ancient and modern authors. On the other hand, these recipes do not come from a single tradition. Some belong to the more traditional discipline of husbandry,⁸ while others can be found in books of natural magic or books of secrets (where they are often called 'experiments').⁹ Bacon has clearly read both kinds of material, for he commends 'collections made of agriculture' (Bacon 1857–1874, III, 332), and, although he is highly critical of 'books of fabulous experiments and secrets' (330), he nevertheless recommends the assembling of two large 'calendars' of 'inventions' and 'useful experiments'.¹⁰

An example of this approach is Bacon's so-called 'promiscuous experiments' (624–629 from the *Sylva Sylvarum*), all of which deal with the conservation of

⁸Scholars tend to distinguish sharply between the Roman tradition of husbandry as preserved in books on *de re rustica* and the more modern tradition of natural history (histories of plants and herbals). The first is a discipline midway between 'economics' (in the Aristotelian sense) and agriculture. In the sixteenth century, this discipline of husbandry became very popular in Italy and France (and subsequently in the rest of Europe). The ancient sources of this tradition were Marcus Porcius Cato's *De agricultura* (c. 160 BC), Marcus Terentius Varro's *De re rustica* (c. 37 BC) and Lucius Iunius Moderatus Columella's *De re rustica* (60–65 AD). To these were later added compilations such as a fifth-century book on *res rusticae* by Palladius and the later *Geoponica* (tenth century AD). By the mid-sixteenth century, these sources often appeared bound together under the common name *De re rustica* (see, for example, Giocondo 1514) and many books in the vernacular had been added to this ancient tradition. Part translation, part adaptation of ancient traditions, these works became quite popular, translated and adjusted to 'local' contexts. Such, for example, is Charles Estienne's compilation from Columella, 'adapted' to French agricultural practices and further translated and adapted into English by Richard Surflet (see Estienne and Liébault 1570; Estienne and Surflet 1600; Orsi 2005). Although the situation becomes more complex when it comes to the flourishing literature on agriculture and gardening, nevertheless, with respect to the kind of recipes and experiments concerning the preservation of fruits, this division remains useful. This material belongs mainly to a particular chapter in books on husbandry, a chapter dedicated to preserving and increasing 'household stuff' in a farm. On the reception of the classical tradition of husbandry, see Fussell 1969 and Bushnell 2003.

⁹On the relation between Della Porta and the tradition of 'secrets', see Eamon 1984, 1994; Ruscelli [Alexis of Piedmont] 1984; Orsi 2005.

¹⁰In this instance, by 'usefulness' Bacon understands 'productivity', that is, experiments which prove to be conducive to new inventions and experiments. He explicitly mentions modern 'technologies' in this chapter, as in the recipe for the artificial freezing of water. See Bacon 1857–1874, IV, 369; III, 362–363.

fruits. The first gives a traditional recipe for keeping quinces in syrup of honey, as well as possible variations of the same recipes in which one replaces the honey with syrup of sugar or sugared wine. The second provides a list of good preservatives and fruit-lofts; vessels ‘filled with fine sand, or with powder of chalk’, ‘meal and flour’, ‘dust of oak wood’ and ‘mill’. The third experiment explains how to pick fruits so that they might last long: for instance, it is suggested that they be picked just before they are fully ripe, in dry weather, and at noon, ‘when wind bloweth south; and when the moon is under the earth, and in decrease’ (Bacon 1857–1874, II, 534–535). The fourth offers recipes for the preservation of grapes hung ‘in a dry place’, or in a vessel half-filled with wine. The fifth specifies the need to isolate the stalk of the fruits by putting it into elder pith, while the sixth mentions the traditional recipe of keeping fruits in bottles ‘let down into wells under water’. What Bacon is thus offering in this string of experiments is an interesting *selection* of recipes for the preservation of fruits.

One of Bacon’s possible sources for this particular kind of experimental activity is Pliny’s *Historia naturalis* (c. 77–79 AD). In Book 15, Chap. 18, he gave a list of recipes which was itself an abbreviated discussion of a subject that had already been treated extensively by such authors as Cato, Varro and Columella, a subject traditionally belonging to the field of husbandry (*oeconomia*). The chapter makes reference to quinces ‘boiled or soaked in honey’, to pomegranates or apples kept in ‘large jars of sand’, in flour or milk, and to grapes stored in earthenware vessels ‘carefully smeared with a coating of pitch’ and sunk ‘into wells or cisterns’. It also contains the suggestion that one thrust the stalk of apples ‘into elder pith’. Pliny also gives two (conflicting) recipes for how to pick the fruits in such a way that they may last a long time. In the first, apples are to be picked after the autumn equinox, ‘not before the sixteenth day of the moon nor later than the twenty eight day of the moon’, on a dry day, early in the morning ‘an hour after sunrise’. The second recommends to pick the fruit ‘before it is completely ripe’, towards noon on a dry day, when the wind blows from the south, and ‘when the moon is waning’ and ‘below the horizon’.¹¹ Of the two, Bacon selects the second, but leaves out some of the other recipes mentioned by Pliny in the same chapter, such as to pack fruit in flocks of wool, to enclose apples and pears in small individual earthenware pots and to submerge them under water, or to use ‘potters clay’ to cover grapes and dry them in the sun before hanging them in a dry place.

In conclusion, Bacon’s series of experiments reads as a selection of recipes borrowed from Pliny and the ancient tradition of husbandry, but with two notable additions: the proposal to replace honey with sugar or sweetened syrups, and the replacement of earthenware pots with glass bottles. Both are extensions of the ancient recipes for the preservation of fruits, using ‘modern’ technologies (glass) and substances (sugar). The first is common in the literature on husbandry, natural

¹¹ Pliny, *Historia naturalis*, XV, xviii, 62: ‘E proximis quidam altius curam repetunt, deputarique statim poma ac vites ad hunc usum praecipiant decrescente luna, post horam diei tertiam, caelo sereno aut siccis ventis. Similiter deligi et ex locis siccis et ante perfectam maturitatem, addito ut luna infra terram sit’. See Pliny 1949–1962, IV, 331.

magic and books of secrets at the end of the sixteenth century.¹² The preservation of fruits in vials of glass is described at length in Book 4 of Della Porta's *Magia naturalis*, in the context of a general discussion in which ancient recipes on how to preserve fruits are closely evaluated. After mentioning various recipes for creating artificial 'fruit-safes', that is, devices for hermetically isolating the fruits from the surrounding air,¹³ and after discussing various ways to seal and plaster such vessels, Della Porta claims to have repeatedly shown that fruits and flowers 'shut up in vessels of glass' and 'drowned in Cisterns, or ditches, or some place underneath the ground' last the longest without putrefaction (Della Porta 1658, 121).¹⁴

Fruits are to be laid up in vials of glass, as we shewed before: and when the pipe or neck of the glass is stopt close up, then they are to be drowned in cisterns, and they will last good for certain whole years. Likewise, flowers are to be closed up in a vessel that is somewhat long, and the neck of it must be stopt up [*per Hermetis sigillum*, in the original], as we viewed before, and then they must be cast into the water: for by this means they may be kept fresh for a long time. I have also put new wine into an earthen vessel that hath been glazed within, and have laid it in the water with a weight upon it to keep it down; and a year after, I found it in the same taste and goodness, as when I put it into the vessel. By the like device as this is, we may preserve things that are shut up, even for ever (Della Porta 1658, 128).¹⁵

In this way, Della Porta goes one step further than traditional recipes for preserving fruits over the winter, and offers a general 'technology' for preservation: sealed glass bottles placed under water in deep wells protect the enclosed objects from the variations of the surrounding air and thus delay putrefaction.¹⁶ The procedure is no longer directed solely towards the preservation of fruits; it is extended to flowers, meat, wine and other bodies. Also, it is no longer strictly concerned with how to preserve bodies for the purpose of simple utility: what these recipes suggest are more general ways of delaying, or even preventing putrefaction. They lead to the

¹²On the more general interest in producing glass cheap enough to be used for greenhouses and gardening, see Thick 2010, 57ff.

¹³*Oropothecas* is a term introduced by Varro to designate a place for storing fruits. With Della Porta it becomes a technological device which isolates fruit from the damages produced by heat and variations in the air (see Della Porta 1589, 175). The English translator renders this term as 'fruit-safes' or 'artificial fruit-safes'. For a more general discussion in Della Porta, see his work *Villae libri XII*, Chap. 28, entitled 'De oropothecis' (Della Porta 1592, 56–57).

¹⁴See also Della Porta 1658, 126: 'For I have oft-times observed it, being seriously employed in these affairs, that if the air be uniform, and without alteration, the fruits and flowers that have been shut up in vessels of glass, have lasted long without any putrefaction: but when once they felt any alteration in the air, presently they began to putrefy. For this cause are those vessels to be drowned in Cistern, or ditches, or some place underneath the ground, that so the variable alterations of the air may not be felt by the fruit'.

¹⁵See also Della Porta 1589, 85: 'Fructus, uti diximus, in vitreas phialas conditos, ac vitrariorum fornaci, vel tubulo lumini clausos sub cisternis mergimus, et ad annos incorruptos servamus. Eodem modo clausos flores in oblongo vase, et collo ut diximus ocluso, scilicet per Hermetis sigillum, ut dicunt, et sub aquis mersos, diu, multumque recentes asservavimus. Item mustum in vas sigillum vitreatum clausum, et pondere sub aquis demersum, ad annum, ut posuimus invenimus'.

¹⁶The recipe is listed under the very general title: 'How all things that are shut up, may be preserved for many years' (Della Porta 1658, 128).

general conclusion that sealing up perishable materials in durable substances can permanently prevent putrefaction.¹⁷ Della Porta's favorite example is amber: sealed in amber, bodies are preserved forever. Consequently, Chap. 8 of Book 4 of *Magia naturalis* ends with a recipe on 'how to make amber soft' in order to use it as a universal preservative. Della Porta also mentions other 'universal' preservatives: quicksilver,¹⁸ distilled spirit of wine¹⁹ and the more general (and also more mysterious) effect of cold in preserving bodies and delaying putrefaction.²⁰ For each of these 'universal' preservatives, Della Porta claims he has made 'experiments' and 'trials'.²¹

Book 4 of *Magia naturalis* is a curious mixture of traditional recipes and new experiments, of mere collections of 'trials' and serious reflections on the limits and methods of experimentation. At first sight, it contains the same kind of miscellaneous materials about 'husbandry' that we find in Book 12 of Columella's *De re rustica* (60–65 AD).²² It deals with how to preserve the products of farming, how to increase 'household stuffe', how to ensure the good administration and the good life

¹⁷Della Porta 1658, 130–131: 'things that are shut up, even for ever, if we wrap them up in some commixtion of other things, so that the air may not pierce them through; but especially, if the commixtion it self be such, as is not subject to putrefaction'.

¹⁸Under the title 'Quicksilver will preserve all things from putretude', Della Porta provides a general recipe for placing fruits in vessels and 'cast[ing] quicksilver upon them', in order to 'preserve them long and well' (Della Porta 1658, 140).

¹⁹Della Porta claims that all things can be preserved in distilled wine, which is 'free from all putrefaction whatsoever: wherefore all things that are drenched in this kind of liquor, if the vessel be carefully closed up, must needs last unputrefied even for a hole age, nay for all eternity' (Della Porta 1658, 134).

²⁰The chapter on fruit-safes ends with a paragraph on the preserving powers of cold: 'I have seen flesh and fish preserved from putrefaction, for a whole moneth together in very cold places, without any other art at all besides the coldness of the place. In rooms that are made under the ground, and very cold, where there cometh neither heat, nor any Southerly winde, but that they are continually cold and dry, almost every thing may be preserved without putrefaction. [*In subterraneis locis, et frigidissimis, ubi omnis calor, et austrinus ventus exclusus est, ubi perpetua siccitas et frigiditas est, Omnia imputrida, asservantur*']'. The passage continues with two observations: first, that 'in a certain monastery' near Naples, human cadavers (*hominum cadavera*) were preserved 'for many years together', and second, that fruits placed in 'pits of snow' have survived the winter completely unchanged. From this, Della Porta concludes that 'there is nothing better and more available for the preservation of any thing, then is the dryness and the coldness of such places as they are laid up in, to be kept. [*In summa nil praestabilius ad rerum conservationem, quam loci siccitas, vel frigiditas valet*]' (Della Porta 1658, 116–117; Della Porta 1591, 178).

²¹As Eamon has shown, in the sixteenth century the terms 'secrets' and 'experiments' were sometimes used interchangeably to denote a recipe or a formula that had actually been put to the test. In these trials there is always a mixture of bookish sources and new inventions. The 'experimenters' sometimes collaborate along the way in collecting recipes. See Eamon and Paheau 1984, 333; Eamon 1985, 484.

²²Book XII of Columella's *De re rustica* deals with the duties and 'offices' of the farmer's wife. They extend from taking care of the household stuff, provisions and furniture, to ministering to the health of the household. The preservation and conservation of the products of the farm forms the most important part of the chapter. Recipes are offered for picking herbs, fruits and vegetables, storing them, making preserves, oil, wine and distilled drinks. See Columella 1745, XII, 500ff.

of the farmer and his household.²³ By the end of the sixteenth century, this way of organizing the subject had become a widespread literary model for many books on husbandry.²⁴ A good number of these works, however, differ significantly from the ancient tradition of *res rustica*, as does Della Porta's book on 'increasing the household stuffe'.

There are at least three important ways in which Della Porta's ideas on how to preserve things differ from the classical tradition. First of all, his interest is not only confined to finding the best recipe for preserving fruits for the winter, but relates to a more general attempt to delay putrefaction 'for many years', or even 'forever'.²⁵ His evaluative and comparative discussion of various received recipes and methods of husbandry is clearly directed towards discovering the best devices to ensure long-term preservation of fruits, flowers, liquids, meat and corpses.²⁶ Some traditional methods are subject to close scrutiny and criticism, and new methods are proposed to replace the traditional recipes of Varro, Columella and Palladius.²⁷ Book 4 of *Magia naturalis*, therefore, is more than a traditional compilation of recipes and, in this respect, differs substantially from all other traditional books on husbandry, natural history and agriculture. Della Porta offers a selection of the best methods and a comparative and quite critical discussion of ancient sources. In some cases, he clearly goes a step further and discusses the limits of various experiments. In a characteristic manner, Della Porta writes, for example, of which fruits can and which fruits cannot be preserved in honey, demonstrating thereby that honey is not

²³ Book 4 of *Magia naturalis* also contains materials developed more fully in his *Villa*. As Orsi has shown, Della Porta used the results of his investigations in *Villa* to expand (to the point of rewriting) the first edition of the *Magia naturalis* (see Della Porta 1592 and Orsi 2005).

²⁴ See, for example, the additions and changes made to the organization of the translation and adaptation of Book 12 of Columella's *De re rustica* by Charles Estienne, Jean Liebault and Richard Surflet. In Estienne's *Agriculture* (1570), the contributions of the farmer's wife are redefined. She is in charge of the health of the household and of the breeding of cattle and fowls. The breeding of fowls extends also to pheasants, doves and peacocks. Meanwhile, the parts about preserving fruits, making wine and olive oil are redistributed in the chapters dedicated to gardens. In Richard Surflet's edition of Estienne's *Maison Rustique, or the Countrie Farme*, the medical contributions of the farmer's wife, for example, are widely extended. So are the sections on the medicinal properties of herbs, fruits and vegetables cultivated on the property (Estienne and Liebault 1570; Estienne and Surflet 1600).

²⁵ More generally, Della Porta's interest is in producing marvelous objects (*meraviglia*), objects that will create wonder and testify the power of the magician (see Orsi 2005; Balbiani 2001). Della Porta's critical discussion of ancient sources of husbandry, however, is also worth noting. In Book 4, he constantly engages in comparisons of ancient recipes, sometimes specifically rejecting one in favor of another. See, for example, Della Porta 1658, 112.

²⁶ One of the recurrent topics of Book 4 is the preservation of human bodies in cold, in snow and honey. Della Porta also gives a recipe for mummification (Della Porta 1658, 140–141).

²⁷ Almost every chapter of Book 4 begins with a selection of ancient recipes followed by what Della Porta claims to be his own trials and recipes. Sometimes this is also announced at the beginning of the chapter. For example: 'We have shewed before, that, if we would preserve fruit long, we must keep away both heat and moisture from them; both which qualities are found in the air. Wherefore we will first set down the devices of Antiquity in this behalf, and then our own device and experiments' (Della Porta 1658, 123. See also Della Porta 1658, 112, 114, 120).

a universal ‘preservative’, as was traditionally assumed.²⁸ By contrast, amber, quicksilver and spirit of wine are better and more universal preservatives. This also relates to the third significant difference between Della Porta’s treatment of preservation and the way in which the subject had been handled in the classical tradition. Although the emphasis of Della Porta’s natural magic is on the production of marvelous objects and extraordinary processes, such as mummies, flies, vipers and other animals enclosed in amber and flowers preserved in quicksilver, it is equally clear that the production of natural magical technologies relies on a certain amount of theoretical support. In the case of conservation, preservation and the devising of things that last ‘forever’, the technology of creating ‘artificial fruit-safes’ is based upon a causal theory about putrefaction. There are two major causes behind putrefaction, and they both act in the same way, that is, through air, more precisely, through what Della Porta calls the ‘inequalities of the air’,²⁹ namely, changes in the levels of heat and cold together with varying (and sometimes conflicting) influences of celestial bodies.³⁰ In order to prevent putrefaction, the practitioner in natural magic has to isolate the body from all external influences. This isolation includes two components: hermetical sealing (excluding the direct action of the air upon the body) and thermal isolation (in order to prevent a situation in which the body is affected by variations in the surrounding air).

Echoes of Della Porta’s views on the preservation of bodies abound in Bacon’s natural histories. Incidentally, the manuscript of the *Sylva Sylvarum* explicitly quotes ‘Porta. Fol. 195’ as a source for a trial recorded as ‘Leven to last a year’.³¹ However, while Della Porta’s interest in leavening occurs in a chapter on making

²⁸Della Porta 1658, 130: ‘I have endeavoured my self in this Practise, how to keep fruits without putrefaction, and for this cause, I laid up all kinds of fruits in vessels of glass filled with honey, that so I might prove, which might be preserved longest: and I found great difference among them, some kinds lasting long and some but a little while. For, the fruits that were by their own kind, full of moisture, did attain the honey: so that the honey begin it self attained, was not possibly able to preserve the fruit from putrefaction. Grapes, Figgs and Peaches are soon putrified by reason of their moistness; quinces, apples and pears do last longer uncorrupted; but Nutts will last green and sound a whole year together’. See also his similar discussion about the limits of other traditional recipes for the preservation of fruits, such as keeping them in wine and vinegar (Della Porta 1658, 134).

²⁹This phrase encompasses not only variations of temperature and humidity, but also other qualities of the air, such as a certain tendency to putrefy or produce putrefaction determined by a particular astral configuration, for instance, a ‘pestilence’ of the air. For a more extended discussion, see Della Porta 1592, 56–57.

³⁰An elaborate discussion of the agents of putrefaction can be found in Della Porta’s *Villa*, where the focus is less on experiments and the production of marvelous effects and more on theoretical debates over the agents and causes of putrefaction amongst the ancients (see Della Porta 1592, 51–53).

³¹I have used Graham Rees’s transcription of Bacon’s manuscript in Rees 1981. The reference is to Della Porta’s 1591 edition of *Magia naturalis*. The recipe in the 1658 translation reads: ‘If you would have leaven last you all the year, when the new wine hath boiled in the vessels, skim off the froth that boils on the top, and mingle with it Millet-meal, and work it well together, and make morsels of it, which dry in the Sun, and lay up in a moist place; and you may take a sufficient quantity and use it for leaven’ (Della Porta 1658, 142).

bread, Bacon is more interested in the clarification, maturation and preservation of beer. Both in the manuscript of the *Sylva Sylvarum* and in the published text, experiments which deal with apples are on adjacent pages with similar experiments concerning bottles of beer. Folio 43^r of the manuscript begins with the following list:

l Beere in Lime. l Beere in Dung l Beere hangd vp in Smoke. l Beere in Bran. ll Beere twice a day iogged in the wheele-barrow. l Beere swung 4. times in a day (Rees 1981, 405).

Bottles of beer also appear on different lists, for example on a list of 'experiments' to be tried in a conservatory of snow and on a list of 'burials'.³²

The published version of the *Sylva Sylvarum* records the potential results of such trials. However, they are developed in separate sets of experiments, and Bacon makes it clear that they deal with different problems. One set of experiments treats simply of methods for the preservation of beer once this is made; they can be seen as simply extended treatments of knowledge accumulated from Della Porta and various books on husbandry, dealing with a range of subjects that goes from apples and wine to beer. Another set of experiments refers to ways of making beer, of accelerating the process of 'clarification' of new beer and its 'maturation'. This time, the conditions suggested go against traditional recommendations for good preservatives in the matter of husbandry, such as dung (an agent of putrefaction), hot ambers or 'rotating' bottles to speed up the process of maturation and fermentation. Consider, for example, the following experiment:

Take bottles and swing them, or carry them in a wheel-barrow, upon rough ground, twice in a day; but then you may not fill the bottles full, but leave some air; for if the liquor come close to the stopple, it cannot play nor flower: and when you have shaken them well either way, pour the drink into another bottle, stopped close, after the usual manner; for if it stay with much air in it, the drink will pall; neither will it settle so perfectly in all the parts. Let it stand some twenty-four hours, then take it, and put it again into a bottle with air, *ut supra*: and thence into a bottle stopped *ut supra*: and so repeat the same operation for seven days. Note that in the emptying of one bottle into another, you must do it swiftly, lest the drink pall. It were good also to try in a bottle with a little air below the neck, without emptying. This instance is referred to the even distribution and refining of the spirits of motion (Bacon 1857–1874, II, 444).

Not only is this experiment not taken from Della Porta; it is also too complex and detailed to be a mere theoretical extension based upon traditional experiments in husbandry (say, experiments relating to the production and preservation of wine). It has many significant details, including quantitative directions regarding the lapse of time and the number of repetitions necessary to produce the effect. It contains methodological caveats relating to the limits of the recipe and the procedures to be followed, not to mention a reference to a possible theoretical explanation. Moreover, it is clear that through these experiments involving fruit or bottles of beer Bacon

³²For example, fol. 39^r contains a list of '*Infusions or Burialls of Bodies in Earth*', in which various substances are mentioned, such as eggs, wax, flowers, flesh and oyster shells. Some of the objects are marked with a star, suggesting perhaps that that particular trial was done or 'sorted out'. Marked with stars are oranges, apples and 'A Bottle of Beere'. The list ends with an interesting remark concerning the repetition of the suggested trials: 'Each in 3 seueral places' (Bacon 1996, 403).

intends to study similar processes under similar conditions, in this case, the fact that spirits entrapped in matter produce effects after a certain lapse of time.

What we can see in this series of experiments is the creative ways in which Bacon uses accumulated knowledge. Although he incorporates many of the traditional trials and recipes found in Pliny, Columella and Della Porta, Bacon employs them as merely ‘materials for the building’ of quite different ‘experiments’, trials and recipes. He first makes a selection of experiments, to which he frequently appends comparative and detailed studies of the results; to these he then adds his own contribution to the initial recipe. In doing so, Bacon does not act very differently from Della Porta, who applied the same amount of critical and creative reading. Bacon, however, might be seen as moving a step further (in the same direction), through extending the series of observations from fruits to bottles of beer.

Another characteristic way in which Bacon borrows experiments from previous authors concerns critical (and theoretical) reflections.³³ For example, he clearly takes from Della Porta a list of preservatives which were very dear to the natural magical tradition, such as spirit of wine ‘well rectified’, quicksilver and amber. The reference is at times almost verbatim:

We see, how flies and spiders, and the like, get a sepulcher in amber, more durable than the monument, and embalming of the body of any king. And I conceive the like will be of bodies put in quicksilver.³⁴

The same list of preservatives is detailed in ‘*Experiment solitary touching prohibition of putrefaction and the long conservation of bodies*’, which begins with a recipe for mummification (also given by Della Porta), and continues with the bold statement that ‘putrefaction, which we conceive to be so natural a period of bodies, is but an accident’. The paragraph continues with a list of Della Porta’s favourite preservatives:

And therefore bodies in shining amber, in quicksilver, in balmes (whereof we now speak), in wax, in honey, in gummes, and (it may be) in conservatories of snow, &c., are preserved very long (Bacon 1857–1874, II, 598).

In the very same passage, Bacon is also openly critical of Della Porta. First of all, he does not agree with Della Porta’s theory regarding the agents and causes of putrefaction. Nor does he agree with the possibility of preserving bodies forever, regardless of whether they are stored in amber, quicksilver, ‘balms’ or conservatories of snow. Quite to the contrary, Bacon clearly states that in order to be preserved in amber bodies need to be relatively small, thin and devoid of all moisture. Moist bodies will putrefy, no matter how well sealed, and the spirit enclosed in them will find

³³For a more general discussion of Bacon’s criticisms of Della Porta’s experiments, recipes and ‘technologies’ see also Rusu 2013.

³⁴In the corresponding passage, Della Porta refers to one of Martial’s *Epigrams* (IV, 59), where the Roman poet had described the amber that enclosed a viper as a nobler and more lasting tomb than the one of Cleopatra herself: ‘Flentibus Heliadum ramis dum vipera repit | Fluxit in obstantem succina gemma feram, | Quae dum miratur pingui se rore teneri, | Concreto riguit vincta repente gelu, | Ne tibi regali placeas, Cleopatra, sepulchro, | Vipera si tumulo nobiliore iacet’ (Della Porta 1658, 128; Della Porta 1589, 85).

a way to get out, regardless of how thick the isolating material is. For Bacon, there are two major causes of putrefaction, located respectively in the body and in its surrounding environment:

All putrefactions come chiefly from the inward spirits of the body; and partly also from the ambient body, be it air, liquor, or whatsoever else. And this last, by two means: either by ingress of the substance of the ambient body into the body putrefied; or by excitation and solicitation of the body putrefied, and the parts thereof, by the body ambient (Bacon 1857–1874, II, 612).

Given these premises, Bacon concludes that, although useful, hermetic isolations and the exclusion of the surrounding air are not sufficient to delay or prevent putrefaction.³⁵ Further difficulties have to be overcome, such as the nature of the body under investigation and its interaction with the surrounding enclosure. In part, it is a problem of scale: if leaves, minute insects and other small and dry bodies might be trapped 'forever' in amber or ice, the same is not valid for fruits, flesh, corpses or any other bodies in which the spirit can move and 'make a round and circulation within themselves' (Bacon 1857–1874, II, 384). This means that practically any body large enough or 'gross... may corrupt within itself' (589).³⁶ In this case, the inner spirit will continue its workings and will try to find a way out of the closure, irrespective of how hermetic the sealing is. The third, and perhaps most important part of the problem of preservation is related to the surrounding enclosure. It involves finding bodies 'not commaterial, but merely heterogeneal towards the body that is to be preserved' (589), and for this role quicksilver is one of Bacon's favourite candidates. The manuscript of the *Sylva Sylvarum* contains numerous references to experiments with fruits and flowers 'hung in quicksilver', with apples 'dipped' in quicksilver or with pieces of raw flesh 'buried' in quicksilver.³⁷ However, they are clearly not experiments for preserving things 'forever'. The time recorded in such experiments is rather short; it can be days, or weeks, but no longer than a month. Only one of these experiments is recorded in the published version:

Take a stock-gilly-flower, and tie it gently upon a stick and put them both into a stoop-glass full of quicksilver, so that the flower be covered: then lay a little weight upon the top of the glass that may keep the stick down; and look upon them after four or five days; and you shall find the flower fresh, and the stalk harder and less flexible than it was. If you compare

³⁵ Bacon argues that as far as 'human working on natural bodies' is concerned, 'much upset' is caused by the 'common air which is all round, and thrusts itself upon us, and by the rays of the heavenly bodies'. As a result, it is essential that such factors be eliminated. Under the multi-purpose instances (*instantiae polychrestae*), he discusses the theory and 'technology' underlying the creation of these sealing devices (Bacon 2004, 418–419).

³⁶ Bacon also notes that the exclusion of air, far from preventing putrefaction, speeds it up in those bodies 'that need emission of spirits to discharge some of the superfluous moisture'. This is why clothes that are not regularly aired breed mold, or grains that are stored over winter and are not regularly turned over become moldy (Bacon 1857–1874, II, 454).

³⁷ See, for example, 'A piece of raw flesh buried in Quicksilver for 9 daies, came forth fresh, and some bloud had wrought it selfe out, and lay on the outside of the Quick-silver, and about the stick that kept it downe. It was waxed a little blacker on the outside only, but not apparently hardened' (Rees 1981, 402).

it with another flower gathered at the same time, it will be more manifest. This sheweth that bodies do preserve excellently in quicksilver; and not preserve only, but by the coldness of quicksilver indurate; for the freshness of the flower may be merely conservation; (which is the more to be observed, because the quicksilver presseth the flower;) but the stiffness of the stalk cannot be without induration, from the cold (as it seemeth) of the quicksilver (Bacon 1857–1874, II, 598).

There are evident similarities between this experiment and analogous trials conducted by contemporary practitioners of natural magic. Its expected result is clearly shared: a remarkable ‘object’ that will most probably create wonder. Moreover, the carnation dipped in quicksilver has unusual and unexpected properties; fresh as it may look, it becomes stiff and hard. On the other hand, the way in which Bacon records his experiments differs in significant ways from Della Porta’s recipes for natural magical findings. Differences regard, firstly, details. The reader is instructed about what to do and receives full information about what is to be obtained after five days. Secondly, the results of the experiment are assessed by comparison with a standard case: the dipped flower is contrasted with another flower gathered at the same time, so that it is possible to gauge the level of their respective ‘freshness’. Finally, Bacon intimates that the experiment produces not one, but two effects: though it is kept ‘fresh’, the flower suffers a process of ‘induration’ (that is to say, it becomes stiff and hard). We are even offered a causal explanation: induration is brought about by the coldness of quicksilver.

4.3 Technologies, Experimentation and the Books of Secrets

Although Bacon’s experiments recording the effects of placing flowers, fruits and flesh in quicksilver are more sophisticated and detailed than Della Porta’s recipes, it would be premature to assume that the difference is due solely to the fact that Bacon performed them. In fact, many of Della Porta’s recipes for preservation became common stock in the sixteenth-century literature on secrets. In the specific case of Della Porta’s technology concerning the construction of ‘fruit-safes’, I have identified at least one important follower amongst Bacon’s contemporaries, namely, Sir Hugh Platt (1552–1608). Platt’s book, *The Jewell House of Art and Nature* (1594), opens with a chapter entitled: ‘Sundry new and artificial ways for the keeping of fruits and flowers, in their fresh hue, after they are gathered from the stalks or branches’.³⁸ The chapter advocates technological solutions drawn from Della Porta, developed with the same creative and critical flair I have thus far attributed to Bacon.³⁹ Similar techniques can also be found in Platt’s other books, for example in

³⁸The popularity of Hugh Platt’s *Jewell House* in the seventeenth century is subject to contention. While Deborah Harkness makes a case for the book’s popularity, Malcolm Thick claims that by comparison with other works by Platt, *Jewell House* is the least popular. It is fair to say, however, that the book went through a second edition in 1653 and parts of it were published separately as pamphlets. See Harkness 2007; Thick 2010.

³⁹For Platt’s reading of Della Porta’s *Magia naturalis*, see Mukherjee 2010 and Thick 2010.

his widely read *Floraes Paradise* (1608).⁴⁰ Platt presents himself as both a champion and a critic of Della Porta, whom he reprimands for using a 'cloudy and dark' language.⁴¹ All this calls for a more careful comparative examination of Platt's and Bacon's technologies of experimenting with fruit. We might inquire, for instance, whether Bacon's critical and creative borrowings were the mere result of a common technique of reading, learning and experimenting that was widely available at the time through the popular books of secrets.

As a Cambridge educated gentleman, trained at Lincoln's Inn and practicing the law, Platt is not the most likely trader of secrets. His books represent a strange mixture of scholarly pursuits and strikingly wide interests in natural history, husbandry, the mechanical arts, alchemy and natural philosophy, with a practical concern for the improvement of the land, the cultivation of new species, knowledge of ciphers and the discovery of innovative methods for distillation, germination and the prolongation of life. Platt's vast knowledge and experimental skill – but, most of all, his manner of reasoning on the basis of experiments followed by queries, further developed in new experiments and then supplemented by theoretical hypotheses, which, in turn, are tested by other experiments – are so strikingly similar to Bacon's form of experimental philosophy that Deborah Harkness has reached the conclusion that plagiarism was involved on Bacon's part.⁴² My purpose in this chapter is not to substantiate or refute such accusations, but rather to concentrate on examining particular instances of similarity and divergence between Bacon's and Platt's experiments with fruit, plants and beer. There are numerous references in Bacon's natural historical works to the types of experiments and recipes tried or merely suggested in Platt's books. They are enough, in fact, to suggest that a careful comparative study of the two corpuses is necessary in order to establish what may in fact be another important source behind Bacon's project for a 'new' natural history. For the present purpose of this chapter, however, it does not really matter whether Bacon actually read Platt and borrowed directly from his books. I take Platt's experiments and recipes as representing another way of reforming the ancient tradition of husbandry, and I compare them with Bacon's similar concerns and reformulations of the same problems.

Platt offers many experiments for the preservation of fruit, flowers, wine and beer. He is interested in both the economic aspects of their preservation and the provision of theoretical explanations. He claims that his experiments and recipes are a mixed bag: 'some are but mine own Conceits and Quaeres, and some, the reports of other mens practices'. Some are said to have failed but still be worthwhile for their 'probabilities'. Others are good to learn, in order to find out more about nature

⁴⁰ For a discussion of Platt's *Florae* and a discussion of Bacon's borrowings of gardening recipes from it see Rusu 2013.

⁴¹ Platt 1608, A4: 'And I make no question, but that if hee [Della Porta] had knowne this part of vegetale Philosophy... he would have penned the same as a Sphinx, and rolld it up in the most cloudy and darksome speech that he could possibly have devised'.

⁴² Harkness 2007, 248–249. For a more nuanced discussion of Platt's projects and outlook, see Thick 2010.

and her secrets. Platt is clearly familiar with Della Porta's 'fruit-safes'. The first chapter of *The Jewell House* offers, in fact, Platt's own improved versions of 'fruit-safes' with a critical discussion of Della Porta. His recipes for the preservation of fruit extend from the more traditional leaden pots for each kind of fruit and flower (pots which are subsequently buried and isolated from the heat of the air, earthen pots 'well leaded within, and covered with earthen covers, well burnt and leaded likewise cementing or closing them together with the Goldsmiths wax or cement, consisting of stone pitch, rosen, powder of brick and such like') to glass bells which cover miniature silver trees where one can hang cherries for as long as 'two whole moneths' (Platt 1594, 2–4). The glass bells are submerged in a large pot of distilled water.⁴³ In addition to presenting various methods for storing fruits, Platt devotes much attention to the general issue of isolation and sealing:

These little pots you must place within greater, and these greater within vessels of wood, stopping up every breathing place that you can imagine (for here I can assure you that the ayr will be a player, unless you can keep it out of the Alley perforce). If you would afterwards bury these vessels, then were it requisite to pitch them well, both within and without (Platt 1594, 2).⁴⁴

Although he discusses the use of earthen pots and vessels made of lead, Platt clearly prefers glass vessels as being 'the best of all others'.⁴⁵ He also offers a recipe on how to prepare and seal glass vessels, specially designed for the purpose of preserving fruit and flowers over the winter. He has his own recipe for the *Sigillum Hermetis*, which is quite different from Della Porta's:

Yet some commend the keeping of fruit or flowers in glasses made of purpose for them, to be the best of all others, so as the glasses be made with long necks, and be nipped (*hermetice*) with a pair of hot tongs, the manner whereof you shall find hereafter set down (Platt 1594, 2–3).⁴⁶

Such sealed glasses are to be further isolated by immersing them into cold water. Other forms of sealing listed in the *Floraes Paradise* involve oiled paper, but also linseed oil boiled together with 'powder of amber' (Platt and Bellingham 1659, 149). One such recipe, moreover, records an interesting – and quite 'Baconian' –

⁴³ Platt also offers a recipe for manufacturing a silver tree and a glass bell, and discusses distillation as a means of preventing water from putrefying.

⁴⁴ See also his recipe on '[h]ow to nip or close a glass with a pair of hot tongs, which is commonly called *Sigillum Hermetis*' (Platt 1594, 87).

⁴⁵ Platt claims that preserving fruits in glass bottles is to be preferred, particularly by comparison with more traditional recipes, which suggest the coating of fruits in 'wax well tempered with Turpentine, Pitch, Rosen, Sweet suet, or Barrows greace'. Such techniques are deemed useless for those fruits which 'begin to rot first at the core, as the Katherin pear, & divers other sorts of fruit do' (Platt 1594, 2–3).

⁴⁶ The recipe for the *Sigillum Hermetis*, i.e., of how to seal a glass by melting its top with a pair of tongs, is given in Platt 1594, 87–88.

query, that is, whether 'a Bladder will not serve instead of oily paper' (Platt and Bellingham 1659, 150).⁴⁷

Even more interesting than Platt's recipes and suggestions, however, is the way in which he deals with the question concerning the limits of such experiments. Unlike Della Porta, Platt does not claim to be able to keep fruits 'for a very long time' or 'for ever'. In fact, he is explicitly critical of boastings of this kind and claims that, no matter how hermetical the sealing is, fruits will eventually begin to putrefy. The argument is partly empirical, partly theoretical:

But if the fruit begin to rot first at the core, as the Katherin pear, & divers other sorts of fruit do, then all the outward covers and enclosures whatsoever (yea though they were dipped in dissolved Amber which is counted the purest and most defensative ferment of all the rest) will never be able to turn nature out of her bias. Here also sharp spirited wits have imagined that if spirit of wine well rectified, were fluted with the imbibition of any flower, until it could work no more upon the same, that thereby it were possible to preserve any flower of the same kind, along time therein. But this is to be understood onley of the dry leaves which bring nothing else but the tincture and strength of the hearb with them, and not of the moist leaves, which will leave a putrifying flame behind them, which in time will help to corrupt them (Platt 1594, 2–3).

From his observations in the field of gardening, Platt simply offers examples of fruits putrefying 'from the inside', thus providing evidence contrary to the accepted theory according to which putrefaction begins at the stalk. To this he adds an argument relating to his (alchemical) matter-theory⁴⁸: all bodies contain spirits of a more or less active nature, a 'putrifying flame' which will continue to work no matter how well sealed the closure is. In some cases, Platt claims, the enclosed spirits are particularly active: these are the so-called 'wild spirits', which 'can endure no imprisonment'.⁴⁹ In other words, the study of putrefaction should take into consideration not only the properties and different characteristics of the air, but also the qualities of the spirits in bodies. Such spirits are, in Platt's view, 'unknown' to the 'vulgar', but a good knowledge of them is essential for the philosopher.⁵⁰

⁴⁷The inflated pig bladder is one of Bacon's favorite instruments for the study of rarefaction and condensation. Trials for keeping flowers, fish or one's hand inside an inflated bladder are also recorded in the manuscript and published versions of the *Sylva Sylvarum*.

⁴⁸On Platt's alchemical matter theory and its sources, see Thick 2010.

⁴⁹Platt 1594, 87: 'For there can be certain wild spirits within who can endure no imprisonment, but if they can find no way, they will make way, bearing out before them both lock, bolt and hinges, and yet they are such as the Philosopher cannot want, though the vulgar sort know no use of them'.

⁵⁰This is why Platt ends his recipe of the *Sigillum Hermetis* with a discussion concerning the type of spirit enclosed in bodies. 'Distilled oyl' or water can be kept for a long time in a sealed glass vessel. Meanwhile, 'the juyce of any strong or fiery plant, as also of any decoction that is apt to work it self into a body, as new must, or the strong wort wither of ale or beer, least you do not onely misspend your time your liquor, and break your glass, but also happen to get a shrewd turn your self if you be within gunshot. For there be certain wild spirits within who can endure no imprisonment, but if they can find no way, they will make way, bearing out before them both lock, bolt and hinges, and yet they are such as the Philosopher cannot want, though the vulgar sort know no use of them' (Platt 1594, 87–88).

Can bodies be preserved forever? Platt's answer is negative, and on this matter he is in perfect agreement with Bacon. This, however, does not make devices for preserving substances less useful. It also does not make the theoretical question of preservation less interesting. Both Bacon and Platt are keen on knowing how putrefaction occurs and how to delay or speed up the process. Both are also interested in other phenomena related to putrefaction, such as concoction, hardening and, most important of all, restoration of spirits and prolongation of life. Platt's books stand witness to a profound interest in improving preservation, securing restoration and delaying putrefaction. This is apparent in more traditional recipes devoted to means of preserving apples, grapes (Platt 1608, 81, 87, 93, 172), flowers, carrots and turnips (56–57), green walnuts (Platt 1594, 68), oranges, lemons or various juices,⁵¹ as well as to ways of rectifying wine and vinegar, or the spirit of wine.⁵² His interest is also apparent in the more esoteric recipes (or mere allusions to secret recipes) focused on how to make 'any decoction... to last longer', or how to make orange and lemon juice last from one year to the next.⁵³ It is clear from such recipes that, instead of concentrating on isolating bodies, Platt suggests means of purifying and 'rectifying' them with the help of heat, cold, and distillation. He claims that the 'best way' to delay putrefaction requires 'a true and Philosophical rotation whereby the inward fire of nature may be stirred up in every vegetable, to defend itself sufficiently against all putrifying whatsoever' (Platt 1594, 81).⁵⁴ Although Platt does not disclose particular restorative recipes in *The Jewell House*, he offers enough clues as to what particular substances might be tried in order to 'purify', 'restore' and 'revive' the vital spirits (viewed as substances containing large proportions of 'vegetative salt'). These include: nitre, spirit of wine well rectified, quicksilver, plus a large list of other compound substances in which the art of the alchemist, doctor

⁵¹ Platt is also advocating the use of sugar and sugared syrups to make preservatives. In this, he differs from Della Porta who is solely interested in the preservative powers of honey. See, for example, Platt 1594, 190–191.

⁵² At the end of his posthumous *Floraes Paradise* (1608) one can find 'An offer of some new, rare and profitable inventions', that is, a list of 'secrets' on offer (for sale), amongst which is how to make English wine, or how to produce cider which, through a process of maturation, will taste like claret or 'Rhenish wine' (Platt 1608, P3).

⁵³ Platt 1594, 181–182: 'And so I have kept both the juyce of cowslips which (if I be not deceived) will not last long by any ordinary course of preserving, and the juyce of Orenge simply of themselves without any addition, as sound and perfect at the years end, as they were the first day or rather (to speak truly) somewhat exalted in kind. But because such secrets are fitter for a Philosophers laboratory, then a gentlewomans closet, I will not here offer that disgrace unto nature, to discover and magistry upon so base an occasion. And as concerning the keeping of Orenge and Limons in the same state, bigness, colour, & taste, as they are brought us out of Spain, or Portugal, it may be that in my next labours I will write at large thereof, and in plain terms, according to those undoubted and approved trials which I have often made in mine own house for many years together'.

⁵⁴ See also Platt 1594, 187.

or gardener has managed to concentrate the 'vegetative salt'. It is not surprising that Bacon's list of restoratives is very similar to Platt's.⁵⁵

What is perhaps most surprising, and has been little explored so far, is how both Bacon and Platt view the more traditional issue of preserving bodies and the study of putrefaction in close connection with other important natural processes, such as maturation, concoction and hardening, on the one hand, and life restoration and prolongation, on the other. As a result, they record experiments dealing with the 'acceleration' of maturation in fruits and bottles of beer or cider,⁵⁶ the 'clarification' of liquors (such as beer and wine),⁵⁷ the restoration of stale beer by burying it under the ground and mummification as belonging to the same category (Platt 1594, 57). They see such experiments as belonging to a broader inquiry into the recesses and folds of nature,⁵⁸ that is, into the invisible motions of the active spirit entrapped inside natural bodies.⁵⁹ It is important to note that Platt and Bacon have different theories about the nature of this living spirit. Platt talks about 'vegetative salt', the quintessence and water capable of congealing the influences of celestial bodies, while Bacon's theory of spirits is both less alchemical and much more variegated (without being developed in full, it extends on a good number of pages in Bacon's more speculative writings).⁶⁰ Of course, Platt's experiments are mostly focused upon producing useful or marvelous results: their relation with his corresponding alchemical theory of matter is rather loose, and he only makes connections

⁵⁵ Chief amongst these is the use of nitre. For Platt on the use of nitre for embalming, see Platt 1594, 101. Bacon extensively uses what he believes are the restorative powers of nitre, and recommends it as an important agent in the prolongation of life. On the other hand, the manuscript of the *Sylva Sylvarum* records that 'Nitre maketh Bread and Flesh both more short and || Nitre || more tender' (Rees 1981, 408).

⁵⁶ Platt's recipes for the acceleration/maturation of beer and his process of 'restoring' 'stale beer', as recorded at Platt 1594, 57 ff., are almost identical with Bacon's similar experiments in the *Sylva Sylvarum* (310, 314 and 315).

⁵⁷ Platt has numerous experiments and recipes for the production and preservation of beer and cider. He also wrote a manifesto for the promotion of English wines, entitled *An Offer of Some New, Rare and Profitable Inventions* (1608). In it he alludes to his methods of speeding up fermentation and maturation with marvelous results, such as making cider very close in taste to 'Rhenish wines' (see Platt 1608, P3).

⁵⁸ Sometimes the language which Platt and Bacon use to talk about the purpose of their experimental research is strikingly similar. This is how the 'Epistle to the Reader' in *Floraes Paradise* ends: 'And thus, gentle Reader, having acquainted thee with my long, costly, and laborious Collections, not written at adventure, or by any imaginary conceit in a Schollers private Studie, but wrung out of the earth, by the painfull hand of experience; and having also given thee a touch of Nature, whom no man as yet every durst send naked into the worlde, without the veyle; and expecting, by thy good encouragement for higher and deeper discoveries hereafter, I leave thee to the God of Nature, from whom all the true light of Nature proceedeth' (Platt 1608).

⁵⁹ They also seem to have quite similar view about how putrefaction can be turned into vivification by a 'controlled process'. As a result, they are both interested in fertilizers and fertilization and argue for the controlled use of nitre, marl and dung. See Platt 1594 and Bacon 1857–1874, II, 525ff.

⁶⁰ On Bacon's matter theory, see Rees 1977, 1996; Weeks, Sophie 2007a, b; Gigliani 2010.

occasionally and in passing.⁶¹ Where Platt and Bacon seem to agree, however, is in their way of looking at experiments with fruits as a privileged viewpoint to observe the hidden and invisible motions of the active spirits enclosed in bodies.

With respect to the specific case of Bacon, a series of questions present themselves. What was his aim in assembling large quantities of experiments with apples, plants and bottles of beer and in applying creative (and sometimes critical) readings and borrowings from various traditions? Did Bacon actually perform some of the experiments he describes? And if the answer is in the affirmative, what was his purpose? These are the questions to which I will now turn.

4.4 Experimental Series: The Manuscript and the Printed Text of *Sylva Sylvarum*

In this section I want to formulate a series of arguments to support the thesis that Bacon did in fact perform some of the experiments with fruit he recorded in his late natural histories and, particularly, in his posthumous *Sylva Sylvarum*. These groups refer to Bacon's habit to keep multiple records of the same experiment, to vary the parameters defining the experimental setting and to introduce comparative criteria to assess the results of the experiments.

My first argument refers to Bacon's multiple recordings of experiments, as well as his lists of experiments, trials and queries, all relating to experiments with apples and other fruit. One reason behind his decision to record numerous variations of what in the end is the same basic experiment – that is, placing apples and other fruits under differing conditions 'to see what happens' – can be explained simply by the fact that Bacon did indeed perform them and recorded different results, formulated further questions and suggested further trials. A comparative study of the manuscript version and the published version of *Sylva Sylvarum* suggests a large number of such multiple recordings. Take, for example, the following list:

Put a green Apple into Hay, and leaue another | of the same Apples to compare with it, and see | how much sooner the one will sweeten and ripen | before | <then> the other. | An Apple in a Boxe or chest. | An Apple in quick Lime. | An Apple in Ashes. | An Apple in Lavender. | An Apple in Fennell. | An Apple in straws | An Apple closed vp in yellow waxe | An Apple couered ouer with Apples or Crabbs. | An Apple couered ouer with Onions. | An Apple in Dung. | An Apple in the Aire. | An Apple in Chalke. | An Apple layd vpon a vessel of Sacke or Malmesey. | An Apple hanged vp in Smoke. | An Apple in Sand. | An Apple rouled gently with the Hand and layed vp | An Apple in Wool | An Apple in Feathers | An Apple in Flower | An Apple in Bran || *L. Done Octob 10 ||* (Rees 1981, 406).

What we have here is a list of 'traditional' preservatives relating to the apple experiments I have already discussed in the preceding sections. In the manuscript,

⁶¹ For Platt, experiments are not merely illustrations of his matter theory; rather, he often employs his matter theory as necessary background knowledge for devising or interpreting a given experiment.

this list is supplemented by other experiments, which record similar trials to be made in a conservatory of snow: 'Apples 4 <whereof> for sevenight 2. for a Moneth 2.' (Rees 1981, 404). Similarly, '3 Apples' appear in the list of bodies to be buried 'in Earth', 'each in 3 several places' (Rees 1981, 403). Although most of the substances used here as preservatives as well as the technologies employed for preservation are well known, the multiple recordings of these experiments differ substantially from both the more classical recipes in the tradition of husbandry and from the instructions contained in Renaissance books of secrets. The published version does not merely expand on these lists, but develops several series of experiments dealing, respectively, with the comparative 'maturation' of apples kept in straw, hay, wax, crabs, and smoke (experiments 317–323), with the 'acceleration of maturation' of fruits pierced or bruised (what Bacon calls 'solution of continuity'),⁶² and with the beginnings of putrefaction. A comparative survey of the published and manuscript versions of these 'experiments' reveals Bacon's selective approach: from the long list of preservatives enumerated in the manuscript, only a selection remains in the published version. For example, lavender, fennel and other plants are eliminated, while the attempt to roll an apple on a hard surface to see whether it matures earlier is recorded separately, in a different experiment. Other substances are added to the list, too, such as conservatories of snow, resin, plaster and quicksilver.

Moreover, and this is my second argument, even in the sketchy and schematic form of the manuscript, Bacon's lists provide a multitude of details absent from both Della Porta and Platt. An investigation into the types of details provided by the various forms of recordings, in the manuscript and in the published work, can be further divided into three sub-categories: there are details referring to the experimental set-up, but there are also details referring to the results of the experiments, as well as further methodological and theoretical instructions necessary for the replication of the same experiments.

Bacon's manuscript of the *Sylva Sylvarum* offers quite detailed descriptions of the experimental settings. We are given precise numbers for the series of trials, for the different places selected for 'burial', and for the number of apples subjected to the trial. Equally interesting is the date recorded at the end of various lists, meant to 'certify' the trial. Of course, such 'certification' should not be taken as a proof that the experiment was actually made on that particular date. It could be only a rhetorical element borrowed from the tradition of the books of secrets.⁶³ Platt's *Floraes Paradise* contains the same kind of recording: the experiments often end with the standard phrase 'Probatum per...', followed by the name of Platt's source.⁶⁴

⁶² This series appears in the *Sylva Sylvarum* as Experiments 325, 326, 333, 858 and 861.

⁶³ It can also have the function of an aide-mémoire (either to remember when a particular experiment or observation was made, or to remember an idea to be tried in the future). My thanks to Guido Giglioli for pointing this out to me.

⁶⁴ See, for example, 'Probatum per Maister Andr. Hill', or 'Probatum per Master Colborn' in experiments concerning grafting (Platt 1608, 135, 137, 149). Sometimes the sources are only identified by their initials. In some cases, the term *probatum* is missing, while in others the experiments end

By contrast, the published version of the *Sylva Sylvarum* does not record the date of the trial. Nor does it record the number of apples subject to the trial, or the number of repetitions of the same experiment. Instead, the published version offers a detailed description of the *results* of such trials. On the one hand, Bacon gives a quite thorough description of what happens to all these apples after a certain amount of time: how they look, how they taste and how they compare with each other. This detailed and accurate description of the results does not appear in any of the sources discussed in the previous section of my chapter. Both Della Porta and Platt merely mention whether a recipe ‘works’ or not, or whether it is better than another recipe for preserving fruit. By contrast, the amount of detail offered by Bacon seems to indicate that he did perform these experiments. This is particularly obvious when one reads various records of the same experiment across Bacon’s natural histories. As we have already seen, keeping an apple in wax ends in two different recordings: in the *Sylva Sylvarum* it is recorded that ‘after a month’s space, the apple enclosed in wax was as green and fresh as at the first putting in, and the kernels continued white’ (Bacon 1857–1874, II, 446), while in the *De vijs mortis* the record describes what happened to an apple kept longer under the same conditions until it began to putrefy (Bacon 1996, 309). This variation in the ‘lapse of time’ plays an essential role in Bacon’s experiments and is also a recurrent feature of the way some experiments are recorded. In the experiment describing the burial of lemons ‘four foot within the earth’ in a ‘moist place and a rainy time’, we are told that after a fortnight they ‘come fourth no ways mouldy or rotten, but were become *a little harder than they were; otherwise fresh in their colour; but their juice somewhat flatted*’, while, after another fortnight, they become putrefied (Bacon 1857–1874, II, 467. Emphasis added).⁶⁵

This experiment records what Bacon calls a ‘variation’ in the mode of experimentation: by varying one of the parameters involved in the experiment (time), one can move from a particular question (How do burials contribute to the preservation of fruit?) to another (At what point does maturation transform itself into putrefaction?). It is a procedure frequently applied in Bacon’s experiments, and represents a methodological innovation which allows for the extension of one experiment into a series of experiments simply by varying the original parameters.⁶⁶ It is clear that all the experiments with fruit discussed so far belong to various series generated through the variation of two important parameters: the medium in which the fruit is placed and the amount of time the fruit is kept under certain conditions.

My third argument in favor of the claim that Bacon performed at least some of the experiments he discussed refers precisely to his habit of inserting methodological considerations in the recordings of experimental trials. In some cases, such

with a further query. Platt’s sources can be gardeners, practitioners in glass-making and other mechanical arts, and even other authors writing about husbandry. On Platt’s experts, see Mukherjee 2010; Thick 2010.

⁶⁵The ways in which a lemon grows mold are described in other experiments throughout the *Sylva Sylvarum*. See, for example, Bacon 1857–1874, II, 453.

⁶⁶See also Jalobeanu 2013.

methodological additions are explicit, while in others a certain amount of conceptual and historical reconstruction is needed to access the methodology at the core of Bacon's experiments. For the purpose of this chapter, however, it suffices to point towards the most striking methodological innovation in his experiments with fruit: the introduction of a control group. In order to record the results of a series of experiments, Bacon assesses them comparatively with a group of fruits kept under 'regular' or 'normal' conditions. This control group is already present in some of the lists of experiments sketched out in the manuscript of the *Sylva Sylvarum*.⁶⁷ The published version further develops these suggestions and refines them further.⁶⁸ For example, the series of experiments investigating the effects of piercing and bruising upon the maturation of apples ends with a coda:

In these trials also, as was used in the first, set another of the same fruits by, to compare them; and try them, by their yellowness, and by their sweetness (Bacon 1857–1874, II, 448).

Note that Bacon does not only specify the need for a control group, but also indicates the parameters whose modification the experimenter should observe and record. This comparative evaluation of the results in each series of experiments is entirely missing in the traditions of both husbandry and natural magic. It is more sophisticated, remarkably precise and represents a unique and quite characteristic addition to Bacon's model of experimentation.

To sum up, I have formulated three main arguments in favor of the claim that Bacon did not merely select his experiments and examples from previous traditions, but performed some of the experiments himself. Both the multiple records he kept of various forms and variations of a traditional recipe, enriched with details and suggestions, and the 'extension' of an experiment into a cluster of related experimental settings by varying a precise number of parameters suggest that Bacon in fact undertook repeated trials. The large number of details and the finesse of some of the recorded results also suggest repeated experimental practices and methodological reflections upon such practices. Moreover, a further argument in favor of the claim that Bacon devoted substantial reflection to the methodological aspects of experimenting with fruits is the presence of experiments dealing with the art of husbandry in the section dealing with the role of experimentation in the advancement of learning, added to *De augmentis scientiarum* (1623). A good number of the 'modes' relating to the art of *experientia literata* are exemplified with instances and experiments which stem from the tradition of husbandry.

⁶⁷Bacon in Rees 1981, 406: 'Put a green Apple into Hay, and leaue another | of the same Apples to compare with it, and see | how much sooner the one will sweeten and ripen || before ||<then> the other'.

⁶⁸Among those experiments clearly stating the need for a control group are 317–322, 385 and 401 in the *Sylva Sylvarum*.

4.5 Laboratories for the Study of Spirits: Bacon's Apples and the Prolongation of Life

We have seen so far how Bacon spent a lot of time reading and experimenting with fruit. His writings show a serious interest in reading, selecting, testing and developing experiments from the traditions of husbandry and natural magic. But what was the purpose of all this work? Why were these experiments so interesting to him? The best place to look if one wants an answer to this question is his methodological writings, where he investigated similar experiments. Experimenting with fruit appears to have been among Bacon's persistent concerns for two reasons. The first is that selecting experiments from husbandry, natural history and natural magic in order to extend and 'translate' them into other fields was, according to Bacon, one of the keys to discovery ('invention'). As he boldly puts it in *De augmentis scientiarum*:

the best chance of bringing down as from heaven a shower of inventions at once useful and new, is to bring within the knowledge of one man, or a few who may sharpen one another by conference, the experiments of a number of mechanical arts; that by this translation (as I call it) of experiments the arts may mutually cherish and as it were kindle one another by mixture of rays. For though the rational method of inquiry by the Organon promises far greater things in the end, yet this sagacity proceeding by Learned Experience will in the meantime present mankind with a number of inventions which lie near at hand, and scatter them like the donatives that used to be thrown among the people (Bacon 1857–1874, IV, 417).

Examples include the translation of knowledge accumulated in the preservation of fruit in the tradition of husbandry into the (relatively) new art of making cider; by knowing that fruit matures better if it is kept for a while among other fruit of the same sort, the cider-maker keeps apples in piles on the ground before piercing and bruising them to foster putrefaction. Similarly, Bacon suggests that perhaps we might transfer what we have learned about the preservative powers of honey or about embalming to a different field, like, for instance, the domain of techniques for prolonging life (Bacon 1857–1874, IV, 417).

The second reason behind Bacon's constant interest in experiments with fruit is that they are methodologically relevant not only because they exemplify the modalities of knowledge transfer through the art of *experientia literata*, but also because they shed light on the character and processes of nature. They belong to what Bacon calls the eighteenth kind of instances with special power (*instantiae praerogativae*), specifically termed 'Instances of the Pathway' (*instantiae viae*). These are special instances that 'chart the motions of nature as they gradually unfold' (Bacon 2004, 359). They cover particular natural processes which are invisible to the naked-eye observer because of their scale or because they unfold in a manner that is too slow to be 'observable'. Among such processes Bacon lists vegetation, generation, putrefaction and vivification. The observation of these processes is compared to a night-watch: it is long, has many steps (hence the second name given to these instances: *instantiae itinerantes* and *instantiae articulatae*) and several important phases, the

first of which, Bacon claims, is the most important. The careful study of the 'inception' of putrefaction, desiccation and vivification belongs to another category of instances of special power, namely, the 'Summonising' or 'Evoking Instances' (*instantiae citantes* or *evocantes*). Under them, Bacon lists experiments which are attempts to observe the first signs of the emission and departure of spirits detained in bodies. Both sets of instances belong to the more general category of 'Instances of the Lamp' (*instantiae lampadis*), that is, special experiments and shortcuts designed to 'show' and to 'make visible' the invisible actions of the spirit.

In conclusion, experiments with fruit belong to a more general research plan which attempts to survey the particular motions of spirits while they operate inside a body (generation, growth and maturation) and struggle to leave that body (putrefaction and desiccation). In this respect, fruits are apt laboratories that allow the observer to survey such motions: they were once part of a living being, and although cut off, one can presume that they still contain some of the living spirits present throughout the plant. The presence of the living spirit would explain, for Bacon, a process such as maturation (i.e., the natural working of the spirit in a fruit until this is fully grown). The attempt to survey the 'inception of putrefaction' (i.e., the initial moments when the spirit begins to depart from rotten apples) would give the experimenter a way to classify natural processes. It is clear from Bacon's theory that natural processes such as vegetation, concoction (leading to growth), maturation and putrefaction are mere names attached to what is in fact one seamless continuum of life. A fine line has therefore to be drawn between maturation and putrefaction, and it is the role of experiments to do so.

Another important application of Bacon's experiments with fruit is that isolating a fruit under various conditions is also a way of manipulating the spirit enclosed in it. Hermetic seals, for example, prevent the natural flight of the spirit (and the visible effect is the desiccation or putrefaction of the body), but cannot stop its motions. Depending on the type of isolating substance and the time, such an experiment can force the spirit to 'eat' the body in which it is contained. Or, to use Bacon's words in *Historia vitae et mortis*,

when spirit is well restrained, instead of elaborating or turning thin matter into spirit (which the spirit does when it is given an escape route) it converts gross matter into moist, with the result that things are softened and have, so to speak, new life put into them (Bacon 1996, 319).

Bacon claims that this is precisely why hermetic seals do not work as technologies of conservation; apples coated in wax or sealed in amber will eventually be turned into 'moisture' by the spirit working within. By contrast, porous closures or substances which absorb moisture act as better preservatives. It is therefore better to keep apples in such materials as flour, bran and sand. This, however, is a minor side issue when compared with other, more theoretical implications underlying the experiments in question. Sealed closures, for instance, can be used as instruments and technological devices to study the workings of spirits in a controlled manner, in isolation from those agents external to them. Sealing is one way to 'arm' and 'defend' a body against 'any external force', to stop 'extraneous and extrinsic

motions', and hence to discover the motions 'working within'. This is a particularly good way to study what Bacon calls 'dissimilar and various schematisms (like putrefactions) which bodies gain with the passage of time'. But this technology can also produce new effects, for the 'imprisonment' of a body can inhibit 'spontaneous motions', or can produce a violent motion of response (Bacon 2004, 435).

Furthermore, experiments with fruit belong to a more comprehensive investigation into what Bacon calls the 'ways of death', that is, the ways the spirit multiplies, destroys and 'wrecks the very workshop by which it is itself repaired' (Bacon 1996, 275). The *De vijs mortis* delineates a theoretical method and an experimental methodology for the study of such phenomena. The theory itself is complex and sometimes confusing and contradictory (since the writing was never finished and bears the traces of continuous rewriting).⁶⁹ The methodology outlined therein, however, is quite clear. It amounts to studying first how inanimate beings putrefy in order to extend these results to animate beings:

In the first place... anyone who tries to examine the deterioration of an animal, and investigate its causes and cures (if any there be) or the means at least of delaying it, ought to start by looking at the animal first as an inanimate thing which does not take on food, and only then separately as an animate thing which does. For it is certainly true that whatever a natural inanimate body (like wood, stone, metal, *uprooted plant*, and so forth) suffers from time or age, the surrounding air, the rays of the heavenly bodies, and the changes and vicissitudes of the climate, the same things are also endured by the living body, except that the vital nature superadded can partly repel the injuries inflicted by time and external factors, and partly (which is the main thing) repair and make food these same injuries by taking on food (Bacon 1996, 275).

The study of 'uprooted plants' – or apples, for that matter – becomes, therefore, a prerequisite for the study of maturation, aging and decay of more complicated living beings, such as animals (and perhaps also humans). In conclusion, Bacon's apples can be viewed as simplified and self-contained laboratories for the study of the basic motions of the spirits enclosed in matter. Bacon seemed to have believed that it was possible to transfer the results obtained in his 'apple laboratories' to the more complex bodies of animals by simply adding parameters into his experimental set-ups (for example, by taking into consideration the fact that animals must consume food).

4.6 Conclusion

The main purpose of this chapter was to demonstrate how the investigation of a particular series of experiments, recurrent in Bacon's writings, can shed much needed light on two related (and major) problems in the field of Baconian studies, that is, Bacon's use of natural-historical sources and the defining characteristics of

⁶⁹On the various strata of *De vijs mortis* and the composition of the manuscript, see Rees's 'Introduction' to Bacon 1996.

his experimental strategies. I have shown the extent to which Bacon selected, developed and criticized recipes, trials and experiments collected from available works of natural history, husbandry and natural magic. I have then argued that Bacon further developed this original material and that he devised experiments whose results were subject to multiple and careful recordings, in both his published and unpublished writings. Finally, I have explained the way in which experiments involving apples were integrated into Bacon's larger programme to study the hidden motions and appetites of spirits. In picking apples as objects of study Bacon was quite traditional; in developing technologies of conservation and recipes for the prolongation of life on the basis of his study of apples, he was again following in the footsteps of his predecessors, such as Giambattista Della Porta and Hugh Platt. However, in devising an experimental methodology which would allow him to use apples as laboratories for the study of the hidden motions of spirits, he went beyond the achievements of his predecessors. In further elaborating methodological strategies to transfer knowledge accumulated in experiments with fruit to the more complex 'laboratory' of the animal body, Bacon opened new avenues that were unknown to his contemporaries. Leaving behind the closed waters of the mechanical arts, he emerged into the vast ocean of experimental philosophy.

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Chapter 5

Prolongatio Vitae and *Euthanasia* in Francis Bacon

Marta Fattori

Abstract In this paper, I am not going to discuss the themes of *prolongatio vitae* and *euthanasia* in the full context of Bacon's natural philosophy, addressing his doctrines of the trichotomy of the spirits, *plica materiae* and the manifold qualities he attributes to the *spiritus*: branching, continuous, vital, and so on. On all of these issues, the reader should rather refer to Graham Rees's general and specific introductions to the volumes of the 'Oxford Francis Bacon' and to the sources, cross-references and commentaries provided therein. Instead, I shall address the themes in reverse, as it were: I shall deal with *euthanasia* first, that is, and then *prolongatio vitae*, because the former issue undoubtedly stems from the latter; but I shall finally return to *euthanasia* at the close.

5.1 *Euthanasia* and the *Index Librorum Prohibitorum*

The only, and yet quite remarkable, passage in which the term 'euthanasia' appears in *De augmentis scientiarum* (hereafter abbreviated as *DAS*) did not fail to capture the attention of Giulio Maria Bianchi (1626–1707), the influential Dominican, when he was appointed third censor by the Holy Office to pronounce on whether Bacon's work was to be placed on the Index (1668) (Fattori 2005, 21–25). Of the three censorial reports, the Dominican's is the most articulated and exacting on matters of doctrine. Not only does it treat several significant passages the two former censors had not discussed, but the passages he discusses are grouped into an articulated thematic structure:

I have read the work, Most Eminent Fathers, entitled *Francisci Baconis de Verulamio Angliae Cancellarij de Augmentis Scientiarum libri IX*. It is written by a heretic and published in Amsterdam. In his work, the author has attempted with remarkable skill to conceal

The translation is by Mattia Bilardello.

M. Fattori (✉)
Sapienza-Università di Roma, Rome, Italy
e-mail: marta.fattori@uniroma1.it

the errors that are to be found therein and scattered throughout; furthermore, he expresses himself with such adroit circumspection that indeed it is difficult to criticise his exposition.¹

The censor's opinion, concealments notwithstanding, is unhesitatingly negative: as is apparent from the first line, Francis Bacon is identified as a heretic, and the report insists throughout on the perniciousness of the author, who comes to be qualified as *vafer* – one who insinuates and dissimulates, cunningly promotes doctrines without naming them and conceals his sources. The condemnation, besides, is based on a set of very precise reasons: for statements against prelates, against the Catholic hierarchy and pontifical decrees; for denouncing the ignorance of monks; for the author's wholesale repudiation of ecclesiastical hierarchy; for professing a belief in fate (a likely passageway into atheism); and finally, in a move that is novel and peculiar to this report, the censor also singles out Bacon's advocacy of euthanasia. While rating the work highly and finding it notable, and even acknowledging that it does not deal with religion *ex professo*, the cultivated and pugnacious Dominican deems it is to be condemned – albeit under the *nisi corrigatur* provision (on the condition, that is, that *DAS* be subject to revision). The work of the *vafer Baconus*, he notes, is contaminated with a profusion of unorthodox insinuations: 'I have noticed several times when he falls into error, sometimes concerning customs, sometimes concerning the sincerity of history, and sometimes in the solidity of doctrine'.

The first chapter for incrimination identifies the passage in which, among other things, Bacon appears to advocate an author and a practice which – whether in conjunction or not – are severely proscribed, namely Epicurus and euthanasia. In the words of the censor:

The first instance regards customs, when – fol. 258. – under the pretence of teaching doctors that it is their task to discover the most gentle and painless way to leave this life, he is not ashamed to refer to the way chosen by Epicurus, when he realised that his disease was incurable and rendered insensible his ventricles and his senses by abundant libations. Not only does Bacon fail to repudiate this method; he also complains about the doctors of his times who seem to think it their duty to abandon those patients who are approaching their end. Such a doctrine is not only against all good custom; it is also impious, for to deprive of the use of his reason a man who has reached the end of his life at the crucial moment only in order to allow him to die more serenely is clearly impious; although an exception should be made for criminals condemned to die on the scaffold [385^v], whose end can be facilitated by intoxicating them.²

The indication of page numbers in the report (as in fol. 258, above), refers, naturally, to the edition of *DAS* available to the censors. Here we read:

Item, ut paulo ulterius insistam; etiam plane censeo ad officium medici pertinere, non tantum ut sanitatem restituat, verum etiam ut dolores et cruciatus morborum mitiget; neque id ipsum solummodo cum illa mitigatio doloris, veluti symptomatis periculosi, ad convalescentiam faciat et conducat; imo vero cum, abjecta prorsus omni sanitatis spe, excessum tantum praebeat e vita magis lenem et placidum. Siquidem non parva est foelicitatis pars

¹ See ACDF, Indice, Protocolli, IIa 37, c. 385r. English translation in Fattori 2005, 44. ACDF = Archive of the Congregation for the Doctrine of the Faith.

² See ACDF, Indice, Protocolli, IIa 37, cc. 385r–385v. English translation in Fattori 2005, 44–45.

(quam sibi tantopere precari solebat Augustus Caesar) *illa Euthanasia*; quae etiam observata est in excessu Antonini Pii, quando non tam mori videretur quam dulci et alto sopore excipi. Scribitur etiam de Epicuro, quod hoc ipsum sibi procuraverit; cum enim morbus ejus haberetur pro desperato, ventriculum et sensus meri largiore haustu et ingurgitatione obruit; unde illud in epigrammate, hinc Stygias ebrius hausit aquas. Vino scilicet Stygii laticis amaritudinem sustulit. At nostris temporibus medicis quasi religio est, aegrotis postquam deplorati sint assidere; ubi meo iudicio, si officio suo atque adeo humanitati ipsi deesse nolint, et artem ediscere et diligentiam praestare deberent, qua animam agentes facilius et mitius e vita demergent. Hanc autem partem, inquisitionem de *Euthanasia Exteriori* (ad differentiam ejus *Euthanasiae* quae animae praeparationem respicit) appellamus, eamque inter *Desiderata* reponimus.³

In this passage, Bacon enlists among the *desiderata* not only the pursuit of the means to prolong life, but also the possibility of what he terms *euthanasia exterior* – an option which stems from his general critique of ‘modern’ medicine.

None of the implications in the passage escape Giulio Maria Bianchi: insofar as the practice entails that an individual be deprived of the use of reason in the prime of their life, merely to the end of ensuring a painless death, it is contrary to Christian *pietas*, and indeed positively impious and inhumane. The Dominican concedes that only criminals condemned to the gallows might be an allowed exception – for the reason, we might assume, that since these individuals have *already* forsaken all humanity through heresy, they are as such non-human (i.e., devoid of reason).

Let us pause for a moment on Bacon’s text. The issue had already been touched upon some twenty years previously in a section on medicine included in the *Advancement of Learning* (1605), with a heading on the page margin marking out the topic as *euthanasia exteriori*. In all other respects, the formulation of the older passage will be translated into the Latin of *DAS* almost word for word:

Nay further, I esteem it the office of a physician not only to restore health, but to mitigate pain and dolours; and not only when such mitigation may conduce to recovery, but when it may serve to make a fair and easy passage: for it is no small felicity which Augustus Caesar was wont to wish to himself, that same I *Euthanasia*; and which was specially noted in the death of Antoninus Pius, whose death was after the fashion and semblance of a kindly and pleasant sleep. So it is written of Epicurus, that after his disease was judged desperate, he drowned his stomach and senses with a large draught and ingurgitation of wine; whereupon the epigram was made, *Hinc Stygias ebrius hausit aquas*; he was not sober enough to taste any bitterness of the Stygian water. But the physicians contrariwise do make a kind of scruple and religion to stay with the patient after the disease is deplored; whereas, in my judgment, they ought both to enquire the skill and to give the attendances for the facilitating and asswaging of the pains and agonies of death.⁴

The main difference, thus, is that the heading that appeared in Latin on the page margin in the *Advancement of Learning* is reworked into the body of the text in *De augmentis scientiarum*, where it appears in the closing lines of the passage accompanied by the clarification ‘exterior euthanasia’ (so defined in order that it not be

³*DAS*, IV, 2, in Bacon 1662, 258–259. For the purposes of collation, we have consulted the copy held at the Biblioteca Nazionale ‘Vittorio Emanuele II’ of Rome, collocation number 12.24.B.36. See also Bacon 1857–1874, I, 594–595. Emphasis added.

⁴*AL*, II, (ed. M. Kiernan), in *OFB*, IV, 2000, 100–101.

confused with the preparation of the soul for its departure from the body), and numbered among the *desiderata*.

Let us further note that no other occurrences of euthanasia are to be found in the works of Bacon, whether in Latin or English. And yet, in just two lines of definition and elucidation of the notion of *exterior euthanasia*, Bacon is able to set his particular seal on medical reflection and studies, criticize contemporary, ‘modern’ philosophers, and implicate something of his theory of spirits, which had previously inspired him to publish not only the *Historia vitae et mortis*, but also to lay down the plans of the unfinished *De vijs mortis* (available as a holograph manuscript).

5.2 *Spiritus*, Telesio, and the Prolongation of Life

Bacon’s *De vijs mortis*, catalogued as Hardwick MS n. 72, was discovered by Peter Beal in 1980 and first published in 1984 by Graham Rees and Christopher Upton. Since it is now definitively incorporated in Volume 6 in the Oxford Francis Bacon series (abbreviated as *OFB VI*), I shall remit all specific issues of philological and interpretative order to the commentary and notes (and appended bibliography) supplied by Rees. What I find rather surprising is that studies of Bacon do not yet seem to have engaged with the importance of this ‘new’ text, the value of which appears to be remarkable. Having provided a theoretical, and at the same time ‘historical’ investigation of the presence and operations of the *spiritus* within matter and bodies in general, the whole object of *De vijs mortis* appears to lie in the analysis of the causes and conditions presiding over everything that lasts and everything that, to the contrary, declines and perishes. As Rees notes, *De vijs mortis* is structured so that its second part draws the concrete conclusions deriving from the premises laid in the first.⁵

A distinction between the peculiar *spiritus* of things inanimate and that of living beings is outlined, marking a distinct advancement over the previous doctrine, which only generically affirmed there to be a *spiritus* within matter. Instances of the older doctrine are such as had appeared, for example, in the fable ‘Proserpina, sive Spiritus’, contained in *De sapientia veterum* (1609). When set against *De vijs mortis*, this fable amounts to no more than a gathering of materials and doctrines which have been allowed to accumulate, to a certain extent, but which are yet to be ordered into a comprehensive and systematic account: viewed in retrospect, the former consolidated theories come across as preliminary sketches. The struggle between Pluto and Ceres, Proserpina’s eating of the pomegranate and the unavailing efforts of Theseus and Pyriouthos amount to narrative elements which ultimately present an elegant description of seasonal progress (Proserpina’s two seasons), and even manage to incorporate a denunciation of alchemy that is quite refined and to the point. On the other hand, the imprisoned spirit which each character in the fable strives to recover is but a single spirit, and only generically outlined. *De vijs mortis*, on the other hand, expands on the fact that the spirit of inanimate bodies is ‘isolated’ or

⁵ See Graham Rees’s *Introduction*, in *OFB VI*, 1996, xxxiii–xxxv.

‘without continuity’; that plants have a ‘branching’ spirit ‘with continuity’; and that animate bodies have a spirit ‘with continuity’ (which is also precisely located – e.g., within the head).⁶ Furthermore, two spirits coexist within organic living organisms: a ‘mortuary’ spirit that acts as *destructor* and is ‘inanimate’, forever labouring to escape its incarceration in matter by subjugating the matter within which it is enclosed; and a ‘superadded vital spirit’ (*spiritus vitalis superadditus*), which, on the contrary, operates so as to direct and restrain the damaging force of the former.⁷ Both spirits are engaged in an ongoing struggle against each other, and both draw nourishment through the body itself, so that they can be seen as at once inhabiting and bringing the bodily parts to life. It is this struggle that is vividly represented through the *exemplum* of the deathly ordeal of Mezentius,⁸ which consisted in tying up a living person face to face with a corpse ‘ut viva in amplexu mortuorum immoriantur’ (so that the living perish in the embrace of the dead), a reference of such poignancy as to be recorded again at the opening of the *Historia vitae et mortis*.⁹ Otherwise, the only sources Bacon cites are Telesio, with whom he disagrees, and the latter’s disciple Agostino Doni.

De vijs mortis opens with a reference to Telesio, who held that old age and death were the effects of an excess of innate heat which eventually brought about the destruction of the body:

On the other hand and indeed putting the opposite case, Telesio sought the cause of death not in any kind of [fol. 2^r] wasting away but in superfluity; he believed that with age the heat steadily becomes fiercer and sharper, especially in the liver which is white, soft, and rich or sweet to the taste in young animals but blackened, hard, salty and, as it were, parched in old ones. Thus since blood is the true sap and refreshment of the body, and since the nature of the blood depends on the liver, he thought it was obvious that the body is destroyed by this same parching of the liver (Bacon 1996, 271).¹⁰

Let me note, in passing, that the sizeable reference to Telesio here is carefully worked into a wider and sophisticated manoeuvre *contra* Avicenna, and that his propositions, as we shall see, are something Bacon takes particular care to reject

⁶ *De vijs mortis*, in *OFB*, VI, 1996, 318.

⁷ The spirits in animals are characterized by ‘*Motus Regius sive Politicus*, which is to say the government of all other bodily parts’ (Bacon 2004, 408, 1857–1874, I, 344); see also *Comentarius solutus*, in Bacon 1857–1874, XI, 72 (fol. 21, b). See Rees 1984, 1996, 139, 143; Fattori 1984; and Walker 1972.

⁸ Virgil, *Aeneid*, VIII, 481–488: ‘Hanc multos florentem annos rex deinde superbo | imperio et saeuus tenuit Mezentius armis. | Quid memorem infandas caedes, quid facta tyranni | effera? di capiti ipsius generique reseruent! | mortua quin etiam iungebat corpora uiuis | componens manibusque manus atque oribus ora, | tormenti genus, et sanie taboque fluentis | complexu in misero longa sic morte necabat’.

⁹ *Historia vitae et mortis*, in *OFB*, XII, 2007, 146. On Mezentius’s ordeal, see Giglioli 2005, 142.

¹⁰ *lat.*, p. 270: ‘ex altera parte atque adeo ex opposito Telesius mortem quaesivit non in decremento aliquo, sed in excessu; opinatus Calorem cum aetate perpetuo magis et magis ignescere et acriorem fieri, praesertim in hepate, quae in Animalibus tenerae aetatis invenitur albicans, mollis, sapore dulcis vel suppinguis, in senili vero corpore nigricans, durus, salsus, et quasi torrefactus. Itaque cum sanguis ait Corporis verus succus et irrigatio, sanguinis vero natura sequatur iecur, ex ista adustione iecinoris plane Corpus destrui putavit’.

as untruthful. These aspects of the text are the object of a parallel research of mine, and would seem to furnish relevant evidence as to the conjectural dating of both *De vijs mortis* and *De principiis atque originibus*. Preliminary results on this particular issue have appeared in my recent essay ‘*La ‘plica materiae’: de Telesio à Bacon*, and shall be expanded elsewhere (Fattori 2012, 449–473). Here we might note that Bacon’s treatment of Telesio in *De vijs mortis* is quite the same as in *De principiis*: although mentioned at the outset on the strength of the ‘novelty’ of his theories and the interest of his natural enquiries, and although appraised as a ‘modern’, as one superseding crystallised and obsolete conceptions, Bacon laments that Telesio did not pursue his analyses far enough to attain the truth. He particularly rejects his theory concerning the accumulation of heat in old age, and concludes by underlining how it befalls upon himself to start the research anew, and (counter to what other thinkers have largely done and are doing), take as his point of departure an enquiry into the very nature of things (*ex analogia universi*). Bacon sees Telesio as one who fails to pursue his enquiry to its end and mistakes the part for the whole. So it is not that the intensity of the heat increases and, as it progressively becomes greater, consumes the rest. Quite to the contrary, Bacon observes heat to abate with age, and to begin to fail to an extent that is readily manifested in every faculty and every motion of the elderly, in the capacity for digestion, in the incidence of phlegmatic illnesses, in the activity of the nerves, and finally in the dullness of the sense of touch.¹¹ As Graham Rees observes: ‘The only authority named in *De vijs* was Telesio, whose views Bacon promoted at the expense of the dominant tradition of ideas on the subject. The promotion was temporary for he proceeded to reject Telesio because he did not go far enough’.¹²

5.3 *Prolongatio Vitae: Between Bacon and Descartes*

The question of the means to the prolongation of life is naturally tied in with the ambition to provide new foundations for the art of medicine, an *ars conjecturalis*, and transform it into a science that would investigate the causes of disease, intervene in these causes, eliminate the symptoms, restore health (here too Bacon uses the term *instauratio*) and, *in this way*, achieve the goal of the prolongation of life. Dietary issues, the humours and mental conditions are all functional elements to this end. It is no wonder, then, that this enquiry was to be pursued by such thinkers as Descartes, who treated the question in his last work, *Les passions de l’âme* (1649), and particularly in its prefatory *Lettre-Préface* (hereafter abbreviated as *LP*) (Fattori 1998). Yet Ettore Lojacono records how Descartes’s interests in this field also

¹¹ *De vijs mortis*, in *OFB*, VI, 1996, 272: At illa sententia Telesij magis citra veritatem cadit, quam a veritate aberrat; siquidem alienum a vero non est, calorem cum aetate intendi et insurgere in calorem magis acrem et igneum, quique alimenta sua magis absorbeat et depascit; sed abruptit contemplationem Telesius, neque eam producit, ut par est;

¹² Graham Rees’s *Introduction*, in *OFB*, VI, 1996, lxv.

provoked derision, such that the event of his death at the court of Queen Christina of Sweden elicited comment by the anonymous contributor to an Antwerp gazette: ‘A fool has died in Sweden, who believed he could live as long as he willed’.¹³

The *LP* (ostensibly an anonymous work in the form of a virtual exchange in four epistles, devised as a preface to *Les passions de l’âme*, and certainly either written or approved by Descartes himself) places considerable emphasis on the conditions that might ensure the preservation of good health in human beings. Bacon, as we have seen, ranked medicine as one of the foremost *desiderata*, particularly in its connection to *prolongatio vitae* (*DAS*, IV, 2, Bacon 1857–1874, I, 586, 590), which is the main concern of the *Historia vitae et mortis* (1623). Medicine was also of great interest to Descartes, who indeed had drawn plans for a treatise on it. Common to Bacon and Descartes was their trust that discoveries in areas which were deemed beyond the bounds of the possible *could* be made: in their view, impossibility stemmed from a logic contrary to the logic of *inventio*, a logic structurally incapable of even imagining such undertakings. When conformed to the parameters of *inventio*, such discoveries became normal. The history of chance discoveries, some of which had contributed to modify the perception and understanding of the world quite radically, was exemplary in illustrating how once something entirely unexpected *had* been found, such a thing immediately came to be viewed as normal: that which had *formerly* appeared an impossibility, *then* became a commonplace to the extent that once the logic was reversed the belatedness of the discovery came to be looked upon with wonder (Descartes cites the compass, the art of printing and the spyglass – with the spyglass instead of Bacon’s gunpowder):

Therefore, we see by experience that the people who have this opinion [i.e., *that the Ancients were wiser and more knowledgeable than the Moderns*] deeply rooted in their minds are also those who remain the most ignorant and uncouth. And since this is still quite common among us, it can be used as evidence to prove that we are far from knowing all that we are able to know. This can be clearly demonstrated by a great number of very useful inventions, such as the use of the compass, the art of printing, the telescope and the like, which have been discovered only in the last centuries, and yet they look quite simple to those who know them.¹⁴

¹³ See Ettore Lojacono in the bibliographical note in Descartes 1994, I, 104. See Descartes 1964–1974, VI, 62: ‘Il est vray que celle qui est maintenant en vsage, contient peu de choses dont l’vtilité soit si remarquable; mais, sans que i’aye aucun dessein de la mespriser, ie m’assure qu’il n’y a personne, mesme de ceux qui en font profession, qui n’auouë que tout ce qu’on y sçait n’est presque rien, a comparaison de ce qui reste a y sçauoir, et qu’on se pourroit exemter d’vne infinité de maladies, tant du corps que de l’esprit, et mesme aussy peustestre de l’affoiblissement de la vieillesse, si on auoit assez de connoissance de leurs causes, et de tous les remedes dont la Nature nous a pourueus’.

¹⁴ Our translation. *Passions de l’âme*, in Descartes 1964–1974, XI, 309: ‘Aussi voit on par experience, que les peuples en l’esprit desquels elle est le plus enracinée, sont ceux qui sont demeurez le plus ignorans et le plus rudes. Et pource qu’elle est encore assez frequente parmy nous, cela peut servir de raison pour prouuer, qu’il s’en faut beaucoup que nous ne sçachions tout ce que nous sommes capables de sçauoir. Ce qui peut aussi fort clairement estre prouvé par plusieurs inventions tres utiles, comme sont l’usage de la boussole, l’art d’imprimer, les lunettes d’approche, et semblables, qui n’ont esté trouvées qu’aux derniers siecles, bien qu’elles semblent maintenant assez faciles à ceux qui les sçavent’.

Reflection on the benefits of accidental discoveries leads to speculation about what might be achieved if there could conceivably be a method to discovery; and to speculation on the application of such a method to the preservation of perfect health in human beings. So medicine (which Bacon regards – I repeat and wish to emphasize once again – as an *ars conjecturalis*) is numbered among the *desiderata* in special connection to the subject of *prolongatio vitae*; a theme that is central to his *Historia vitae et mortis*, but which also came to be particularly influential on Descartes.

Published in 1623, the *Historia vitae et mortis* enjoyed great fortune and circulation in its own time, although over the past two centuries it has largely been either ignored or undervalued by critics. For questions of interpretation, philological problems and the investigation of the sources of the *Historia*, I once again refer the interested reader to Rees, for I wish to concentrate on the question of the text's circulation, so that the hypothesis that the works of Bacon were studied in the French and Cartesian milieu might satisfactorily be accounted for and verified. In the *Dialogues faits à l'imitation des anciens*, for instance, La Mothe Le Vayer accurately cites two important passages from the *Historia vitae et mortis*.¹⁵ Likewise, the celebrated physician Johann Sigismund Henninger (d. 1719) collated the four classical works that were thought to have provided fundamental contributions on the subject in his *Quadruga scriptorum diaeteticorum celebriorum* (Strasbourg, 1713), the first of these being Bacon's *Historia vitae et mortis*. In so doing, we should note, Henninger was consciously drawing on a fully consolidated tradition. The view that Bacon and Descartes have in common, the one which furnishes the main grounds for revising the epistemological status of medicine, is the conviction that medicine must be founded in philosophy in order to stand as a science, on pains of otherwise never delivering its fruits to humankind. Bacon's tripartite ordering of the discipline into *conservatio sanitatis*, *curatio morborum* and *prolongatio vitae* is accepted by Descartes, although the latter does not pursue it theoretically and instead insists on the shortcomings of the art. The theoretical debate concerning medicine and its status runs through the entire seventeenth century (and had started halfway through the sixteenth): even as late as the close of the seventeenth century, when the *Pareri* (1693) of the Neapolitan physician and scientist Leonardo di Capua is placed on the Index, the well-read (notwithstanding his profession) censor of the Holy Office Giovanni Maria Gabrielli (1654–1711) rebuked the author (one whose credentials included the friendship of powerful members of the high clergy) for his scepticism, for not believing in medicine and for his mischievous ironies, as in this passage:

Now, medicine, with its herbs and concoctions, what does it do? It conjures some devilry for every ailment, until a man is laid for ever at rest; indeed must we term medicine the art of making everyone the world over an ass.¹⁶ Yet, the causes whereby these physicians

¹⁵On Bacon as a source of La Mothe, see *La diffusion de Bacon dans le libéralisme français*, in Fattori 2012, 416–419.

¹⁶see: “Si avons nous beau monter sur des eschasses, car sur des eschasses encores faut-il marcher de nos jambes. Et au plus eslevé throne du monde si ne sommes assis que sus nostre cul.”, *De l'expérience*, III, 13, 1115, in Montaigne 1965.

became wicked thus, as we have bespoken, we may more clearly argue, inasmuch as not only those residing in our own lands: where physicians appear in need of finer artifices; but also in those realms wherein men of a cruder and coarser stock dwell, these physicians too are wanted to every kind of trickery and malice they deem useful to the affirmation of their arts; sicque non contentus Medicinam in Morboniam relegasse et ex toto hoc nostro orbe eiecisse, eam usque ad Indios Orientales insectatus mox concludit: Now if the current state of medicine be that fraud and deceit are its proper habit, must we then hold and praise as most fortunate such as we habitually term barbarous, being their privilege that of the utmost inexperience of this craft. (Our translation, see Fattori 2004, 40).

For a comprehensive account of medicine, however, we have to turn to *De augmentis scientiarum*,¹⁷ where Bacon for the first time offers a complete analysis of the discipline, which again fully anticipates comparable discussions in Descartes.¹⁸

¹⁷DAS, IV, 2 in *SEH*, I, 590–599: ‘Quod eo magis facere debent, quia philosophiae ipsae quibus innituntur medici, sive methodici sive chymici, (*medicina autem in philosophia non fundata res infirma est.*)parvi revera sunt[...].Medicina igitur (uti perspeximus) adhuc taliter comparata est, ut fuerit magis ostentata quam elaborata, etiam magis elaborata quam amplificata; cum labores in eam insumpti potius in circulo quam in progressu se exercuerint. Plurima enim in ea video a scriptoribus iterata, addita pauca. Eam in tres partes dividemus, quae tria ejus officia nominabimus. *Primum est Conservatio Sanitatis; secundum Curatio Morborum; tertium Prolongatio Vitae.* At istud postremum non videntur medici tanquam partem principalem artis suae agnovisse, verum idem reliquis duobus satis imperite immiscuisse[...].Ars autem et industria humana naturae et fato non imperant, sed subministrant. Verum de hac parte paulo post dicemus; haec tantum interea praefati, ne quis tertium istud officium medicinae cum duobus prioribus (quod fere adhuc factus est) imperite confundat. Quod ad officium tuendae sanitatis attinet (ex officiis praedictis Medicinae primum), multi de eo scripserunt, cum in aliis rebus satis imperite, tum nimium (ut arbitramur) delectui ciborum, minus quam par est quantitati eorum, tribuentes[...]. Verum cum haec pars, de Valetudinis Conservatione, secundum totum tractata sit, defectus minores persequi non est nostri instituti. Quod vero ad Curationem Morborum attinet, illa demum pars est Medicinae in qua plurimum laboris insumptum est, licet fructu satis tenui. Continet autem doctrinam de morbis quibus corpus humanum subijcitur; una cum eorundem causis, symptomatibus, et medelis. In hoc secundo officio medicinae, multa sunt quae desiderantur[...].Neque igitur dubitabo inter Desiderata reponere opus aliquod de Curationibus Morborum qui habentur pro Insanabilibus; ut evocentur et excitentur medici aliqui egregii et magnanimi, qui huic operi (quantum largitur natura rerum) incumbant; quando hoc ipsum, *istos morbos pronuntiare insanabiles*, neglectum et incuriam veluti lege sanciat, et ignorantiam ab infamia eximat[...].Hanc autem partem, inquisitionem de Euthanasia Exteriori (ad differentiam ejus Euthanasiae quae animae praeparationem respicit) appellamus, eamque inter Desiderata reponimus[...].Sunt et alia quae ad prolongationem vitae et atrophiam senilem longius summovendam juvant; sed tamen non usurpantur absque periculo valetudinis, adeo ut qui iis utentur ad prolongationem vitae debeant simul incommodis occurrere, quae alioquin eorum usu supervenire possint. Atque Monita hactenus dedimus’ (emphasis added).

¹⁸Descartes 1964–1974, XI, 309–310: ‘Mais il n’y a rien en quoy le besoin que nous avons d’acquérir de nouvelles connoissances, paroisse mieux qu’en ce qui regarde la Medecine. Car bien qu’on ne doute point que Dieu n’ait pourvu cette Terre de toutes les choses qui sont necessaires aux hommes pour s’y conserver en parfaite santé jusques à une extreme vieillesse; et bien qu’il y ait rien au monde si desirable que la connoissance de ces choses, en sorte qu’elle a esté autrefois la principale estude des Rois et des Sages: *toutefois l’experience montre qu’on est encore si éloigné de l’avoir toute, que souvent on est arresté au lit par de petits maux, que tous les plus sçavans Medecins ne peuvent connoistre, et qu’ils ne font qu’aigrir par leurs remedes lorsqu’ils entreprennent de les chasser.* Enquoy le defect de leur art, et le besoin qu’on a de le perfectionner, sont si evidens, que, pour ceux qui ne conçoivent pas ce que c’est que la Physique, il suffit de leur dire qu’elle est la science qui doit enseigner à connoistre si parfaitement la nature de l’homme, et de

The *LP* deals with medicine in an ample and detailed passage: God has supplied the earth, the author notes, with ‘toutes les choses qui sont necessaires aux hommes pour s’y conserver en parfaite santé jusques à une extreme vieillesse’; yet experience shows how ‘on est encore éloigné de l’avoir toute’ and that all of the worlds’ men of wisdom ‘ne peuvent connoistre, e qu’ils ne font qu’aigrir par leurs remedes lorsqu’ils entreprenent de les chasser’. From this follows, simultaneously, ‘le defaut de leur art, e le besoin qu’on a de le perfectionner’, since medicine is ‘la science qui doit enseigner à connoistre si parfaitement la nature de l’homme, e de toutes les choses qui luy peuvent servir d’alimens ou de remedes, qu’il luy soit aysé de s’exempter par son moyen de toutes sortes de maladies’. Hence the shortcomings in our knowledge of the medical art are to be observed among theologians and physicians alike; medicine is reliant on philosophy, inasmuch as the latter concerns itself with physics:

There remains the philosophers, among whom, all the sensible ones are already on your side and are delighted to see that you produce the truth in such a way that it cannot be oppressed by the malevolence of the pedants.¹⁹

In these statements, the same principles are invoked as in the passage from *DAS* quoted above: ‘*medicina autem in philosophia non fundata res infirma est*’. And this explains where physicians and chemists alike have erred. Therefore, although it has been widely studied, medicine remains an art ‘*magis ostentata quam elaborata, etiam magis elaborata quam amplificata*’.²⁰ Bacon saw the greatest efforts as having been devoted to the treatment of disease, *curatio morborum*, which in his understanding ought to be the second part of the partition of medicine, falling between *conservatio sanitatis* and *prolongatio vitae*. And yet, for all the efforts, little success could be said to have been attained: ‘*Quod vero ad Curationem Morborum attinet, illa demum pars est Medicinae in qua plurimum laboris insumptum est, licet fructu satis tenui*’. In the *New Atlantis*, medicine, comprehensively understood as the treatment of disease, the improvement of the quality of life and the creation of new medicines, assumes a position of cardinal importance and comes to be regarded as one of the most useful sciences for human well-being, and therefore for human progress.²¹

toutes les choses qui luy peuvent servir d’alimens ou de remedes, qu’il luy soit aysé de s’exempter par son moyen de toutes sortes de maladies. *Car, sans parler de ses autres usages, celui-la seul est assez important, pour obliger les plus insensibles à favoriser les desseins d’un homme, qui a desja prouvé, par les choses qu’il a inventées, qu’on a grand sujet d’attendre de luy tout ce qui reste encore à trouver en cette science*’ (emphasis added).

¹⁹ *Passions de l’âme*, in Descartes 1964–1974, XI, 311: ‘Il ne reste donc que les Philosophes, entre lesquels tous ceux qui ont de l’esprit sont desja pour vous, et seront tres-ayes de voir que vous produisiez la verité en telle sorte, que la malignité des Pedans ne la puisse opprimer’.

²⁰ *DAS*, IV, 2, in Bacon. 1857–1874, I, 590.

²¹ Bacon 1661, 62: ‘Habemus etiam septa, et vivaria, pro bestiis, et avibus, omnigenis: quibus, non tam propter novitatem et raritatem, quam ad dissectiones, et experimenta anatomica, utimur, ut ab iis, quid fieri possit, circa corpus humanum, lucem accipiamus. In quibus mirabiles multos effectus reperimus, veluti vitae in iis continuationem, licet nonnullae partes, quas vos pro vitalibus habetis, perierint, aut extractae fuerint; resuscitationem nonnullarum, quae specie tenus, mortuae erant et similia.’

My chief reason for insisting on the Bacon-Descartes relationship with regard to medicine, more generally, and particularly to *prolongatio vitae*, was to show how that discussion was an integral part of a broader philosophical and cultural debate, something that neither was nor is immediately obvious. Now, however, I wish to return to euthanasia, which, conversely, is an indicator of the great modernity of Bacon, and for a long time will remain an element that is exclusive to his thinking alone.

5.4 Precedents for *Euthanasia* in Bacon's Thought

Bacon's passage on euthanasia is well known and frequently cited, Bacon himself being quite commonly acknowledged as one of the first modern thinkers to approach the issue. What I wish to do is to qualify its singularity. What he defines as *exterior euthanasia*, the practice that, in his view, should be the resort of the most attentive medical practitioners when they find the spirits are no longer amendable, or are putrescent and perishing, has but few antecedents, and all of these antecedents belong within early modern Anglo-Saxon culture. Without naming it, Thomas More seems to bring euthanasia into his discussion of slaves in *Utopia* (1516):

I have already told you with what care they look after their sick, so that nothing is left undone that can contribute either to their case or health; and for those who are taken with fixed and incurable diseases, they use all possible ways to cherish them and to make their lives as comfortable as possible. [...] Such as are wrought on by these persuasions either starve themselves of their own accord, or take opium, and by that means die without pain. But no man is forced on this way of ending his life; and if they cannot be persuaded to it, this does not induce them to fail in their attendance and care of them: but as they believe that a voluntary death, when it is chosen upon such an authority, is very honourable, so if any man takes away his own life without the approbation of the priests and the senate, they give him none of the honours of a decent funeral, but throw his body into a ditch.²²

The connotations in More's argument here, just as in every other part of *Utopia*, are distinctly more social than individual. In effect, he puts forth the idea of the first organized system of euthanasia, whereby those who are ailed by painful and hopeless diseases are assisted and encouraged by a commission of magistrates and

²²More 1885, ii: 'Egrotantes; ut dixi, magno cum adfectu curant, nihilque prorsus omittunt quo sanitati eos, uel medicinae uel uictus obseruatione, restituant. Quin insanabili morbo laborantes assidendo, colloquendo, adhibendo demum quae possunt leuamenta solantur. Caeterum si non immedicabilis modo morbus sit uerumetiam perpetuo uexet atque disrutiet; tum sacerdotes ac migistratus hortantur hominem, quandoquidem omnibus uitae munijs impar alijs molestus ac sibi grauis morti iam suae superuiuat, ne secum statuat pestem diutius ac luem alere, neue quum tormentum ei uita sit mori dubitet, quin bona spe fretus acerba illa uita uelut carcere atque aculeo uel ipse semet eximat; uel ab alijs eripi se sua uoluntate patiat; hoc illum quum non commoda, sed supplicium abrupturus morte sit prudenter facturum, quoniam uero sacerdotum in ea re consilijs, id est interpretum dei sit obsecuturus, etiam pie sanctaeque facturum'. For the English translation, Sir Thomas More's *Utopia*. [Burnet's Translation. Edited by Henry Morley.]

priests to embrace a timely and ‘welcome’ death. The actual word ‘euthanasia’, though, never appears in More.

Henry Montagu also obliquely approached the theme in his *Contemplatio mortis, et immortalitatis* of 1637; though only Ben Jonson (who also composed the eulogy for Francis Bacon) explicitly named euthanasia in his eulogy of Venetia Digby, who died a ‘misterious death’ in 1633, being fully aware of the charges of irreligiousness to which he was exposing himself:

Dare I prophane, so irreligious be,
 To greet or grieve her soft euthanasee?
 So sweetly taken to the court of blisse,
 As spirits had stolne her spirit in a kisse,
 From off her pillow and deluded bed;
 And left her lovely body unthought dead!²³

These are lines in which one might trace various echoes of Bacon’s framing of the issue. Strictly connected to its classical sources, modern discourse on euthanasia is commonly traced back to Bacon (although the passage here quoted from *De augmentis scientiarum* is erroneously ascribed to *Novum organum*, even in dictionaries).²⁴ In comparing the two forms of euthanasia, the one exterior, and the other directed at preparing the soul to exit the body, Bacon draws on three classical sources: the death of Augustus as related in Suetonius,²⁵ the *exemplum* of Antoninus Pius that is to be found in the *Historia Augusta*,²⁶ and Diogenes Laertius’s commentary following his narrative of the death of Epicurus (Diogenes 1925, X, 96).

The form that was both accepted and acceptable as euthanasia proper, as against ‘exterior’ euthanasia, was in line with an ancient tradition in philosophy and denoted a natural, pleasant death, that was accepted placidly and in a serene disposition of mind; a death that was understood and celebrated as the perfect culmination of existence. In tracing the distinction between two possible uses of the term, Bacon refers to all the canonical sources from antiquity, as we have just noted. No doubt, these chosen *exempla* are canonical, though they might also be quite self-conscious and not incidental. Augustus employs the term and calls for the practice to be dispensed

²³ See Jonson, *Elegy on my muse*, in Jonson 2012, VII.

²⁴ See, for example, ‘Euthanasia’, in Auroux 1990.

²⁵ Suetonius 1914: ‘Then he sent them all off, and while he was asking some newcomers from the city about the daughter of Drusus, who was ill, he suddenly passed away as he was kissing Livia, uttering these last words: “Live mindful of our wedlock, Livia, and farewell”, thus blessed with an easy death and such a one as he had always longed for. For almost always on hearing that anyone had died swiftly and painlessly, he prayed that he and his might have a like euthanasia, for that was the term he was wont to use. He gave but one single sign of wandering before he breathed his last, calling out in sudden terror that forty men were carrying him off. And even this was rather a premonition than a delusion, since it was that very number of soldiers of the pretorian guard that carried him forth to lie in state’.

²⁶ *Historia Augusta* 1921, xii: ‘Tertia die, cum se gravari videret, Marco Antonino rem publicam et filiam praesentibus praefectis commendavit Fortunamque auream, quae in cubiculo principum poni solebat, tansferri ad eum iussit, 6 signum tum tribuno aequanimitatis dedit atque ita conversus quasi dormiret, spiritum reddidit apud Lorium’.

at the appropriate time to himself and his own kin, as Svetonius stresses: ‘For almost always on hearing that anyone had died swiftly and painlessly, he prayed that he and his might have a like euthanasia, for that was the term he was wont to use’ (Svetonius 1914). In a similar vein, the painless death of Antoninus Pius is portrayed as the slumber of the sage. On the other hand, the instance of Epicurus has been severally condemned and reappraised, to the extent that the Latin term *ebrius*, ‘drunken’ (*Hinc Stygius ebrius hausit aquas*; ‘he was not sober enough to taste any bitterness of the Stygian water’, as the passage in Bacon relates) was emended by Pierre Gassendi, the great advocate of modern philosophy, to an innocuous *protinus* (‘at once’):

Extremum hoc moriens Epicurus dixit amicis: | Salvete, et placitis invigilate meis | Quippe
iniit pelvim calidum, vinoque subhausto | Plutonis gelidas *protinus* hausit aquas (Gassendi
1656, 156; emphasis added).

The form of euthanasia Bacon distinguished from the ‘exterior’ continued the philosophical tradition of antiquity and signified an agreeable, placid and natural death to be met in serene spirit – the optimal completion of one’s course of life. The process leading to such a goal was neither simple nor within anyone’s reach, and required preparation of a spiritual/mental order. I believe that the view propounded by Bacon can only be properly evaluated in the light of his beliefs about the spirits, and that *De vijs mortis* and the *Historia vitae et mortis* are crucial works to that end – the former to a far greater extent than the latter. Bacon thus enlists exterior euthanasia among the *desiderata* for medical science and finds the physicians of his time to be wanting intellectually, insofar as they do not master the theory, and are thus unable to acknowledge that, when the *spiritus mortualis* has finally prevailed, no treatment of the symptoms will avail, nor indeed could there be any hopes of redressing the balance. I am persuaded that the keys for a better understanding of the innovative elements in Bacon’s theorization are to be found in his studies of the doctrine of the spirits: in *De vijs mortis*, foremost, and then in the *Historia vitae et mortis*.

Bacon’s lesson was taken up with exemplary lucidity by Jonathan Swift’s commentator, John Boyle Orrery. In Epistle XIV, first published in 1752 as part of his *Remarks on the Life and Writings of Dr. Jonathan Swift*, Orrery reports that when Epicurus realized his condition was incurable, he took such large draughts of wine as to become utterly intoxicated and deprived of his senses, and thus died more like a Bacchanal than a philosopher – an assesment adumbrated in Virgil’s epigram, *Hinc Stygius ebrius hausit aquas* (Orrery 1752, 206–207). Wishing to rehabilitate Epicurus, Orrery turned to his admirers, ancient and modern, from Diogenes Laertius down to Bacon, whose authority, however, he found to be severe almost to a fault:

I should not have ventured into this criticism and censure upon these ancient philosophers, not even to you, my dearest Ham, if my opinion was not in a great measure supported by Lord Bacon, who, as he was certainly the most accurate judge of this subject, might be perhaps, from that pre-eminence, too severe a critic (Orrery 1752, 107).

Perhaps it escaped Orrery that, to the Lord Chancellor, the instance of Epicurus had been decisive in illustrating the distinction between the two kinds of euthanasia.

At any rate, when at last he comments upon Swift's active old age as that of a man who was indeed melancholy, but who possessed an alert mind until his death, Orrery enlists Bacon's examples: 'this is that *Euthanasia* which Augustus often desired, which Antoninus Pius enjoyed, and for which every wise man will pray' (Orrery 1752, 109). It is only appropriate, then, and of great pertinence in emphasizing the modernity of Bacon, that in the French edition of Orrery's letters, the translator François Lacombe, who deemed them a literary work of great importance in enhancing our understanding of such an important author in the English language, should have replaced the word euthanasia with the expression *fermeté stoïque* (Orrery 1753, 170).

Appendix: Concordances of *Prolongatio Vitae* in Bacon's latin Works

Legenda:

NO = *Novum organum*

DAS = *De augmentis scientiarum*

HVM = *Historia vitae et mortis*

Number page taken from Bacon 1857–1874

NO e DAS = Bacon 1857–1874, I

HVM = Bacon 1857–1874, II

NO, 194

quipartim ex credulitate, partim ex impostura, genus humanum promissis onerantur:
VITAE PROLONGATIONEM, senectutis retardationem, dolorum levationem, naturalium defectuum reparationem.

354–355

eorum inutiles et incensivos motus, ex quo ad curas morborum, et VITAE PROLONGATIONEM haud parum conferant.

AS, 427–428

officia tria: viz. in *Conservationem Sanitatis, Curationem Morborum*, et PROLONGATIONEM VITAE: quodque pars postrema de Prolongatione vitae disjungi debeat a duabus reliquis.

et *Prolongationem Vitae*: quodque pars postrema de PROLONGATIONE VITAE disjungi debeat a duabus reliquis. Cap. III.

574

per diaetas, balnea, unctiones, medicinas proprias, accommodata etiam exercitia, et similia, VITAM PROLONGARI aut vigorem juventutis aliqua ex parte renovari; quam quod hoc fieri

586

Officia tria: viz. in Conservationem Sanitatis, Curationem Morborum, et PROLONGATIONEM VITAE: *quodque pars postrema de Prolongatione Vitae disjungi debeat a duabus reliquis.*

Morborum, et Prolongationem Vitae: *quodque pars postrema de Prolongatione Vitae disjungi debeat a duabus reliquis.*

590–591

Conservatio Sanitatis; secundum Curatio Morborum; tertium PROLONGATIO VITAE. At istud postremum non videntur medici tanquam partem principalem artis suae agnovisse, verum idem propulsentur morbi antequam ingruant, et curentur postquam invaserint, PROLONGATIONEM VITAE ultro sequi. Quod licet minime dubium sit, tamen parum acute prospiciunt horum utrumque ad dubiumsit, tamen parum acute prospiciunt horum utrumque ad morbos tantum pertinere, et ad eam solummodo VITAE PROLONGATIONEM quae a morbis abbreviatur et intercipitur. Atqui filum [./.]

598

Tertiam partem Medicinae posuimus illam de PROLONGATIONE VITAE, quae nova est, et *desideratur*; estque omnium nobilissima. Si enim tale aliquid inveniri possit, non versabitur tantum medicina

598–599

non margaritarum essentiis, et similibus nugis; sed ut pro certo habeant PROLONGATIONEM VITAE esse rem operosam, et quae ex compluribus remediis atque eorum inter se connexione idonea

tamen de summa vitae detrahunt, et atrophiam senilem absque morbis accelerant.

Sunt et alia quae ad PROLONGATIONEM VITAE et atrophiam senilem longius summovendam juvant; sed tamen

non usurpantur absque periculo valetudinis, adeo ut qui iis utentur ad PROLONGATIONEM VITAE debeant simul incommodis occurrere, quae alioquin ex eorum usu supervenire possint.

600–601

conservatoriis nivalibus; cadaver inter balsama. Per Reparationem, ut in flamma, et in mechanicis. Operanti ad PROLONGATIONEM VITAE utroque genere utendum est (disjuncta minus

ac denique quadantenus ut Mechanica conservantur. Tres igitur sunt ad PROLONGANDAM VITAM intentiones; Retardatio Consumptionis, Probitas Reparationis, et Renovatio ejus

tria tamen veluti praecipua subjungere visum est. *Praecipimus* primo, ut PROLONGATIO VITAE expectetur potius a diaetis stasis quam a regimine aliquo victus familiaris, aut etiam a medicamentorum

601–602

Secundo *praecipimus*, ut PROLONGATIO VITAE expectetur potius ab operatione in spiritus, et a malacisatione partium, quam a

fabrica (missis externis) a tribus patiatur, spiritibus scilicet, partibus, et alimentis; via PROLONGATIONIS VITAE per alimentandi modos longa est, atque per multas ambages et circuitus; atviae

est, minus estactivum ad assimilandum. Atque de PROLONGATIONE VITAE, quae est pars tertia Medicinae noviter ascripta, haec dicta sint.

627–628–629

partis illius medicinae de Curationibus Morborum ad partes illas de Tuenda Sanitate et PROLONGATIONE VITAE transferantur. Si enim *opiatum aliquod insigne* ad spirituum in morbo pestilenti

HVM, 109

inquirito. 10. De medicinis quae putantur VITAM PROLONGARE, seorsum inquirito.

119

magis juveniles et virides; quinetiam existimamus morbos emaciantes, postea bene curatos, compluribus VITAM PROLONGASSE. *Observationes Majores.*

153

Illud certe minime dubium est, quindiaeta bene instituta partes ad PROLONGANDAM VITAM potiores teneat; neque conveni unquam aliquem valde longaezum, qui interrogatus de victu suo

158

colligi et componi debent; atque de sigillis planetarum, per quae virtutes coelitus ad PROLONGATIONEM VITAE haurire et deducere possimus; et hujusmodi fabulosis et superstitiosis;

160

quae tamen de summa vitae detrahunt. Sunt et alia quae ad PROLONGATIONEM VITAE plurimum juvant, sed tamen non sunt absque periculo valetudinis; nisi per accommodata quaedam

163

20. Graeci multum posuerunt, et ad sanitatem, et ad PROLONGATIONEM VITAE, in opiatis: Arabes vero adhuc magis; in tantum ut medicine suae grandiores (quas Deorum Manus vocant)

ne turbent et tumultuentur, id optime transfertur ad PROLONGATIONEM VITAE; cum idem faciat ad utrumque; condensatio videlicet spirituum. Id autem praestant ante omnia opiata.

164

31. Ex his quae dicta sunt, possent deduci quaedam Designationes, sive consilia, ad PROLONGATIONEM VITAE, secundum hanc Intentionem, scilicet Condensationis Spirituum per Opiata.

165

est), ita haec secundaria familiariter, et in victu quotidiano, sumi possunt; et multum conferent ad PROLONGATIONEM VITAE. Certe pharmacopoeus quidam Calecutiae, ex usu ambrae, ad centum

166

At rursus, quia familiariter et in victu quotidiano moderate adhiberi potest, etiam longe potentior ad PROLONGATIONEM VITAE est quam per opiata.

169

excitata, raro peracta; atque nonnulli ex affectibus, de quibus postea dicitur. Atque de calore spirituum, analogo ad PROLONGATIONEM VITAE, jam inquisitum est.

170

hiemalibus. 77. Verum ut somnus moderatus ad PROLONGATIONEM VITAE facit, ita multo magis, si sit placidus et non turbidus.

171

83. Moeror et tristitia, si metu vacet et non nimium angat, VITAM potius PROLONGAT: spiritus enim contrahit, et est condensationis genus.

172

90. Spes omnium affectuum utilissima est, et ad PROLONGATIONEM VITAE plurimum facit; si non nimium saepe intercidat, sed phantasiam boni intuitu pascat: itaque qui finem aliquem,

extenditur, sicut aurum. 91. Admiratio, et levis contemplatio, ad VITAM PROLONGANDAM maxime faciunt; detinent enim spiritus in rebus quae placent,

175

operatio super spiritus eorumque recrudescentiam ad PROLONGATIONEM VITAE est via maxime proclivis et compendiarum: propter duplex scilicet compendium; alterum, quod spiritus compendio

182

calor parum aut nihil agere possint, omnino id non tantum putrefactioni sed etiam arefactioni obstiturum, et ad VITAM PROLONGANDAM fore efficacissimum. In hoc tamen plures adhibendae

186

qui nisi curentur, etiam in viscera principalia incurrunt: quatenus vero ad PROLONGATIONEM VITAE et reparationem per alimenta et retardationem atrophiae senilis, si concoctiones et

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Chapter 6

Francis Bacon's Flux of the Spirits and Renaissance Paradigms of Hybridity and Adaptation

Miranda Anderson

[T] his Proteus of Matter, being held by the Sleeves, will turn and change into many Metamorphoses.

Francis Bacon, Sylva Sylvarum

Abstract Francis Bacon's works cover a diverse range of spheres, including natural philosophy, experimental science, discursive essays and contemporary politics; yet underpinning this diversity, and spanning his roles as intellectual scholar and public official, lies his belief in a hybridity and adaptiveness in Nature that is also expressed in humans. Bacon describes the compound nature of the human body as an extreme manifestation of the hybridity to be found in Nature more generally, and it is this that results in humans' particularly fluid and impressionable nature. This hybridity is also expressed by the co-effective nature of the bodily humours and the passions of the mind, with the distribution of the faculties of the mind in the organs of the body also reflecting the non-trivially embodied nature of the mind. The embodied mind is described as an 'uneven mirror' which 'inserts and mingles its own nature with the nature of things as it forms and devises its own notions'; this reveals that a blurring between the characteristics of subject and object is inevitable, with a projection of one's own qualities onto the object (Bacon 2000b, 19). Errors and false beliefs on the epistemological level result from the ontological interrelationship of natural bodies; these errors arise not just from our hybridity, or flawed sensory perceptions, but also from the discernment and motions of the minuscule yet material spirits through which all matter is dynamically interconnected. That humans are not only embodied but also extended into the world is implied by the flux from spirit to spirit, not only within, but also between entities, and this resulted in Bacon's interest in pursuing empirical tests on social permeability, as well as on humans' and other entities' more general susceptibility to appropriate another substance's properties.

M. Anderson (✉)
University of Edinburgh, Edinburgh, UK
e-mail: Miranda.Anderson@ed.ac.uk

In *Sylva Sylvarum* Bacon explained that the spirits or ‘Pneumatics’ are the properties which govern nature in both animate and non-animate bodies. Without proper knowledge of the almost unceasing motion of the spirits no true analysis of Nature in general or of human nature in particular could be made: only a more empirical natural history could provide the necessary foundation for the building of a true philosophy. Hybridity in Nature requires a similar hybridity on a theoretical level, with inclusive approaches to understanding humans and Nature, as a supplement to their categorical division. Natural hybridity reflects, and in addition necessitates, hybridity on a linguistic, technological and sociocultural level, since while Bacon argues that humans are both the rulers and the cause for which the world was created, he also continues that without the aid of many resources they are unarmed and naked. Awareness and skepticism about humans’ tendency to frame experience according to human qualities and beliefs, and to accept elegant fictions and abstractions as truth, leads Bacon to emphasize the need by the human mind of tools and assistance, in order to overcome the illusions that impede it. One such tool is language, since although words can cause error because they only reflect the current notions of things, language’s contingency also allows for the concentrated transmission of ideas, and writing further supplements the memory, enabling the retaining and recovery of knowledge.

In *De sapientia veterum* Bacon explained that those who aim to forcibly govern matter will discover that matter instead metamorphoses into diverse forms, until, as if completing a circuit, it returns to its original state of being. Matter’s adaptation into metamorphosed and renewed forms indicates the underlying cause of human nature’s capacity to be flexible and hybrid and yet remain itself. Only through perceiving Nature anew could humans ever hope to grasp epistemologically their natural extendedness: Bacon’s innovative, albeit paradoxical seeming, proposal is that admission of the intellectual need for external tools and assistance is the necessary antidote to ontological hybridity and adaptability.

6.1 The Embodied Mind and the Material Spirits

Underlying the diversity of Bacon’s works lies his consistent belief in a hybridity and adaptiveness in nature that is also operative in humans. This section will begin by examining Bacon’s portrayal of the cognitive roles played by the body, and will compare this with a few of his contemporaries’ views, before then focusing on the spiritual mechanisms to which Bacon innovatively ascribed an expanded role as a further means of explaining and tackling human hybridity and adaptiveness.

Bacon’s account of knowledge is influenced by the pervasive Platonic notion that the filtering of sensory impressions enables the recollection of the universal forms imprinted in the mind, but he places a significant new emphasis on the role of nature (Plato 1999, 91E–92A). In the *Advancement of Learning* (1605) his opening address flatters James VI thus:

your Maiestie were the best instance to make a man of *Platoes* opinion, that all knowledge is but remembrance, and that the minde of man *by nature* knoweth all things, and hath but her owne natue and originall notions (which by the strangenesse and darkenesse of this Tabernacle of the bodie are sequestered) againe reuiuied and restored (Bacon 2000a, 3; my emphasis).

The 'strangenesse and darkenesse' the body confers on the mind is contrasted with both the mind in its natural state *and* when it is re-enlightened 'by nature', both of which senses are conveyed by that deliberately equivocal phrase. Biblical influences are also evident here: 'tabernacle', literally a tent, is a term that can be used for a portable temple or church, for Christ's body, or for the dwelling of God.¹ This suggests the sanctity of the body, as well as its enclosing transitoriness, with notions of the mind and body not clearly polarized because of their interdependence.

Competing, conflicting and overlapping accounts of the relation of knowledge to embodiment were circulating. Sir John Davies's didactic poem *Nosce Teipsum* (1599) presents the human mind as capable of independent self-reflection, but adds that since the Fall the damaged vision attainable in the 'waterie glasse' of one's own mind often wrongly leads humans to rely instead on their error-choked senses (Davies 1599, 5). The interdependence of mind (or soul) and matter is less negatively fraught in Helkiah Crooke's *Mikrokosmographia* (1615), in which 'the image of the diuine nature' is described as 'most liuely imprinted in his soule and in his body, and in the substance & qualities of them both' (Crooke 1615, 2). Crooke, as royal physician, wrote this encyclopaedic account of the human body as a defense of the need for interest to be taken in anatomy, not only for medical, but also for theological and philosophical reasons (Crooke 1615, 12).² He argues that in the body we may 'behold the liuely Image of all this whole Vniuerse, which wee see with our eyes (as it were) shadowed in a Glasse'; thus, for Crooke, the human body is St. Paul's dark glass.³ While thinkers like Crooke were contending that the attainment of divine, natural and self-knowledge were available through the body, Bacon extends this interest in materiality further into the world itself by making such attainment dependent on knowledge of the natural world. The first aphorism of his *Novum organum* (1620) is: 'Man is nature's agent and interpreter; he does and understands only as much as he has observed the order of nature in fact or by inference' (Bacon 2000b, 33). William Rawley's preface to the reader in *Sylva Sylvarum* explains that Bacon believed 'Naturall History' to be 'Fundamentall to the Erecting and Building of a true Philosophy' that would 'unloose Mens mindes' (Rawley in Bacon 1626, A1^r-A1^v). So it is in light of these ideas that we must read Bacon's claim that 'the minde of man *by nature* knoweth all things' (Bacon 2000a, 3; my emphasis).

¹ See Coote 1596 and Wilson 1612.

² Jonathan Sawday explores the relation of concepts of anatomization to wider Renaissance cultural and literary discourses in *The Body Emblazoned* (Sawday 1995); Marina Wallace and Martin Kemp also tackle their interrelation in the book *Spectacular Bodies* (Kemp and Wallace 2000).

³ Crooke 1615, 4: 'For now we see through a glass, darkly; but then face to face: now I know in part; but then shall I know even as also I am known'. See 1 Cor. 13:12.

Bacon shared the general understanding at the time of the dynamic intermingling of the bodily humours and the passions of the mind. In the *Advancement of Learning* he gives examples of the effect that the imagination has on the body and that fasting has on the mind in order to demonstrate how the humours respond to the passions and the passions to the humours (Bacon 2000a, 94–95). Bacon’s account acknowledges the co-effective nature of the agents of the body and mind and he concludes that therefore attempts to understand either must engage with both (Bacon 2000a, 95). He further explains that ‘the Lyneaments of the bodie doe disclose the disposition and inclination of the minde in generall; but the Motions of the countenance and parts, doe not only so, but do further disclose the present humour and state of the mind & will’ (Bacon 2000a, 94). Bodily structures reveal persistent dispositions, while expressions and gestures reveal ongoing cognitive processes in such a way that through them another’s mind can be inferred. The art of physiognomy, it is argued, is an inversion of the exposition of dreams: ‘the first is PHYSIOGNOMIE, which discovereth the disposition of the mind, by the Lyneaments of the bodie. The second is the EXPOSITION OF NATVRALL DREAMES, which discovereth the state of the bodie, by the imaginations of the minde’ (Bacon 2000a, 94). Intimacy of body and mind means the body’s revealed properties can be used to understand the mind and vice versa, with gestures and expressions acting as a material means to read another’s mind. Bacon also advises investigation of ‘the Seates, and Domiciles which the seuerall faculties of the minde, doe take and occupate in the Organs of the Bodie’, thus identifying cognitive powers as distributed within the body rather than restricted to the brain (Bacon 2000a, 96).

While in Renaissance texts the word ‘spirit’, like the word ‘mind’, is often used interchangeably with the word ‘soul’, and is sometimes defined as indicating an immortal intellectual part of the soul which distinguishes humans from the rest of creation,⁴ ‘the spirits’ engendered of air and blood were the mechanism generally

⁴An anonymous reviewer was careful to point out that the spirit is usually understood as material and the vehicle of the soul rather than interchangeable with it; however, as I argue here, there is slippage or variation in the particular uses of terms, with the spirit frequently also described as superior to, or as the superior intellectual part of the soul, as in the following example from Charron 1608, 54: ‘The action of the reasonable Soule is the knowledge and vnderstanding of all things: The Spirit of man is capable of vnderstanding all things... The first soueraigne Spirit, GOD, doth first know himselfe, and afterwards in himselfe all things; the latter Spirit, Man, quite contrarie, all other things rather than himselfe’. This slippage is explicitly described in La Primaudaye 1618, 34: ‘So that one would thinke, that the soule and spirit are two distinct things, although we see euery where the one taken for the other’. The relation is then discussed, and a distinction and a tautology simultaneously drawn: ‘I thinke we may here set downe some speciall difference betwixt them, although vndoubtedly the one is taken indifferently for the other, without any absurdity, yea they are one and the same thing. The difference may be made in this sort, if wee say, that the soule is common to all things that haue life, as we vse to say, that all beasts are animated, and haue sensible soules: but that the spirit which is immortall, and capable of reason & knowledge, is proper and peculiar to man onely, And it seemeth that *Sophocles* would teach vs this distinction, when he saith, that *The spirit is the same thing to the soule, which the eye is to the body*’ (35). See also Nixon 1612, 3–4: ‘The Soule is common to all things that haue life, But the Spirit (which is immortall and capable of *Reason* and knowledge) is proper to *Man* only: Or wee may say, the Spirit is the first and principall part of the Soule, wherein the *minde*, *vnderstanding*, and

held responsible for the transportation of the passions and the faculties of the soul around the body.⁵ The spirits were understood to exist on a continuum, and were refined from the most material and bloody natural spirits of the liver into the vital spirits of the heart, and then into the more airy animal spirits of the brain (Burton 2001, 1.1.2.2; Crooke 1615, 824). As an analogy, Crooke conjures the invisible power of climatic forces acting on a mechanistic-body structure: 'they are like the winde which whiskes about in euery corner and turns the heauy saile of a Wind-mill'. In addition, Crooke describes that the 'formes of the Imagination' could be 'insculp'd or engrauen in the aery spirites and vice versa, since 'the aer is full of formes... so our spirits which are aery doe easily admit all species or formes of things' (Crooke 1615, 312). Thus, the spirits were understood as a transportation mechanism for the passions and the faculties of the soul, while the relationship between the affiliated air and the spirits formed a system in which shared properties resulted in the flux of species in and out of the 'transpirable' body and mind (Crooke 1615, 175).

However, in general accounts the prime mover and power in the body and world were the three faculties of the soul. Typically, on the bottom rung of this ontological and epistemological ladder, was the vegetative soul, a life-giving and digestive force in plants, animals and humans; one step up, was the sensitive soul, shared by humans and animals, and relating to the faculties of feeling and sense; last of all, was the intellectual or rational soul, which distinguished humans from the rest of creation.⁶ A Renaissance commonplace derived from the Platonic tradition was the view that the soul in the body was analogous to the diffusion of God's presence in the world:

incorporeall and diffusiue, quickning, sustaining, gouerning and moouing the whole body, and euery part thereof, euen as God supporteth and ruleth the whole world, being by a diffusiue nature, or rather infinite omnipresence, at all times, in euery place (Crooke 1615, 2).

The distinction between accounts of the spirits' and the soul's diffusive capacity is the extensiveness and incorporeality of the latter. This notion of a dynamically distributed and expressed force is explicitly naturalized and materialized through Bacon's expanded notion of the spirits, as not just the transportation mechanism for the activities of the tripartite soul, but as themselves the fundamental power in the natural world and in mortal human nature.

Bacon himself emphasized, and perhaps even over-emphasized, the radical nature of his highlighting of the role of what he claimed were the scarcely understood spirits. These he contended were the properties that governed nature in both animate and inanimate bodies: 'through their almost unceasing motion the spirits do

memory are contain'd.' Marginal commentary on the Bible (1590) glosses 'the spirite of a man' as the 'minde of man' (1 Cor. 2.11) and John Donne requires an entire sermon to describe the range of possible meanings of the word 'spirit': 'amongst the manifold acceptations of the word spirit... it is either the soul it self, or the vitall spirits... or the superior faculties of the soul' (*Sermons* 5: 65).

⁵Lemnius 1576, 8–9; Nixon 1612, 8; Crooke 1615, 174.

⁶See Burton 2001, 1.1.2.5; Castiglione 2003, 325; Crooke 1615, 2; Coeffeteau 1621, A8^v-A9^r.

in effect all' (Bacon 1626, 31).⁷ A significant aspect of his transformation of the existing taxonomies is Bacon's assertion that the activities of the spirits have been mistakenly ascribed to the vegetative and sensitive souls:

And then, when they come to Plants and liuing Creatures, they call them Soules... Neither is this a Question of Words, but infinitely materiall in Nature. For Spirits are nothing else but a Naturall Body, rarified to a Proportion, & included in the Tangible Parts of Bodies, as in an Integument (Bacon 1626, 31).

The reason for the previous failure to recognize the role of the spirits, despite their prevalence, is human over-dependence on their limited perceptual capacities:

The Knowledge of man (hitherto) hath beene determined by the View, or Sight; So that whatsoeuer is Inuisible, either in respect of the Finenesse of the Body it selfe; Or the Smallnesse of the Parts; Or of the Subtilty of the Motion; is little inquired. And yet these be the Things that Gouverne Nature Principally; And without which, you cannot make any true Analysis and Indication of the Proceedings of Nature. The Spirits or Pneumatics, that are in all Tangible Bodies, are scarce knowne (Bacon 1626, 31).

Thus Bacon describes human hybridity as expressed in the co-effective nature of the humours and the passions, and the distribution of the faculties of the mind in the organs of the body also reflects the mind's embodied nature. His replacement of the vegetative and sensitive souls with the spirits gives even greater emphasis to human nature's participation in Nature than in the preceding accounts, with the flowing of mind, body and world into each other depicted as enabled by the activities of the spirits.

6.2 Mutability and Adaptation

Human and natural mutability was understood as both a glory and a cause for concern. William Drummond observed that the human '[b]odie is but a masse of discording humours... which though agreeing for a trace of time, yet can never be made vniforme and kept in a just proportion... we should rather wonder how so fragill a matter should so long endure, than how so soone decay' (Drummond 1623, 51).⁸ Insecurity was driven by an awareness that man was made from matter that was not only mutable, but subject to decay. Yet there was also an understanding of the value of mutability. Edmund Spenser's 'Mutabilitie Cantos', for example, concern a trial to settle the extent of the rule of Mutability, who pretends to be sovereign over all. Nature points out that despite, or rather because of, all things' incessant change, it is self-extending and self-creating motion rather than disorder that is at work:

They are not changed from their first estate;
But by their change their being doe dilate:

⁷On the role of the spirits see Rees 1977.

⁸See also Davies of Hereford 1609.

And turning themselves at length againe,
 Doe worke their owne perfection so by fate:
 Then ouer them Change doth not rule and raigne;
 But they raigne ouer change, and doe their states maintaine
 (Spenser 1987, 7.58.4-9).

In Spenser's enactivist account, the character Nature asserts the universal principle that living entities 'dilate', which suggests that openness and a capacity to extend are natural properties. It is part of their autopoietical nature to reach beyond their initial sphere in order to work towards their fuller realization, and so to both preserve and perfect their natural condition. Similarly in *De sapientia veterum* (1609/1619) Bacon figures Proteus as representative of matter, concluding that his mutability signifies that:

if any expert Minister of Nature, shall encounter Matter by main force, vexing, and vrging her with intent and purpose to reduce her to nothing; shee contrariwise... being thus caught in the straites of necessitie, doth change and turne her selfe into diuers strange formes and shapes of things, so that at length (by fetching a circuit, as it were) shee comes to a period, and (if the force continue)... takes her selfe to her former being (Bacon 1619, 69–70).⁹

Matter's transmutation leads by a circuit to its former state with its mutability in effect a continuity of its natural condition. Crooke's explanation of the divine purpose of mutability can also help us unpack the circulatory nature of materiality: he explains that, as a parallel to the immortality of the soul, the 'matter of all things is eternall' because the 'dissolution of created things is but a resolution of one thing into another', through a perpetuity not of particular things but of the elementary parts of nature, although individual natures are also extended more directly through their offspring (Crooke 1615, 198). Drummond later gives a similar account in 'The Cypresse Grove':

Eternall things are raised far above this Spheare of Generation & Corruption, where the first Matter, like an euer-flowing & ebbing Sea, with diuerse waues, but the same water, keepeth a restles and neuer-tyring current; what is below, in the vniuersalitie of the kind, not in it selfe doth abide, Man a long line of years hath continued, This Man euerie hundreth is swept away (Drummond 1623, 48–49).

Humans' elemental matter directly and indirectly participates in and is reformed into similar and new forms of matter. Thus, mutability not only leads to death and corruption, but also results in humans' extendibility through time, via body as well as soul, in sustained, renewed and metamorphosed forms. Despite concerns over human materiality, these theories explore its role in enabling the continuity, flexibility and extendibility of both humans and nature.

Giovanni Pico della Mirandola (1463–1494) had also emphasized human adaptability and the extent of our freedom to 'fashion thyself in whatever shape thou shalt prefer' (Pico della Mirandola 1948, 225). The injunction 'Know Thyself', Pico explains, 'encourages us to the investigation of all nature, of which the nature of man is both the connecting link and, so to speak, the "mixed bowl"' (Pico della

⁹*De sapientia veterum*, the original in Latin, was published in 1609, and was then translated into English in 1619 with the title *The Wisedome of the Ancients*.

Mirandola 1948, 235). John Davies (1569–1626) makes evident the wider acceptance of these views: in *Nosce Teipsum* he imagines the Ovidian mythical tales of human transformations as literalizations of man’s tripartite nature and ability to rise and descend into other forms (Davies 1599, 53). Meanwhile, Croke describes the wonder that man ‘can suddenly (Proteus-like) transform himselfe into any particular thing’, giving as a physiological basis the soft and pliable nature of the human body and brain (1615, 3, 5). In *De sapientia veterum*, Bacon describes that in the man of clay Prometheus makes ‘certaine particles were taken from diuers liuing creatures, & mixt & tempered with that clayie masse, because it is most true that of all things comprehended within the compasse of the vniuerse, Man is a thing most mixt and compounded’ (Bacon 1619, 126). Humans are the most diversely composed due to the greater variability of their lives and bodies: ‘man in his Mansion, sleepe, exercise, passions, hath infinit variations; and it cannot be denied, but that the bodie of Man of all other things, is of the most compounded Masse’ (Bacon 2000a, 96–97). This analogy does not include the soul, which Bacon describes as ‘the simplest of substances’, but this apparent disjunction is undermined by the fact that, while it resides in the body, the soul ‘enjoys no rest’ since the ‘variable composition of mans bodie hath made it as an Instrument easie to distemper’ (Bacon 2000a, 97).

Renaissance models subsequently emphasize the particular malleability of humans to experience and training. Lemnius, for example, offers the following image:

the mindes and bodyes of men be in a maner as it were yong Sproutes & trees, which being artificially handled... may like soft waxe, or as tractable and moyst claye, be fashioned, framed and made applyable to learne any knowledge, and vertue, any ciuilitye: and by artificiall instruction bee trayned to conceyue Artes and behaiour both comely and commendable (Lemnius 1576, 3–4).

Suggested here is the potential for the cultural shaping of human beings, as well as the innate properties which enable it. Bacon comments on the fluidity and pliability of ‘mens watry and soft natures’, which poise them for symbiotic and transformative relationships with the world. Yet he laments the fact that humans are formable by custom to such an extent that they act as ‘if they were Dead Images, and Engines moved onely by the wheelles of *Custome*’ (Bacon 1996, 419; 2000a, 107). The central position of man, Bacon emphasizes, signifies that by Providence man is made ruler over and is the final cause of the world (Bacon 1619, 125). While Pico della Mirandola’s and Davies’s accounts emphasize the particularity of humans’ hybrid metamorphic capacity, Bacon (and to a lesser extent Croke and Drummond) also insist on a continuity with the natural world with adaptive hybridity as a feature that is based in the properties of nature:

Nature is also excellently set forth with a biformed body, with respect to the differences betweene superiour and inferiour creatures. For the one part by reason of their pulchritude, & equabilite of motio[n], & constancy, & dominion ouer the earth & earthly things, is worthily set out by the shape of man: and the other part in respect of their perturbations and vnconstant motions (and therefore needing to be moderated by the celestiall) may be well fitted with the figure of a brute beast. This description of his body pertaines also to the participation of *Species*, for no naturall beeing seemes to be simple, but as it were

participating and compounded of two. As for example; man hath something of a beast: a beast something of a plant: a plant something of an inanimate bodie, so that all naturall things are in very deed biformed, that is to say compounded of a Superiour, and inferior *Species* (Bacon 1619, 26–27).

Thus, the compound nature of the human body is an extreme manifestation of the hybridity of nature itself. This tension between constancy and inconstancy, which Bacon places at the heart of Nature can be traced back to Platonic, Boethian and Ficinian notions of the tensions in humans between the worldly ends of the mortal body versus those of the immortal mind (Plato 1993; Boethius 1999; Ficino 1948). As Guido Giglioni has observed, Bacon places a notion of conflict between two basic appetites of matter, for liberty and for union, at the centre of his natural philosophy (Giglioni 2010). Seemingly anticipating Descartes by his stove conceiving of the *cogito*, Bacon proposes that these contrary motions of matter had not been paid sufficient attention to by philosophers who, as a reflection of their own private lives of retirement, ‘have sought to make mens minds too vniforme and harmonically’ (Bacon 2000a, 142). Correlations between the different levels of existence meant that matter’s adaptation into metamorphosed and renewed forms could be understood as indicating the underlying cause of human nature’s capacity to be flexible and hybrid and yet remain itself, with Bacon providing by means of the spirits the natural mechanism that created an underlying dynamic of conflicting tendencies towards constancy and inconstancy in both animate and inanimate matter.

6.3 Out of the Ontological and Epistemological Cave with Linguistic Mind Tools

[M]an in his originals, seemes to be a thing vnarmed, and naked, and vnable to helpe it selfe, as needing the aide of many things (Bacon 1619, 27).

Bacon combines a keen awareness of humans’ tendency to create elegant fictions with this understanding of human nature as fundamentally hybrid and adaptive and this in turn leads to an insistence on the need by the human mind of tools and supplementation. Fundamental concerns about the limits and deficiencies of human cognitive and perceptive faculties were also creating general epistemological doubts. In the early seventeenth century, Galileo was exploring the errors and limits of the senses; this innovatively implied that nature is organized according to independent laws, laws to which humans did not have privileged access, with the ensuing need to newly subject appearances to scrutiny (Piccolino and Wade 2008, 1320–1321). While Walter Raleigh (c.1552–1618) and Michel de Montaigne (1533–1592) were reconsidering the limits of individual human capacities in relation to other humans and animals, Bacon, interested also in relations between animate and inanimate bodies goes further; he compares, for example, the ability of a weather-glass to accurately report the least difference of temperature with man’s dull sense which cannot discern it (Bacon 1627, 211). He argued that ‘all Bodies

whatsoever, though they haue no Sense, yet they haue Perception', which he describes as a subtler discerner. And he continued to explain that it is this perceptual faculty of the spirits that precedes motion in matter: 'For when one Body is applied to another, there is a Kinde of Election, to embrace that which is Agreeable, and to exclude or expell that which is Ingrate: And whether the Body be Alterant, or Altered, euermore a Perception precedeth Operation'. This fuelling of motion creates constancy or unconstancy in matter through attraction or expulsion, and he claimed this explains the diversity of nature, '[f]or else all Bodies would be alike One to Another' (Bacon 1627, 211).

Yet not only the senses but also the spirits are implicated, since errors and false beliefs on the epistemological level result from the ontological interrelationship of these natural bodies, as even though the perceptions of the spirits are capable of more subtle discernment they are also affected by our physical dispositions and environments. In the *Advancement of Learning* Bacon uses a mirror motif and perceptual terms in order to explain the natural and sociocultural causes behind the inaccuracies of our mental images, evoking Plato's visual allegory of the shadows in the Cave. He concludes:

So in like manner, although our persons liue in the view of Heauen, yet our *spirites* are included in the Cauces of our owne complexions and Customes: which minister vnto vs infinite Errors and vaine opinions, if they bee not recalled to examination (Bacon 2000a, 117).

In *Novum organum* Bacon employs another mirror motif to point out the phenomenological blurring that takes place between subjective faculties and objective qualities, suggesting that the mind creates a mirror-like distortion:

just as an uneven mirror alters the rays of things from their proper shape and figure, so also the mind, when it is affected by things through the senses, does not faithfully preserve them, but inserts and mingles its own nature with the nature of things as it forms and devises its own notions (Bacon 2000b, 19).

A blurring between the characteristics of subject and object is inevitable, with a projection of one's own qualities onto the object, resulting in an epistemological gap, which is ironically based on the underlying interrelationships of natural bodies. While in more recent phenomenological accounts this simply marks the self-consciousness that accompanies any act of consciousness, in the Renaissance the fact that the mind and reason are not reliably stable reflective mediums against which embodied experience can be measured, but implicated and entangled in it, is a cause of concern.¹⁰

Raleigh, Montaigne and Bacon all sceptically comment on the limitations of human perceptual and cognitive capacities. In *Sceptick* Walter Raleigh rather naïvely proposes that we may attempt to duplicate another's perception of something through, for example, the manual manipulation of the eye into a long slit, so as to gain an impression of how the world might look to a cat (Raleigh 1657, 125).

¹⁰ See Sartre 1956, liv: 'This self-consciousness we ought to consider not as a new consciousness, but as the *only mode of existence which is possible for a consciousness of something*'.

Thomas Nagel's more recent scepticism famously ridicules the idea that by strapping on a pair of wings he will know what it is like for a bat to be a bat; he will only know what it is like for him to behave like a bat (Nagel 1979, 169). Underlying Raleigh's greater confidence in the possibility of imitated perception is perhaps a retained belief in shared humourality and a cosmological system composed of functional analogies. However, like Nagel, Montaigne cynically derides the possibility of man achieving an alternative perspective. Quoting Augustine, he ridicules humanity's pretensions: 'In truth it is not God, whom they cannot conceive, conceiving themselves in his stead, not him but themselves whom they compare, not with him, but with themselves' (Montaigne 2003, 481). This is also similar to Nagel's more recent suggestion that our understanding may be limited by our imagination since it is based on our experience (Nagel 1979, 169). William Rawley describes Bacon as similarly commenting on the human tendency to perceive the world by the light of their own imagination rather than as God made it. Humans' approximate conceptions relate to their own properties rather than to any divine truth. Bacon's remedy against this human tendency 'to reduce the World to the Narrownesse of their Mindes' is that 'Men should learne and perceiue, how seuer a Thing the true Inquisition of Nature is; And should accustome themselues, by the light of Particulars, to enlarge their Mindes, to the Amplitude of the World' (Bacon 1627, 74).

In *Novum organum* Bacon elaborates on the methodology for his plan to overcome the four 'idols', the 'illusions' which 'block men's minds'. These four idols belong to the general nature of man, one's own individual nature, the common understanding and philosophical theories (Bacon 2000b, 40). Bacon's damning description of the last as 'idols of the theatre' uses the variety of different accounts of the heavens as evidence of the human tendency to create narratives that satisfy our own understanding:

For just as several accounts of the heavens can be fashioned from the *phenomena* of the air, so, and much more, various dogmas can be based and constructed upon the phenomena of philosophy. And the stories of this kind of theatre have something else in common with the dramatist's theatre, that narratives made up for the stage are neater and more elegant than true stories from history, and are the sort of thing people prefer (Bacon 2000b, 50).

The types of stories created reveal the pattern-making and human-relating tendency of the human mind (Bacon 2000b, 42). Bacon argues that rather than relying on authorities and traditions, which reflect the human tendency to create elegant patterns and leap to abstraction, there should instead be a more incremental and empirical testing for the '*Interpretation of Nature*' (Bacon 2000b, 30). These stories can also be seen as narrowing the flux of existence to an anthropocentric middle-scope, especially when newly confronted by a range of realities spanning the microscopic to the telescopic.¹¹ What is required, Bacon contends, is that we appreciate that tools and assistance are needed by the mind as well as the body: 'Neither the

¹¹ Development of the glassmaking industry had resulted in new or improved magnifying glasses, spectacles and glass windows, and it assisted in the development of telescopes and microscopes. See Haden 1976, 788–790; Mason 1971, 208–209.

bare hand nor the unaided intellect has much power; the work is done by tools and assistance, and the intellect needs them as much as the hand' (Bacon 2000b, 33).

Renaissance relation to the textual reflects its more general exploratory interest as to how the material world could be utilized as a means toward *both* a theological and a secular understanding of the mind, the self and the world. Bacon compares the circumnavigation of the earth by man in his own age to that of 'the heavenly Bodies' above, and global exploration into uncharted territories to contemporary intellectual discoveries of the age:

But to circle the Earth, as the heavenly Bodies doe, was not done, nor enterprised, till these later times: In respect of the many memorable voyages after the maner of heaven, about the globe of the earth... And this Proficiencie in Nauigation, and discoveries, may plant also an expectation of the furdur proficiencie, and augmentation of all Scyences, because it may seeme they are ordained by God... to meete in one Age (Bacon 2000a, 71).

Yet present-day academics' wonder and anxiety over the proliferation of publications in 'the information age' is paralleled by Renaissance scholars' reaction to the information overload caused by the growing number of books available due to print technology. Technological advances which enabled the production of an ever increasing number of books required that scholars adapt their ways of working in order to deal with the expanding amount of information at their disposal. This was achieved through the development of a number of different sorting methods and memory aids, which extended the amount of information subjects could access through offloading it in increasingly structured external systems. In order to cope with the increasing number of texts, some Renaissance scholars advised the intensive reading of a select canon, whereas Bacon advised different kinds of reading for different kinds of books: 'Some books are to bee tasted, others to bee swallowed, and some few to bee chewed and digested: That is, some bookes are to be read only in partes; others to be read, but cursorily, and some few to be read wholly and with diligence and attention' (Bacon 1996, 439). While Bacon is renowned for an empiricism that was accompanied by a criticism of the contingency and self-referentiality of language, since as he complains 'words beget words', he nevertheless defends commonplace books against the criticism that they cause a lack of retentiveness and sloth of memory, as he asserts it is their partialness that allows for a concentrated transmission of ideas (Bacon 2000a, 119, b, 48). As in *Novum organum*, Bacon argues in the *Advancement of Learning* that humans need tools to supplement their cognitive capacities. The cause for the limitedness and uncertainty of human knowledge is not just attributable to the senses, but more generally to the weakness of our intellectual powers, and Bacon states that he explains this in order to stir us up to seek help from tools, giving the illustration that 'no man, be he never so cunning or practised, can make a straight line or perfect circle by steadinesse of hand, which may bee easily done by helpe of a Ruler or Compasse' (Bacon 2000a, 111). Bacon compares as a parallel to perceptual illusions the 'false appearances, that are imposed vpon vs by words'. Yet although words can cause error because they only reflect the current notions of things, Bacon continues that words enable us to recover knowledge, and that writing, as a supplement to memory, also enables the retention

of knowledge (Bacon 2000a, 117, 110–111, 119). Thus, in Bacon's account, despite and because of the fact that these resources are also flawed and limited, language and books are mind tools that supplement physical cognitive processes and through their very constraints enable evolving structures of knowledge to be cognised and transmitted. This utilization of cognitive tools, more recently described by Andy Clark as making humans 'Natural-Born Cyborgs' (Clark 2003), appears here to operate as a cultural extension of what Bacon argues is the fundamental hybridity of human nature and of the natural world.

6.4 Social Supplements and the Correlations of Physical and Political Bodies

Another aspect of Bacon's notion of human extendedness that relates to our social nature can helpfully be traced back to Stoic notions of the self, in which modes of social extension and incorporation were understood to participate fundamentally in the nature of the self. Hierocles imagined the self as spread outwards over a set of concentric circles:

The first and closest circle is the one which a given self (*auto tis*) has drawn as though around a centre, namely his own mind (*dianoia*). In this circle is included (*periekhetai*) the body and anything taken (*perieilēmēna*) for the sake of the body (Hierocles in Sorabji 2006, 44).

Circles further out represent other people, from one's family, friends and fellow citizens to foreigners. The notion that each person appropriates his own bodily parts and other people influenced early Christians such as Tertullian, and antagonized Plutarch, who complains: 'How then does he [Chrysippus] wear us out, by writing again in every book of physics and, by God, of ethics, that immediately from birth we are attached (*oikeiousthai*) to ourselves and our parts and our own offspring' (Plutarch in Sorabji 2006, 104). Seneca later extends this appropriative capacity to include the age or period: 'Each age has its own constitution... Everyone is attached to the constitution in which they find themselves' (Seneca in Sorabji 2006, 104). These modes of social extension via friends, family and one's age have recently been explained in terms of evolutionary theory, with Stephen Kosslyn defining 'Social Prosthetic Systems' as people we rely on to extend our reasoning abilities and regulate our emotions, so optimizing our cognitive capacities (Kosslyn 2006). When the already pervasive notions of social extendedness emerge in Bacon's works they are explained in light of his theory of the spirits.

During the Renaissance, interconnections with other humans were generally understood in relation to the humoral nature of the mind and the body. Montaigne believed that people, like the soul and body, were only separated by a 'narrow seam', such that one person's imagination could act upon another (Montaigne 2003, 90). Belief in 'affective contagion' is compared by Katherine Rowe with current terms such as mass hysteria and buzz, or word of mouth, but she concludes it was

then a more pervasive feature of everyday life (Rowe 2004, 176). The individual was defined as a member of overlapping collectives: Latin Christendom, the Body of the Church, as well as general human society. Phillip Stubbes observes that ‘common reason aduertiseth vs, that wee are not borne for our selues onelie... Our Countrey challengeth a part of our byrth, our brethren and frendes require an other parte, and our parentes... doe vindicate a third parte’ (Stubbes 1583, B4^v). Donne set out his belief in the collective and interdependent nature of humanity in his ‘Seventeenth Meditation’: ‘All *mankinde* is of one *Author*, and is one *volume*... No Man is an *Iland*, intire of it selfe; every man is a peece of the *Continent*, a part of the maine’ (Donne 1987, 86–87). In the works of Bacon, the editor Kiernan notes that the injunction of the Delphic Oracle to ‘know thyself’ (‘nosce teipsum’) was a colloquial rebuke; ‘A Nosce Teipsum’ had become ‘a chiding’ or a ‘disgrace’ (Kiernan in Bacon 2000a, 290). This example of how socialized and externalized self-knowledge was suggests common acceptance of the concept of an extended subjectivity and reflexivity. Through concepts of the world as subject and inversely of the subject as world, a profound sense of their interrelation arose, with subjectivity perceived as collectively operative through an extended social system.

Influenced by Platonic and Ficinian beliefs, nowhere can the pleasure in socially extended subjectivity be felt more strongly than in the realm of love, ‘that falls like sleep on lovers and combines | The soft, and sweetest minds | In equal knots’ (Jonson 1996, 50). Donne describes his heterosexual match as ‘we two being one’ (Donne 1990, 24); Montaigne describes La Boétie as ‘the one who is not another man: he is myself’ (Montaigne 2003, 172); Celia tells Rosalind ‘thou and I am one’; in *Philaster*, the King calls his daughter ‘you, my self’; and in Shakespeare’s Sonnet 116 love is ‘the marriage of true minds’ (Shakespeare 1997, 1.3.91, 3.2.38, 1962). These descriptions suggest that people naturally conceived of minds and subjectivity as socially extended. In *Sylva Sylvarum*, Bacon provides an explanation for this that relates to his natural philosophy, arguing that it occurs through ‘Light Effluxions from Spirit to Spirit, when Men are in Presence one with another, as well as from Body to Body’ (Bacon 1627, 261–262). Following the Stoics, he describes these ‘[e]ffluxions’ as particularly pronounced between family members, lovers and friends. Nevertheless, teachers also influence learners, the young revitalize the old, and the joyful cheer the melancholic, as simply being in the company of another enables this transmission of spirits from one to another (Bacon 1627, 57).

Yet this permeability, which involves a dissolving into one that removes critical distance, could equally invite a Stoic view of the passions’ negative potential to perturb the mind. Hence amorous love is described by Bacon as a ‘Syren’ and a ‘Fury’ that ‘doth much mischief’ (Bacon 1996, 39). In his *Essays* (1625), Bacon further explains that while social interchange was necessary in order for a person to exist as a human subject, with those who have an aversion towards society comparable to a ‘Savage Beast’, ultimately a balanced division between self-love and love of society is necessary (Bacon 1996, 107–118, 97). Where a means to self-knowledge was sought, both engagement and critical distance were particularly necessary, since another person acting as a mirror to the self could provide a means of extended reflexivity. In a flattering letter to Lancelot Andrewes, Bacon comments that ‘no

man can be judge and party: and when our minds judge by reflection of themselves they are more subject to error'. While in an earlier letter to the Earl of Essex he insisted that 'I will not dispose of myself without your allowance; not only because it is the best wisdom of a friend (for who can by often looking in the glass discern and judge so well of his own favour, as another with whom he converseth?)' (Bacon 1861–1874, IV, 141; I, 235). Forms of extended reflexivity were not restricted to the living, as texts could provide another means of social supplement:

For I hold that conjunction of minds and studies has a greater part in friendships than civil ties and offices of occasion... So I seem to have my conversation among the ancients more than among those with whom I live. And why should I not likewise converse rather with the absent than the present, and make my friendships by choice and election, rather than suffer them, as the manner is, to be settled by accident? (Bacon 1861–1874, IV, 146–147).

Bacon describes the more general influence of people on one another as suggesting that there is 'some Transmission of Spirits' involved. Human concern for other people's good opinion he relates to the interconnected nature of humankind, since it is as if 'all Spirits and Soules of Men, came forth out of one Diuine Limbus; Else why should Men be so much affected with that, which others thinke, or say?' (Bacon 1627, 262). Thus Bacon not only depicts the boundary between one human and another as negotiable and porous, but he posits a natural means through which the dynamic interaction occurs, with the flux of the material spirits maintaining the interconnected nature of all human society. Society is also intimately interconnected with the wider natural world, as these fluxes also operate between animate and inanimate matter. Bacon explains that 'many Things... worke vpon the Spirits of Man by Secret Sympathy, and Antipathy', such as precious stones or the brains or hearts of other creatures, and some of these relations are what he sets out to explore through practical experimentation (Bacon 1627, 257).

These natural principles are at work within the political body as well as the social one. In *Valerius Terminus*, written around 1603, Bacon calls for the study of nature as a means to increase 'the power and kingdom of mankind' (Bacon 1857–1859, III, 215–252).¹² This is more fully elaborated in relation to civil rule in *A Brief Discourse Touching the Happy Union of the Kingdoms of England and Scotland* (1603), where he advises King James to follow 'the congruity between the principles of nature and policy', like the Persian kings who had been taught to take 'the fundamental laws of nature, with the branches and passages of them, as an original and first model, whence to take and describe and copy and imitation for government' (Bacon 1603, A5^v, A3v–A4^r). Bacon's advice, intended to slow the haste with which James sought to conjoin the two kingdoms, depicts two types of unions and associates the inferior conjunction with human haste versus the seamless fusion achieved by patient Nature:

¹²For a discussion of the way in which feminist historiography has problematized Bacon's concept of the masculine domination of man over the feminine world, see Vickers 2008 and Park 2008; these issues will not be tackled here other than implicitly by suggesting the extent to which Bacon's natural philosophy shows human knowledge and power as fundamentally dependent on nature.

it is the dutie of man, to make a fitte application of bodies together. But, the perfect fermentation and incorporation of them, must bee left to Nature and Time: and vnnaturall hasting thereof, dooth disturbe the worke, and not dispatche it... So, wee see, after the grist is put into the stock, and bound; it must bee left to Nature and Time, to make that continuum, which was at first but contiguum (Bacon 1603, B2^v).

Bacon further warns that the hasty type of conjoining is ‘the mother of sedition and alteration’, while the unhurried type leads to ‘peace and continuance’: so in political states these two types of unions could lead to the contrary motions of constancy and inconstancy he described at work in natural matter (Bacon 1603, B2^v). These also operate on the socio-political level as the private pursuit of sameness or general pursuit to uphold common respects (Bacon 1603, A5^r). In his efforts to influence the King, Bacon also drew on contemporary medical theories, advising that his financial recovery would be achieved by ‘the medicine of the Galenists and Arabians, and not of the Chemists or Paracelsians’, that is, not by ‘any one fine extract or strong water, but by a skilful compound of a number of ingredients’ (Bacon 1861–1874, IV, 311–314).

Drawing on models of Nature and on the medical theories based on these were tactics Bacon had previously used on Queen Elizabeth. In his attempts to temper the Queen’s anger with the Earl of Essex, he reflected her own discourse back at her, suggesting an altered manner of dealing with Essex through adapting her notions of medical methods. Bacon reports that the Queen complained that physicians err when, after having drawn out the ill humour, they do not then have ‘the discretion to change their medicine, but apply still drawing medicines, when they should rather intend to cure and corroborate the part’. He then admonishes her for not considering that ‘there is the like occasion of physic ministered to the mind’, so now in the case of Essex, she should ‘minister strength and comfort unto him’ rather than continue to mortify him (Bacon 1861–1874, III, 155–156).¹³ When the Queen was again indignant with Essex, this time for seeking favours from her rather than expressing selfless love, Bacon drew on his notion of two conflicting sympathies of perfection and preservation, which he describes as an expression of the conflicting motions of the spirits towards constancy and inconstancy, and as ultimately the divergent effects of the same drive towards stable union. Bacon explains that these sympathies coexist in Nature as a means to explain that Essex’s seeking of favors is not contrary to his expressions of chivalric love:

O Madam, how doth your majesty conster of these things, as if these two could not stand well together, which indeed Nature hath planted in all creatures. For there are but two sympathies, the one towards perfection, other towards preservation. That to perfection, as the iron contendeth towards the loadstone: that to preservation, as the vine will creep towards a stake or prop that stands by it; not for any love to the stake but to uphold itself. And therefore, Madam, you must distinguish: my Lord’s desire to do you service is as to his perfection, that which he thinks himself to be born for; whereas his desire to obtain this thing of you, is but for a sustentation (Bacon 1861–1874, III, 156).

Nonetheless, these conflicting yet correlated natural motions are also to be found in a political form in terms of the Queen’s power over the state. Bacon, (typically)

¹³Also compare with *Sylva Sylvarum*, 18: ‘It helpeth, both in Medicine, and Aliment, to Change and not to continue the same Medicine & Aliment still’.

at once innovatively and conservatively, expounds in a House of Commons speech: 'The Queen, as she is our sovereign, hath both an enlarging and restraining power. For by her prerogative she may first set at liberty things restrained by statute law or otherwise; and secondly, by her prerogative, she may restrain things which be at liberty' (Bacon 1861–1874, III, 26–28). Thus, that humans' cognitive processes are not only embodied, but also extended into the world is implied by the flux from spirit to spirit not only within, but also between entities, which resulted in Bacon's interest in pursuing empirical tests on social permeability, with the principles at work in nature a means to understand the contrary motions at work in the private and political body.

6.5 Conclusion

In the Renaissance the ever-increasing emphasis on the practical and moral utility of self-knowledge in this world allowed secular concerns an increased predominance. This was accompanied by an escalating anxiety about the reliability of the human senses and mind, and scepticism about our tendency to frame experience according to human qualities and beliefs, and to accept elegant fictions and abstractions as truths. The human mind's propensity to extend itself into bodies and into the world can cause anxiety and this anxiety can lead to a desire to close literal and figurative doors, to shut out epistemologically that which ontologically will remain an interdependent connaturality. Contemporary desire to protect the self through pre-emptive closure is evidenced in Gosson's advice to women: 'The best counsel that I can giue you, is to keepe home... Close vp your eyes, stoppe your eares, tye vp your tongues' (Gosson 1579, F4^v). Bacon chooses the opposite approach, in advocating as a reflection of our ontological entanglement with the world an epistemological engagement with it, by means of the resources which it offers as supplements to our faulty and limited corporeal faculties. While Renaissance commonplaces allow a certain significance to the world as a source of knowledge, Bacon distinctively frames his ideas and responses to the issues raised as necessitating the pursuit of natural philosophy for the advancement of knowledge, advocating that it is only through empirical knowledge of the natural world that clearer knowledge of human nature can emerge. Bacon's innovative, albeit paradoxical seeming, proposal is that admission of the intellectual need for external tools and assistance is the necessary antidote to ontological hybridity. The contrary movements in Nature are mirrored in Bacon's own vacillation between a private intellectual life and a public career, and his understanding of both the natural and the sociopolitical spheres is ultimately underpinned by his notion of the motions of the spirits.

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Chapter 7

Cupido, sive Atomus; Dionysus, sive Cupiditas: Francis Bacon on Desire

Guido Giglioni

Abstract In *De sapientia veterum*, Bacon advocated the use of mythology as a proper tool for philosophical inquiry. He argued that the myths of pagan antiquity (*fabulae*) contained a speculative core, while philosophy, by engaging in emblematic interpretations, could provide access to the most recondite principles of human knowledge (*fabulam philosophiam continere, et philosophiam rursus fabulam*). This fundamental assumption can be seen at work in the way in which Bacon discussed several major philosophical questions. In this chapter, I focus on his emblematic and mythopoetic treatment of the twin notions of natural appetite (Cupid) and human desire (Dionysus).

7.1 Introduction: Dionysian and Cupidinous Desire

In *De sapientia veterum* ('The Wisdom of the Ancients', 1609), Bacon centred his analysis of the closely related figures of Dionysus and Cupid on the concept of chance, with its cluster of related meanings – luck, hazard, felicitousness (*casus, temeritas, felicitas*). And, in the spirit of Dionysian and Cupidinous randomness, I would like to begin this chapter with an element of haphazard coincidence. It may certainly look like an arbitrary game, but when I first juxtaposed the titles of the two Baconian fables dealing with Dionysus and Cupid ('Dionysus, sive cupiditas' and 'Cupido, sive atomus'), I realized that the result was an accidental chiasmus centred on the subject of appetite: the extreme poles are represented by desire (Dionysus) and matter (atom), and are connected through the notion of desire (*cupiditas, Cupido*), understood as a primeval and ineradicable drive, shaping natural as well as

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G. Giglioni (✉)

Warburg Institute, Woburn Square, London WC1 0AB, UK

e-mail: guido.giglioni@sas.ac.uk

social reality. It is a chiasmus that, in fact, can be taken to symbolize Bacon's philosophy as a whole (the matter of both the natural and the human world is appetite), but it is especially true of his *De sapientia veterum*, where the exegesis of the ancient fables of mankind brings to the fore the close intertwinement of natural and moral philosophy (and dramatically so, as we will see, for, in Bacon's opinion, moral and political knowledge is the distinctively human way to ameliorate postlapsarian nature). As a philosophy of appetite, Bacon's metaphysics is principally concerned with motions and desires: motions of matter can be understood in terms of primordial non-human desires, and human desires can be seen as rooted in the original drives of matter. This is the chiasmus resulting from the juxtaposition of the titles 'Cupido sive atomus' and 'Dionysus sive cupiditas'. Or maybe the juxtaposition can be better described as a case of metalepsis (*transsumptio*): a transfer of meaning which seamlessly leads from one semantic field to another; in this case, from the physical to the moral, and from the moral back to the physical: 'atomus', 'Cupido', 'Dionysus', 'cupiditas'. Chiasmus is a figure which highlights, almost in a visual manner, the correspondences between the various elements involved in a sentence; metalepsis deals with the disposition of words in a more conceptual sense.¹

When the relationship between Dionysus and Cupid is understood in terms of a symbolic shift, the transfer of meaning can also be seen as happening from the high to the low, and the other way around. Dionysus is human desire, therefore higher than the non-human desire of stones (*lapides*), woods (*sylvae*) and beasts (*ferae*). On the other hand, non-human desire is ontologically more relevant precisely because it is primeval, and, as we will see, Bacon is of the opinion that the perpetual renewal of things (*instauratio* or *restitutio*) is by far the noblest enterprise in philosophy. *De sapientia veterum* is entirely pervaded by the tension between Olympian and infernal gods, between supralunary and subterreneous realities (*umbrae et dii inferi*). It is a contrast that has broader implications on a philosophical level: it signifies a tension between the dignity of social and public life and the vacuity of self-love (*philautia*), between the indefinite stability of *tellus omnium mater* and the *umbratilis* life of transient things,² between the freedom of civil society (*convivia deorum*, i.e., *imperii iura et prerogativae et affluentia et felicitas*) and the determinism of Stygian *necessitas* (Bacon 1857–1874, VI, 634), between the kingdom of Jupiter (*fabrica integralis*) and the recurrent attempts to overturn his rule through rebellions (Saturn, the Titans and the Giants, which all signify a relapse into more precarious organizations of life, *male cohaerentes rerum compages*, 649–650), and, finally, between order (*mundus*) et disorder (*chaos*) (639). Within this picture, Dionysus plays quite a central role. In Bacon's mythological account of philosophy, he is the god who more than any other straddles the regions of Olympus and Tartarus, having been raised by Jupiter and Proserpina. He is both male and female, Greek by birth, but Asian in relation to the lands he conquered; he died, and yet managed to

¹ See Quintilian's famous example of metalepsis in his *Institutio oratoria* (VIII, vi, 38–39): 'cano canto', and 'canto dico', therefore 'cano dico'.

² Bacon 1857–1874, VI, 633 ('Narcissus, sive philautia'), 661 ('Deucalion, sive restitutio').

be born again; finally, in being associated with states of intoxication and madness, he vividly embodies the brutal clash between reality and appearance.

7.2 The Principles of Bacon's Mythography

Bacon was certainly abreast with the latest trends in mythographic research. With his *Emblematum liber* (published for the first time in Augsburg in 1531), Andrea Alciato (1492–1550) had started the vogue of using mythological settings for emblematic purposes. Among the classics of Renaissance mythography, we should at least mention Lilio Gregorio Giraldi's *De deis gentium varia et multiplex historia* (Basel 1548), Vincenzo Cartari's *Le imagini colla sposizione degli dei degli antichi* (Venice 1556) and Natale Conti's *Mythologiae sive explicationis fabularum libri decem* (Venice 1567). Geoffrey Whitney (c. 1548–c. 1601) produced the first English emblem book – *A Choice of Emblems* – published in Leiden in 1586, followed in 1612, by Henry Peacham's *Minerva Britannia, or a Garden of Heroical Devises* (Daly 1988; Kingsley-Smith 2010, 16).

In line with the principles of Platonic exegesis, Bacon detected two principal aims in the use of symbols: they both disguise (*ad involucreum et velum*) and reveal the truth (*ad lumen et illustrationem*), that is to say, they protect knowledge from being trivialized and manipulated, while spreading its meanings without losing in complexity and flexibility. It should also be pointed out that we do not find in Bacon any euhemerist attempt to provide plausible historical explanations for the plots and details of mythological narratives – ‘the natural meanings hidden under the fable’ (*i sensi fisici sotto favola coperti*), to use Giovanni Boccaccio's phrase (Boccaccio 1574, 93).³ This is a point that applies to *De sapientia veterum* as a whole. While Natale Conti (1520–1582), to give an example, thought that the usefulness of fables lay in their being entertaining and edifying, for Bacon they were both unsettling and heuristic (*ingenii violentia*, in Bacon 1857–1874, VI, 627). As such, they promoted knowledge and allowed us to say things that otherwise could not be said because they were either inappropriate or difficult. If Conti found a plausible meaning – usually of a historical and scientific nature rather than philosophical – behind the most implausible details, Bacon assumed that the most ancient records of human history had an original agreement with the truth of nature, therefore there was no need to explain away all those elements in the story that seemed unlikely (except when they showed traces of fabrication, manipulation and mistake).

³ Giovanni Boccaccio (1313–1375) began to work on his *Genealogiae deorum gentium libri* (‘On the Genealogy of the Gods of the Gentiles’) around 1360, and continued to expand and rewrite the work until his death. Besides Ovid and Statius, Boccaccio drew on the twelfth-century *Liber imaginum deorum* by a certain Alberic of London, on the source-book of Greek and Roman myths provided by the so called ‘Vatican Mythographers’ (sometime between the ninth and the eleventh centuries), and finally on the popular *Mythologiarum libri III* by Fulgentius, who lived between the fifth and the sixth centuries.

Another distinctive trait of Bacon's mythography is the freedom with which he elaborated his own grammar of mythological personifications, to be used as material for philosophical notions and arguments. This does not mean that, to a certain extent, he did not rely on a set of well-established views concerning the pagan gods. As a matter of fact, like in many other contemporary accounts, the Ovidian narrative remains the prevalent one. Bacon, however, reinterpreted many loci of the mythological fables by applying the principles of his own philosophy. In this respect, his system of 'parabolic' and 'allegorical' associations is an idiosyncratic attempt to combine antiquarianism and metaphysics through a subtle exercise in philosophical imagination. In doing so, he provided a highly selective but innovative reading of traditional figures of classical mythology.

As a literary device in which visual memories coalesce with verbal descriptions, emblems were among Bacon's favourite argumentative tools. Before we delve into his emblematic analysis of Dionysian and Cupidinous desire in *De sapientia veterum*, a few words on Bacon's mythographic views are thus in order, starting with two general questions: do we need an image when we think of ourselves? Do we need an image when we think of our history? Both questions were anxiously discussed by philosophers, antiquarians and historians during the Renaissance, and both questions dramatically addressed the precariously temporal dimensions of the human mind and mankind's culture, that is to say, the survival of the individual soul and the survival of the pagan gods. This issue – the role played by images in perpetuating the individual and collective soul of human beings – is at the heart of Bacon's *De sapientia veterum*. His priorities were clearly stated in a dedicatory letter to Robert Cecil, the Earl of Salisbury (1563–1612): here Bacon presented his mythographic endeavours as a kind of intellectual inquiry (*philosophia*) into the most ancient wisdom (*antiquitas primaeva*), elaborated through the interpretation of emblematic and allegorical symbols (*parabola*). Three levels were at stake: time (*tempus*), literary genre (*docendi forma*) and the subject matter (*operis materia*). For Bacon, this was a domain of human experience (*vita et anima humana*) where religion seemed to have come first and philosophy took on the exegetic role (*decus secundum*) (Bacon 1857–1874, VI, 619).⁴

Bacon summed up the interplay of mythological imagination and philosophical knowledge in his interpretation of 'Coelum', by writing that 'a fable contains philosophy, and philosophy in turn a fable (*fabulam philosophiam continere, et philosophiam rursus fabulam*)'; and he went on by saying: 'we know, according to faith (*ex fide*) that all these things [i.e., the events recounted in the fables of the ancient poets] are nothing other than the oracles of the senses, long ceasing and disappearing (*sensus iam pridem cessantia et deficientia oracula*), for both the matter and the structure of the universe reflect its Creator in the most truthful way (*ad Creatorem verissime referatur*)' (Bacon 1857–1874, VI, 650). This is a nicely argued point, which elegantly interweaves several strains in Bacon's emblematic thinking: that the world is a divine creation, while our fables of the world are oracles – creations – of the senses; that consequently these oracles are as precarious and fallible as the

⁴On Bacon's fables, see Lemmi 1933; Rossi 1968 [1957], 73–134; Lewis 2009, 2010.

human senses, and yet the original correspondence between God the creator and created matter (taking the latter in both its raw and structured condition) warrants the validity of the fables.

In line with tradition, Bacon called the myths of the ancient Greeks the ‘fables of the poets’. He was well aware that, as a literary genre, could be insidious, for they were often used as a means of escapist fantasy and to provide mere aesthetic pleasure (*voluptas, deliciae, ludi*). They could also be interpreted in infinite ways (*versatilis materia*), more or less removed from reality (either *ad historiae similitudinem* or using *licentia* and *vanitas*), as witnessed by the examples of Stoic and alchemical allegories, both dismissed by Bacon as futile exercises (*omnis ingeniorum circa allegorias levitas et indulgentia*) (Bacon 1857–1874, VI, 625). Did the ancient fables of the poets contain intentional meaning? This was a crucial question in Bacon’s work. Had the fables been created in a deliberate manner by the ‘wit’ (*ingenium*) of such poets as Homer and Hesiod, or were myths more original than the poets’ minds – indeed, more original than the human mind as a whole – representing rather a relic of the sacred word of God (*reliquiae sacrae*), after the catastrophe of Adam’s Fall? It was precisely the absurd plots in the fables and the disquieting nature of some of the details described there that forced the mind to look for a possible interpretation.

Despite their apparent ties to escapism and incongruity, however, Bacon was convinced that parables had a strong philosophical and theological import, for they worked as mediators between divine and human knowledge (*commercia divinorum et humanorum*). In his opinion, it was precisely the presence of hidden and convoluted senses (*sensus occultus et involutus*) that made myths a repository of reliable information. This meant that the *mysterium* of the fables was original and was no frivolous invention on man’s part (*ingenium*). Further accretions might have been added by later generations (like the ones dealing with *res civiles*), but the original core (dealing with the *natura rerum*) could be traced back to the very beginnings of human history: ‘what the fables have in common derives from ancient memory (*vetus memoria*); variations are additions depending on the style of individual writers’ (Bacon 1857–1874, VI, 625–627). Bacon summed up this point in an elegant way through a disjunctive argument:

The wisdom of ancient times (*sapientia prisci saeculi*) was either great (*magna*) or fortunate (*felix*): it was great, if figures or tropes were devised intentionally (*de industria*); it was fortunate, if human beings, while intent on doing other things, provided matter and opportunity for such worthy contemplations (628).

The strange kind of unintentional, random and yet felicitous meaningfulness that, in Bacon’s eyes, seemed to characterize the mythological understanding of reality was ultimately even more fascinating and appealing to him, for myths followed argumentative paths that appeared to be alternative to rational inferences: they were *extra cogitationis vias*. Precisely because fables told of outlandish situations, Bacon insisted, ‘nobody could come up with a dream so unnatural (*monstruosum*)’, and situated off the beaten track of ordinary thinking (*extra cogitationis vias*)’ (627). On the other hand, the absurdity of the fables was so glaring that one

was led to assume that perhaps there was a deeper meaning in them. Bacon pointed out that powerful and vivid associations (*similitudo et coniunctio*) linked the story to the signified thing (*significatum*), both in the plot (*textura ipsa fabulae*) and the attributes of the main characters (626). It was a kind of nonsense that seemed to be ready to burst with meaning at any moment.

In a way, the complex edifice of Bacon's mythology can be crystallized into one simple hermeneutic principle: the greater the nonsense, the deeper the meaning (which is an interpretative principle that does not entirely tally with the one upheld by all forms of Platonizing mythography, that is to say: the more obscure the symbol, the deeper the meaning). For Bacon, the exegetical postulate that secured a possible link between meaning and nonsense was the assumption that meaning was always a matter of creation (starting with God's production of the world), inscrutable but capable of generating further meanings. What was then the criterion that prevented philosophers and exegetes from falling into utter arbitrariness in matters of interpretation? This criterion, for Bacon, lay in the temporal proximity to the event of the Fall; which was another way of stressing the inescapably historical character of truth (*veritas filia temporis*). Records of human civilization that were temporally close to the time of our protoplasts, Adam and Eve, came with a more veridical content (See Lancaster 2015, 191–192). These records were the Bible, first of all, and then came the pagan fables, which had been handed down to us from generation to generation, by way of oral transmission. In this sense, the Bible was more reliable than Homer, Homer more than Ovid, Ovid more than Boccaccio, and so on, and the good interpreter was the one who knew how to distinguish the symbolic core – still alive and brimming with meaning after millennia of successive readings – from ornamental additions, whose only role seemed to be that of explaining away all those disquieting particulars that stubbornly resisted exhaustive clarification. Antiquity was therefore a mark of historical truth, all the more so because the oracles of the senses reflected the original oracles of God. Bacon summed up the discussion in *De sapientia veterum* by saying that, 'as hieroglyphics came before letters, so parables were more ancient than arguments'.⁵ It is for this reason that, as a result of our progenitors' sin, reality remained suspended in an atmosphere saturated with enigmas and symbols (*omnia fabularum omnigenum, et aenigmatum, et parabolarum, et similitudinum plena erant*), an indication that those times were still affected by powerful remnants of energy reverberating from God's initial creative act, unlike modern times, where meanings were diluted and effete. Mythical symbols were truthful because they reflected the original unity of being and knowledge, of matter and form (628). As already said, Bacon's ontology (and consequently his epistemology) presupposed an original correspondence between reality and its representation, regardless of whether the representation in question was a symbolic

⁵Bacon 1857–1874, VI, 628. See also *De augmentis scientiarum*, Bacon 1857–1874, I, 652: 'Hieroglyphicorum usus vetustus admodum et in veneratione quadam habitus, praecipue apud Aegyptios, gentem valde antiquam; adeo ut videantur Hieroglyphica fuisse Scriptio quaedam antenata et senior ipsis Elementis Literarum, nisi forte apud Hebraeos'.

reflection, an object of the senses or an intelligible notion (*cum mundi et materia et fabrica ad Creatorem verissime referatur*, 650).

To recapitulate my argument so far, Bacon maintained that there were two sources of historical information about the first stages of life on earth (in addition to the testimonies of direct divine revelation and the results of sense perception distorted by postlapsarian decadence): the Bible (*sacrae literae*) and Greek mythology, the ‘fables of the poets’.⁶ Religion came first in this case because revelation manifested itself through a book, long before the stories related to primeval nature and humanity underwent poetical elaboration. While the Scriptures were a record of the most ancient events (*antiquitas primaeva*), the fables represented a diaphragm (*tantum velum* or *medium*) between silence and language, oblivion (*oblivio*) and memory (*memoria*), loss of meaning and its precarious recovery (*inter ea quae perierunt et ea quae extant*). As such, myths were devices which helped to retrace forgotten truths (Bacon 1857–1874, VI, 625). An example of the way in which biblical and mythological themes interwove in Bacon’s inquiry is provided by the fable of Pan. Of the three views of nature symbolized by Pan (nature as a creation of God; as a material principle – *materiatum principium* – originally endowed with motions; and as a record of postlapsarian life and its perishable character), the third demonstrated that there was a form of primordial conformity between the biblical account (*mysteria Hebraeorum*) and Greek mythology, conformity made possible, so Bacon conjectured, by the mediation of Egyptian sages (*per Aegyptios internuncios*). This interpretation of Pan as degraded nature, Bacon added, did not refer to ‘the condition of the world in its very beginnings (*mera natalia sua*), but after the fall of Adam (*post lapsum Adami*), as exposed to death and decay, and liable to them. That condition was, and remains, the offspring of God and sin’. By doing so, Bacon could provide a unified interpretation of the three symbolical representations of Pan:

This story (*narratio*) about the birth of Pan may sound true, if we make the appropriate distinctions, in terms of reality and time, for this Pan, whom we observe and contemplate, and whom we venerate more than we should, originated from the word of God, through confused matter (*confusa materia*) – this, too, created by God – while transgression and corruption crept in (Bacon 1857–1874, VI, 637).⁷

From a rhetorical point of view, Bacon characterized ‘parables’ and ‘fables’ as a means to appeal to ordinary taste (*vulgaris*), for they dealt with obvious truths (*manifesta*), worn-out traditions (*obsoleta*) and commonsensical views (*loci communes*), while reaching the loftier faculties of the mind (*altior intellectus*). In doing so, they contributed to the betterment of life (*vitae ardua*) and a better understanding of the

⁶On the sources of human knowledge, see *De augmentis scientiarum*, in Bacon 1857–1874, I, 539.

⁷See also the fable of ‘Coelum, sive origines’: ‘Fabula videtur aenigma de origine rerum, non multum discrepans ab ea philosophia quam postea Democritus amplexus est. Qui apertissime omnium aeternitatem materiae asseruit, aeternitatem mundi negavit; in quo aliquanto propius ad veritatem verbi divini accessit, cuius narratio materiam informem ante opera dierum statuit’ (Bacon 1857–1874, VI, 649). Here Bacon elaborates on Natale Conti’s *Mythologiae, sive explicationum fabularum libri decem*. See Conti 1637 [1567], 346a: ‘Pana rursus dixerunt esse Mercurii filium, quia cum Mercurius sit vis divina ac voluntas, ut diximus, quae res ad ortum perducit, ac Pan naturalia simplicia corpora, universa illa a divina voluntate gubernantur’.

secrets of nature (*scientiarum arcana*). Just as fables were situated in the liminal area that divided oblivion from memory, and facilitated the recollection of truth, so parables occupied the space between common sense and intellect, and helped dispel the oppressive presence of trite banalities from human minds (Bacon 1857–1874, VI, 619–620). ‘Through parables’, Bacon claimed, ‘one may look for an easier and more generous access to the intellect’ (628). Moreover, he did not discriminate too neatly between fable (as an original production of meaning) and allegory (as an extrinsic exegetical device that came at a later stage in history to make sense of an otherwise inscrutable symbol). Fables were inherently allegorical because their meaning was constitutively unstable and required constant interpretative adjustment, while allegories were inherently creative because, following the way in which Bacon had organized the human faculties according to their products, allegories belonged to the sphere of the imagination (*fictio*, ‘poesy’), which is another way of referring to the already mentioned aphorism concerning the interdependence of fable and philosophy: *fabulam philosophiam continere, et philosophiam rursus fabulam* (650).

7.3 Dionysus

As explained in the Introduction to this volume, a characteristic idol-oriented anxiety surrounded Bacon and the culture to which he belonged. It stemmed from the powerful allure exercised by desire, fantasy and lust, often resulting in a disquieting mix of iconoclastic and iconophilic inclinations. Jane Kingsley-Smith has detailed ‘Cupid’s increasing presence within English culture’, a culture saturated with images of and references to Cupid, from the *Roman de la rose* (c. 1230–1275) and Petrarch (1304–1374) to tapestries and masques, emblems and ballads, prints and plays (Kingsley-Smith 2010, 15). She argues that, as a result of the Protestant reinterpretation of love, a ‘tragic English ‘Cupid’ emerged out of the delicate process of cultural hybridization between local and continental traditions. Combining ‘England’s darkest fears about the power of lust’ and the deceptions of artistic imagination, ‘Cupid became a figure of perturbation, perceived as ‘an idol’, ‘both a pagan deity and a delusive fiction’ (20–21, 27). Cupid ‘and his fellow pagan deities had a long history of disseminating fears and doubts within the confines of Christianized cultures. In his renowned study on the survival of the pagan gods, Jean Seznec (1905–1983) argued that mythological characters arrived in the Renaissance as sophisticated and pliable carriers of verbal and visual information (Seznec 1981 [1940]). In this case, Cupid was the principal carrier of meanings related to desire.

Bacon’s work reflects this trend in that it gave a prominent place to this particular god in his philosophical pantheon. Cupid, however, shared the emblematic and metaphysical field of desire with another mythological figure, Dionysus. Dionysus, as Bacon argued in *De sapientia veterum*, symbolized the nature of *cupiditas* (*describitur sub personam Bacchi natura cupiditatis*, Bacon 1857–1874, VI, 665).

He emphasized the ethical significance of Dionysus's fable (*videtur ad mores pertinere*), turning the story into a parable of moral philosophy (*nihil in philosophia morali melius inveniatur*). Dionysus, however, was also ambiguous and double by nature; he did not symbolize rational will, but a tainted desire (*cupiditas*) engendered out of careless precipitancy, forbidden wishes and a delusional perception of reality:

The person of Bacchus represents the nature of desire (*cupiditas*), that is, emotion and passion (*affectus et perturbatio*), for the mother of all desire (*cupiditas*), including the most wicked desire (*nocentissima*), is nothing but longing for and want of (*appetitus et desiderium*) the apparent good. Desire is always conceived in a forbidden wish (*votum illicitum*), accepted in a heedless way (*temere concessum*), before it can be perused and understood (Bacon 1857–1874, VI, 665).

In the fable, Semele, Dionysus's mother, represented the apparent good, easily overwhelmed by the force of the passions, Semele was burned, annihilated by Jupiter, to imply that no apparent good can stand the vision of the true reality of things. If, in general, the nature of the good (*natura boni*) is the mother of desire (*mater cupiditatis*), its father (*genitor*) is the human soul represented through Jupiter, more specifically, the lower part of the soul (*animae pars inferior*). Its nurse, so to speak, is Proserpina (*apud Proserpinam ad tempus educatur*), that is, the lower regions of both natural and moral life. The travails of his birth and infancy explain the shady and shameless character of Dionysian *cupiditas*:

[*Cupiditas*] looks for hiding-places (*latebras quaerit*); it remains clandestine (*clandestina*) and lives underground, as it were (*quasi subterranea*), until, once the bridles of shame and fear have been removed, and insolence (*audacia*) has gained a foothold, it either assumes a pretence of virtue or goes so far as to defy infamy itself (Bacon 1857–1874, VI, 665).

All these characteristics indicate, when considered within the confines of the ethical domain, that desire is a frightening power, to be contained and held in check. This point is confirmed by Dionysus's attributes: bisexuality (*ambigui sexus esse*), the power to be born again (*mortuum reviviscere*), his expertise in vine cultivation and wine production (*inventio vitis*) and his conquest of foreign lands (*provinciarum subiugator*). Desire is intrinsically dubious and equivocal, seemingly dormant but always alive in a state of latency, ready to rise from its apparent grave when the least occasion is given (*praebita materia et occasione*), self-fuelling and insatiable in its greed for new stimulations (*appetitus infinitus neque satiabilis*). Here Bacon is providing a subtle emblematic analysis of the tragic phenomenon of addiction:

every emotion (*affectus*) is clever (*ingeniosus*) and shrewd (*sagax*) in tracing out its own stimulants (*fomites suos*). And of all things that became known to humankind, wine is the most powerful and most effective substance to rouse and inflame passions (*perturbationes*) of any kind, and is like their universal stimulant (*fomes communis*) (Bacon 1857–1874, VI, 666).

It is interesting to note that, while in the mythographic literature the invention of wine by Dionysus was by and large regarded as a positive achievement, Bacon

looked at wine, in the exegetical context of the fable, as yet another instance of the destructive nature of desire.⁸

Desire never rests, for it has a remorselessly conative nature: ‘it always strives beyond its limits and eagerly gazes at new things’ (*ad ulteriora tendit et novis inhiat*). Further evidence of its ambivalent and murky nature is the oscillation between light-hearted merriment (*facetis*), signified by the ‘ridiculous demons’ that dance around Dionysus’s chariot, and savage cruelty (*crudelis* and *immitis*), symbolized by the tigers which accompany him (passions are their den, *apud affectus stabulant*).⁹ Ivy, one of Dionysus’s most renowned attributes, is for Bacon another sign of the ambivalent nature of Dionysian desire: ‘every passion (*affectus*) thrives and grows stronger through oppositions (*renitentia*) and prohibitions (*vetitum*), as if through antiperistasis (*tanquam antiperistasis*), as ivy does through the winter’ (667). As already noted in Chap. 3 of this volume, antiperistasis is a time-honoured concept in Greek cosmology, employed by Hippocrates and Plato among others to explain the origin of natural phenomena as the result of an unremitting chase between opposing natural forces. This is another case in Bacon’s cosmos in which the inherently ‘antiperistaltic’ drive of desire underlies both material and moral processes.

Of the many ambivalences embodied by Dionysus, the contrast between reality and appearance is probably the most significant and the one which causes the most painful consequences. Desire, born out of apparent good (*Semele*), unable to resist the vision of reality (*Jupiter*) and feeding on surrogates of reality (wine), thrives on the production and enjoyment of appearances. Among the episodes in Dionysus’s life, Bacon also mentions his marriage with *Ariadnes*, who had been previously abandoned by *Theseus*. Bacon interpreted this story as evidence that desire feeds on misapprehensions, delusions and fabrications, clinging to opinions disproven by reality (*quod experientia repudiavit*) and long discarded by other people once they have grown weary of them (*res relictæ ... post experimentum dismissæ et fastiditæ*, Bacon 1857–1874, VI, 666). Another instance of delusion linked to desire is the ease with which knowledge (*doctrina*), represented in this case by the *Muses*, capitulates to the flattery of egotistic passions. Bacon recognized the power that emotions

⁸In additions to the risks deriving from drinking too much, Renaissance mythographers emphasized the positive aspects of wine consumption. In Ficino, wine intoxication was a symbol of divine ecstasy (Ficino 1989, 102). Conti also stressed the medicinal virtues of wine and the natural link between wine and natural heat (Conti 1637 [1567], 265b–266a, 273a). Euhemerically speaking, Conti interpreted Dionysus’s cycle of death and rebirth as a symbol of wine production: ‘Quidam etiam dixerunt illum a Iove ac Cerere natum esse, et discerptum a terrigenis et coctum, sed a Cerere compactis membris rursus iuvenem revixisse, quæ certe omnia spectant ad culturam vitis et vini expressionem. Dicunt enim illud significare e terra et imbre capere incrementum, vinumque ex expresso racemo producere’ (Conti 1637 [1567], 276a).

⁹Bacon 1857–1874, VI, 666. Satyrs and silens also accompanied Pan. See Bacon 1857–1874, VI, 639: ‘una perpetuo comitantur Satyri et Sileni; senectus scilicet et iuventus; omnium enim rerum est ætas quaedam hilaris et saltatrix; atque rursus ætas tarda et bibula: utriusque autem ætatis studia vere contemplanti (tanquam Democrito) fortasse ridicula et deformia videntur, instar Satyri alicuius aut Sileni’.

had on knowledge (*ingeniorum indulgentia*), a situation represented by the Muses following Dionysus's entourage (Bacon 1857–1874, VI, 666).

Through references to Pentheus, the king of Thebes, and the madness of Bacchic worship, Bacon also touched upon religion and its precarious relationship with political power. He likely knew of Euripides's play. As in *Bacchae*, so in Bacon's fable the focus was on the interplay of religion, unreason and authority.¹⁰ Pentheus's prying on Bacchic rites represented for Bacon the concerned attention with which reason tries to curb the force of unrestrained desire and pleasure. Reason's inability to control desire ends in the proliferation of all sorts of superstitions, for, in Bacon's opinion, there was a special link between *prava religio* and insane passions (Bacon 1857–1874, VI, 667; see Lancaster 2012, 255–258).¹¹ He saw the relationship between Pentheus and the devotees of Dionysus's cult as a theologico-political re-enactment of the metaphysical contrast between knowledge and desire: all overbearing passions (*affectus praevalidus*) are hostile to inquisitive research (*inquisitio curiosa*) and responsible freedom (*admonitio salutaris et libera*, 667). In the fable 'Actaeon et Pentheus, sive curiosus', Bacon's position was closer to tradition. Here Pentheus symbolized 'human curiosity', lost in 'searching secrets', 'coveting them and laying hold of their knowledge as a result of an unwholesome appetite (*appetitus male sanus*)'; more specifically, 'Pentheus' meant inconsiderate scrutiny of divine secrets (*secreta divina*): 'Since he wanted to observe Bacchus's hidden rites (*sacrificia occulta*) by climbing a tree, Pentheus was seized by madness (*furor*)'. Pentheus's calamitous madness (*Pentheï dementia; Penthei calamitas*) led him to see double (*ut res congeminas se existimaret*), as a punishment for mixing up natural with divine light¹²:

Those who, through a reckless attempt, and quite unmindful of their mortality, aspire to divine mysteries through the summits of nature and the heights of philosophy (as if by climbing a tree) are punished with everlasting fickleness, wavering and confused judgment (Bacon 1857–1874, VI, 646).

While in the fable of Dionysus Bacon seemed to depart from available interpretations in Renaissance mythographic literature to provide a positive interpretation of the unfortunate king of Thebes, his reading of Pentheus in the homonymous fable looked more traditional. Rather than being a sign of internal contradiction, the presence in *De sapientia veterum* of both positive and negative views of Pentheus – symbolizing either the fragility of political reason when confronted with the forces

¹⁰ Euripides's *Bacchae* were first printed in the original Greek in the Aldine edition of 1503 and then translated into Latin by Rudolf Ambühl (Dorotheus Camillus, 1499–1578), professor of Greek language in Zurich, in 1550, and by Coroliano Martirano (1503–1577), Bishop of Cosenza, in 1556.

¹¹ This point is also discussed in the *Essayes*. See Bacon 1985, 11–16. Bacon's interest in the genesis of human superstition and its corrosive effects on human societies is another key aspect that connects his politico-theological inquiry to the one later on carried out by Spinoza in his *Tractatus theologico-politicus* (1670). See Spinoza 1925–1987, III, 5–6; Spinoza 1999 [1670], 58–60.

¹² Bacon 1857–1874, VI, 646: 'Cum enim aliud sit lumen naturae, aliud divinum; ita, cum illis fit ac si duos soles viderent'.

of unhinged religious fanaticism or the inability of dogmatic reason to channel the energy of religious devotion – denoted Bacon’s own wavering views about the role of religion in human life.¹³

7.4 Cupid

While Bacon’s Dionysus was meant to symbolize *cupiditas*, that is, desire as it manifested itself in a variety of moral, political and religious settings, his Cupid shifted the focus of the discussion from the human to the natural world. As I have already argued in Chap. 3 of this volume, Bacon took the atom to represent non-human desire. By doing so, he highlighted the elementary motion of matter more than its allegedly indivisible particles as the atom’s most appropriate meaning. The two fables were nevertheless related, for in Bacon’s philosophy, as this book has pointed out more than once, the boundaries separating natural from moral philosophy remained deliberately blurry. This is all the more the case since desire is also an ontological principle in Bacon’s philosophy. One of the meanings of Dionysus’s ivy, besides being a symbol of the reactive nature of desire, was the pervasive outreach of appetite in human actions and decisions, for ivy has the characteristic of branching off in all directions (*affectus... tanquam hedera circumfunditur*, Bacon 1857–1874, VI, 667). Another image used by Bacon to signify the ubiquitous presence of desire in nature was the predatory character of appetite. Nature was indeed perceived as a hunting ground. In the fable of Pan, he condensed that principle into a bleak aphorism: ‘Every natural action, every motion and process are nothing but hunting’ (*Omnis enim naturalis actio, atque adeo motus et processus, nihil aliud quam venatio est*, 638).

Through the myth of Cupid, Bacon intended to shed further light on what he called ‘the cradles of nature’ (*cunabula naturae*). These were ‘the appetite or stimulus of prime matter (*appetitus sive stimulus materiae primae*), or – to speak more clearly – the natural motion of the atom (*motus naturalis atomi*)’ (Bacon 1857–1874, VI, 655). Cupid was a most ancient and unique power embedded by God into nature to fashion everything out of matter (*illa vis antiquissima et unica, quae ex materia omnia constituit et effingit*). In this respect, within the domain of the created universe, it was the ultimate principle and the uncaused first cause (*sine causa ... huius autem virtutis causa nulla potest esse in natura*). As an original appetitive force, Cupid looked perilously close to God (*Deum enim semper excipimus; post Deum, causa causarum, ipsa incausabilis*, 655). From this point of view, in Bacon’s

¹³Conti maintained that Pentheus wished to eradicate ‘simulators’ of Bacchic rituals (‘Cum vero multa impura facinora orgiorum sacrorumque Bacchanaliorum simulatione committerentur’), but that he failed to understand that changes imposed on ‘inveterate wantonness’ and ‘ancestral over-indulgence’ cannot be abrupt (‘cum periculosum sit regibus inveteratam lasciviam et avitam aliquam intemperantiam uno die velle obliterare, cum nihil repentinum aequo animo natura patiatur, paulatimque delenda sint quae minime conveniunt’). See Conti 1637 [1567], 271a.

system of mythological hermeneutics, he was more original than Dionysus, for ‘Dionysian’ (i.e., human) desire came after ‘Cupidinous’ (i.e., natural) desire. Bacon defined Cupid as the original *vis*, *virtus* or *vigor* in matter, a ‘principle of motion’ described as unintentional and underived. It was a force that had no perception (*surda*) and no cause (*positiva*), that is, a reality that remained thoroughly inscrutable and could only be accepted as a postulate (*per causas sciri non potest*). As the original law of motion enacted by God at the end of His creation – ‘the one and summary law’ (*unica et summaria lex*) through which nature was allowed to behave as a substitute of God –, natural desire was the power that, in a counterintuitive way, held the universe together:

Human thought (*cogitatio mortalium*) merely skims over and can barely grasp the summary law of nature, that is, the power of this desire (*virtus istius Cupidinis*), introduced by God into the first particles of things so that they were able to coalesce together, and through the repetition and multiplication of their combinations the whole variety of things is produced and brought together (Bacon 1857–1874, VI, 655).

Bacon argued that, of the ancient philosophers, only Democritus had come close to the truth when he pictured atoms as endowed with motion, and above all, with motion towards the centre of the universe:

Democritus, who examined the question quite deeply, after having provided the atom with dimensions and shape, attributed to it one desire (*unicus Cupido*), i.e., a primary motion, in an absolute sense, and a secondary one, in a relative sense. The reason is that he thought that all things were specifically carried to the centre of the world, but those parts that had more matter (for they were carried to the centre more quickly), hit and displaced the ones that had less matter, pushing them to the opposite direction (Bacon 1857–1874, VI, 655–656).

Democritus also postulated a vacuum (*vacuum intermistum, non segregatum*), which for Bacon was the reason why Cupid had been represented as an archer (*sagittarius*): the *virtus* of the atom acted at a distance, and without this force and its ability to cross the interspersed void, everything would be frozen in motionless torpor (*omnia torperent* and *immobilia manerent*, 656).¹⁴ Despite his favourable opinion of Democritus, though, Bacon maintained that the latter’s speculations (*meditatio*) about the atom remained ‘of a limited scope’, for he failed to explain the circular motion of the heavenly bodies and the various motions of contraction and expansion in matter. Bacon’s solution to the characteristic aporias of Democritean atomism was to look at matter as a seamlessly pliable substratum differentiated by a plurality of motions. Again, the true ‘atom’ of the story was not matter, but motion (see Chap. 3 in this volume).¹⁵

¹⁴Another emblematic representation of action at a distance is Pan’s hair (i.e., the ‘rays of things’). See Bacon 1857–1874, VI, 637: ‘Corpus autem naturae elegantissime et verissime depingitur hirsutum, propter rerum radios; radii enim sunt tanquam naturae crines, sive villi, atque omnia fere vel magis vel minus radiosa sunt: quod in facultate visus manifestissimum est, nec minus in omni virtute et operatione ad distans; quicquid enim operatur ad distans, id etiam radios emittere recte dici potest; sed maxime omnium prominet barba Panis, quia radii corporum coelestium maxime ex longinquo operantur et penetrant’.

¹⁵On Bacon’s atomism, see Kargon 1966; Gemelli 1996; Manzo 2001.

Cupid as an emblem of atomic motion is yet another example of Bacon's original place in the field of Renaissance mythography. His remarks on the nature of cupidinous appetite, by contrast, are more in line with tradition. Since antiquity, Cupid had been taken as a symbol of the disrupting force of love. In the course of the Middle Ages, he accrued a number of moralizing and allegorical meanings. His lustful nature turned him into a blind character and reinforced the view that his origins were dark and demonic. This tendency continued between the fifteenth and the sixteenth centuries. Ovidian, Petrarchan and painted Cupids started to crop up in many corners of European culture.¹⁶ Bacon presented Cupid as a particularly multilayered figure. Two of these levels concerned the interplay of natural and social desire. He differentiated between an 'ancient' and a 'younger' Cupid. The latter was the son of Venus and the youngest deity of all (*deorum natu minimus*). For Bacon, the shift from the old to the young Cupid signalled the transition from the physical to the ethical meaning of desire (*In illius autem descriptione allegoria ad mores deflectit et traducitur*). Here Cupid stood for any kind of social involvement (*sympathia*), which Bacon characterized as an evolution of the original appetitive drives in matter, namely, 'that ancient Cupid from which all the most refined social behaviour derives' (*haec [sympathia] autem [pendet] a principiiis magis altis et fatalibus, et tanquam ab antiquo illo Cupidine, a quo omnis exquisita sympathia pendet, 655, 657*). By inserting *Cupido junior* between *Cupido antiquior* and *Dionysus*, Bacon was thus explaining in emblematic terms how the blind motions of matter underwent a process of natural and cultural domestication.

7.5 Dionysian and Cupidinous Desire: Crossing the Boundaries of Life and Death

In Bacon's account, there was an important point that connected Dionysian and Cupidinous desire: they were both forms of unintentional drive, generated by the 'Night'. Cupid was blind; Dionysus was the son of blinding. The latter's mother, Semele, wished to have a direct view of the good, and was reduced to ashes; Cupid, on the other hand, shot his arrows blindfolded. In both cases, desire signalled the limit encountered by knowledge in its attempt to master reality. The philosophical question then became how order could derive from disorder – moral order in Dionysus, natural order in Cupid. This view matched Bacon's relentless condemnation of final causes every time they were applied as explanatory devices, for he was convinced that more often than not natural purposes were mere human projections. Therefore, Bacon insisted, the allegory about Cupid's blindness was 'most wise' (*sapientissima*), since the principle of natural motion seemed to have almost no providence (*minimum providentiae*, Bacon 1857–1874, VI, 656). In Dionysus's fable, ungoverned and undirected drives led civilization to destruction. The solution

¹⁶On Renaissance theory of love, see Nelson 1958; Krays 1994. On Cupid in the Renaissance, see Hyde 1986. On the literary and pictorial motif of 'blind Cupid', see Panofsky 1972 [1939].

was then to be sought in a theologico-political setting. As already explained in the Introduction to this volume, Bacon described order as the unintended consequence of a plurality of self-interested atomic appetites. These myriad natural motions served a greater purpose without them knowing that they were being manipulated, and unaware, moreover, of the reasons behind this manipulation. At the level of social desire this was the task of the prince; at the level of natural desire, this function was performed by the summary law of nature created by God, that is, *atomic* Cupid. God's providence smacked of Machiavelli's cunning of reason (see Lancaster's chapter in this volume).

In Bacon's philosophy, the oblique character of the theologico-political course of action was best symbolized by Pan, represented with the feet of a goat in order to signify that the paths of nature were 'partly straight and partly crooked'. It was a meaning that was further confirmed by the shape of Pan's staff, which was crooked at the top. Bacon glossed: 'almost all the works of divine providence in the world occur by twists and turns (*per ambages et circuitus*), so that while one thing appears to be done, another one at the same time is really being done'. For Bacon, human governments that relied on the good use of *prudencia* (*regimen humanum omne prudentius*) were clear instantiations of the law of divine providence: 'those who sit at the helm, through pretexts and following oblique paths, induce (*superinducunt*) and insinuate what they think is good (*convenientia*) for the people in a more felicitous way (*felicius*) than if they proceed in a direct manner (*ex directo*)' (Bacon 1857–1874, VI, 638).

Going back to the initial point in this chapter, the link between material and human desire becomes clearer when we consider the fables of Dionysus and Cupid together in the form of a narrative chiasmus. However atomic – that is, self-interested – appetites were in Bacon's view, they clearly governed both material and social aggregates. Passions (*affectus*) – emblematically represented by Dionysus's trail – were the forces through which matter regulated itself and human beings established relationships among each other. Both natural and social desires were unnerving realities because of the destructive power which resulted from their atomizing and factious tendencies; they followed the law of self-preservation to the letter, being completely overtaken by the urge for immediate satisfaction. Dionysian and Cupidinous desire, however, did not only meet with respect to the motives underlying natural and social activity. They also brought to the fore the complex entanglement of conscious and unconscious desire. In Bacon's pantheon, Dionysius and Jupiter were related deities precisely because of the nexus that linked inner drives to conscious decisions. As Bacon specified at the end of the fable of Dionysus, it was not always easy 'to distinguish Bacchus's deeds (*facta Bacchi*) from those of Jupiter (*facta Jovis*)' (Bacon 1857–1874, VI, 667). The reason was that sometimes Dionysus's and Jupiter's roles overlapped (*confusio personarum*), for glorious deeds could result from heroic deliberation (*virtus; recta ratio; magnanimitas*), or they could derive from unconscious desire (*latens affectus; occulta cupiditas*, 667). In this case, the contrast was between will and desire, and both Cupid and Dionysus shirked the light of Jovial awareness. Finally, both Dionysian and Cupidinous desires treaded the treacherous territories that separated life from death: Dionysus

oscillated between Jupiter and Proserpina, while Cupid, understood as atomic motion, represented the reaction of desire to torpor and inactivity. In Baconian terms, desire meant life, that is, a desperate effort to resist death, understood as the principle of immobility. At a deeper level, though, desire was a primordial and irrepressible tendency to restore the original condition of rest. In this sense, Cupid, depicted as the ambiguous enforcer of the summary law of nature, would ultimately reinstate the regime of indefinite permanence which was the norm before the Fall and the ensuing disfigurement of nature.

In the fable of Pan, the conflict of life and death was also represented through a wrestling match between Cupid (the ‘younger’ Cupid, I assume) and Pan (*audacia Panis, et pugna per provocationem*). The duel of the two deities meant that matter was ‘not without a tendency and appetite to dissolve the universe (*materia non caret inclinatione et appetitu ad dissolutionem mundi*) and to relapse into ancient chaos (*ad recidivationem in illud Chaos antiquum*), unless Pan’s wicked character (*malitia*) and violence (*impetus*) were restrained and brought back to order’ (Bacon 1857–1874, VI, 639).¹⁷ In *De sapientia veterum*, however, the best emblematic representation of the conflict between life and death was provided by the fable of Orpheus. As already explained in the Introduction to this volume, Bacon conceived of Orpheus’s music as a symbol of philosophy (*philosophiae descriptio*); there were, though, two kinds of Orphic song (*Orphei cantio*), one directed to placate the shades of the dead (*Manes*), the other to tame the beasts and the woods (*ferae et sylvae*). The former referred to natural philosophy, the latter to moral and political philosophy,

for by far the most noble work of natural philosophy (*opus naturalis philosophiae longe nobilissimum*) is the very restoration and renewal of perishable things (*ipsa restitutio et instauratio rerum corruptibilium*), and – at a lower level – the preservation of bodies in their state (*corporum in statu suo conservatio*), and the delaying of dissolution and putrefaction (*dissolutionis et putredinis retardatio*) (Bacon 1857–1874, VI, 639).

If this objective could ever be achieved, Bacon continued, it was to be pursued by refining the temperaments of nature in suitable ways, that is to say, through the progress of anatomy and medicine (see Marta Fattori’s contribution in this volume). The problem was that, at that time, this task remained beyond the reach of humankind. Owing to technological challenges and growing frustrations of all kinds, the task of restoring and renewing natural life was bound to fail. Therefore, all efforts had to be directed to turning knowledge and the transformation of natural reality into knowledge and the transformation of social reality. Bacon’s reasoning in the fable of Orpheus was quite straightforward, but extremely radical: philosophy coincided with natural philosophy, which in turn coincided with the ‘attempt (*experimentum*) to renew the mortal body’. Moral philosophy – or the philosophy of human things – was akin to a plan B, after the project of perpetuating life indefinitely was deemed to be unfeasible. Since death was still an inexorable limit to the expansion

¹⁷For *Junior Cupido*, see Bacon 1857–1874, VI, 656.

of physical life, moral life could then act as a surrogate and transform the destructive energy released by desire into a force of civilization:

Being therefore unable to accomplish such a momentous task, and understandably sad for this reason, philosophy turns itself to human affairs (*vertit se ad res humanas*). By resorting to persuasion and eloquence, philosophy instils love for virtue, justice and peace into the soul of human beings. In doing so, it brings peoples together, makes them accept the rule of the laws, submit to power and forget the untameable passions (*affectus indomiti*), while they follow and obey precepts and disciplines. After that, buildings are built, cities are founded, fields and gardens are preserved by planting trees, so much so that not without a reason stones and woods are said to be drawn and moved. And this care for public affairs (*rerum civilium cura*) takes place in due order after the attempt to renew the mortal body has been assiduously made and in the end it failed. And since the unavoidable necessity of death appears increasingly more evident to the eyes of human beings, this encourages them to pursue eternity through their merits and the glory of their name (Bacon 1857–1874, VI, 648).

Having failed to perpetuate life, human beings try to perpetuate the memory and glory of their accomplishments by producing imperishable records of their spiritual life. The accord between natural and moral philosophy rests therefore on a precarious balance, which is due precisely to the unstable nature of desire. It is certainly no accident that, in Bacon's account, Orpheus's sacrifice by dismemberment (*σπαραγμός*) epitomizes philosophy, 'torn to pieces and scattered in the fields' by enraged desire, that is, by Bacchus and his female devotees.¹⁸ The folly of the Bacchantes, by contrast, represents the fragility of both life and human civilization. As already pointed out in the Introduction to this volume, unrestrained desire brought to an end the contemplative harmony of 'Orpheus's theatre':

and finally the Thracian women, instigated by Bacchus's incitements, first blew a horn which was so unbearably hoarse that, because of the noise, the sound of music could not be heard any longer. It was at that moment that the power which was the bond of this order and society [symbolized by 'Orpheus's theatre'] was dissolved (*soluta virtute quae ordinis et societatis istius erat vinculum*), disorder broke out, and every animal recovered its previous nature and attacked each other as they used to do (Bacon 1857–1874, VI, 647).

In the domain of *prisca sapientia*, Dionysian desire represented the counterpart of postlapsarian lust. Both events wreaked havoc in the world of nature. Both marked the beginning of a long and difficult search after peace and settlement.¹⁹ In the fable 'Coelum, sive origines' ('Heaven, or the Origins'), Bacon had warned that, as Democritus had correctly pointed out, the universe could relapse back into chaos and disorder, for Saturn, despite having been 'ousted and cast down', was nevertheless 'not annihilated, nor extinguished' (Bacon 1857–1874, VI, 650). The destructive forces of unruly desire may lie dormant for long periods of time, but they are

¹⁸ Bacon 1857–1874, VI, 647: 'Orpheus autem ipse tandem a mulieribus furentibus discerptus est, et sparsus per agros'.

¹⁹ Bacon 1857–1874, VI, 650: 'Postquam autem mundus mole et vi sua consisteret, tamen otium ab initio non fuisse. Nam secutos primum in coelestibus regionibus motus notabiles, qui virtute solis in coelestibus praedominante ita sopiti sunt, ut mundi status conservaretur: postea similiter in inferioribus, per inundationes, tempestates, ventos, terrae motus magis universales; quibus etiam oppressis et dissipatis, magis pacata ac durabilis rerum conspiratio et tranquillitas accrevit'.

always ready to resurface and ruin that particular level of order attained by and specific to history:

the very works of wisdom, although they excel among the accomplishments of human nature, are nevertheless confined within the limits of time, for it may happen that, after kingdoms and republics have blossomed for a while, all of a sudden unrest, seditions and wars emerge; and in the middle of their clash, first the laws fall silent, and human beings go back to the depravations of their nature. The desolation is before everyone's eyes in the fields and the cities. And if this kind of madness continues, it doesn't take long before literature and most certainly philosophy are also torn to pieces. As a result, only some fragments of culture can be found in a few places, like planks after a shipwreck, and barbaric times break out (Bacon 1857–1874, VI, 648).

When unspoiled by the violence of sectarian divisions and fanatic dogmatism, religion, too, was for Bacon one of the preservers of civilization. In the fable 'Sirenes, sive voluptas' ('The Sirens, or Pleasure'), he returned one last time to Orpheus and presented his singing as the best remedy (*praestantissimum remedium*) against the excesses of material pleasure. In this case, the Greek hero had managed to combine the theological and philosophical functions of learning (*doctrina* and *eruditio*) in such a way that his praises of God (*laudes deorum*) had prevailed over the attractions of unrestrained pleasure (*sirenum voces*). Religious meditations (*meditationes rerum divinarum*), Bacon insisted, 'overcome the pleasures of the senses not only with their power, but also with their pleasantness' (Bacon 1857–1874, VI, 686).

7.6 Conclusion: Desire and the Unintended Consequences of Theologico-political Order

Writing in 1945, a few months before his death, Ernst Cassirer noticed 'the preponderance of mythical thought over rational thought' in some modern political systems. Like Bacon with his *De sapientia veterum*, Cassirer devoted his last book, *The Myth of the State*, to exploring the persistence of primordial 'political myths' in an attempt to understand the chasm between our knowledge of nature and human action. Both Bacon and Cassirer stressed the importance of language as a repository of accrued knowledge: 'Language is not only a school of wisdom but also a school of folly' (Cassirer 1946, 19).

Bacon used the gods of Greco-Roman antiquity to discuss philosophical notions. Being related to each other, they created new symbolic associations throughout his work. Bacon's Dionysus, for instance, was connected to Semele (apparent good), Jupiter (the light of the intellect) and Proserpina (the lower regions of the soul where desire dwells, often dormant in a condition of latency but ready to react when triggered by the smallest stimulant). Within this family of philosophical characters, Dionysus represented the power of desire, its force to come back to life, the murky nature of lust (for it thrived in prohibition and precipitation), the ritualistic apparatus needed to curb its otherwise destructive force, its feral nature (symbolized by the

accompanying tigers and demons), its addictive potential (wine) and its pervasive and reactive energy (ivy). By contrast, Bacon's Cupid was an overarching reflection on the nature of chance, understood as the random motion of the atoms and the limits of intentional design in the human representation of nature (*fortuna*), the inconsiderate and hazardous activity of human desire (*temeritas*), but, above all, the mystery of the happy coincidence between purpose and result (*casus felix*), a notion at the very heart of *De sapientia veterum*, in which Bacon theorized the serendipitous convergence of philosophical meanings with mythological fables.

Bacon's original foray into the territory of Renaissance mythology sheds further light on his views concerning the nature of appetite (*natura cupiditatis*). His emblematic inquiry, centred on the figures of Dionysus and Cupid, demonstrated that desire was disturbingly duplicitous, in that it kindled the processes of life while accelerating the arrival of death. Ways of controlling natural and social desire (Cupid and Dionysus) were key factors in balancing the interplay between the forces of life and the forces of death. The 'antiperistaltic' relation of life and death, however, was not the only polarity connected to the essence of desire. Cupid and Dionysus symbolized the boundaries between nature and culture, knowledge and will, gods and humans. Above all, they defined the boundaries that separated reason from unreason. And if it is true that Bacon explored the origins of social desire mainly through Dionysus, and those of natural appetite through Cupid, Dionysus and Cupid were not two distinct forms of cupidity, but two sides within the general evolution of life and within the history of human attempts to defer death. After all, as we have seen, a younger, more prudent Cupid developed out of the older, darker and more demonic one.

If we now go back to the initial chiasmus – Dionysus is to desire (*cupiditas*) what Cupid is to matter (*atomus*) –, we realize that in Bacon's account the atom was at the centre of his discussion about desire and appetite, for both Cupid and Dionysus had an 'atomic' nature. This means that desire was particulate, divisive and solipsistic by nature; atoms were appetitive forces in natural matter which perpetuated their divisive actions within the kind of derived and secondary matter that was the world of human culture and civilization. Bacon's take on Dionysus was a meditation on desire, and, through the fable on Cupid, it expanded into a meditation on matter and its innermost motions, as well as a narrative about how the self-interested drive of desire parcelled out matter into unstable aggregates of atoms. These themes were all closely intertwined in Bacon, for he had a deeply Dionysian view of reality as a domain pervaded by irrepressible appetites, unruly and self-possessive, which could only be managed by resorting to tactics of indirect control and crooked action. From this point of view, the way in which Bacon handled the question of desire was ultimately of a theologico-political nature, in the sense that, while at a social level (Dionysian desire) the rulers of a stable community had to resort to oblique means in order to channel the atomic and self-interested desires of individuals towards a greater good, at a natural level (Cupidinous desire), God arranged the organization of the cosmos in such a way that conflicting motions could lead to patterns of relatively stable organization.

By and large, Bacon's interpretation of Dionysus was dark and sombre, a sort of bleak cautionary tale: unbridled desire leads to death; indeed, desire as such leads to death (the most elementary motion in Bacon's physics, as I have already pointed out in Chap. 3, is motion towards rest). This seems to be quite a significant departure from the Renaissance mythography of Giraldis, Conti and Cartari, for whom many of the characteristics related to Dionysus's story were positive (wine, ivy and Bacchanalian revels, for instance).²⁰ It seems that in the account of Dionysus provided by Bacon (and in other related fables) desire was constitutively impure, for it was never a spontaneous activity, but always 'antiperistaltic', that is, antagonistic and reactive. It was a response to oppositions (*renitentia*) or prohibitions (*vetitum*); blind, in that it was not directed by knowledge; in perpetual need of greater stimulation, being entrapped in a vicious circle of addiction and habituation. It was particularly the circle of addiction and habituation that struck Bacon as symptomatic of death. In the *Sylva Sylvarum* he went so far as to conduct experiments to gauge the extent to which 'nature, by continual use of any thing, groweth to a satiety and dullness, either of appetite or working' (Bacon 1857–1874, II, 369). Pleasure and habituation were often a way of assuaging the hardships of life: '(generally) it is a rule, that whatsoever is somewhat ingrate at first, is made grateful by custom; but whatsoever is so pleasing at first, groweth quickly to satiete' (441). And so, towards the end of his life, Bacon could confirm at an experimental level what he had already ascertained while exploring the most ancient remnants of human civilization.

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²⁰Giraldis 1548, 377–378; Cartari 1571 [1556], 414, 428; Conti 1637 [1567], 266, 267.

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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 classification 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 preservation reveal traces of Stoicism, Telesian natural philosophy, the natural law tradition, 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.

S. Manzo (✉)

Instituto de Investigaciones en Humanidades y Ciencias Sociales (UNLP-CONICET),
Calle 51 e/ 124 y 125, (1925), Ensenada, Buenos Aires, Argentina
e-mail: manzosa@yahoo.com.ar

8.1 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 physical 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 preservation, 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.

8.2 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 classification of the sciences. There he described 'first philosophy' (which he also called 'primitive or summary philosophy', *philosophia prima*, or *sapientia*) as the universal science, the 'mother' of the sciences and the 'receptacle of axioms'. First philosophy 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 *conservatio*. 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 theoretical claims of every science (Bacon 1857–1874, I, 540–541). Communication among sciences allows for their mutual collaboration, since they are able to illuminate 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 isolation 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 correlated with the ontological unity in diversity which runs throughout Bacon's philosophy. 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 understanding' (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 distinguished between four basic kinds of universal appetites which he labeled the 'quaternion 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 pleasure of nourishment and generation; and in man do make the aptest and most natural division 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

⁴This 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, fundandum 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.

⁵The 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 correlated, 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 discourses 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 appetites 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 'individual 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, apparently 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 peculiarity.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

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

⁷See also Bacon 2000a, 136.

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

⁹On 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.

¹⁰See 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 translation 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 establish 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 communion 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 abandon 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 doctrine, 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 appetites 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 explicitly 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 chapter 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 ('consenting' 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 differences 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 resemblance 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 following 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.

8.3 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 enumeration. On the contrary, he cautiously admits that he is offering tentative classifications of the most widespread motions, which perhaps might be modified by further research (Bacon 2004, 413). Both classifications, however, reduce the simple motions to four basic appetites resembling the ‘quaternion of good’: *conservatio*, *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 annihilation, 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 predominance’ 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 indicates 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 bodies move to the Center of the earth; But rather then suffer a diuulsion in the continuance of Nature, they wil moou upwards from the Center of the Earth: forsaking 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 individual 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 sympathy’, 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 Countrie of Massie Bodies’ (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 continuity (*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* (*exhorrentia motus*); or of special forms like the rest' (Bacon 2004, 413; English translation 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 conservationem 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 *Abecedarium novum naturae*, enjoyment, 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 enumerated 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 *antitypia* 'subsists in every body' (Bacon 2004, 385). It seems, then, that self-preservation

²³Bacon 2000b, 192: 'Itaque muniuntur corpora natura corpora ad conservationem ipsorum motibus quatuor predictis, tanquam armis defensivis, quibus se tueantur ab annihilatione, a vacuo, a tortura, et a separatione'. The motions alluded to are *antitypia*, *nexus*, *libertatis*, and *continuationis 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 organum*.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 'logical 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 doctrine 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 reciprocal 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 processes 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).

8.4 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 philosophy 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 inseparable 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 *antitypia*, *renitentia*, *resistentia* and *anteresis*) was widely considered to be a distinctive quality of matter by which it resisted penetration. Resistance distinguished impenetrable 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 qualitibus incorporeis*, 19.483, 13–16 (von Arnim 1903–1905, SVF II 381). It is worth noting that doxographic 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 *antitypia*) 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 attributes *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 maintained a corpuscularian theory of matter along with the idea that resistance to annihilation (expressed by such different terms as *antitypia*, *resistentia* and *virtus conservatrix*) was an essential property of matter, and correlated it with the constancy 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 *antitypia* in the *Abecedarium* reads as follows:

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

³³Patrizi 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 demonstrabitur postea. A lumine, habent etiam calorem, a calore essentiam, et vires, et actiones. Antitypam, 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 authors 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 ratio 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 quocunq[ue] 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.

³⁴On 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 situated; 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 single 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 matter. 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 something to nothing. Whether this be done by the failure of the preserving power (*virtus conservatrix*), 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 highest 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 appetite, since this prerogative belongs to God alone. Although matter also possesses certain tendencies towards discord, destruction and chaos, the desire for preservation 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 conservation 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 originibus*, 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 privative’, 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 particular 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 matter 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 opposition 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 passive 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 natural 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, augetur apparet unquam, quod si calori, frigori que 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 subsists 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 attention 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 characteristic 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 constancy 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 destruction, 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 annihilated 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).

⁴²My translation of Bacon 1996, 258: 'transmittit, ut passivam, & tamquam ad rationem quantitatis, quam ad formam & Actionem, pertinentem'.

8.5 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 ability to provoke 'panic terrors' is interpreted by Bacon as a 'very wise doctrine' hidden 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 '*fruition 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 lowest 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 universal perception.

This understanding of preservation as self-preservation embedded in the particular 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 protection is the instinct for self-conservation and the maintainance of itself in the best condition

⁴³My 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."

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

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

⁴⁶See 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 appetite 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: natural 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 individual operation preserves the being at the highest level and graces it with the greatest 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-vacuumist position, but he rejected the widespread anti-vacuumist explanation that nature abhors vacuum due to the fact that 'universal nature' sought the conservation of the universe 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).

⁴⁷Cicero, *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.

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

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

⁵⁰See Clericuzio 1988, 39.

⁵¹On 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 context 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 natural 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 specially. when it is considered generallye, then it is referred to all creatures, aswell reasonable and unreasonable. for al unreasonable creatures liue under a certaine rule to them given by nature, necessary for them to the conseruation of their being (Saint Germain 1575, 3^r).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, pertinent 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 proprietie 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 condition 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 contemporary, 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 aeterna*, 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 preservation: ‘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 physics; 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 contributes to the well-being of the particular members of the republic. The same holds in theology, 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

⁵⁹The *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 principles 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 common 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 individual and selfish inclinations, and against the destructive tendencies of matter and man. This response demands a significant effort, particularly when conflicting appetites 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 direction 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 individual 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 systematized in late scholastic philosophical works. An influential expression of this doctrine 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 procreation, 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

⁶⁰Conimbricenses 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 subtracted. 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, q. 1, a. 3).

⁶³ The commentary quotes these lines: ‘Ac mihi quidem veteres illi maius quiddam animo complexi 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 whatsoever their owne particular, as we plainly see they doe, when things natural in that regard forget their ordinary natural woont, that which is heaue 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)

8.6 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 species 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, particularly in *Valerius Terminus* and the *Abecedarium novum naturae*. In this framework 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 necessarily 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 complex when the interests of antagonistic social groups are involved (e.g., wars, religious 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 transmutation 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

⁶⁴This 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 undisputed 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 oppositions, 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 preservation of the whole, the existence of conflicts becomes essential.

Finally, I would like to resume the question of the relationship between the natural 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 philosophy as parallel orders that reflect each other. Neither moral philosophy nor natural 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 displays unity in diversity.

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Chapter 9

Francis Bacon on the Motions of the Mind

Sorana Corneanu

Abstract This chapter is an inquiry into the place of the mind and its motions in Francis Bacon's ontology and in his map of the disciplines. A strong tendency in Baconian scholarship is to suggest that Bacon made the move of attributing the faculties of the mind to the corporeal soul (the *spiritus*) of man. I argue against this attribution and the consequent identification of the motions of the mind with the motions of the spirit, and propose that the separation between them served two specific purposes in Bacon's philosophy: maintaining the hierarchy of the chain of being and thus the distinction between humans and brutes within the realm of philosophy (rather than grounding it in a division of labour between philosophy and theology); and establishing what he called 'the league' between the mind and the body as a distinct field of inquiry, placed at the core of his theoretical and operative doctrine concerning man. I propose that Bacon had a broad, multi-layered view of activity and interactivity in the created realm, and that the conceptual framework to which such a view could be moored is constituted by his understanding of the world as made up of analogously structured, consensual patterns, which form the subject matter of *philosophia prima*.

9.1 The Motions of the Mind Between Abstract Physics and the Doctrine Concerning Man

In Book 3 of *De augmentis scientiarum* (1623), Francis Bacon significantly expanded the outline of the science of physics originally sketched in *The Advancement of Learning* (1605). He brought in much of the matter theory he had developed in the meantime and established that one key aim of physics was the inquiry into the physical causes of two interrelated types of 'natures': the configurations or 'schematisms' of matter and the appetites or motions of material things. These natures constitute the subject matter of 'abstract physics', which is the part of physics bordering on metaphysics. The latter looks into the same natures, but with

S. Corneanu (✉)
University of Bucharest, Bucharest, Romania
e-mail: sorana.corneanu@lils.unibuc.ro

the aim of establishing their unchangeable material essences (the forms), rather than their variable causes (Bacon 1857–1874, IV, 347, 361). Bacon also compiled lists of the two types of natures, which have comparable, albeit not exact correspondents in similar lists in the *Novum organum* (1620) and in the *Abecedarium novum naturae* (1622). Examples of schematisms include such pairs of natures as dense and rare, heavy and light, hot and cold, tangible and pneumatic. Among the appetites and motions he lists such motions as those of resistance, connection, liberty and motion into a new sphere. Bacon thinks that the observable behaviour and properties of bodies can be explained in terms of these fundamental originating natures, which are invisible to the naked eye. All kinds of observable physical transformations, for instance, are processes caused by certain motions inherent in the two main types of sublunary matter, tangible and pneumatic, subject to the quantities, qualities and structural patterns of the same types of matter (Bacon 1857–1874, IV, 356–357).¹

In *De augmentis scientiarum*, Bacon ends his lists of the two types of natures by signalling that there is a group of entities which one may be put in mind of when considering the schematisms and motions of matter, but which in fact belong to another doctrine, namely the doctrine concerning man. Here are the two endings:

Organic, Inorganic; Animate, Inanimate. Further I do not go. For Sensible and Insensible, Rational and Irrational, I refer to the doctrine concerning Man (*ad doctrinam de Homine rejicimus*).

For voluntary motion in animals; the motion which takes place in the actions of the senses; motion of imagination, appetite, and will; motion of the mind, determination, and intellectual faculties; these I refer to their proper doctrines (*ad proprias doctrinas amandamus*) (Bacon 1857–1874, IV, 356–357; I, 560–561).

As far as the schematisms are concerned, there is a slight variation in the *Abecedarium novum naturae*: there, the pair sensible-insensible features among the schematisms of matter, alongside the pair animate-inanimate. Together, these schematisms configure the major classes of beings, with the exception of man. Inanimate beings are tangible bodies that contain pneumatic, discontinuous spirits. In contrast, the spirit in animate beings (plants and animals) is self-continuous, ramified and inflamed. The difference between plants and animals is a difference between insensible and sensible: the animals' spirit is more inflamed than that of the plants and in addition has 'certain seats or cells in the body where it gets together in itself', which function like command centres for the whole organism, and make sensation possible.² In contrast, insensible beings lack sensation, but are endowed with a fundamental type of perception, which characterizes all matter (Bacon 1857–1874, IV, 402–403; Bacon 1857–1874, II, 602–603). Bacon calls inanimate spirits 'non-living' and animate spirits 'vital'. Man also possesses a vital spirit (*spiritus*). The

¹See also Bacon (2004, 209–213; 2000b, 203). On Bacon's matter theory, see Rees 1977, 1996; Rees's introduction to Bacon 1996, xxxvi–lxix, and Bacon 2000b, xxxvi–xlvi; Weeks 2007; Giglioli 2010a, 2011, Chap. 3.

²Bacon (2000b, 187–189; 2000b, 347–355; 1857–1874, II, 528–529). See further Rees 1984b; Fattori 1984; Rees's introduction to Bacon 1996, lvi–lxv. For the various aspects and uses of spirit theories in the early modern age, see Sutton 1998, 25–49; Göttler and Neuber (eds) 2008.

human spirit is of the same nature as the spirit of animals, of which it is only a subclass, and this explains why it is not considered a category of schematism in itself (Bacon 2000b, 191). What does distinguish man from animals is the possession of a rational soul in addition to the *spiritus*. The former is of divine origin and incorporeal, while the latter is identified as the sensible or irrational soul³ of man (Bacon 1857–1874, IV, 397). It is therefore the rational-irrational schematisms that constitute man, where the irrational is equivalent to the sensible in the sensible-insensible pair. The sensible-insensible pair might well have found a place among the schematisms of matter listed in *De augmentis scientiarum*, as it did in the *Abecedarium novum naturae*. Similarly and by way of consequence, animal voluntary motion and sensation could have been numbered among the motions of matter, as associated with the sensible schematism. Nevertheless, Bacon prefers to group the sensible-insensible with the rational-irrational under the doctrine *de Homine*, so that he might present a complete picture of man, as a creature equally endowed with a tangible body, sensibility and rationality.

The questions that arise from the qualified acknowledgement of the elements of the doctrine of man at the end of Bacon's presentation of abstract physics are the following: In what way is Bacon's referral to the doctrine of man significant for the respective schematisms and motions? Is it possible for Bacon to consider the rational soul a 'schematism' even if it is incorporeal and of divine origin? Are there activities in Bacon's world that may be called motions without being anchored in corporeality? May the 'motions of the mind' constitute such motions, and thus be associated with the 'schematism' of the rational? And, since Bacon presents the schematisms in pairs, obviously implying specific relations between them, what is the relation between the rational and the irrational/sensible schematisms and between the respective motions associated with them? And, finally, within which branch of knowledge are these questions legitimately asked and answered?

This is another way of asking a question which has previously been raised in Bacon scholarship; that is, whether Bacon attributed the human faculties – in particular, memory, imagination and reason – to the rational or the irrational soul. The question is interesting not only within Baconian studies, but also from the point of view of the histories of doctrines of spirit, soul, body and mind which populated the late Renaissance and early modern age, and thus of the shapes such disciplines as psychology, physiology, and anthropology assumed at the time.⁴ It is, I think, fair to say that the dominant tendency is to see Bacon taking a materializing stance towards the human soul, usually understood as indebted to Telesian and/or late Renaissance medical thought. On this reading, the material vital spirit (*spiritus*) takes over all the human cognitive functions as its prerogatives, from sensation to rational cognition,

³Throughout, I use the term 'irrational' in conformity with Bacon's own vocabulary (*irrationalis*) and Spedding's translation; in its strict meaning, the term serves to distinguish this kind of soul from the higher, rational soul and does not involve present-day associations with 'absurdity' or 'incoherence'. Thanks to the anonymous reviewer who brought up this point.

⁴As traced in, e.g., Park 1988; Kessler 1988; Michael 2000; Des Chene 2000; Vidal 2006; Serjeantson 2011; Sutton 2013.

and is thus responsible for the entire sensitive-cognitive work relevant to philosophy. The incorporeal rational soul retains a place in the discussion of man, yet it becomes mainly or even uniquely relevant from a theological point of view. As far as Bacon is concerned, this line of interpretation comes in several shapes: (a) the faculties are attributed to the rational soul, but in the end the physiological picture of the spirit engulfs the soul's identity⁵; (b) the rational soul is probably responsible only for abstract thinking, but the materializing tendency is clear, in conformity with Bacon's indebtedness to Bernardino Telesio (1509–1588) and Agostino Doni (fl. 1579–1583)⁶; (c) the faculties are definitely attributed to the *spiritus*, in conformity with Bacon's indebtedness to the medical tradition.⁷ One consequence of this line of interpretation is that, from the perspective of natural philosophy, there is no radical difference between humans and animals, other than the degree of complexity that distinguishes between similarly constructed 'centralized systems of activity'⁸; otherwise, from the perspective of theology, the rational, incorporeal, divinely-inspired soul does have a role in man's eschatological fate, yet there is little communication between this soul and the spirit: each has its distinct sphere of (disciplinary) relevance.⁹

⁵Wallace 1967, 11–39; Jardine 1974, 88–96.

⁶Walker (1984a, 224; 1984b), Rees (1984a, 302) (but Rees warns that 'Bacon's view of the higher faculties in human beings needs more discussion'). For more general comparisons between Bacon and Telesio, see Walker (1958, 190–202; Pousseur 1990). Rees 1984b, 277–278, sees the Baconian rational soul as a 'supernatural principle informing ventricular concentrations of spirit, corresponding to the three faculties' (to 'inform' here means to 'energize'). This is closer to my interpretation, with two caveats: even if the rational soul has a supernatural origin (the 'breath of God'), it is also a member of the *scala naturae* and a subject on which philosophy and theology are expected to agree; and soul-activity has more of a distinct identity than the idea of its being wholly translated into spirit-activity would suggest.

⁷Tonelli Olivieri 1991.

⁸Walker 1984b, 320.

⁹Telesio has more to say than Doni about the divinely infused soul, although they share the idea that the nature of this soul is entirely a matter of faith. Both delimit the areas of relevance of the two souls in a similar way: the infused soul is relevant to those acts of moral-religious conscience whereby men are capable of bending the fundamental tendency of the *spiritus*, the appetite of self-preservation (Telesio 1586, 178), or generally to matters of salvation (Doni 1581, 122–123); natural philosophy can nevertheless build a doctrine of human nature entirely based on the natural activities of the material *spiritus*, since all the human cognitive functions (sensation, imagination, memory, recollection, reasoning and understanding) are explicitly attributed to the *spiritus* and ultimately resolved into its fundamental capacities for sense and motion (Telesio 1586, 314–316; Doni 1581, Chaps. 17, 18, 19, 20, 21, and 22). On Telesio's philosophy of mind, see Spruit 1997; and on his conception of the sentience of nature, which grounds for him the activity of the *spiritus*, see Giglioni 2010c. See also Giglioni 2013, for an analysis of the complex nuances of Bacon's position on the relation between the human *spiritus* and the appetitive matter of the universe on the one hand, and between the *spiritus* and the human rational soul on the other. Here I argue for a tighter relation between the latter two.

While Bacon is of a mind with Telesio and Doni on the existence of two souls in man¹⁰ and on the question of their origins, I will argue here that he does not decide that the rational soul is a uniquely theological affair, nor does he attribute all the cognitive functions of man to the *spiritus*. It is true that there is a high level of ambiguity in what Bacon wrote on the subject and that he did not develop the issue in any satisfactory way. However, there are various hints in his writings which together allow us to build a case for the following position: Bacon attributed the higher mental activities in man (memory, imagination and reason) to the rational soul and understood them to stand in a complex relationship with the motions of the material vital spirit of man. The argument will proceed as follows: Bacon's chain-of-being ontology includes incorporeal substances and actions which are seen as legitimate objects of philosophy, and on which philosophy and theology are expected to agree (Sect. 9.2). The distinction between motions of mind and motions of spirit is important not only for his chain-of-being view of the created world, but also for the establishment of the 'league' between mind and body as a distinct field of inquiry subsumed under Bacon's doctrine concerning man, a doctrine with both theoretical and operative (in this case largely medical) dimensions (Sect. 9.3). The relationships between the material and the immaterial motions are grounded in Bacon's views on the multi-layered activity and interactivity in the created world, and are an instance of the 'consents' of things studied by *philosophia prima* (Sect. 9.4). All of this will show, I hope, that approaching the issue from the point of view of the schematisms and motions that are mentioned in his abstract physics only to be referred to the doctrine of man offers a privileged vantage point for understanding Bacon's idiosyncratic position.

9.2 The Two Souls, the Chain of Being and Actions Without Bodies

Book 4 of *De augmentis scientiarum* includes as much new material, when compared with the *Advancement of Learning*, as Book 3. A significant part of this material is constituted by Bacon's introduction of *spiritus* in his theory of the soul. The details of this theory have been analysed so often that it will suffice to give only a very brief sketch here, and to highlight several issues that have been less commented upon.

As pointed out above, man is distinguished from animals by the possession of a rational soul, alongside the irrational or sensible soul (the *spiritus*), which he shares with animals. Bacon establishes from the beginning that the rational soul has a divine origin (it comes from the 'breath of God'), while the sensible soul originates in the 'womb of the elements'. This is a theological distinction (based on Genesis 1:20, 1:24, 2:7) that is consonant with the principles of philosophy, which also

¹⁰On the two-soul theories of the Renaissance as indebted to scholastic soul-pluralism rather than mainstream Thomism, see Michael 2000, 158–168.

recognize the superiority of the human soul compared with that of brutes (Bacon 1857–1874, IV, 360). The philosophical recognition is based on the perceived difference between humans and brutes in terms of excellence of functions:

For there are many and great excellencies of the human soul above the soul of brutes, manifest even to those who philosophise according to the sense. Now wherever the mark of so many and great excellencies is found, there also a specific difference ought to be constituted; and therefore I do not much like the confused and promiscuous manner in which philosophers have handled the functions of the soul; as if the human soul differed from the spirit of brutes in degree rather than kind; as the sun differs from the stars, or gold from metals (Bacon 1857–1874, IV, 397).

This is an important point for Bacon and he dwells on it in a further passage that includes both an endorsement of the theory of the substantial sensible soul, as defended by Telesio and Doni, and a refutation of the reduction of the human soul to the *spiritus*.¹¹ Indeed, Bacon commends the two philosophers for their insight that the sensible soul is to be understood as an active corporeal substance and not as an ‘act’ or ‘form’ of the body in the scholastic sense.¹² It is a substance ‘compounded of the natures of flame and air’, nourished by watery and oily substances, repaired by blood, branching throughout the body, and having its command centre in the brain. By means of its specific motions, the *spiritus* is involved in sensation and voluntary motion in both brutes and humans: it easily receives the impressions of the senses owing to its airy nature and propagates its actions as a result of its fiery nature; and, by means of its ‘compressions, dilatations, and agitations’, it can put the gross parts of the body in motion (Bacon 1857–1874, IV, 398, 401).¹³ Immediately after the description of the sensible soul, however, Bacon adds:

Let there be therefore a more diligent inquiry concerning this doctrine [of the sensible soul]; the rather because the imperfect understanding of this has bred opinions superstitious and corrupt and most injurious to the dignity of the human mind, touching metempsychosis, and the purification of souls in periods of years, and indeed too near an affinity between the human soul and the soul of brutes. For this soul is in brutes the principal soul, the body of the brute being its instrument; whereas in man it is itself only the instrument of the rational soul, and may be more fitly termed not soul, but spirit (Bacon 1857–1874, IV, 398).¹⁴

The rejection of Pythagorean and Platonic metempsychosis coupled with the distinction between humans and brutes in terms of the former’s excellence of activities is a common theme in the type of medical-theological literature I will introduce

¹¹ This is not to say that either Telesio or Doni conflate the two souls. But they do distribute them between revealed theology and natural philosophy. As I argue below, Bacon has a much more nuanced position.

¹² See Telesio 1586, 180; Doni 1581, Chaps. 4 and 5.

¹³ See also Bacon 2007, 352–353, where his notes of biological philosophy are a bit more detailed: the human body has not only a vital spirit but also a multitude of ‘non-living’ spirits which are involved in nutritive, digestive and sensitive activities; such activities ‘flow from’ (*sequuntur*) the nature of the particular bodily members and their non-living (yet ‘perceptive’) spirits, but are ‘sparked off’ (*actuata*) by the vigour of the vital spirit.

¹⁴ See also Bacon 2007, 377: ‘For the structure of the parts [of the body] is the instrument of the spirit, just as the spirit is the instrument of the rational soul, which is incorporeal and divine’.

as a relevant context for Bacon in the next section, as is the notion that the spirit is the ‘instrument’ of the incorporeal rational soul.¹⁵ For the moment it is worth pointing out that, while clearly endorsing the *spiritus* theory, Bacon was also concerned about (and vocally refuted) any identification of the human soul with the *spiritus*, which he saw as a dangerous possible consequence of the *spiritus* theory if embraced in a reductive way. To embrace this consequence is to ‘philosophise according to the sense’.

In *De augmentis scientiarum*, he tells us that the nature of the rational soul (‘whether it be native or adventive, separable or inseparable, mortal or immortal, how far it is tied to the laws of matter, how far exempted from them; and the like’) is to be addressed in theology rather than philosophy, in conformity with the divine origin of the human soul. Unless theology is allowed to decide the matter, Bacon goes on, these questions ‘will be subject to many errors and illusions of the sense’. However, he allows that the substance of the rational soul may also be inquired ‘in philosophy’ in a ‘more diligent and more profound’ way than before (provided the errors and illusions of the senses are kept at bay) (Bacon 1857–1874, IV, 397–398). This statement, if taken seriously, is apt to signal Bacon’s distance from the position on the disciplinary distribution of the two souls in Telesio and Doni. The question then becomes whether for Bacon the incorporeal can be an object of nature, and an object that can be approached within philosophy. I think the answer is a qualified yes. Two types of consideration argue for a positive answer: one has to do with Bacon’s views on the chain of being; the other with his views on action at a distance.

Bacon’s chain of being does not end with man; it includes the supra-human level of spiritual intelligences, in conformity with traditional pictures of the chain of being, also known as the *scala naturae*.¹⁶ We learn about this level in Bacon’s treatment of the *Doctrina de angelis et spiritibus*, which he assigns as an appendix to the rational discipline of natural theology (or divine philosophy). Within this discipline, the nature of angels is ‘neither inscrutable nor interdicted’. The study of the nature of angels, Bacon points out, has given rise to all sorts of superstitions and fanciful speculations, but this does not mean that it cannot be undertaken in a sober way. A sober kind of study is possible owing to the ‘affinity it [the nature of angels] bears to the human soul’, and it can take the form of ‘either ascending to the knowledge of their nature by the ladder of things corporeal, or beholding it in the soul of man as in a mirror’ (Bacon 1857–1874, IV, 342–343). The contemplation of the upward hierarchy of the scale of creatures is an act of the rational mind aided by observation

¹⁵For instance, Lemnius 1658, 33 and Lemnius 1583, 56–57; Woolton 1576, 15^r–16^r; Nemesius 2008, 73–74 and [Nemesius] 1512, fols. xi^v–xii^r. Aristotle also rejects Pythagorean metempsychosis, on grounds which are slightly yet not essentially different: he objects that the soul and the body that would be brought together cannot be random, but need to have some ‘community of nature’ (*koinonia*) (*De anima*, I, 3, 407a14–26, in Aristotle 1984).

¹⁶On Bacon’s chain of being up to man, see Rees 1984a, 272–275. On the meanings of ‘spirit’ in Bacon (which, besides the material spirits, includes angels and spiritual species, e.g., light and sounds), see *ibid.*, 266–267.

of the hierarchical gradations of material beings.¹⁷ Bacon concludes: ‘the contemplation and knowledge of their [both angels’ and demons’] nature, power, and illusions, not only from passages of Scripture, but from reason or experience, is not the least part of spiritual wisdom’ (Bacon 1857–1874, IV, 342).¹⁸

The angels also feature in the sections on moral philosophy, as part of an illustration of one of the members of the doctrine of the good, namely, the good of perfection, which represents the aspiration of any individual being to rise to the ‘dignity and excellence’ of a higher nature. In the human realm, ‘the assumption and approach of man to the Divine or Angelical nature is the perfection of his form’ (Bacon 1857–1874, V, 12).¹⁹ In *Valerius Terminus* (1603), Bacon likens the good of perfection (or approach, or assumption) to the motion of attraction in corporeal things, whereby a body is moved ‘to approach to that which is higher in the same kind’ (Bacon 1857–1874, III, 229–230).²⁰ Man’s soul is drawn towards the angels just as, say, a piece of iron is drawn to a loadstone. This reinforces the notion of the affinity between human souls and angels and their vicinity in the chain of being. Moreover, as we have seen, both incorporeal angels themselves and the hierarchical distinctions between brutes, humans and angels are a fit object of natural theology, one of the branches of philosophical knowledge in Bacon’s map of the disciplines.

Besides the natural theological context of angels, a further reference to the incorporeal as part of the world studied by philosophy features in the squarely natural philosophical discussion of action at a distance. One of the sets of ‘instances with

¹⁷The idea is common currency in medieval, Renaissance and early modern thought. In the late Renaissance reprisal of Bartholomaeus Anglicus’s *De proprietatibus rerum*, the ‘Prologue of the Translator’ tells us: ‘Also it is not possible, that our wit and intendment might ascende unto the contemplation of the heavenly Hierarchies immaterials, if our wit be not led by some materiall thing, as a man is ledde by the hande: so by these formes visibles, our wit may be ledde to the consideration of the greatnes or magnitude of the most excellent beauteous claretie, divine and invisible’ (1582, i^r). The notion of seeing invisible things in visible things (see Romans 1:20, commonly invoked in support of the legitimacy of natural theology) here serves the inference to the existence of angels. The same idea (that by rationally understanding the hierarchical nature of the order of creatures, we will naturally come to the conclusion that there is a level of incorporeal intelligences) can be found, for instance, in Patrizi 1591, 24 (with the same Biblical reference); Yves de Paris 1642, 505; and is germane to Thomas Aquinas’s ‘argument from perfection’ in *Summa Theologica*, Ia, q. 50, a. 1 (Aquinas 1947). For similar arguments in the seventeenth century, see Lewis 2012, 24–25, 71–75. Angels are generally understood in this period to be part of the natural order of creatures: for Aquinas they are ‘in the order of natural being’ (*in esse naturae*) (*Summa Theologica*, Ia, ‘Proemium’ to q. 61); for Yves de Paris, ‘en la Nature’ or ‘l’ordre des choses créées’ (503, 505), and an object of natural theology. Thanks to Lucian Petrescu for the references to Yves de Paris and Romans.

¹⁸Compared with the corresponding passage in the *Advancement of Learning* (Bacon 2000a, 79), the section in *De augmentis scientiarum* adds the idea of the affinity between human souls and angels, and reinforces the (hardly strongly Calvinist) natural character of the study of angels, by means of reason and experience, alongside scriptural exegesis.

¹⁹I will note here that the angels’ capacities are not only morally or spiritually, but also cognitively relevant: their position higher up on the scale of intellectual creatures possibly allows them to have direct knowledge of material forms in the affirmative way (Bacon 2004, 253).

²⁰On such comparisons as part of *philosophia prima*, see below.

special powers' in the *Novum organum* (1620) illustrates 'instances of divorce' (*instantiae divortii*), which help the intellect to detect 'false forms', that is, to identify natures that are commonly thought to be inseparable from one another (and thus governed by the same form), but which in fact are quite distinct. The main example considers the relation between 'the corporeal nature' (*natura corporea*) and 'natural action' (*actio naturalis*). The question is whether these natures are separable or not. Those instances which can help decide the matter – and they will do it in favour of separation ('divorce') – are several types of action at a distance, in particular magnetic action. Magnetic action, Bacon explains, is indifferent to the medium between the two bodies and is not communicated by contact via intervening bodies. He concludes:

But if the virtue or action has nothing to do with the intervening body, it follows that the virtue or natural action exists for some time and in some place without subsisting in a body, since it subsists neither in the bodies marking the limits nor in the ones intervening. Therefore the magnetic action might be an *Instance of Divorce* between a corporeal nature and a natural action.

From this conclusion he derives a further lesson:

To this we can add, as a corollary or extra benefit not to be missed, that even a philosopher guided by the senses can prove that there exist entities and substances separate and incorporeal. For if a virtue and natural action emanating from a body can subsist in some time and space quite without a body, that is close to saying that it can take its very origins from an incorporeal substance (Bacon 2004, 339–341).

For Bacon, therefore, the phenomenon of magnetism may well indicate that there are types of activity in the natural world that are neither generated, nor sustained by bodies. Although we might think that natural action is necessarily anchored in corporeal entities, in fact it is very possible that it is not, and magnetic action is an instance of this possibility. This realization is of great moment in the philosophical inquiry into nature, since it will not allow the inquirer to imagine forms where there are none, and thus such instances 'anchor the intellect with lead weights' (Bacon 2004, 339). With this in mind, Bacon's talk of 'immaterial' and 'less material' virtues in *Sylva Sylvarum* (1626) does not sound so surprising, and neither does his observation that their study helps the mind to detach itself from overly material inquiries, 'to the end that the intellect may be rectified, and become not partial' (Bacon 1857–1874, II, 390). The corollary unhesitatingly draws the consequence of all of this: there are natural actions that may be both generated and sustained by incorporeal substances, just as more familiar actions are generated and sustained by corporeal substances. Bacon also takes this opportunity to attack the 'philosopher guided by the senses' (which echoes his similar attack in the context of the discussion of the human soul): if only he paid attention to the relevant instances of divorce, it would be impossible even for him to deny the existence of incorporeal entities in the created realm. Bacon does not explicitly say here what these entities are; but of course the unsurprising candidates would be rational souls and angels.

I introduced this survey of Bacon's thoughts on incorporeal entities within the created realm as a route to answering the question whether for him the incorporeal

is part of nature and can be studied philosophically (which Bacon's observation in relation to the rational soul suggested). The answer is indeed a qualified yes: yes, if by 'nature' we understand the whole set of existing entities, or the realm of God's creatures (the *scala naturae*), which includes incorporeal *substances*. This realm is the subject of philosophy, that is, of rational inquiry, one which agrees with the teachings of the Scripture. Moreover, incorporeal *activity* is part and parcel of material nature, as the example of incorporeal magnetic action shows.

Indeed, one thing a philosopher may learn in a natural-philosophical way is, as we have seen, that an incorporeal entity may be a source as well as carrier of natural action. From this point of view, Bacon's statement that, as far as the faculties of the soul are concerned, a *doctrina de anima* (considered as a branch of natural philosophy, as it had traditionally been) would study 'physically' (*physice*) the origins of the faculties as they inhere in the soul need not point to a materialist conception of the human soul (Bacon 1857–1874, IV, 398–399; I, 607). This would be inconsistent with the immediately preceding passage which warned against the identification of the human soul with the soul of brutes and introduced the linguistic distinction (not always respected, but in that place important) between the rational *anima* and the *spiritus*. But besides the textual context, one point of the investigation above has been to show that for Bacon a natural philosopher, even one 'guided by the senses', would be able to discover, *within* natural philosophy (or in a natural philosophical way – *physice*), that incorporeal substances can be *sources* of natural *activity*. In the case of the soul, this would translate as a grasp of the fact that the incorporeal rational soul is a source of activities (the 'motions of the mind') which are involved (as we will see below) in complex relationships with the material motions of the body and its *spiritus*.

However, we recall, Bacon also claimed in *De augmentis scientiarum* that the *substance* of the rational soul may be inquired within philosophy (*in philosophia*) in a more diligent way than before (Bacon 1857–1874, IV, 397–398; I, 605). Note that Bacon uses here 'philosophy', not natural philosophy, and he may well be taken to mean 'philosophy' as it covers both natural philosophy and natural theology (or divine philosophy). In the corresponding passage in the *Advancement of Learning* he used 'in Nature' (which means, he explained, in conformity with the '*Laws of Heauen and Earth*') and added that, as a divine creation 'immediately inspired from God', man's rational soul cannot be subject to these laws 'otherwise than by accident' (Bacon 2000a, 103). The change from 'in nature' to 'in philosophy', correlated with the expansions in the section on angels as objects of natural theology in *De augmentis scientiarum*, is likely to indicate that for Bacon in this later work the substance of the rational soul is, just like the substance of angels, a fit object of natural theology. True, neither natural philosophy, nor natural theology has the last word on the matter, which will belong only to revealed theology (it is from the Scripture that we learn, for instance, of the divine origin of the rational soul). Natural philosophy, however, *can* tell us that natural action may originate in incorporeal substances, even if these substances cannot be subject to material laws other than by accident; and natural theology, too, *can* tell us something about the nature of the incorporeal substances themselves. It is remarkable that Bacon allows in fact both natural

philosophy and natural theology to tell significant (even if not definitive) things about the incorporeal, provided the inquirer is not ‘guided by the senses’.

Let me point out that, in this context, to be guided by the senses is wrong not because they prevent the mind from studying invisible material natures (the material motions and schematisms) that are the real causes of material things – which is Bacon’s more frequent complaint in natural philosophy.²¹ Rather, the problem here is that the senses block the philosopher’s grasp of the other invisible realm – of incorporeal entities. And yet, in both cases, the senses and the understanding can be helped and rectified by reason and experience. In the case of man (and angels), a further source of knowledge is required, Scripture. As far as man’s rational soul is concerned, its nature, while not an impossible object of philosophy, had better be handled by theology. But what is surely and entirely a theological matter is God’s ‘work of redemption’, or the eschatological fate of man’s soul: ‘the ways and proceedings of God with spirits are not included in Nature, that is, in the laws of heaven and earth; but are reserved to the law of his secret will and grace’ (Bacon 1857–1874, VII, 221). God’s work of redemption is indeed completely extraneous to the laws of heaven and earth, but his work of creation and its results, which include both corporeal and incorporeal entities, are not completely divorced from them.²²

In this section I have argued that Bacon’s ontology includes incorporeal substances and motions, the study of which is a layered inquiry which goes from natural philosophy through natural theology to revealed theology. While natural philosophy cannot say much about the substance of the rational soul, it can nevertheless establish the notion of the incorporeal rational soul as a *source* of incorporeal activity; the latter is a part of nature, just as incorporeal magnetic action is. This activity is constituted by the operations of the faculties of the rational soul (the motions of the mind). In what follows, I want to look at the relations between the motions of the mind and the motions of the material spirit. Part of the reason Bacon needed to distinguish between the two, as we have seen above, is that he wanted to maintain the chain-of-being distinction between humans and brutes in a way that integrated the relevance of theology and the relevance of philosophy to the study of man; another part, as we will see below, is that he was after a way of understanding the *interaction* between body and mind that could benefit an integrated medicine, of both body and mind: in order for this interaction to be firmly grounded in the nature of things, the two orders of entities (corporeal and mental) had to be distinct.

²¹ See, for example, Bacon 2004, 87–89.

²² See the distinction between the two types of divine ‘work’ in *A Confession of Faith* (Bacon 1857–1874, VII, 221), which largely correspond to the orders (or laws) of nature and of grace.

9.3 Mind, Spirit and Body: ‘Instrument’ and ‘Sympathy’

In *De augmentis scientiarum*, Bacon introduces the faculties of the soul (*facultates animae*) immediately after the passage warning against the identification of the rational soul (*anima rationalis*) with the soul of brutes (*spiritus*). He tells us that these faculties are ‘well known’: understanding, reason, imagination, memory, appetite and will (*Intellectus, Ratio, Phantasia, Memoria, Appetitus, Voluntas*) (Bacon 1857–1874, IV, 398; I, 607). As has been repeatedly observed, Bacon does not assign these faculties to either soul in any explicit way. Nevertheless, there is reason to believe that, in man, these faculties belong to the rational soul. One clear indication is that absent from the list are sensation and voluntary motion. This would be a strange omission indeed if Bacon’s intention had been to list the faculties inherent in the *spiritus*. Instead, sensation and voluntary motion are explicitly mentioned a few pages later as the ‘faculties of the inferior or sensible soul’ (Bacon 1857–1874, IV, 401). In his translation of this work, Gilbert Watts recognized this division in his diagram of the Baconian sciences, where he distributed the faculties of the soul between the categories ‘Rationale – Intellect; reason; Imagination &c.’ and ‘Sensuale – Voluntary motion, Sense &c.’ (Bacon 1640, ii3’).

This does not mean that animals are devoid of imagination, memory, or passions. Indeed, the very functioning of sensation and voluntary motion depends upon imagination and memory, which, in the case of animals, can only be modifications of the *spiritus* receiving impressions and initiating action.²³ Similarly, animals experience a variety of passions, which likewise involve the activities of sensation, imagination and memory, as well as bodily modifications and motions – all realized by the spirit. In fact, animals may also be said to possess a kind of reason, *solertia brutorum*, which is a sort of ratiocination concerned with practical solutions. Sometimes such ratiocinations are so remarkable in their ingenuity that animals appear to ‘syllogize’. This prompts the question whether human ratiocination and animal ingenuity may be rooted in one and the same form of the *discursus ingenii* (Bacon 2004, 319). The reason-like ingenuity of animals had been a constant topic of medieval and Renaissance discussions about the internal senses – those apprehensive and appetitive powers of man occupying the borderline between body and soul, sense and intellect. In these discussions, such ingenuity was often related to some of the internal senses of the soul (especially the *vis imaginativa*, the *aestimativa* and the *cogitativa*). In these accounts, humans also possess this power, but a variant that is subject to reason or intellect.²⁴ Bacon, in fact, adopts the same view in his comments on the art of discovery, thereby reaffirming the human-animal distinction, while adding a normative load to it: in their practical ingenuity, animals make their discoveries by chance, not art, since they are governed by ‘the necessity of self-preservation’

²³ See Rees’s introduction to Bacon 1996, lviii.

²⁴ See Wolfson 1935; Harvey 1975; Summers 1987, 198–227; Black 2000; Lewis 2014.

(Bacon 1857–1874, IV, 409).²⁵ But human discovery requires the ‘faculty of reason’ (*rationalis facultas*) and the ‘office of art’ (*officium artis*) (Bacon 1857–1874, IV, 410; Bacon 1857–1874, I, 619). It is worth pointing out that later in the century, Walter Charleton (1619–1707), drawing on Bacon as well as Pierre Gassendi (1592–1655) and Thomas Willis (1621–1675) for the two-soul theory in his *Natural History of the Passions* (1674), established a similar distinction: the acts of the corporeal soul in brutes are coordinated and directed by a ‘natural instinct’, while in humans their governance is ensured by the rational soul (Charleton 1674, 38–39).

The existence of imagination, memory, passions and a kind of reason in brutes is probably one of the reasons why Bacon did not explicitly assign his list of faculties to either of the two souls. But the possession of these faculties by animals (which in their case is attributed to the *spiritus*) does not necessitate the attribution of the same faculties to the *spiritus* in the case of man. The human apprehensive powers (memory, imagination and reason or understanding) and the human appetitive powers (appetite and will) are powers whose ‘excellencies’ attest to their attribution to that which distinguishes humans from brutes. In the context of the theory of the two souls, as well as in that of the division of human learning according to the three apprehensive faculties, this is identified as the rational soul (Bacon 1857–1874, IV, 292). Talk of ‘excellencies’, let us note, is not reserved for the highest intellectual operations of the soul, which were usually understood to occur without bodily modifications.²⁶ Nor is it meant to serve any kind of naïve optimism about human nature. As will become clear further on, Bacon is concerned with the various irregular, distempered activities of the soul which interact with equally erratic activities of the body; yet they are characteristically human, as are the prescribed remedies. The relevant context, then, will be medical in an extended sense.

In various places, Bacon describes the operations of the faculties of the mind and the specific motions through which they are realized: examples include his account of human cognition and deliberate action; the motions of the imagination and the will in religious illumination or virtue (Bacon 1857–1874, IV, 406); the cognitive mechanisms involved in rhetorical persuasion (Bacon 1857–1874, IV, 457); or the ‘mind’s inborn and spontaneous movements’, which Bacon’s ‘new logic’ is expected to govern, and the ‘motion and discourse of the mind’, which the same logic is intended to bring in contact with the nature of things (Bacon 2004, 53, 191). It is indeed in the moral, religious, rhetorical and logical contexts that the motions of the mind are discussed in their own right, as self-standing mechanisms, which can be described without recourse to the spirit. But this does not mean that they have nothing to do with the spirit. On the contrary, these motions are intertwined in multifarious ways with the material motions of the corporeal soul. This is because the spirit is indeed the ‘instrument’ of the rational soul, and one with which the latter stands in a relation of ‘sympathy’.

²⁵The passage uses the same example (an ingenious raven) as the one featuring in the *Novum organum* in th0065 discussion of the *discursus ingenii*.

²⁶Bacon refers to this theme in Bacon 2000a, 53.

In the remainder of this section, I will look at the use of these notions in Bacon and in a particular type of medical thinking of his time, while in the final section I will return to his ontology and map of the disciplines and inquire into the place therein of the correlations and interactions between the two types of motions and the two types of schematisms (the rational and the sensible). But for the moment let me briefly comment on the case of voluntary motion, which Bacon associates with the *spiritus*, and on the way the imagination is said to be involved in it. The investigation of the motions of the vital spirit that are the ‘source of motion’ (*motus fons*) in the body is one important desideratum for Bacon. He adds that other constituent elements of voluntary motion – the imagination as the ‘director and driver of this motion’ (*motus rector et quasi auriga*) and the offices and structures of the parts of the body – had already been well studied (Bacon 1857–1874, IV, 401; I, 609–610). Here it seems that Bacon envisages, as Aristotle did, two types or perhaps levels of causal explanation, which may be called the physiological-anatomical and the psychological.²⁷ It is true that, in the case of animals (and this is where Bacon consciously departs from Aristotle), the imagination can only be described in terms of the motions of the *spiritus* itself; an account of voluntary motion in their case would therefore involve an explanation of the relation between the motions of the spirit that constitute the imagination and the motions of the spirit that produce bodily movement. In the case of humans, however, Bacon’s sketchy outline of the issue allows that the psychological level of causation be attributed to the rational soul: as the ‘director and driver’ of voluntary motion, the imagination shares the natural activity-producing function of the rational soul, which uses the *spiritus* as its instrument. An account of voluntary motion in man, therefore, would involve an explanation of the relation between the motions of the imagination and the motions of the *spiritus*, probably in terms of the sympathy between the mental and the bodily constituents of man.²⁸

By using the notions of ‘instrument’ and ‘sympathy’ in order to describe the relationship between the rational soul and the corporeal soul, Bacon was echoing a vocabulary long-entrenched in philosophical and medical accounts of the soul. ‘Instrument’ indicated a type of relation between body and soul different from the one advocated in Aristotelian-scholastic *de anima* treatises.²⁹ The notion made sense when the two members of the equation were less mutually involved than form and matter. But it does feature in Aristotle himself, in passages which do not rely on

²⁷ See, for instance, *De anima*, I, 1, 403a25–403b10, for a general statement; and with respect to voluntary motion, *ibid.*, III, 10, 433b14–26.

²⁸ In a cryptic passage added to the section in *De augmentis scientiarum* dealing with parabolic poetry, Bacon commends ‘one of the moderns’ for identifying a common element (a *vis cogitativa*) in all the operations of the human *anima*, which is itself ‘referred’ (*reduxit*) to motion (Bacon 1857–1874, IV, 325; I, 528). Spedding rightly mentions Doni 1581, Chap. 21; Telesio 1586 is also relevant, esp. p. 314 (which has a dancing-singing analogy similar to Bacon’s). The passage sounds as materialist as one so inclined would hope for; yet it is in fact perfectly compatible with the reading I am offering here.

²⁹ Des Chene 2000, 9.

the soul-as-form-of-the-body idea.³⁰ The related notion of *pneuma* (which in Latin became *spiritus*) as the ‘first body’ or ‘vehicle’ of the incorporeal soul is present in the Platonic tradition.³¹ This use is not far from Galen’s own discussion of the ‘psychic *pneuma*’ as the ‘first instrument’ (*proton organon*) of the soul.³² The notion became then current in the Galenic medical tradition, signalling in an uncommitted way that, besides the medically relevant discussion of mental events as subject to the body, the existence of an autonomous soul that used the body and its humours and spirits as its instruments (rather than simply being equal to the humours or the spirits) was possible. But the tendency of the medical literature had been to look at mental phenomena solely from the point of view of the body’s (and the spirits’) influence on them. As a consequence, this tradition could raise the question whether the soul of the philosophers’ theories might after all be identified with the spirits (while ultimately leaving it to the philosophers to sort this problem out).³³

The medical tradition had also developed the theory of the location of the faculties of the soul in the human body, which included both the three ‘souls’ (concupiscible, irascible and rational), respectively placed in the liver, heart and brain, and the ventricular location of the ruling faculties (memory, imagination and reason, alongside sensation and motion) in the brain.³⁴ Bacon was clearly aware of this tradition and identified the inquiry into ‘the proper seats and domiciles’ that the faculties of the mind occupy in the body as one of the members of the doctrine of the ‘league’ (*foedus*) between body and mind. He was not very happy with earlier solutions, but while he commented that the ventricular theory was ‘not destitute of error’, he nevertheless agreed with the interest of the inquiry (Bacon 1857–1874, IV, 378). Here we want to ask whether the notion of the seats of the soul/mind in the body necessarily implies the materiality of the soul/mind. Grazia Tonelli Olivieri has proposed that this notion, as embraced by Bacon, is the most powerful argument in favour of the idea that he attributed the human faculties to the corporeal soul.³⁵ If the faculties are embodied locally, it follows that they are products of a material substance, since what is located in a body must be a body. In fact, it was the very medical tradition

³⁰ See, for instance, the account of voluntary motion in *De anima*, III, 10, 433b18–20.

³¹ These are, for instance, the functions of the *pneuma phantastikon* in Synesius’s *De insomniis*: see Park 1974, 60; Watson 1988, 110–111, 114. Plato himself had used both the ‘instrument’ and the ‘vehicle’ notions; see, for instance, *Timaeus*, 45A–B, 69D–70A (Plato 1997). For an account of this notion in Aristotle, see Bos 2003.

³² In Book 7 of *De placitis Hippocratis et Platonis*, Galen offers this view as preferable to two different conceptions – that the *pneuma* is the first ‘home’ of the soul, and that the *pneuma* is the soul itself: see Rocca 2003, 177–178. For further comments, see *ibid.*, 19, 196–198. The Galenic, Aristotelian and Platonic uses of the notion were transmitted to the medieval West mainly through the work of Avicenna: see Harvey 1975, 23–27.

³³ Harvey 1975, 8, 18, 28. For the way Arnau de Villanova (with whose work Bacon was familiar) read Galen in the thirteenth century, characterizing the *animata virtus* that acts in the body as sufficient for the physician’s purposes, although it was really distinct from the philosopher’s soul, see McVaugh 2001.

³⁴ Harvey 1975, 4–30, esp. 13–17; Rocca 2003, 245–247.

³⁵ Tonelli Olivieri 1991, 65ff.

Tonelli Olivieri has reconstructed as a relevant background to Bacon that developed a conception which accommodated the location idea with the attribution of the faculties to an incorporeal rational soul; the latter was seen as distinct from the spirits or spirit of the body, but using them as its instruments.

The medical treatises I will discuss below are written by physicians who took active interest in the moral and religious ‘cure of souls’ as well; they share their approach and conceptual vocabulary with a number of theological works that took an active interest in the medical cure of bodies. Both types of texts, I will argue, are after an ideal of an integrated medicine, of both body and mind. One important question raised in these texts has to do with the manner in which the body affects the soul. That the body can affect the soul is attested by a number of mental affections due to alterations of the body, its humours and its spirits, affections which the medical tradition had long recognized (typical examples include cases of injury to the head resulting in lethargy, of corrupt vapours rising to the head and provoking witlessness, and of the effects of music, images, food or wine on the mental activities). It was such cases that prompted the famous and endlessly repeated Galenic notion that ‘the manners of the soul follow the temperament of the body’.³⁶ And it was exactly these kinds of problems that could prompt the question whether the human soul was, in actual fact, constituted by the spirits or humours of the body. The answers we find in these treatises rely on the notion of body, spirit and humours as ‘instruments’ of the soul, in conjunction with the idea of the co-affectability of body and soul, owing to a relation of ‘sympathy’ holding between them.

In his *Treatise of Melancholie* (1586), for instance, Timothie Bright (c.1551–1615) is quite close to Bacon and the two-soul theories of the Renaissance, since he unifies spirit, just as he does soul. Instead of the traditional variety of souls or parts of soul, there is just one soul (‘a nature eternall and divine’), and its activity is represented by just one faculty, which becomes diversified in its actions according to the variation of the instruments it employs (Bright 1586, 37; 42–44). The main instrument is the spirit, which is itself a unified, active substance (instead of the three kinds of spirits of the medical tradition – natural, vital and animal): it is ‘the most universall instrument of the soule’, which ‘embraceth at ful, so farre as bodely uses require, al the universall faculty, wherewith the soule is indued, and directeth it, and guideth it, unto more particular instruments, for more speciall and private uses’ (Bright 1586, 45). Thus, in language reminiscent of Bacon’s account, Bright tells us that the spirit is an ‘effectuall, and pregnant substance’, bred out of the primordial chaos and enlivening of all things, and that it is distinct from the soul, which is a breath of life infused into the body by God. Although he does not call it a corporeal ‘soul’, Bright’s spirit has similar, although not identical functions. It performs distinct offices in conformity with the various places in the body where its activity is located: in the brain, the spirit is the chief instrument of sense, motion and

³⁶Galen’s late work *Quod animi mores temperamenta corporis sequantur* became fully known to the Western world in the first half of the sixteenth century; compared with earlier works, it has a more marked position of medical determinism. On the historical and conceptual details of the early modern *quaestio galenica*, see Bigotti 2012, ‘Introduction’.

cogitation; in the heart, it is the instrument of life, affections and perturbations; and in the liver, it is the instrument of nourishment and growth (Bright 1586, 47).³⁷ Bright concludes: ‘And these actions are bodily performed of the soule, by employing that excellent, and catholicke instrument of spirit, to the mechanicall works of the grosse, and earthly partes of our bodies’ (Bright 1586, 48).

A similar picture is in the work of Dutch physician Levinus Lemnius (1505–1568), whose *Secret Miracles of Nature* (translated into English in 1658) was known in England in the late sixteenth century in its Latin original, *De occultis naturae miraculis* (first edition 1559, followed by further Latin editions in 1564, 1571, 1573, 1581 and 1583, an Italian edition in 1560 and a French edition in 1567). For Lemnius, as for Bright and Bacon, the soul is a breath of life from God, a heavenly spirit and incorporeal substance made after God’s image; its faculties are its ornaments and gifts, and the expression of its activity: ‘This onely enliveneth and rules the body, and instructs it with various actions, exercising it with many offices’. These offices include life functions, sensori-motor functions, as well as cognitive functions, and ‘all these are the offices of the Soul, whereby it declares its power, and performs its actions’ with the help of its instruments (Lemnius 1658, 32), which include the bodily parts and the ‘aethereal spirit’ (Lemnius 1658, 7, 8). Similar claims are in works whose main concern is theological, but which incorporate an important amount of medical knowledge in their pursuit of a comprehensive knowledge and integrative care of the human being holistically considered as a union of body and soul. One important English example is the work of John Woolton (c.1537–1594) on the *Immortalitie of the soule* (1576), which draws for the relevant themes on the *Liber de anima* (1552) by Philipp Melanchthon (1497–1560) and, among its ancient sources, on *De natura hominis* by Nemesius (late fourth century AD).³⁸

The notion of ‘instrument’ serves an important role. It establishes that the generator of activity is indeed the soul, but that the performance of the various activities which make up man’s cogitative, sensitive and indeed vegetative life is corporeally carried out by the spirit in the various organs of the body. This does not mean that the spirit is a passive instrument; in fact, it has its own share of activity-originating power, which is nevertheless generally subsumed under the activity of the rational soul. However, the spirit and generally the body can very well affect the soul in a variety of ways, just as the soul can affect the body and its spirit. Undoubtedly, there is co-affectability – grounded for some authors in ‘sympathy’ – between body and soul. This shows that the body and the soul of man do indeed make up a unity, one that is both medically and theologically relevant. Indeed, the Galenic idea that the

³⁷The difference is that, in Bacon’s case, the vegetative and sensitive-motor functions are assigned to the *spiritus* itself, rather than to the soul using the *spiritus* as an instrument.

³⁸See Woolton 1576, 12^{r-v}, 28^r–29^r; Melanchthon 1569, 4^{r-v}, 13; Nemesius 2008, 8, 99. Nemesius’s work was often misattributed to Gregory of Nyssa (e.g., [Nemesius], 1512). Melanchthon’s position borders rather on those of Telesio and Doni: while he does make (cursory) use of the notion of ‘instrument’ (as do the other two), he insists more on the theological-philosophical division of labour between the two souls (1569, 9^v–11^r).

‘manners of the soul follow the temperament of the body’ is in fact accepted and integrated into a larger account of the troubles of the soul, since it does not necessarily imply a strong position on the nature of the soul.³⁹ Of course the body affects the soul, but it does so – these texts insist – in a particular way, that is, only with respect to its instruments: according to Bright, ‘the soul is no more impaired by the body than the craftsman by his instrument’; it undergoes ‘no alteration of substance or nature, nor any blemish of natural faculty or decay of such faculties as are essential to the soul’; the body can only give such discontent to the soul ‘as a false stringed lute, giveth to the musician’ (Bright 1586, 38–39, 48). Similarly, according to Lemnius, ‘the soul is affected not with a primary passion’, but only secondarily, ‘by reason of company’ (*per consensum, ac lege consortij*) with the body. Mental operations are indeed operations *of the soul*, performed via its instruments; it is therefore natural that when its instruments are impaired or unfit or ‘out of tune’, the operations will be performed in a less than felicitous manner.⁴⁰

On the other hand, the soul’s activity has its own distinct identity. There are tribulations (and excellencies) of the soul not due to the influence of the body. There are indeed motions *of the soul*, whose disturbed or virtuous state depends on the bad or good care of the soul itself rather than on that of the body. Support for this view comes from a number of sources: the Platonic idea that the soul has diseases proper to its own nature⁴¹; the Roman Stoic understanding of the passions as weak cogitations or erroneous opinions; and the Augustinian notion that passions, vices, sins and torments of conscience originate in the soul itself.⁴² According to Lemnius, for instance, the incorporeal soul ‘hath inward tortures, griefs, fears, jealousies, envies, hatred, indignation, and rackings of conscience’; these are ‘perturbations’ which afflict both the soul and the body (Lemnius 1658, 40). It is with respect to these tribulations, specific to the incorporeal soul itself, that the notion of a Christian word-cure of fallen souls is most frequently invoked (Lemnius 1658, 46).⁴³

The core concern of these texts is therefore medical in an enlarged sense: the medical works are obviously interested in the body in the first place, but they also take into account the cure of the mind in as comprehensive a way as possible, which allows them to stay clear of a reductive physiological approach to the soul.⁴⁴ The cure of the mind, in their view, is, in fact, the cure of the entire man: it involves therapeutic action on both body and mind. Such a view is grounded in the notion that both are sources of activity, and members of a complex relationship of

³⁹ Lemnius notes, quite rightly, that Galen did not commit himself to such a position (1658, 35).

⁴⁰ Lemnius (1658, 36; 1583, 63, 103). See also Walkington 1607, 11^v (Walkington followed Lemnius in his medical writings.) See also Woolton 1576, 10^r, 39^r; Nemesius 2008, 81.

⁴¹ Plato, *Republic* 610A–C.

⁴² Augustine 1969, IV, 271 (XIV, 3); 283, 285 (XIV, 5).

⁴³ See also Woolton 1576, 30^v; Bright 1586, 187–198. For comments on this double sphere of interest in Bright and other humanist works on melancholy, see Gowland 2012.

⁴⁴ Compare Huarte 1594 who, while also using the ‘instrument’ vocabulary, takes a line of medical determinism alien to these texts: in his case, the disposition (or, temperament) of the instruments fully determines the actions of the soul.

interactivity. Nowhere is this double face of the cure of the mind more evident than in the discussion of the passions. Since the passions pertain to the very bond between body and mind, they may be analysed either in terms of the action of the soul on the body or of the action of the body on the soul; that is to say, as Lemnius puts it, either as ‘weak cogitations’ produced by an ill mind (*mala mens*) that also disturb the body, or as caused by the humours of the body, with larger consequences for the mind. It follows that the cure of the passions just is this integrated cure of the whole man, which includes ‘speech that is a Physitian to a sick mind’ (*animo medicus, oratio*) as well as sleep, meat or drink (Lemnius 1658, 37, 61).⁴⁵

I suggest that the stakes of the idea of separating body and soul as distinct but interrelated sources of activity within a medical context had to do with establishing an integrated medicine of both body and soul rather than with securing a philosophical demonstration of the immortality of the soul. Bacon shared this concern.⁴⁶ What he called the ‘league’ between mind and body was of prime interest to him. In the fourth book of *De augmentis scientiarum*, he placed its discussion before the sections which treat separately of body and mind. The investigation of the league looks into the ‘SYMPATHIES AND CONCORDANCES BETVVEENE THE MIND AND BODY, which being mixed, cannot be properly assigned to the sciences of either’; or, into ‘those things which are common as well to the body as the soul’ (Bacon 2000a, 94; 1857–1874, IV, 373–375).⁴⁷ The doctrine of the ‘league’ is a distinct field of inquiry that studies ‘either how and how far the humours and temperament of the body alter and work upon the mind; or again, how and how far the passions or apprehensions of the mind alter and work upon the body’ (Bacon 1857–1874, IV, 377). It is precisely because the doctrine of the league is so important to Bacon that mind and body need to remain separate orders. This will help us understand as well as treat phenomena relevant to our medical and moral-religious well-being. The use by physicians of drugs to heal diseases of the mind and their consideration of the ‘accidents of the mind’ (i.e., the passions) in their regimens of the body are cases in point. Similarly, the use of corporeal regimens in religious practices and the cases of the influence of the imagination on one’s own body (for better or worse) are also instances of the same relationship between mind and body, owing to ‘the sympathy of the mind with the state and disposition of the body’ (*quod anima compatiatur corpori*) (Bacon 1857–1874, IV, 377; I, 585).⁴⁸

⁴⁵ See also Lemnius 1583, 64–65, 106.

⁴⁶ For Bacon the immortality of the soul is a theological issue. Nevertheless, intimations of immortality are available even to those philosophers who deny it in principle because they are ‘most immersed in the senses’. What they cannot deny is the dignity and hence perpetuation of knowledge and thus the perpetuation of the intellectual part of the soul (although, as the Christian revelation teaches, it will be not only the intellect, but the affections and the whole body, too, that will be renewed and made immortal) (Bacon 2000a, 53).

⁴⁷ For the theme of phenomena ‘common to body and soul’ in the antiquity, see King (ed.) 2006; and from the antiquity to the Enlightenment, Wright and Potter (eds) 2000.

⁴⁸ A relevant use of the notion of ‘sympathy’ in this sense is in the former Jesuit Thomas Wright’s treatise of the passions: although drawing on Aquinas for much of his view of the faculties and passions of the soul, he left aside the Thomist notion of the soul informing the body and relied

In various places in his work Bacon investigates the sympathy between mind and body with regard to the passions. In *Sylva Sylvarum*, Century 8, he examines the question of the ‘impression which the passions of the mind make upon the body’, and looks at the various corporeal modifications the passions produce via the motions of the spirits (Bacon 1857–1874, II, 567–571). In the *Historia vitae et mortis* (1623) he discusses the way in which the motions of the spirits are influenced by the affections of the mind (*Motu Spirituum per Animi Affectus*): since the passions of the mind ‘work directly on the spirit’ and the spirit ‘works directly on the body’, the passions have a role to play in the prolongation of life. This aim can be achieved by an ‘operation on the spirits’, which takes the form of a combined set of preventative medical and moral philosophical prescriptions, since both diets and the command over one’s mind are apt to influence the spirits (Bacon 2007, 271, 273). While discussing the ‘multi-purpose’ instances of consent in the *Novum organum*, Bacon similarly considers the action not only of nutrients, but also of the will on the body: here, he contends that ‘the human will can make the body do more than other living things can’ (Bacon 2004, 439). Conversely, the body and the spirit also influence the mind. It follows that an ‘operation on the mind’ of the kind Bacon envisages for his practical moral philosophy in the *Advancement of Learning* and *De augmentis scientiarum* will pay attention both to the way bodily constitutions shape natural characters and to the way moral and religious exercises contribute to the ‘cure’ and ‘culture’ of the mind (Bacon 2000a, 146–156; 1857–1874, V, 19–30). In all these discussions, we learn about the way the passions act on the spirit (and thus further on the grosser, tangible body of man), as well as about the way the body and the spirits act on the passions. This mutual action is explained as an instance of sympathy. Nowhere, though, does Bacon say that the operations of the passions are identical with the operations of the spirits: he never analyses the passions as being themselves constituted by the kinds of motions he attributes to the spirits.⁴⁹

I will come back to the notions of ‘sympathy’ and ‘consent’ and their larger import in Bacon’s philosophy in the next section. Before I do so, I would like to consider the occurrence of the motions of the mind in the context of the doctrine of the idols, which is a good place to observe Bacon’s analysis of mind/intellect as a unitary group of functions involving not only the apprehensive powers (reason/judgment, memory and imagination) but also the appetitive ones (will and the passions). This is also the place where Bacon uses a variegated vocabulary about

instead on Fracastoro’s notion of sympathy. Both physicians and natural philosophers, he tells us, agree that the passions influence the body in important ways, yet it is very difficult to explain ‘the manner how an operation that lodgeth in the soule can alter the bodie, and moove the humors from one place to another’; they agree, however, that ‘it may proceede from a certaine sympathie of nature, a subordination of one part to another’ (1604, 4). In *De sympathia et antipathia rerum* (1546), Fracastoro discusses the sympathies and antipathies of the soul starting with Chap. 12; the passions are discussed from the same point of view in Chaps. 17, 18, 19, 20, 21, and 22 (see Fracastoro 1574).

⁴⁹He might be read as coming close to doing that in the *Sylva Sylvarum*, Century 8 (Bacon 1857–1874, II, 567–571): but in fact the issue there, as noted above, is the ‘impression which the passions of the mind make upon the body’.

motion to refer to the activities of the mind. This vocabulary describes not so much the general operations of the faculties as rather particular types of movements which the mind is said to undergo in the formation of erroneous notions (the idols). Interestingly, these movements are described with terms which echo the descriptions of the motions and appetites of matter: for example, infection, contamination, desire to rest or restlessness and agitation, excitation, impression, general desires, pleasures and longings.

The cognitive life of human beings is as indebted to the league between the body and the mind as their moral life. The intellect is subject to the individual peculiarities of corporeal constitutions as well as to natural characters, and the kinds of errors it is prone to on this account are listed under the idols of the cave (Bacon 2004, 89; 1857–1874, IV, 433). Conversely, certain types of philosophical styles of thought lead to modifications of spirits and humours that influence the health of the body and the length of one’s life (Bacon 2007, 229–233). But the intellect also seems to have its own troubles, rooted in its own nature, which take the form of various types of erratic motions in which judgment, imagination, passions and will play various roles.⁵⁰ Thus, the intellect is more ‘moved and excited’ by affirmative instances, which display the presence of a nature, than by negatives, which are instances of its absence (Bacon 2004, 85). It is also more ‘swayed’ by sets of similar instances than by dissimilar (‘heterogeneous’) instances (Bacon 2004, 85). It ‘swells and cannot stay still or rest’, with the result that it forms erroneous notions of infinity, eternity and final causes (Bacon 2004, 85–87). It ‘longs to leap up to higher generalities to find rest there’ (Bacon 2004, 71). Indeed, it takes ‘delight’ in generalities and has an ‘appetite for expatiation and meditation’ (Bacon 1857–1874, IV, 370). So the intellect can be infected or impressed by passions and imagination, it can be moved and excited, it swells and is restless, it has longings, desires and appetites.

The similarity with the language describing the motions and appetites of matter is striking. Does this mean that the human intellect is material and to be identified with the *spiritus* after all? I do not think so. For one thing, although Bacon does use *spiritus* in this context, this usage is inconclusive, since he sometimes uses *spiritus* to refer to the human mind, and here he uses it interchangeably with *intellectus* and *animus* (Bacon 2004, 82–83, 88–89; 1857–1874, I, 644). More importantly, it is difficult to see how the *spiritus* itself could be animated by desires and longings for *generalities* and *abstractions*. A material appetite for abstraction would be a curious type of appetite indeed. Equally, the restlessness of the intellect cannot really be the same as the material motion of ‘trepidation’ with which it does bear some resemblance, since it is an inclination to such abstract ideas as infinity and final causes (Bacon 2004, 411–413). So what is going on here? I will attempt to answer this question in the following section.

The upshot of the discussion above is that Bacon shared several key notions with a specific medical-theological tradition of his time: that the human faculties belong

⁵⁰ For the will and affections, see Bacon 2004, 87. The imagination has a widespread presence in the account of the idols. For a discussion of both its epistemic and its physiological role in this context, see Corneanu and Vermeir 2012.

to the human soul, which is an incorporeal soul of divine origin; that this soul/mind is a source of activity in its own right, just as the body and the spirit are; and that the soul/mind's activity is both expressed by, and regularly interacts with, the material motions of the body and spirit. The terms which serve to point out this distinctness-cum-relationship are 'instrument' and 'sympathy'. Consequently, Bacon described the interactions between the motions of the mind and the motions of the spirits *as interactions* rather than analysing the former in terms of the latter. And the types of interactivity between mind and body, as well as the kinds of activities specific to either body or mind, constituted for him a distinct field of study, one that was aimed at an integrated medicine of both body and mind.

9.4 The Architectures and Fabrics of Things: 'Consent' and 'Nature'

Bacon's world is structured to a large extent by sympathies and antipathies. He was nevertheless unhappy with those Renaissance traditions that made, he argued, a fanciful use of these notions, and within his own physics he redefined these 'occult powers' as material motions and appetites. Sympathies or consents and antipathies or aversions are fundamental desires of matter, for Bacon. In the *Novum organum* he explains that consent lies in the 'mutual symmetry of forms and schematisms', and that it is this symmetry which underwrites various types of natural operations. There is consent among the elements of the two great classes of the constituents of the physical world (the two 'quaternions' of sulphur and mercury). There is also consent between bodies and their nourishment, or between the parts and humours of bodies and particular medicines. The magnetic attraction between iron and loadstone is likewise an instance of consent (Bacon 2004, 437–441). The same magnetic action is mentioned in the discussion of the fundamental motions of matter, where we learn that it is characterized by a 'passing on of virtue ... with no passing on of substance' (Bacon 2004, 397–399). Further on, we are informed that the kinds of motions of transmission without communication of substance relevant to the magnetic example are 'excitation' and 'impression' (Bacon 2004, 403–407).⁵¹

Iron attracted to a loadstone was also an example of magnetic action in the aphorism devoted to 'instances of divorce', as discussed in the first section. What Bacon advanced there, we recall, was that these instances tell us that natural action and body are not necessarily linked. That is because natural action may travel without being anchored in a body. In the context of the discussion of the fundamental motions of matter, we learn that this magnetic action is also an instance of consent, as well as of transmission of virtues without communication of substance. In sum, in the physical world, consent or sympathy between bodies is to be understood as rooted in the symmetry of their fundamental natures (forms and schematisms),

⁵¹ See also Bacon (1857–1874, IV, 356; 2000b, 199).

which ground various operations, for instance, attraction. In the case of attraction at a distance, that operation is accompanied by a further combination of motions (excitation and impression). These motions are without communication of substance, and in fact seem not to be anchored in any kind of corporeal substance at all.

Can this cluster of notions be transferred to the world in the larger sense, one which includes incorporeal substances such as human souls and angels? I think Bacon may have intended just that. If we accept the rational as a ‘schematism’ – although not quite in the same range as the schematisms of matter (it is added to the abstract-physics list as a coda only to be referred to the doctrine *de Homine*)⁵² – we might also accept that one of the great consents in this world is that between the rational and the sensible, or between mind and body. Another instance of consent in the greater world would be one between the different levels of the rational, for instance, between the human soul and angels, which Bacon says are united by an affinity of nature. The consent between iron and the loadstone is a good analogue of these other consents. If seen as a motion of assumption, it can be used to describe the inclination of the human soul to perfect itself and thus ascend towards the angelic nature. If seen as a motion of impression or excitation, it can also represent the types of co-affectability at work between the human mind and the body. The iron-loadstone consent is perfectly suited to this analogy-making task, since it works by means of an incorporeal natural action. By the same token, in virtue of the consent between the rational and the sensible, the motions of the mind can be described analogously with the motions of the spirit; hence the longings and appetites and agitations of the intellect, which mirror the longings and appetites and agitations of the spirit.

Consent does not mean identity: it takes two distinct orders of things to form an analogy. Nor does it involve a one-to-one mapping of the two orders. Admittedly, the notion of ‘instrument’ may be taken to suggest either of these possibilities: if the spirit is the instrument of the soul and if this means that the soul’s activities are manifested as motions in the substance of the spirit, then possibly there is a perfect match between the two and exact correspondences can be established. It would follow that, in order to learn about the motions of the soul, all one needs to do is look at the motions of the spirit. The soul would be thus amenable to physical research; in fact, it would practically lose its status as a soul and become a physiological phenomenon itself.⁵³ But the ‘instrument’ image can be (and was) used in a looser sense. When combined with ‘sympathy’, there is room for an understanding of the two members of the analogy as self-standing originators of motions that produce effects in each other. They can do that owing to the fundamental consent of their structures, but this does not entail perfect mirroring.

⁵² Understanding the rational as a special kind of schematism need not involve a commitment to an essential definition of it (which is the business of theology, whether natural or revealed); it suffices to conceive it as a source of activity and as a member of a relation with other schematisms (rational or irrational) – which according to Bacon (or so I have argued), are notions available to the philosopher.

⁵³ This is the line of interpretation taken by Wallace 1967, 21; Jardine 1974, 95–96.

Take the example of the appetites of the intellect described in the doctrine of the idols. The intellect's swelling and restlessness issuing in ideas of infinity and final causes is *not* manifested as a swelling and restlessness of the spirit: according to Bacon, a bulging and irregularly moving spirit shortens life; but also according to him, those philosophies which 'entertained high, untrammelled, and great thoughts (of the infinite, the stars, the heroic virtues, and so on)' are 'good ... for longevity' (Bacon 2007, 233). What seems to be going on is that, on the one hand, owing to the consent between the rational and the sensible, their respective motions can be described in similar terms, but on the other, these motions are not identically mapped onto each other, and it is indeed the task of the inquirer into the 'league' between mind and body to investigate the various types of interactions among these distinct sets of motions. That there is correspondence between the two types of motions, which allowed Bacon to switch explanations of human phenomena from one to the other, has also been the conclusion reached by Guido Giglioni in several insightful recent articles.⁵⁴ I have proposed here that the correspondence between the appetites and motions of the mind and the appetites and motions of matter is grounded in a relationship of consent, one that preserves their ontological and agentic distinctness while at the same time establishing the grounds for their interaction.

Bacon uses 'consent' in two senses, as symmetry not only among schematisms of things, but also among sciences. He thinks that there are a number of universal axioms that transcend the boundaries of the particular sciences and act as their sources. He also establishes a specific branch of philosophy for their inquiry, one which embraces all the other sciences (natural philosophy included) and which he calls *philosophia prima*. This supra-science is a reworked version of the most ancient wisdom, comprehending 'the knowledge of things divine and human' (Bacon 1857–1874, IV, 337). Its aim is to pierce into the fundamental 'architectures and fabrics of things', on the model of the Persian magi who sought the correspondences between natural and civil matters (Bacon 1857–1874, IV, 339). In his illustration of axioms that traverse the sciences, Bacon uses examples from grammar, rhetoric, logic, music, perspective, acoustics, astronomy, natural philosophy, moral and civil philosophy, natural theology and theology (Bacon 1857–1874, III, 228–231; IV, 337–339). Among his examples are the axiom 'if equals be added to unequals, the wholes will be unequal' – a rule in mathematics that also holds in civil ethics; or 'putrefaction is more contagious before than after maturity' – a rule in physics that is also true in moral philosophy; or 'whatever is preservative of a greater Form is more powerful in action' – a rule in physics that has its correspondences in politics and theology (Bacon 1857–1874, IV, 337–338).

Bacon also tells us that these axioms point not just to resemblances, but to 'the same footsteps of nature', and thus are indicative of the fundamental 'unity of nature' (Bacon 1857–1874, IV, 339). Unless the nature he is talking about here is allowed to have an extended meaning, it would make no sense for him to include natural philosophy as a member among others in the list governed by *philosophia*

⁵⁴ See Giglioni (2010a, 160, 166; 2010b, 106–107; 2012, 176). The two orders are also discussed by Mouton 1990. I stress here the consensual relation between them.

prima instead of identifying natural philosophy itself as this universal type of knowledge. The nature embraced by this universal science must be one that maps onto the great division of the branches of philosophical knowledge: ‘knowledge of God, knowledge of Nature, and knowledge of Man, or Humanity’. These are like the ‘branches of a tree that meet in one stem’, that is, in their common source, *philosophia prima* (Bacon 1857–1874, IV, 337).⁵⁵ Note that the ‘knowledge of God’ involved here is only the philosophical knowledge made available by natural theology, not the sacred knowledge communicated by revealed theology. The axioms of the sciences are expressions of the unity of nature in the extended sense, that is, the nature that includes not only the natural world but also the human world and the world of God (as far as He can be known by man in a philosophical way). It is indeed within the compass of nature in this extended sense that the rational may be considered a ‘schematism’, even if not a material one. And it is the consents among the entities of nature in the extended sense that ground the consents among the sciences, and thus the axioms of *philosophia prima*. In other words, such consents obtain among the various sciences – divine, natural and human – because they obtain among the levels of all existing things: inanimate, animate insensible, animate sensible, *and* rational. The two types of consent are thus not confined within the territory of natural philosophy or within the territory of material nature. Most of Bacon’s reformist efforts were indeed devoted to this science, and he often found it easy first to extract his universal axioms from physics and then to explain how the same axioms hold water in other sciences. But there is no reason to dismiss Bacon’s own claims concerning the branches of philosophical knowledge (of which knowledge of physical nature is only a part) and the scope of *philosophia prima* (as embracing and nourishing all the sciences, of which natural philosophy is only a member).

Again, natural philosophy was Bacon’s prime concern. But what he valued most was the art of inquiry he forged in order to discover natural philosophical truths. In the *Novum organum*, he proposed that this art of inquiry might be profitably used in the other sciences as well:

Someone will also put it forward as a doubt rather than an objection, whether I speak of natural philosophy alone, or whether I also speak of perfecting the other sciences – logic, ethics and politics – by taking the route I have mapped out. Now I do indeed mean it of all the things just mentioned. For just as the common logic, which runs things by syllogism, reaches not only to the natural but also to all the other sciences; so mine, which advances by Induction, takes in everything. For I compile history and tables of discovery concerning anger, fear, shame and so on, and also ones to do with examples of civil business, no less than to do with the mental motions of memory, composition and division, judgement, and the rest, just as much as I would of hot and cold, or light, or vegetation, or the like (Bacon 2004, 191).⁵⁶

⁵⁵ See also Jardine 1974, 101–108.

⁵⁶ Indeed, the ‘Catalogue of Particular Histories’ attached to the *Novum organum* includes the following titles: ‘77. History of feelings, like anger, love, diffidence, etc. 78. History of the intellectual faculties: thinking, fantasy, discourse, memory, etc.’ (Bacon 2004, 481).

Bacon himself did not compile histories and tables for the passions or the other motions of the mind (although, as we have seen, there are scattered observations in *Sylva Sylvarum* and *Historia vitae et mortis* which may be taken as members of a projected history of the passions). What such histories would have consisted of, however, we can profitably imagine. In light of the argument of this chapter, they would chart the phenomena of the league between mind and body, that is, they would investigate the specific activities of, and the forms of interactivity between, the human soul and the spirits, fluids and parts of the body. They would cull their instances from all types of human activity, namely, the types that form the domains of logic, rhetoric, the arts of tradition, the arts of memory, ethics, and politics, alongside physics and medicine. In their more theoretical mode, they would use as a speculative backdrop the notions of schematism and motion, as poised between abstract physics and the doctrine concerning man, as well as the notions of sympathy and consent, as relevant to the structures of the material and the human worlds, and to the structures of particular and universal knowledge. One part of the theoretical knowledge concerning man – the revealed-theological part – would remain outside their scope; but they would be able to rely on the knowledge concerning the incorporeal human soul that can be obtained from philosophy. At the same time, they would constitute a body of operative knowledge about man, which, on the basis of the insights provided by the collection and analysis of instances, would discover the elements and scope of both the ‘operation on the mind’ and the ‘operation on the spirits’, as well as the mutual influences between them. Among these elements they would probably include the very work the mind is called upon to perform in the compilation and analysis of instances of which these histories themselves consist, along with a certain diet, choice of environment and regimen of life. What they would *not* do is identify the motions of the mind with the motions of the spirits. Given the Baconian make-up of the world, that would be to start from the wrong theoretical premises and, as a consequence, to mix up both the paths of inquiry and the operative benefits derived from them.

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Chapter 10

Francis Bacon on the Moral and Political Character of the Universe

James A.T. Lancaster

Abstract The following chapter seeks to outline a prominent feature of Bacon's view of the natural world – namely, its profoundly moral character – and to suggest that his model of natural philosophy is based not only upon principles drawn from earlier natural philosophers, but also from the spheres of moral and political philosophy. Rather than looking forward to the mechanical and mathematical explanations of Descartes, Newton and the seventeenth century, this chapter will attempt to show how Bacon's understanding of the universe was indebted, at least in part, to the historical, political and moral ideas he found in the works of Tacitus, Machiavelli, Guicciardini and Lipsius. It will then elaborate upon the manner in which Bacon thought the moral and political character of material nature manifested itself in humans, as well as how he thought it should ideally serve as the foundation of law and society.

10.1 Introduction

The idea that the natural world, far from being morally indifferent, includes an ethical dimension is a topic well worth considering in the history and philosophy of science. From the ancient Stoic doctrine of living in accordance with nature to the Christian belief in a world in which ultimate evil is geographically centered in the middle, while the highest good is located beyond the outermost heavens, there is ample evidence to suggest that the natural world has rarely been devoid, historically speaking, of moral significance. This is not to make a claim about the obvious – that the world has always been invested with moral metaphorical and allegorical meaning – but rather to argue that, at various times and in various places, the universe has been perceived as an essentially moral place; that good and evil have, more than occasionally, been considered part of its very essence. Francis Bacon, whose natural philosophy was indebted to the traditions of humanism and political thought, stands

J.A.T. Lancaster (✉)
Royal Holloway, University of London,
London, UK
e-mail: james.lancaster@rhul.ac.uk

as a good example of an early modern philosopher for whom there existed a deep interconnection between the natural and the moral.

For advocating a shift away from the medieval understanding of nature, in which allegorical interpretations of flora and fauna had reigned, Bacon has often been viewed as the herald of a modern, empirical notion of the natural world (Ashworth 1990). It is certainly true that Bacon contributed to a transition in which the intelligibility of nature, having formerly been understood as largely (although certainly not entirely) allegorical, shifted to one in which its comprehension was dependent upon chemical processes, broadly conceived. However, it is equally true that, for Bacon, these processes were driven by motions and directed by laws whose intelligibility depended more upon what might be characterized as ‘moral’ than they did on natural or physical explanations. Bacon’s idea of nature, seemingly like that of anyone who had received a grounding in humanism and the law, was heavily indebted to the sphere of moral and political philosophy, and it was a sphere from which the Baconian universe never entirely disassociated itself (Jardine and Stewart 1999).

10.2 The Moral Character of Creation

Belief in an ultimate order, rather than disorder, to the natural world is probably as close to a universal, philosophical commitment as it is possible to achieve within the history of science. And the idea of order, at least until the nineteenth century, was very rarely without moral significance. While Darwinian evolution may have offered the possibility of the existence of order without the previously implicit corollary of goodness, it is very rare to find an earlier natural philosopher for whom order did not of necessity entail goodness, beauty and life; disorder, evil, ugliness and death. One of the most sustained discourses in which this distinction is present is that of the early modern preoccupation with distinguishing between a pre- and post-lapsarian world; a discourse, as we now know well, with which Bacon was very much conversant (Harrison 2007).

The story is a familiar one. Before the Fall, Adam and Eve had inhabited a world which was perfectly ordered and good – nature, that is, as God had created it. After transgressing God’s commandment not to eat fruit from the tree of good and evil, however, the first man and woman were cast out, evil, death and corruption entered the world, and here we are today living nasty, brutish and short lives. This narrative, as Peter Harrison has shown, became a recurrent explanatory instrument employed by early modern natural philosophers, of whom Bacon was no exception. But Bacon, I would argue, is something of an exception; not because he eschewed the doctrine of the Fall, but rather because he couched it within a complex system of physics and metaphysics, and, starting from his theological convictions, developed a theory (*thema*) of the universe predicated largely upon moral and political intelligibility.

This first becomes evident in Bacon's adherence to a theological variant of the doctrine of the Fall in which Adam and Eve's transgression of the moral law was believed to have caused the order of nature (*ordo naturae*) to deteriorate (Bacon 1996b, 109; Bacon 2000a, 250–251).¹ Unlike other contemporaneous accounts, in which humans alone were thought to have been corrupted as a result of their sin, Bacon believed that the natural world, too, had suffered the consequences of original sin.² 'After the fall of Adam', he wrote in his *Confession of Faith* (c. 1603), the state of the world (*status mundi*) was 'exposed and subjected to death and corruption'.³ For 'by the curse, which notwithstanding was no new creation, but a privation of part of the virtue of the first creation, did the constant and everlasting laws which we call *Nature*' receive a 'revocation' (Bacon 1857–1874, VII, 220–221). A decade or so later in his *De principiis atque originibus* (c. 1612), Bacon would go on to draw an explicit connection between the Fall and his matter theory, when he wrote that the 'schematism' of the universe 'before the Fall (*ante praevariationem*)' was the 'best of those matter (as it had been created) could support' (Bacon 1996a, 251; Bacon 2000b, 221). In other words, the arrangement of matter, of the atom-like particles of which it was composed, had been the best it could possibly be before Adam and Eve had sinned.

This belief, that when Adam transgressed the moral law the natural world, not just man, was cursed, appears most explicitly in sixteenth-century Calvinist theology. In Book 2 of his *Institutes of the Christian Religion* (1536), Jean Calvin (1509–1564) had argued that it should not be thought

strange that he who perverted the whole order of nature in heaven and earth deteriorated his race by his revolt. 'The whole creation groaneth', says Saint Paul, 'being made subject to vanity, not willingly' (Rom 8:20, 22). If the reason is asked, there cannot be a doubt that creation bears part of the punishment deserved by man, for whose use all other creatures were made (Calvin 1845 [1559], II, 214).

Clearly there was precedent enough in the Scriptures for such an interpretation, for in his commentary on Genesis, Calvin again reinforced this interpretation of the Fall, writing that 'before the fall, the state of the world was a most fair and delightful mirror of the divine favor and paternal indulgence towards man. Now in all the elements we perceive that we are cursed' (Calvin 1844–1856, 177; Gen. 3:3, 3:17). For Calvin, then, we witnessed our own curse in the fact that the elements which comprised the natural world had turned red in tooth and claw. While this variant appears to have originated with Luther (1483–1546) and continued in the works of Melancthon (1497–1560), it was unquestionably with Calvin that it found its strongest expression. Nor can there be much doubt that Bacon was first exposed to this belief through the religious leanings of his Puritan mother, Lady Anne Bacon

¹ See Harrison 2007, 180–181.

² For alternative, contemporaneous interpretations of the Fall, see Harrison 2007. Scholars have largely placed Bacon within the standard view that the Fall affected the human mind, but not the natural world, thus offering a theological motivation for empiricism (for instance, Lewis 2007).

³ Bacon 1857–1874, VI, 637: 'sed post lapsum Adami, morti et corruptioni expositum et obnoxium factum'.

(1528–1610), whose non-conformist piety was somewhat renowned, being recognized as far abroad as Geneva, from where Calvin's disciple Theodore Beza (1519–1605) dedicated one of his theological tracts to her (Jardine and Stewart 1999, 83–84).⁴ It was also prevalent among English preachers, from at least the reign of Edward VI, to expound the Genesis narrative in a profoundly anthropocentric way, making it entirely unsurprising that Bacon, who retained a strong predilection for the sermon throughout his life, should adopt a similar view (see Thomas 1984, 18).

We see an early illustration of this distinction between the world before and after the Fall in Bacon's *De sapientia veterum* (1609), where he interprets the fable of Orpheus as an allegorical exposition on the intractability of matter after the Fall. Although he assigns to Orpheus the 'image of a universal Philosophy', the fable nevertheless offers an evocative illustration of the state of both man and nature before and after the Fall (Bacon 1857–1874, VI, 646). By the 'sweetness of his lyre', Orpheus, writes Bacon,

drew to him all kinds of wild beasts, in such a manner that, putting off their particular nature, forgetting all their quarrels and savageness, nor driven headlong by the sting and furies of their lust, nor even caring to satiate their voraciousness or to hound their prey, they all encircled him amenably and gently, as in a theatre, listening very intently to the harmony of his lyre. Nor was this all, for the virtue and sway of his music was so great that it moved the woods and even the stones, such that they too rearranged themselves, taking their positions around him in a suitable and orderly manner (Bacon 1857–1874, VI, 647).

From this picture, it is easy to imagine the original concordance of material nature in the Garden of Eden. Yet, after Orpheus is torn apart by Thracian women, continues Bacon, 'the bond of that order and just alliance' was instantaneously undone and 'chaos ensued'; each and every 'beast returned to his own nature and turned one upon the other', nor did 'the stones and woods remain in their proper places' (Bacon 1857–1874, VI, 647). The chaos which ensues after Orpheus's death is, for Bacon, a reversion – or, in his own words, a 'revocation' – to the original state of matter prior to God's imposition of the summary law before the six days' work (Bacon 1857–1874, VI, 723). The fable of Orpheus shows clearly that 'matter is not without a certain inclination and appetite to dissolve the world and fall back into the ancient chaos' from whence it originated (Bacon 1857–1874, VI, 712, 729; Bacon 1996b, 199, 209–211, 251).

The effects of the Fall can be explained in the distinction that Bacon maintains between the laws of nature (*leges naturae*) and the appetites of matter (*appetitus materiae*). It is crucial to the Baconian concept of nature that what he refers to as the 'summary law of Nature' (*lex summaria Naturae*) and its forms (*formae*), or limiting instances, are not entirely perverted by the Fall, otherwise disorder, and ultimately chaos, would prevail (Bacon 1857–1874, VI, 655, 730). This is first suggested in the *Confession of Faith*, where Bacon writes that the 'laws of nature' received a 'revocation in part by the curse'. This 'revocation', it becomes clear, refers to the

⁴Beza is not the source of Bacon's views about the consequences of the Fall for nature, as he rejected this aspect of Calvin's interpretation (see Mallinson 2003, 118).

‘privation of the part of the virtue of the first creation’; namely, to the summary law of nature. He continues to explain that ‘the word of God’s law became through the fall of Man frustrate as to obedience’ (Bacon 1996b, 108–109). What Bacon means is essentially that after Adam and Eve broke the moral law, matter reverted in part to its original state of chaos: a dose of recalcitrance to the summary law was introduced into nature – the sense signified by his use of the words ‘revocation’, ‘subdue’ and ‘frustrate’. Bacon explains this through the appetites of matter. These are the primordial tendencies or motions present in all material bodies; motions defined not in pure, physical terms, but rather as the desires and urges of an active, organic matter.⁵ Left to themselves these appetites normally ‘attack, usurp, and slaughter one another in turn’ – a characteristic Bacon uses to explain the underlying cause of chaos (Bacon 1996b, 221–223). When influenced by the summary law, however, disorder is turned to order, and the universe acquires goodness, meaning and direction.

Just as Bacon’s view of matter is not comparable to that of contemporary corpuscularian theorists, neither is his view of the laws of nature understandable in terms of Cartesian or Newtonian natural philosophy. The chief reason for this is that Bacon depicts the summary law as itself a material appetite, and the material effects of the Fall as re-introducing an imbalance between appetites into the universe. Bacon makes it clear in *De sapientia veterum* that the ‘summary law of nature’ is an appetite or instinct of primal matter; ‘or to speak more plainly, *the natural motion of the atom*; which is indeed the original and unique force that constitutes and fashions all things out of matter’ (Bacon 1857–1874, VI, 730). It is, he writes, the most ‘general appetite of conjunction and procreation’ (Bacon 1857–1874, VI, 731). Chaos, conceived as a state of imbalance amongst the myriad appetites, existed when the summary law was not yet present, and the ‘agitations and motions of matter produced imperfect and ill-compacted structures of things, that would not hold together’ (Bacon 1857–1875, VI, 723). With the summary law, God introduced order into the universe through a balance achieved by the addition of a powerful procreative appetite, rather than through restricting the appetites already extant. Instead of imposing order onto matter, He bestowed upon it a new appetite in order to facilitate a delicate equilibrium, which in turn made it possible for the world to take shape.

The material effect of the Fall – the reintroduction of appetitive inequality – is alluded to in Bacon’s interpretation of the fable of Orpheus, when the horn of the Thracians is said to overwhelm the music of his lyre, breaking the spell and depriving the universe of ‘part of the virtue of the first creation’. The crass sound of the horn interrupts the delicate balance orchestrated by Orpheus, masking the ordering harmony of his lyre and allowing matter to revert to its original state of self-interest; attacking, usurping and slaughtering itself in order to seize the upper hand. The Fall can consequently be understood as introducing a partial return to the original chaos in which matter first found itself: it is by no means a return to the absolute chaos of Creation, but rather a slackening in the strength of the summary law by which all

⁵On the appetites of matter, see Giglioni 2010; 2011a; 2013a.

other material appetites are kept in balance. For Bacon, the bottom line is that matter, alive with perception and appetite, is less likely to follow the sound of Orpheus's lyre than to sound its own horn (Bacon 1857–1874, III, 26).

Taking a closer look at two of Bacon's appetites of matter, it is possible to get a clearer picture of how he explains such natural phenomena in moral terms. The earliest extant appetite, and the one most fundamental to all material bodies, is that of 'self-preservation', a notion Bacon derives from the Stoics and their doctrine of *οικείωσις*.⁶ In the *Abecedarium novum naturae* ('A New Spelling-Book of Nature', 1622), Bacon describes this appetite as 'a force and resistance inheren[t] in every particle of matter, be it ever so small, with which it can defend itself against entire armies of things, and will not let itself be annihilated' (Bacon 2004, 191). In this way, the 'quantum of nature or universal sum of matter admits neither increase nor decrease' (Bacon 2004, 191). This appetite exists for the good of the universe; for through it the sum total of matter – although highly pliable, and thus capable of drastic change – can never be diminished. The second appetite is that which Bacon calls the 'motion of connection', and it is the simple force through which 'bodies support each other by mutual connection and contact' (Bacon 2004, 191–193). In other words, it is the appetite through which one material body remains united with another. It is at first difficult to tell whether this appetite of connection is, in fact, different from the summary law, as both ultimately appear to describe the same action. However, there is an important difference between them: whereas the appetite of connection governs the assimilation of bodies at the most basic, arithmetical level, the summary law, as Bacon says, is the most 'general appetite', responsible for the unity of the universe as a whole. It is the single law 'in which nature centres', and upon which the 'symmetry of the universe' (*symmetria universi*) depends (Bacon 1857–1874, VI, 730). Bacon chooses to identify it with the cardinal virtue of charity (*caritas*), '*The work which God worketh from the beginning to the end*' (Eccl. 3:11).⁷

Together the appetites of self-preservation and union form what Bacon refers to in *The Advancement of Learning* (1605) as the 'double nature of the good'. Here, he argues that there 'is formed in every thing a double nature of good': 'the one, as every thing is a total or substantive in itself'; the other, 'as it is a part or member of

⁶In later works, such as the *Novum organum* (1620) and the *Abecedarium novum naturae* (1622), Bacon writes that material self-preservation is the foremost appetite. This may be in relation to those appetites matter possessed prior to the introduction of the summary law.

⁷Bacon 1857–1874, VI, 730. Bacon's identification of Christian charity with the summary law of nature is not merely rhetorical, as is suggested in the following passage from the *Advancement of Learning*: 'there was never any philosophy, religion, or other discipline, which did so plainly and highly exalt the good which is communicative, and depress the good which is private and particular, as the Holy Faith; well declaring, that it was the same God that gave the Christian law to men, who gave those laws of nature to inanimate creatures that we spake of before; for [we] read that the elected saints of God have wished themselves anathematised and razed out of the book of life, in an ecstasy of charity and infinite feeling of communion' (Bacon 1996b, 246). Here, again, Bacon is heavily influenced by Calvin, whose opinion, that 'charity is the bond of perfection', he will repeat throughout his entire career. See Calvin 1845 [1559], II, 126–127.

a greater body' (Bacon 1996b, 246). Put differently, there are two kinds of goodness found in material nature: the one, goodness *per se*, or any given object's intrinsic value; the other, goodness insofar as it belongs, and thus contributes to, a collective reality greater than itself. The appetite for self-preservation corresponds, naturally, to the safeguarding of a material body's essential goodness, whereas the appetite of union facilitates a basic level of material conjunction for the purposes both of self-preservation and the greater good. Consequently, for Bacon the appetite of union contributes more to the goodness of the universe than that of self-preservation, as 'to preserve in state is the less, to preserve with advancement is the greater' (Bacon 1996b, 250).

The illustration that Bacon provides to explain the double nature of goodness serves to establish the continuity he believes exists within the moral sphere, from the most basic natures to the most complex:

we see, the Iron in particuler simpthyee mooueth to the Loadstone; But 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 Bodies; so may we goe forward, and see that *Water* and *Massie bodyes* moue to the *Center of the Earth*; But rather then to suffer a diuulsion in the continuance of Nature they wil moue vpwards from the Center of the Earth: forsaking their dutye to the *Earth* in regard of their duty to the *World* (Bacon 2000, 136).

Bodies of any considerable mass, such as earth or water, will naturally tend towards the centre of the Earth out of a desire for self-preservation (the cold environment of the Earth is more habitable for them than the fiery outer heavens), except where the preservation of the greater good (the wider universe) demands otherwise. To give another example, iron will naturally tend towards the nearest loadstone, though not when the preservation of the Earth, or the greater body, depends upon it behaving differently – even if this should lead to a transmutation of its original form. Whether iron moves to the loadstone or forsakes its most basic inclination for the sake of the Earth, is entirely dependent upon the relative strengths of its underlying appetites; and which appetite wins out is ultimately determined by the most general, summary law of nature, whose function it is to maintain balance amongst the appetites of all material bodies throughout the universe.

The behaviour of even the minutest of natural bodies, then, is directed by a kind of moral code imbedded in the fabric of nature, a 'double good' in which the greater good corresponds to the preservation of the whole more so than in its individual, constituent parts, and to which some appetites contribute more than others. Nevertheless, the existence of the greater good, says Bacon, is ultimately predicated upon an equilibrium which necessitates the existence of the summary law. For without the balancing power of the *lex summaria* to mitigate between the appetite of self-preservation and that of union there can only ever be chaos. Now, it should be said that the above account employs the example of only two appetites, whereas, for Bacon, the complex universe we inhabit exists as the result of an extremely precarious balance between dozens of material appetites. Nonetheless, it is still able to provide, I think, a good place to begin to understand how the Baconian universe is an inherently moral entity.

It is somewhat difficult to observe the concrete effects of the balance procured under God's original plan, as nature, even according to its normal course, is a 'labyrinth' to the mind of man (Bacon 1996a, 5–7). Yet, in its deviations, the precarious nature of this appetitive balance becomes more transparent. So, for instance, Bacon suggests that the effects of the Fall upon nature are visible through the reluctance of matter to adhere to the balancing power of the summary law. One such explanation of the general disorder that enters into the natural world relates to the two appetites just noted. In the *Advancement of Learning*, Bacon explains that, through the reluctance of matter to adhere to the law, the appetite of union is often overpowered by the appetite for self-preservation. In essence, this means that the universe is less inclined towards the greater good of the whole, and more inclined to preserve what he labels the 'private, passive good' (Bacon 1996b, 249–250). The now stronger appetite for self-preservation, in other words, drives individual material bodies to seek their own, private good above and beyond the good of the whole – something that would not occur under the full force of the summary law. This could play itself out in a number of ways. On the one hand, Bacon uses this to explain how lions, once able to live in harmony with Adam and Eve in the garden, are now only interested in their own self-preservation, as a result of which they will kill human beings on sight (Bacon 1857–1874, VII, 235). Another example is that of monstrous births. In the *Parasceve* (1620), Bacon writes that nature 'can be forced out of [its] proper state by the perverseness and insubordination of matter', and that when this happens 'monsters' are produced (Bacon 1857–1874, IV, 253). So an imbalance caused by competing material desires recalcitrant to a balancing and ordering law is consequently used to explain what is considered defective in the natural world. This is why, for Bacon, it is equally important to study both the heteroclitics and normal course of nature. Though a disaster, the Fall can still be turned to our advantage through the study of nature's irregularities.

10.3 Political Antecedents

Bacon's conception of the natural world owes a great deal to Democritus (c. 460–370), as well as to his contemporaries Bernardino Telesio (1509–1588) and Severinus (1542–1602).⁸ But it is also owing to political theorists, such as Niccolò Machiavelli (1469–1527), and the Tacitists Francesco Guicciardini (1483–1540) and Justus Lipsius (1547–1606). All three proved exceptionally influential, not just to Bacon's views about politics, ethics, and the law, but also to his understanding of the natural world.

The Tacitean character of Bacon's philosophy is undoubtedly indebted to the years he spent with the young Earl of Essex, Robert Devereux (1565–1601), during the 1590s. In his later writings, Bacon would come to voice a number of opinions similar to those of the politically-minded youth who had assembled around Essex

⁸ See Giglioli 2010, 2011a, 2013a; Margolin 1989; De Mas 1990; Posseur 1990; Rees 1975.

during these early years of his career.⁹ It is hardly surprising, then, that we also find an implicit Tacitean bent to his natural philosophy. Vital channels for the reception of Tacitus (c. 56–117), both Guicciardini and Lipsius proved hugely influential to members of the Essex circle, who were drawn to their writings for offering a realist means to approach the political concerns of late-Elizabethan England. But it was Bacon, more than any of his contemporaries, who drew upon the untapped well of Tacitean thought, seeing in it both a replacement for the failed idealism of Ciceronianism, but also a means to dissolve the castles Aristotelianism had erected in the sky. The ideas that he took from Tacitus, Guicciardini and Lipsius, such as balance of power and the Neostoic notions of fate and necessity, would come, roughly a decade later, to define central aspects of his view of the universe.

The language of appetite that was to become such a key feature of the political landscape of Cinquecento Italy was in many ways a natural extension of Tacitus's view of history as the interplay of competing interests.¹⁰ Guicciardini, though not the first to use this language, saw political power in Tacitean terms, and put forth the view in his *Ricordi* (1512–1530) and, subsequently, in his *Dialogo del reggimento di Firenze* ('Dialogue on the Government of Florence', 1521–1525), that all states had their origin in violence (Tuck 1993, 39). This violence, he suggested, was a result of the conflict that existed between the various, self-interested factions of the unwashed masses. While it had long been considered the chief task of the prince to suppress these popular appetites in order to retain power and preserve the peace, Guicciardini took an approach perhaps best described as a 'Stoic Tacitism' to the problem of governance, arguing that the surest means to secure power was to cultivate an equilibrium favourable to one's personal rule amongst conflicting appetites.¹¹ His notion of a 'balance of power' – first used in the *Storia d'Italia* (1537–1540) – thus suggested that rulers encourage a 'mutual but equal antagonism of various interests' as a means to maintain political power.¹² Combined with the *ragion di stato*, Guicciardini was able to offer a formidable new model of the mechanisms of statecraft based upon a Tacitean view of history that underscored the irreducibility of self-interest, and thus the necessity of securing power through the cultivation of a state of political equilibrium.¹³

Perhaps stemming from his express admiration for Tacitus's historical realism, Bacon borrowed from Guicciardini the notion of a balance of power, transplanting it from a book of Italian political history into the sphere of nature.¹⁴ Writing in his essay 'Of Empire', he praised Guicciardini's *Storia d'Italia*, and argued that war

⁹ See Tuck 1993, 108–109, who has argued that Bacon represents English Taciteanism at its most concentrated in the late-sixteenth and early-seventeenth centuries. Bacon was first exposed to the writings of Guicciardini and Lipsius through his association with Robert Devereux.

¹⁰ Gigliani 2012; Norbrook 2002, 153; Tuck 1993, 36.

¹¹ Gigliani 2012, 159–164.

¹² Tuck 1993, 95–96: Guicciardini first employed the term 'balance of power' in the context of foreign affairs rather than that of civil conflict.

¹³ See Keller's chapter in this volume.

¹⁴ For Bacon's admiration of Tacitus, see Bacon 1996b, 105.

could almost always be justified when necessary for the preservation of a balance of power in Europe (Bacon 2000, 60–61). But it was ultimately in his treatment of nature – perhaps not surprisingly, given that the notion, as Richard Tuck has suggested, is ‘an image more of pharmacy or metallurgy’ than of politics – that Bacon found a true home for Guicciardini’s balance of power (Tuck 1993, 95–96). From at least the publication of the *De sapientia veterum* onwards, Bacon, as we have seen, believed the existence of the universe to be the result of a precarious balance between material appetites. Baconian nature was populated with bodies ‘endowed with many motions, some ruling, others submitting, others again lying hidden unless excited’, whose interaction, unless tempered by the hand of God, would result in chaos (Bacon 1996a, 187–189). It was only with the introduction of the summary law, ‘*The work which God worketh from the beginning to the end*’, that a ‘manifold consent of things (*consensus rerum*)’ emerged, defined as a state of mutual but equal antagonism brought into existence through the principal law of nature, or ‘most general appetite’ (Bacon 1996a, 187–189). Order, what Bacon referred to in his cosmology as the ‘symmetry of the universe’, was thus achieved through a certain ‘necessity [which] moderates and sets limits’ upon the interaction of all material appetites for the greater good of the whole (Bacon 1996a, 169). Like the European continent, then, for Bacon the universe was kept in a constant but, crucially, stable state of war. Nature was very much a political entity, where God’s power was understood not to suppress material activity, but to make sure that it remained forever balanced.

Lipsius, a Flemish humanist who produced definitive editions of both Tacitus and Seneca between the years 1574 and 1607, is another political theorist whose influence on Bacon’s thought extends to the natural world. His immensely popular work of Neostoic consolation, *De constantia* (‘On Constancy’, 1583), as well as his political opus, the *Politicorum sive civilis doctrinae libri sex* (‘Six Books on Politics or Civil Philosophy’, 1589), were, like the writings of Guicciardini, widely circulated amongst members of the Essex circle. It is thus unsurprising that we find a number of ideas derived from Lipsius’s Stoic Tacitism – including those of ‘fate’, ‘providence’, and ‘self-preservation’ – in Bacon’s natural philosophy.

In his attempt to reconcile Stoicism and Christianity, Lipsius postulated a novel relationship between the Stoic notions of οἰκείωσις (self-preservation/adaptation) and μοῖρα (Fate) and that of Christian providence: in essence, he argued that the intractability of divine providence (understood as the immutable and eternally decreed course of nature), operating in tandem with the irrepressible desire for self-preservation, entailed the necessitation of certain actions. ‘This Necessity [or Fate]’, he wrote in *De constantia*, ‘I join next to Providence, because it is a near kin to it, or rather born of it’ (Lipsius 2006 [1595], 58). Stoic fate was thus subjected to Christian providence through the inescapability which arose from the coalescence of God’s immutable design and the necessity to preserve one’s own existence whatever the cost.¹⁵ The violence which resulted was an inexorable fact of life – a simple consequence of the necessity through which God cultivated his creation. From

¹⁵ See also Giglioli 2011b, 42 and Tuck 1993, 53–54.

the human point of view, Lipsius acknowledged that this seemed unduly harsh, but believed that it was ultimately for the greater good, such as when a plant is trimmed back in order for it to grow stronger (Lipsius 2006 [1595], 78–81). Analogously, the only real option left to humans was to cultivate constancy from the ‘sacred seed’ (*semen divinum*) that God had implanted in us whenever we faced fatal necessity.¹⁶

These Neostoic notions proved particularly adaptable to Bacon’s own attempts at a theory of the universe. In at least two separate works, Bacon employed Lipsian terms to describe the fundamental forces of nature. Writing of the summary law in *De sapientia veterum*, for instance, he maintained that, because matter was inherently blind, ‘divine Providence’ was required in order ‘to educe by a fatal and necessary law all the order and beauty of the universe’ (Bacon 1857–1874, VI, 731). Similar to Lipsius, then, Bacon identified the course of nature with providence: the divine plan was responsible in major part for that ‘necessity’ which constrained ‘nature or matter’ (Bacon 1996a, 97–99). But so too was the desire for self-preservation, which, in the *De principiis*, he described similarly as ‘by far the most powerful of all [appetites], completely unconquerable, and as it were nothing but fate and necessity’ (Bacon 1996a, 259–261). Together, these two appetites functioned within the Baconian view of the universe much as they had in *De constantia*: when the ‘necessary law’ of providence (i.e., the summary law) encountered the ‘completely unconquerable’ appetite of self-preservation, nature was necessitated to act in a manner specific to the cultivation of balance and order. Just as necessity was born of providence for Lipsius, so too should the classical Fates, thought Bacon, be regarded as ‘the sisters of nature’; for they are ‘the chain which draws after it the births and durations and deaths of all things; their fallings and risings, their labours and felicities: in short all the fates that can befall them’ (Bacon 1857–1874, VI, 709–710). Lipsius’s Neostoicism can thus be seen as providing the Baconian universe with the parameters (providence and self-preservation) within which a fundamental necessity maintains order and beauty.¹⁷

Unlike Guicciardini and Lipsius, Tacitus never provided Machiavelli with a historical precedent upon which to model his political ideas. Nevertheless, Bacon, ever the synthesist, was able to find a use for Machiavellian conceptions of statecraft in his view of the natural world. Strikingly dissimilar to subsequent, mechanical and mathematical views of the laws of nature, Bacon’s identification of providence with the summary, or highest, law of nature is especially fraught with ambiguity: besides the fact that it is foremost a material appetite, there also arises the problem that,

¹⁶ Bacon shared with Lipsius a great love of gardens: see Lipsius 2006, 124–127; Bacon 2000, 139–145.

¹⁷ In a number of significant ways, Bacon’s view of the universe is much more indebted to the natural philosophical ideas of Telesio. Some of Telesio’s views about self-preservation, appetite and balance overlap with the political theorists whose influence we have been considering. Still, even if Bacon’s views are ultimately more Telesian in tenor, the contribution of Tacitus, Guicciardini and Lipsius should not be dismissed, as – at the very least – it would have reinforced Telesio’s influence on Bacon. For a succinct account of Telesio’s natural philosophy, see Leijenhorst 1999. For Telesio’s impact on Bacon’s view of the natural world, see Gigliani (2011a, 2013a).

while most answerable for order and regularity in the world, providence often achieves this through circuitous ways. In this respect, Bacon's God is not all that dissimilar to Machiavelli's prince. In his *Il principe* (1532), for instance, Machiavelli had argued that 'we find some qualities that look like virtues, yet – if the prince practices them – they will be his destruction, and other qualities that look like vices, yet – if he practices them – they will bring him safety and well-being' (Machiavelli 1999, 59). The use of 'the power to be not good ... in accord with necessity' often represented for Machiavelli the sole means to retain one's political position and the stability of the state (Machiavelli 1999, 58). In this way, an ostensibly malign action could prove virtuous when necessary for the preservation of the whole.

Bacon would come to draw upon this advice in *De sapientia veterum*, where he interpreted the allegory of Pan's 'sheep-hook' as a reference to the mixture of 'straight and crooked in the ways of nature'. Pan's staff was depicted as 'curved chiefly towards the top', he wrote, because 'all the works of Divine Providence in the world are wrought by winding and roundabout ways – where one thing seems to be doing, and another *is* doing'. The same was true of 'human government', which could secure consensus more profitably through 'pretexts and indirect ways than directly; so that every rod or staff of empire is truly crooked at the top' (Bacon 1857–1874, VI, 711. Emphasis added). With 'the whole frame of nature ris[ing] to a point like a pyramid', Bacon reasoned that the summary law, sitting atop nature's highest peak, must frequently compel the appetites of matter to behave in what appeared to the human eye as 'winding and roundabout ways', but which were, in actual fact, necessary to the conservation of balance (Bacon 1857–1874, VI, 710).¹⁸ Just as Machiavelli had argued (albeit in political terms), so too did Bacon agree that the ends of nature justified the means: providence, circuitous as it could be, worked chiefly towards preserving balance for the sake of order and goodness. Although providence might appear to the human eye as irregular, this irregularity actually worked towards the preservation of a fairly regular course in nature.

10.4 The Moral Nature of Humans

Up to this point, I have attempted to provide a summary assessment of Bacon's view of the natural world as an essentially moral place. But humans, too, sprung in large part 'from the wombs of the elements', were also, in Bacon's estimate, very much a part of nature – and, as such, shared to a remarkable extent the same deeply-rooted moral character (Bacon 1857–1874, IV, 396). This is why it is also worthwhile taking a moment to examine his views on the moral nature of humans. For Bacon, humanity's defining characteristic was our 'biformity' (*biformitas*): on the one hand, we were made of the dust of the earth, but on the other we possessed an immaterial soul; both of which, conjointly, defined our essential nature (see Gigliotti 2013b). A particularly enduring question, consequently, has been the extent to

¹⁸Remember that, for Bacon, nature often appears to man as a 'labyrinth'.

which Bacon ascribed the various faculties to either the material or immaterial half, respectively.¹⁹ Without entering too far into this debate, I hope to show only how Bacon thought of our moral awareness as an emergent aspect of our materiality. For all beings in the universe, from the most basic of material bodies (the loadstone) to the most complex (humans), were endowed with a moral compass which was rooted in their appetitive nature. This is not to argue that the human will can be reduced to an appetite of matter – a move Bacon himself never made – but rather to attempt to demonstrate the fundamental interconnectedness of humanity to the universe through exploring the ontological nature of the moral.

In addition to Adam's ability to see the particular natures of things (or their 'proprieties'), there also exists evidence in Bacon's writings that he believed another natural gift had been afforded to the prelapsarians – namely, their ability to sense the goodness which was embedded in the fabric of creation (Bacon 1996b, 123). This idea fits quite well into Bacon's thought as a whole and, moreover, is not without precedent in the work of at least one other sixteenth-century Protestant. The German reformer Philipp Melancthon (1497–1560), a theologian not unknown to Bacon, had held that Adam was capable of grasping not only the internal motions of natural bodies, but even their inherent moral order.²⁰ So when, in his early fragmented essay *Of the Colours of Good and Evil* (1597), Bacon suggested that only a 'universal knowledge of the nature of things' would suffice to guarantee the verity of moral judgments – a universal knowledge which Adam had, in fact, possessed – he was not expressing an entirely unusual opinion (Bacon 1857–1874, VII, 77). Hinting in this essay that 'colours', or shades of the good, had been imprinted upon creation, Bacon might very well have understood a parallel *ordo moralis* to be, if only to a limited extent, perceptible to the human mind in the same sense that the particular essences of things were. While somewhat curious, it is worth calling to mind here the fact that the Bible itself situates the definitive knowledge of good and evil within a tree (Gen. 2:9).

Although it might be argued that Bacon was explicit that the knowledge which had caused man's fall was moral, a closer reading shows that a distinction needs to be drawn. For, what had been forbidden to Adam and Eve was a knowledge of the 'originals of good and evil', that is, the *reasons* why God had decreed some things permissible, while others were prohibited (Bacon 2000, 34). In defense of the pursuit of natural philosophy, Bacon had explained that,

as for the knowledge which induced the fall, it was, as was touched before, not the naturall knowledge of Creatures, but the morall knowledge of good and evil, wherein the supposition was, that Gods commaundments or prohibitions were not the originals of good and evil, but that they had other beginnings which man aspired to know, to the end, to make a totall defection from God, and to depend wholly vpon himselfe (Bacon 2000, 34).

It was, he continued, Adam's 'aspiring desire to attain to *that part of moral knowledge which defineth* of good and evil', not his ability to perceive goodness,

¹⁹ See, for instance, Corneanu in this volume; Wallace 1967.

²⁰ See Methuen 2000 and Harrison 2007, 101.

that had caused him to fall (Bacon 1857–1874, III, 219. Emphasis added). It thus becomes clear that Adam and Eve did not possess a genuine knowledge of good and evil: while they knew *if*, and to what degree, something was good, they had no knowledge of *why* it was so.

This ability to perceive the moral fabric of the universe is further attested to by Bacon's insistence that, even after the Fall, humanity had retained a 'relic' of its original ability to perceive goodness. In the *Advancement of Learning*, he wrote that the term "light of Nature is vsed in two seuerall senses":

The one, that which springeth from Reason, Sense, Induction, Argument, according to the lawes of heauen and earth: The other that which is imprinted vpon the spirit of Man by an inward Instinct, according to the lawe of conscience, which is a sparkle of the puritie of his first Estate: In which later sense onely, is he participant of some light, and discerning: touching the perfection of the Morall lawe (Bacon 2000, 183).

It is the second sense that is particularly interesting here. While the term 'light of nature' (*lumen naturae*) had been used principally to denote natural reason – a concept by no means excluded in the passage above – there is a subtle shift perceptible in the meaning of Bacon's passage. The key term is 'inward Instinct' (*instinctus internus*). The idea that the light of nature had been 'imprinted' upon man by an instinct is likely derived once more from Calvin – from his *Institutes of the Christian Religion* in fact, where he had defined 'instinct' as a 'natural impulse'; that is, an urge to 'follow the inclination of [one's] nature, without reason, without deliberation'.²¹ This definition stands in stark contrast to the earlier Thomistic notion of *synderesis*, which was circumscribed by the judgment of practical reason as opposed to that of blind appetite (Aquinas, *Summa theologiae*, I, q. 79, a. 12). What is so striking about Bacon's idea of the light of nature then, is that it maps so neatly onto his description of the moral inclinations of matter: it is the perception of goodness and the instinct or appetite to pursue it without the intercession of reason. Bacon in fact tells us as much, when he writes in the *Advancement of Learning* that 'this double nature of good, and the comparative thereof, is much more engraven upon man, if he degenerate not' (Bacon 1996b, 246; Bacon 2000, 182). Though his argument is often subtle, his point is consistent: our ability to instinctively perceive and pursue the good emerges from the appetitive character of our material self, not from our immaterial soul.

In *De sapientia veterum*, we see another side of Bacon's readiness to attribute the origins of our moral instinct to the appetitive character of matter. Here, he interprets Pandora, the mythical giver of all earthly gifts, as a metaphor for that 'relic' (*reliquus*) of our original awareness of the moral law (Bacon 1857–1874, I, 831). Originating in Greek mythology, Pandora was shaped out of the earth upon Zeus's command as retribution for Prometheus's theft of the secret fire. There are obvious parallels between Eve, who persuaded Adam to eat the fruit from the tree of good and evil, and the enchantress Pandora and her 'jar' (*pithos*), which was fabled to contain the mysteries of the earth. Bacon, more specifically though, interprets

²¹ Calvin 1845 [1559], I, 43; Greene 1991, 204.

Pandora to signify that aspect of matter which is recalcitrant to the law, and from which human ‘pleasure and sensual appetite’ arise.²² The corruption of material nature is the corruption of human nature: from Pandora, writes Bacon, ‘infinite mischief has flowed forth upon the minds, the bodies, and the fortunes of men, along with a repentance when too late’ (Bacon 1857–1874, VI, 674). As Guido Giglioni has argued, for Bacon material nature consisted principally in the appetitive motions of matter, and ‘man’s essence was rooted in appetite’ (Giglioni 2010, 150). The mythic Pandora thus paints a picture of matter, in both nature and man, in which pleasure and sensual appetite – the impulse to return to the primal chaos – are, on account of the Fall, forever at tension with the summary law that God established for the greater good of man, and to which the greater good of nature is a necessary participant.

10.5 The Goodly Society of Bensalem

Because of the imbalance between material appetites which had resulted after the Fall, Bacon was emphatic that, while heaven and earth declared the omnipotence (*omnipotens*) of God, they could no longer reveal to us His will (*voluntas Dei*). This held true, he stated, ‘not only in those points of faith, which concern the great mysteries of the Deitie, of the Creation, of the Redemption, but likewise those which concerne the law Moral truly interpreted’ (Bacon 1857–1874, I, 545). Seeking after knowledge of either those ‘points of faith’ which circumscribed the Christian religion or those which comprised the ‘law Moral’ through our own natural capacity was impossible on account of original sin. ‘Since the light of nature ‘does not suffice to affirm either the will of God, or to reveal the correct worship of God’, explained Bacon, such knowledge must be acquired elsewhere (Bacon 1857–1874, I, 545).

Bacon’s utopian fable the *New Atlantis* (1626) implies as much, wherein he acknowledges that the inhabitants of Bensalem had acquired some knowledge of ‘divine miracles’ through their natural philosophical endeavours (Bacon 1857–1874, III, 137). Still, even the denizens of Bensalem, who in all likelihood are members of the elect, could never acquire the fundamental points of saving knowledge (Bacon 2000, 137). At most, Bacon saw natural knowledge as a *praeparatio evangelica*, for the people of Bensalem are depicted in the same passage as having received an ark containing the Bible and a letter from the Apostle Bartholomew. Given that the ark appears under a mysterious, cross-like pillar of light and, moreover, that the miracle of the ‘gift of tongues’ is given to them in order to read this letter, it is clear that the Bensalemites were, in fact, chosen to receive a ‘special benediction’, which occurred not through natural means, but through the direct intervention of God (McKnight 2006, 15). It is consequently clear that, for Bacon,

²² Bacon 1857–1874, VI, 674: ‘Atque pervulgatum est illud, et tamen recte positum, per Pandoram significari Voluptatem et Libidinem’.

investigation of the natural world can ensure neither salvation nor the highest moral rectitude (Bacon 1857–1874, I, 544).

Still, the question arises as to how Bensalem could have been a nation ‘compounded of all goodness’ prior to receiving the ‘heavenly light’ (Bacon 1857–1874, III, 137, 147)? Although the fallen world could not reveal the ‘great mysteries of the Deitie’, Bacon conceded that the inhabitants of this elect island were nonetheless able to acquire some ‘information about the law of nature’: matter might no longer be favourably balanced, but the philosophers of Salomon’s House still discovered how to harness it in such a way that it would reveal ‘the secrets of nature’ (Bacon 1857–1874, I, 544; VI, 651). To achieve this, they instituted ‘trials’ and ‘experiments’ designed to provoke it ‘into all kinds of strange and miraculous forms’, through which they were able to determine some of its underlying regularity (Pesci 1999). It is here in the *New Atlantis* that the near proximity between natural knowledge and a well-ordered society is most conspicuous: the island is inhabited by a nation ‘compounded of all goodness’ because its natural philosophers have procured some knowledge of the moral law at precisely the same time as they have revealed the secret motions (or laws) of material nature (See also Derrin 2013, 27–33). Although even Salomon’s House requires the Light of the Gospels, the implication of Bacon’s fictional utopia is that a good and law-abiding society attained through the study of nature is not completely out of reach.

Bacon’s belief that nature could provide the knowledge necessary to construct a society ‘of all goodness’ was not only advocated in his utopian fiction, but is also reflected in his recommendations towards the reformation of the law. Indeed, not only did he base the intelligibility of the universe on a moral explanatory framework, but he in turn attempted to base the precepts of English common law upon the laws and appetites of nature. In his celebrated argument, reported by Edward Coke (1552–1634) in *Calvin’s Case* (1608), for example, Bacon asked:

Is it not a common principle, that the law favoureth three things, life, liberty and dower? And what is the reason of this favour? This, because *our law is grounded upon the law of nature, and these three things do flow from the law of nature*; preservation of life, natural; liberty, which every beast or bird seeketh and affecteth, natural; the society of man and wife, whereof dower is the reward, natural (Bacon 1857–1874, IV, 663–664. Emphasis added).

When Bacon writes that the English common law, ‘our law’, is grounded ‘*upon the law of nature*’ and, moreover, that the ‘preservation of life’, ‘liberty’, and ‘the society of man and wife’ flow from nature, it is difficult to avoid his references to their analogues in the material appetites of nature. Are these not the same material motions as the ‘tendency to self-preservation’, the ‘motion of liberty’, and the ‘motion of union’? Bacon had, after all, emphasized time and time again the fact that God was the Creator of *both* natural and moral laws: the Holy Scriptures, he contended, made explicit the fact that ‘it was the same God that gave the Christian law to men, who gave those laws of nature to inanimate creatures’ (Bacon 1996b, 246). Bacon’s utopic vision of a wholly good society based upon the moral character of nature was also to be found within his professional ambitions.

10.6 Conclusion

In the preceding pages it has been suggested that Bacon understood the natural world to be an essentially moral place; that he regarded both good (balance and order) and evil (imbalance and chaos) as appetitive tendencies firmly entrenched in the order of things: one by God, the other by man. In this, he was looking back to the natural, moral and political philosophy of the Renaissance much more than anticipating the mechanical worldview of the seventeenth century. His was a metaphysics indebted to Democritus, Telesio and the Paracelsians, but also to the ideas of Tacitus, Guicciardini, Lipsius, and Machiavelli – historians and politicians whose ideas he found conducive to the provision of a new model of natural philosophy. Although I have only offered a very cursory examination here, I would conclude by suggesting that I do not believe that locating the moral within the sphere of the natural for Bacon would constitute an act of reading too much into nature. For, although the moral might not be strictly reducible to the laws of nature, it should be remembered that the original moral bond (*foedus*) that had held man to God had not been Christ, but the natural world; such that, even after the Fall, the parallel globes of the natural and the moral had remained largely inseparable.

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Chapter 11

A More Perfect Union: Bacon's Correspondence of Form and Policy

Vera Keller

Abstract A re-interpretation of Francis Bacon's understanding of policy highlights the relationships he drew between the study of natural bodies and the formation, expansion and preservation of political bodies. Bacon's term 'policy' has often been understood unproblematically as law, government or civil science. However, it should be understood in relation to the far more suspect – from both a moral and an epistemological point of view – notion of reason of state. Policy produced and managed political change. Policy offered contingent, probabilistic tools for advancing political power, but ones that were insufficiently supported by the certainty of knowledge required, in Bacon's view, to serve as the basis for a successfully enduring polity. He hoped to design stable, perfectly mixed political bodies through grounding policy within an understanding of natural forms. However, he failed to arrive at a complete metaphysical understanding of forms, and thus did not succeed in constructing a certain, civil science. If he could not stabilize policy through natural knowledge, he could at least bring change to natural knowledge through policy. Bacon thus drew on tools for advancing actual empire in order to advance the bounds of epistemic empire. Deploying the political charlatan's techniques for manipulating human hope, desire and our tendency to delusion, he proposed a wish-list of the most desired discoveries which might tempt humankind to extend the boundaries of epistemic empire.

11.1 Introduction

What role did the reason of state, or 'policy' as it was often rendered in English, play in Francis Bacon's proposals for learning? Given its claim to the status of 'reason' rather than mere cunning, the reason of state brought pressure to bear upon

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V. Keller (✉)

Robert D. Clark Honors College, 1293 University of Oregon, Eugene, OR 97403, USA
e-mail: vkeller@uoregon.edu

long-held assumptions about the nature of reason and its role in epistemic hierarchies.¹ In its instrumental, embodied, time-oriented and empirical orientations, the reason of state had the potential to disrupt those presumptions about the universality of reason which underpinned notions of *scientia*.² Bacon was well positioned, professionally and intellectually, to realize that potential, particularly in the study and yoking of baser human appetites to the project of advancing learning. Surprisingly, however, few historians have devoted serious attention to the relationship between the reason of state and Bacon's policies for learning.³

Bacon, rather, has served as evidence for a division between the study of bodies politic and natural bodies.⁴ According to one history of the 'body politic', ancient analogies between natural bodies and the form of the state dissolved under pressure of the Scientific Revolution in the seventeenth century. New theories of political bodies as a collection of interests, unrelated to the forms of natural bodies, replaced the ancient body politic. It was Francis Bacon's supposed 'materialism and rejection of the Paracelsians' which destroyed 'the philosophic underpinnings of the validity of the analogy' (Hale 1971, 108). However, as Sabine Kalff has argued more recently, figures such as Tommaso Campanella and Francis Bacon drew on matter theory in their formulations of contemporary theories of the state (Kalff 2012). It was precisely in the arena of natural magic where Bacon identified new possibilities for reasoning about political appetites in terms of natural ones.

Far from dividing between the knowledge of natural and political bodies, Bacon was interested in recovering a two-way relationship, or correspondence, between the ultimate knowledge of nature and policy. As he often remarked, it was this correspondence that comprised the true magic once known to the Persian Magi, who were able to form ideal polities according to the shape of nature's hidden

¹The reason of state went beyond classical conceptions of cunning intelligence (*metis*) in its political and social implications. For the view that Baconian induction represents an attempt to transform classical *metis* (cunning intelligence), see Eamon 1994, 289. On cunning, Detienne and Vernant 1978. On reason of state more generally, Meinecke 1924; Senellart 1989; Bireley 1990; Burke 1991; Viroli 1992. Recurrent attempts to define the reason of state raised questions about the meaning of reason itself. See Melliet 1618, 358–359: 'tous les iours nous disons, que telles, et telles choses, se font par raison d'Etat, sans bien entendre neantmoins ce qui est denoté et spécifié par ce mot de Raison d'Etat: mais parce que parmi la pluspart des nations du monde, il ya Raison de nature, Raison ciuile, Raison de guerre, et Raison des gens, il sera bon d'aller examinant, quelles choses sont ces Raisons'. Scipione Chiaramonti listed ten meanings of 'reason' in *Della ragione di stato* (Chiaramonti 1635, 6–7). Erhard Weigel listed four types of reason other than the reason of state in *De ratione status* (Weigel 1667).

²Sorell et al. 2010.

³Caton 1988 and Martin 1993 do not discuss the reason of state. Wormald (1993, 186, 188) mentions 'reason of state' in passing while quoting Bacon; Faulkner (1993, 42–3, 92, 116, 155–57, 181) does discuss the reason of state in Bacon's political thought. Weinberger (1985, 72, 80–82) mentions '*ragioni di stato*'. None of these authors discuss Bacon in relation to a major authority on the reason of state, Giovanni Botero. More generally, Poovey (1998, 86) has drawn attention to the problem of the reason of state or interest and its effects in producing institutions and a 'new method' to meet a new standard of 'disinterested knowledge', which formed against the background of reason of state theory. On interest, see also Stewart 1992 and Stillman 1995.

⁴For instance, Peltonen 1992, 1995, 1996a, and b.

architecture. He first alluded to an 'affinity' between rule and the secrets of nature in a play for the Gray's Inn revels of 1594. There, one counsellor recommended that his prince pursue philosophy and 'the conquest of the works of nature' rather than military conquests. The ruler should search out 'whatsoever is hid and secret in the world', for 'kingdomes have always had an affinity with the secrets and mysteries of learning'. For example, among 'the Persians the kings were attended on by the Magi... and generally those kingdoms were accounted most happy, that had rulers most addicted to philosophy' (Bacon 1857–1874, VIII, 334). Bacon re-phrased the relationship between policy and magic as one of 'affinity and consent' in a work addressed to the new King James. As he told the King in *A Brief Discourse Touching the Happy Union of the Kingdoms of England and Scotland* (1603), applying laws about the structure of natural bodies to political bodies was the true 'Persian magic': it consisted in applying 'contemplations of nature' to 'a sense politic', 'for there is a great affinity and consent between the rules of nature, and the true rules of policy' (Bacon 1857–1874, X, 90). Finally, in the *Advancement of Learning* (1605), he asked, 'Was not the Persian Magicke a reduction or correspondence of the Principles & Architectures of Nature, to the rules and policie of Governments?' (Bacon 1605, II, 22).

This corresponding knowledge needed to be recovered in order to correct defects both in policy and in human knowledge and control over nature. In both cases, such defects involved form in several meanings of the word. Bacon's concerns lay with the form of the reason of state, on the one hand, and with the reason of state's abilities to advance humankind's understanding of natural forms, on the other. The anti-systematic literary form the reason of state took – essays, *discorsi*, *relazioni* and aphorisms – reflected its concern with changing political events. The reason of state offered techniques for producing and negotiating change within the body politic. This was an exciting and often contested idea at a time when social and epistemic *mores* more usually favored stasis within the body politic. The brazenly disordered literary forms preferred by writers on reason of state suggested something to their critics about the effects their knowledge might have upon the form of the political body. Rather than building and maintaining a strong and sober political constitution, critics argued that an overly impudent and present-centred political ingenuity in fact weakened the structure of the body politic through short-term fixes, conflicting interests and attempts at rapid political advancement. As Bacon himself wrote at the start of the *Advancement of Learning*, 'Emperique Phisitions ... commonly haue a fewee pleasing receits, whereupon they are confident and aduenturous, but know neither the causes of diseases nor the complexions of Patients, nor perill of accidents, nor the true method of Cures'. Likewise, 'Empirique Statesmen' with their '*Ragioni di stato*' did not base their counsel in the knowledge of underlying causes, and therefore should not be entrusted with political bodies, although he conceded that learned men might well find a few pointers about 'accommodating for the present' within such *ragioni* (Bacon 1605, I, 8–9). Such statesmen displayed the greatest audacity, as he wrote in his essay 'On Boldness': 'Surely, as there are *Mountebanques* for the Naturall Body: So are there *Mountebanques* for the Politique Body: Men that undertake great Cures; and perhaps have been lucky, in two or three

Experiments, but want the Grounds of Science; and therefore cannot hold out' (Bacon 1625, 63).

Bacon sought to grant policy the 'grounds of science' by supplying the study of political bodies with an understanding of the matter theory underlying natural bodies. Theorizing about the nature of composite and mixed bodies would ground his advice concerning how to frame new political bodies. Bacon faced a crucial problem, however, in any attempt to correlate knowledge of natural forms with a policy for political bodies. The ultimate rules of nature lay out of Bacon's grasp, as he had not in fact rediscovered the ancient Persian magical knowledge of natural forms. It was this knowledge that had allowed the Persians to produce at their command the *magnalia naturae* or the most stupendous acts of nature, by super-inducing a new form upon any matter (Bacon 1605, II, 24; Bacon 1623, 173–4). Rediscovering this knowledge was crucial for advancing human knowledge of and power over nature. Metaphysics (the knowledge of forms) and true magic (the use of that knowledge) promised the most 'radicall and fundamental alterations' in knowledge, whereas mechanics offered mere 'coastings along the shoare' (Bacon 1605, II, 32). Thus, although Bacon was attempting to base a theory of political bodies upon the ultimate rules of nature, he did not yet possess the ultimate knowledge of nature required. He could not offer a stable new political architecture until he recovered the true natural magic.

Policy offered Bacon techniques for accommodating the present and filling in the gap between his current knowledge and his hopes for a future knowledge. Rather than producing a stable, entirely cohesive new political body via the ultimate natural knowledge, Bacon attempted to manage and collect the divergent appetites of mankind into an imperfect body politic through a partial knowledge of nature. He drew upon the 'pleasing receipts' of the political charlatan in order to entice a collectivity to join together in the conquest of nature. Bacon brought movement, ambition and the reason of state's ingenious instrumentalism to the body of learning. His very notion of the advancement of the empire of human knowledge drew on the rhetoric and policies of political expansion. His politically informed views of human nature helped him to recognize the importance of appearances, even if illusionary or dissimulated (Giglioni 2012). As succeeding editions of his *Essayes* show, his approval of deploying morally suspect techniques for political advancement only grew with time (Box 1982).

The particular technique explored here is Bacon's wish-list within natural magic, the *optativa*. Bacon suggested that humankind might be tempted towards the ultimate discovery of natural forms through a collaborative list of the most desired and seemingly impossible discoveries of natural magic, which he called 'Optatives' or *optativa* (Bacon 1605, II, 33). He proposed utilizing humankind's shared desire for these powers in order to motivate collective research such that nature's power might actually be known.

Bacon's integration of a suspect instrumentalism as a means for reaching his greatest epistemic goals is audacious. His daring is dramatized by a fact which does not appear to have been previously noted; the list of *magnalia naturae* at the conclu-

sion of his *New Atlantis* is nearly identical to a list of charlatans' claims he specified (as discussed below) in the *Novum organum*. In order to accommodate for a lack of knowledge in the present, Bacon drew upon the claims of imposters as a means for exciting and motivating humankind into a temporary association of endeavours which might lead to the discovery of forms and the final perfection of human knowledge. Only then, once the true rules of knowledge were known, could the true rules of policy be reached and the union of the body politic be perfected.

11.2 Method and Advancement or Ramism and Reason of State

This technique for advancing knowledge was not a scientific method. As many scholars have long noted, Bacon's reputed concern with method is a misnomer, since for Bacon method referred to the transmission of what was already known, and not to the discovery of the new.⁵ He never aspired to make the *optativa* into a method, but rather to use them as a motivating device to advance ambitious investigations into the furthest reaches of possibility. Given that the limits of possibility were unknown to Bacon, his attempts to motivate research at the bounds of possibility were a dangerous tactic, as they might well result in failure. *Optativa* represent a far bolder and less epistemically certain technique than Bacon's other processes of induction, which have attracted so much scholarly attention as his putative 'scientific method'. Given, however, the audacious centrality of policy to Bacon's idea of the advancement of epistemic empire, even his more epistemically respectable techniques for advancing knowledge were indebted to the correspondence he drew between policy and the ultimate knowledge of nature.

The vernacular *ragion di stato* or *raison d'état* had long been a popular and courtly topic of debate, but it had not been introduced into formal and encyclopedic surveys of learning such as Bacon's *Advancement of Learning*. This was due to epistemic and stylistic commitments both on the part of the vernacular reason of state and on the part of learned encyclopedism. The various genres of the reason of state were those which could best adapt to changing circumstances, such as the aphorism and the essay. Eschewing method, writers on the reason of state did not aspire to create the stable systems demanded of early modern *scientiae*.

Their ability to access truth was for that reason criticized according to the epistemic conventions of the time. For instance, Bacon's friend Fulke Greville (1554–1628) criticized contemporary politics for basing its knowledge upon the contingent 'Customes of men, and Time's unconstant wings'. As a form of knowledge based upon locally and historically contingent particularities, nothing could be 'certaine in those arts, | Which cannot yeeld a generall proposition, To force their bodies out of native parts'. The 'proper objects' of the political arts should be 'forme

⁵On the importance of transmission, see Colclough 2003.

and matters'. Instead, like 'things of mechanical condition' they 'do not perfect nature, but delude' (Greville 1633, 41–42).

Bacon likewise criticized reason of state for lacking system, method and durability. On the other hand, he also disapproved of other forms of learning precisely for being overly systematic, schematic and static. The schematized dichotomous branching charts employed for dividing and organizing parts of knowledge, so beloved by the Ramists, particularly attracted his ire. Bacon complained that when people attempted to pull things onto the rack of this method, and found that they did not fit, they either left things out or twisted them beyond recognition. They pressed out the kernels of the sciences, leaving only arid, empty shells behind.⁶ Even as a technique of transmission, Bacon could therefore conclude, Ramist practices failed to capture the full body of learning, producing lifeless schemata. By contrast, 'Policie', like other 'knowledges that are drenched in flesh and blood', and 'about the which mens affections, praises, fortunes doe turne', 'taste well' compared with the dry 'spinositie' of 'Rationall Knowledges' (Bacon 1605, II, 48). Bacon pried apart the iron claws of the Ramist method to introduce the potential for adaptability and spontaneity.⁷ That is, he did not seek only to show the structure of knowledge and transmit it through method, but to advance it. Integrating a notion of 'advancement' drawn from the reason of state within a methodical survey itself derived from Ramism, Bacon attempted to compose a body for knowledge that would combine the skeleton of method with the flesh and blood of policy.

As many scholars have noted, Bacon frequently cast the idea of improving human knowledge of and control over nature in terms of the advancement of the bounds of empire, often using imagery drawn from New World conquests.⁸ What has not been recognized about such imagery, is that 'advancing the bounds of empire' was inherently part of the reason of state.⁹ In short, scholars have pointed to the practices and iconography of actual empire as a source for Bacon's idea of the advancement of epistemic empire, but not to the political theory of the advancement of empire; that is, the reason of state.¹⁰ Given the epistemologically inferior status

⁶Bacon 1623, 285: 'Homines, cum Methodi suae Legibus res torqueant; et quaecunque in Dichotomias illas non apte cadunt, aut omittant, aut praeter Naturam inflectant; hoc efficiunt, ut quasi Nuclei et grana Scientiarum exiliant, ipsi aridas tantum et desertas Siliquas stringant'; and Bacon 1857–1874, III (*Temporis partus masculus*), 530: 'Nullum mihi commercium cum hoc ignorantiae latibulo, perniciosissima literarum tineae, compendiorum patre, qui cum methodi suae et compendii vinclis res torqueat et premat, res quidem, si qua fuit, elabitur protinus et exiliit; ipse vero aridas et desertissimas nugas stringit'.

⁷The dichotomous organization of Ramist method is readily apparent throughout Bacon's *Advancement of Learning* and other philosophical works, as discussed by Richard Serjeantson in his paper 'Francis Bacon and "The Inquire Touching Humane Nature Entyer"', delivered at the Warburg Institute, 18 June, 2011. On the Ramist roots of period encyclopedism, see Hotson 2011.

⁸See, for instance, Cañizares-Esguerra 2004.

⁹Botero 1589, 1: 'Ragione di Stato si è notitia de' mezi, atti a fondare, conservare, et ampliare un Dominio'.

¹⁰Note that I use 'empire' in the sense of *imperium* and as a synonym for 'dominion'. The 'advancement of empire' in writings of the period sometimes, but not always, refers to colonial empire.

of the reason of state in Bacon's time, recasting the entire body of learning as an empire subject to considerations of reason of state is truly striking and deserves attention.

Bacon brought movement to method by offering a concept of the 'advancement of empire' which had been drawn from the reason of state. Reason of state's negotiation with changing particulars, or what Greville called 'Time's unconstant wings', was what made it a vehicle for introducing change into a methodical system. Yet, it was this very same inconstancy which made the reason of state epistemologically suspect for its inability to generate universal propositions. According to Greville, most politicians did not truly 'perfect nature' and only offered delusions. With the ultimate techniques for perfecting nature through a complete metaphysics (and thus a true civil science) remaining out of his grasp, Bacon did just this by offering a list of imposters' claims in order to encourage humankind to undertake further research.

Bacon's integration of certain aspects of the reason of state's instrumentalism in his proposals – particularly through a system for change within natural magic that he dubbed 'natural prudence' – represents an early attempt to reconcile the anti-systematic reason of state with more traditionally methodical surveys of knowledge. Bacon's discussion and use of the reason of state have gone largely unnoticed, however, due to at least two historiographical perspectives: first, Markku Peltonen's argument that Bacon preferred Machiavelli to Botero and thus that little connection existed between Bacon's politics and his projects for learning, has proven very influential; second, even those who have argued for a connection between Bacon's politics and natural knowledge have based their arguments more on extensive readings of Bacon's own works (such as Wormald) or on his immediate political context in England (such as Martin) than upon the international literature concerning the notion of reason of state. As a result, the effects of the latter have gone largely unnoticed. While the reception of Tacitus in English political thought has long been explored, the influence of Botero is only now beginning to be recognized.¹¹ As a result, the 'rigorously local' view of Bacon's political career and thought has led to a misunderstanding of Bacon's term 'policy' (Martin 1993, 1). For 'policy', in actual fact, served regularly as the English rendition of the Italian *ragion di stato*.¹²

As George Mosse put it, '[f]or the average Englishman from Elizabethan times onward... all "policy" and its practitioner the "politician" seemed to connote dissimulation and treachery' (Mosse 1952, 68). However, Bacon scholars such as Wormald and Martin have understood 'policy' unproblematically as 'government', 'law' or

¹¹ On English Tacitism, see *inter alia* Benjamin 1965, 102–110; Bradford 1983; Salmon 1989; and Smuts 1993. Tuck (1993, 116) writes, for instance, that 'political debate in Jacobean England did not include modern arguments drawn from Botero or Ammirato; there was no sense of the potential world empire of the English comparable to the sense Richelieu fostered of a French universalism'. This view is beginning to be overturned. Tuck himself lists as exceptions Walter Raleigh and Edwin Sandys. See also Breen 1973, 461–462; Baldwin 2004; Fitzmaurice 2007; Malcolm 2007; Sweet 2008; and Daston 2011.

¹² On the reason of state as 'policy' in early modern English, see Orsini 1946.

‘civil science’. For example, in his chapter ‘Policy a great part of philosophy – Bacon’s engagements in policy’, Wormald does not take note of the widespread sceptical attitudes towards ‘policy’ that render Bacon’s linkages between philosophy and policy so striking.¹³

The same problems caused by this semantic shift bedevil Bacon’s use of the term ‘prudence’. Traditionally an intellectual virtue, ‘political prudence’ came to mean ‘the essence of the reason of state’.¹⁴ *Prudentia* sometimes even served as a Latin equivalent for *ragion di stato*.¹⁵ Like the reason of state itself, prudence came to connote clever dissimulation, as in Justus Lipsius’ ‘mixed prudence’; that is, the legitimate use of dissimulation in political engagement (Bireley 1990, 85). The range of meanings invested in the term ‘prudence’ opened up a moral and epistemic grey area.¹⁶ In the essay ‘Of Cunning’, Bacon warned ‘that nothing doth more hurt in a State, then that *Cunning Men* passe for *Wise*’ (Bacon 1625, 133). Through such changing notions of prudence, however, this distinction between cunning and wisdom in state affairs became difficult to define. Bacon himself developed tools he had identified as among the ‘petty points of cunning’ for the advancement of learning, so that he might be able to reach his most epistemically elevated goals.

11.3 Bacon and Botero on True Greatness

The work of integrating the contingent and expedient reckonings of the reason of state within a larger body of knowledge had begun within the literature on the reason of state itself. Giovanni Botero offered a more learned form of the reason of state to compete with popular understandings of the Machiavellian version. He based his political theories on an extensive and popular global survey, his *Relations*, which was drawn from diplomatic dispatches and other eye-witness accounts. He stressed that an extensive body of empirical and political knowledge, collated from travel, history and experience, should serve as the foundation for the reason of state. Such knowledge would support a more sober, mature and durable reason of state, one

¹³Martin (1993, 142) equates ‘policy’ with ‘laws’: ‘The crowning importance of knowledge of the natural world was, for Bacon, its ability to teach us these laws, “the true rules of policy”’. Wormald defines policy as ‘civil science’, ‘a course or courses of action which this science dictates’, ‘the royal government’, and ‘constitutional arrangements of a state as a whole’ (p. 6), as well as ‘government’ and ‘law’ (Wormald 1993, 13).

¹⁴According to Aristotle and his Renaissance revivers such as Leonardo Bruni, the five intellectual virtues were *sapientia*, *scientia*, *prudentia*, *intelligentia* and *ars*. Wisdom applied to deliberation about immutable and true things, and prudence to deliberation about mutable things, with the goal of taking action. See Rice 1958, 44–5; Viroli 1992, 275; Mohnhaupt 2003; and Descendre 2009, 114.

¹⁵See, for instance, Herdesianus 1615 (*De prudentia regnandi particulari seu de ratione status*).

¹⁶As recognized by Faulkner (1993, 42).

which preferred long-term industrial investment over access to rapidly acquired power (for example, Spain's sudden acquisition of the New-World riches). Botero's knowledge-based and long-term version of the reason of state provided it with more durability and stability, and thus more respectability according to the epistemic mores of the period. The extensive history and travel upon which Botero based his reason of state meant that it was ultimately more difficult for the learned to dismiss as merely the work of courtly charlatans or projectors.

In several works, Peltonen has suggested that Bacon's military concepts of 'true greatness' counter the historiographical claim that his political views included economically-oriented promotions of industry as suggested by Botero.¹⁷ This is an important view to address at the outset, since the corollary of Peltonen's argument is that there is no real link between Bacon's politics and his plans for natural knowledge. If Bacon's main orientation was towards a Machiavellian militarism and poverty rather than towards the wealthy domestic economy suggested by Giovanni Botero, Peltonen argues, then the natural and artificial investigations necessary to make the latter possibility a reality would be uncalled for. Among Peltonen's targets are those historians who have cast Bacon in an overly modern light, such as Jerry Weinberger, as well as those whose interpretations suggested too much consistency and identity between Bacon's political and philosophical aims, such as Julian Martin, who has claimed that 'Bacon's plans and proposals were devoted to the "single end" of "enhancing the powers of the State"' (Peltonen 1992, 280). While these points are well taken, Bacon's notion of a 'correspondence' between policy and natural knowledge suggests, in fact, an intermediate position between the lack of any correlation of his political and natural philosophical thought and the idea that the two shared a single end. Bacon deployed tools and concepts from political thought for the purposes of the advancement of learning, but he also deployed natural concepts in the reformulation of ideas concerning political advancement.

The fact that Bacon deployed a metaphor about the advancement of epistemic empire does not necessarily mean that he equated the advancement of learning with the advancement of political empire. In fact, he posed an explicit contrast between the advancement of the self, the advancement of a particular polity and the advancement of epistemic empire by distinguishing three types or grades of ambition: the first was of those who desired to amplify their own power within the *patria*, which was a degenerate and vulgar kind of ambition; the second, a more dignified but still greedy sort of ambition, sought to amplify the power and empire of the *patria* over other humans; and the third kind, which was the most noble, sought the renewal (*instauratio*) and amplification of the power and empire of all humans over the universe of things. Bacon stressed that the last of these (the empire of humankind over nature) depended only upon the arts and sciences; that is, that it entailed the enlargement of epistemic rather than political empire.¹⁸ In fact, should epistemic empire be advanced

¹⁷Peltonen 1992, 1995, 1996a, and b. See also Weber 2003. For another view, see Keller 2012b.

¹⁸Bacon 2004, 194: 'Primum eorum, qui propriam potentiam in Patria sua amplificatione cupiunt; quod genus vulgare est et degener. Secundum eorum, qui Patriae potentiam et Imperium inter humanum genus amplificare nituntur: Illud plus certe habet dignitatis, cupiditatis haud minus.

to its furthest limits and the true rules of nature be discovered and applied to form true rules of policy, the resulting polity would not be a rapidly expanding world empire, but a small, perfectly coherent and utterly stable union (as suggested in Bacon's portrait of Bensalem in the *New Atlantis*, discussed below).

This interpretation may at first glance seem to be negated by the arguments Peltonen has advanced concerning Bacon's discussion of 'true greatness'. This was a notion which, as Peltonen discussed, Bacon began to develop in *A Brief Discourse Touching the Happy Union of the Kingdoms of England and Scotland*. As Peltonen has also noted, Bacon continued to address 'true greatness' in many works, including the unfinished essay 'Of the True Greatness of the Kingdom of Britain' (whose suggested dates range from 1603 to 1608) and 'Of the Greatnesse of Kingdomes', published in the 1612 edition of the *Essays*. He reprised and expanded the idea of 'true greatness' in the 1623 Latin edition of the *Advancement of Learning* in an essay provided as a sample of political writing, 'A Summary Treatise Touching the Enlarging of the Bounds of Empire' ('Exemplum tractatus summarii de proferendis finibus imperii'). He then republished the treatise as an essay in his 1625 edition of the *Essays* as, 'The True Greatnesse of Kingdomes and Estates' (Bacon 1625, 167–186). The question then becomes whether or not Bacon's ideas concerning 'true greatness' are antithetical to Botero's economically-oriented reason of state. At first glance, they certainly appear so, since Bacon explicitly says, following Machiavelli, that arms, not riches, are the sinews of war (at least where 'the Sinews of Mens Armes, in Base and Effeminate People, are failing') (Bacon 1625, 171). However, Bacon's views concerning true greatness can, in fact, be shown to be supported by Botero.

Botero opened his 1589 *Della ragion di Stato* by defining reason of state as that information which concerned the ways in which to found, preserve and expand a dominion.¹⁹ He immediately qualified these distinctions, however: reason of state, he wrote, pertained more to preservation than to the other arts, and more to expansion than to foundation, since it presupposed a prince and a state, both of which could not precede foundation.²⁰ Such a preference for conservation over foundation directly countered the longstanding legal meaning of *ratio status* as the foundational and unchanging constitution of a state, a meaning which predated the emergence of the vernacular *ragion di stato* (Post 1964, 306; Senellart 1989). His inclination towards preservation over foundation drew attention to *ragion di stato* as a means

Quod si quis humani generis ipsius potentiam et imperium in rerum Universitatem instaurare et amplificare conetur; ea proculdubio Ambitio (si modo ita vocanda sit) reliquis et sanior, est et augustior. Hominis autem imperium in Res, in solis Artibus et Scientiis ponitur'.

¹⁹ Botero 1589, 1: 'Ragione di Stato si è notitia de' mezi, atti a fondare, conservare, et ampliare un Dominio'.

²⁰ Botero 1589, 1–2: 'egli è vero, che, se bene, assolutamente parlando, ella si estende alle tre parti sudette, nondimeno pare, che più strettamente abbracci la conservatione, che l'altre; e dell'altre due più l'ampliatione, che la fondatione: e la causa si è; perché la ragione di Stato suppone il Prencipe, e lo Stato, che non suppone, anzi precede affatto la fondatione, come è manifesto'.

for dealing with the changing political moment. Conversely, however, Botero continued to argue that the expansion of dominion was in effect the same art as foundation, for he who expanded wisely, expanded in a stable and firm way.²¹ By laying stress on a slow and wise expansion, Botero thereby implicitly criticized the rapidly expanding Habsburg empire (Pagden 1995).

Botero would continue to point out throughout his work that mid-sized, unified states were more stable than large, disunited states. Internal weakness threatened states more than the external threat of an invading force, for large empires were structurally weak. The greatness (*grandezza*) of rapidly expanding states appeared to expand riches, however it did so in such a way that luxury and avarice, the roots of all evil ('radice d'ogni male'), were concurrently expanded. Such opulence bred disregard for subjects and enemies. These states were maintained more by the reputation of their past than by any true value, and were weak in comparison with more austere states. Like alchemy, which appeared to produce gold, but lost credit when its specious metals were assayed, quickly expanding states enjoyed great fame, but possessed little, genuine vigour.²²

Far from antithetical, Bacon's discussion of 'true greatness' echoes Botero's themes. Botero had argued that the false *grandezza* derived from easy access to riches, the same specious greatness to which Bacon contrasted his own interpretation of 'true greatness'. Like Botero, Bacon emphasized the need to cultivate durability and stability in order that the amplification of a polity might succeed. He worried that an inflated, weak, or imperfectly mixed political body might collapse. As he told Fulke Greville, the 'Unwieldiness of a State' was a sufficient cause 'to ruine the greatest Monarchy', which he believed had been the case with Rome, burdened as it was by its magnitude (Snow 1960, 372). Without royal sovereignty, he warned Parliament, 'we shall be a *meteor* or *corpus imperfecte mistum*; which kind of bodies come speedily to confusion and dissolution' (Bacon 1857–1874, VII, 370). Imperfectly mixed bodies, such as meteors, arose quickly and just as quickly faded away. In order to achieve a more stable and enduring state, a polity needed to be well integrated into a body, a problem particularly at issue in the expansion of the bounds of empire, as in the union of the kingdoms of Scotland and England.

In his *Brief Discourse Touching the Happy Union of the Kingdoms of England and Scotland*, Bacon offered something of a 'political matter theory' towards the amplification of the state. The ultimate aim of this theory was to superinduce truly new forms upon political bodies, unlike the specious gold described by Botero, which only deluded through the appearance of a perfect and durable form. Applying laws about the structure of natural bodies to political bodies was, Bacon told King James, the true 'Persian Magic': it consisted in applying the 'contemplations of

²¹ Botero 1589, 2: 'e l'ampliacione in parte: ma l'arte del fondare, e dell'ampliare è l'istessa; perché chi amplia giuditiosamente ha da fondare quel, che amplia, e da fermarvi bene il piede'.

²² Botero 1589, 8: 'e sì come l'alchimia pare oro all'occhio, ma perde il credito al paragone, così cotali dominii hanno gran fama, e poco nervo'.

nature' to 'a sense politic', for 'there is a great affinity and consent between the rules of nature, and the true rules of policy' (Bacon 1857–1874, X, 90). The chief law of nature that the Persian magicians 'had propounded to their king was the

fundamental law of nature, whereby all things do subsist and are preserved; which is, That every thing in nature, although it have his private and particular affection and appetite, and doth follow and pursue the same in small moments ... yet nevertheless when there is question or case for sustaining of the more general, they forsake their own particularities and proprieties, and attend and conspire to uphold the public (Bacon 1857–1874, X, 91).

For instance, small amounts of iron 'will ascend and approach to the loadstone upon a particular sympathy', but a large amount of iron will forsake 'his appetite of amity with the loadstone, and like a good patriot falleth to the earth' (Bacon 1857–1874, X, 91). The policy of producing a durable political body involved forming a unified whole with bonds sufficiently strong to prevent individual appetites from generating their own distinct movements.

Bacon claimed to draw this policy from considerations of natural philosophy, as the Persian magi had done. The 'best observers of nature', he wrote, had distinguished between

compositio and *mistio*, putting together and mingling: the one being but a conjunction of bodies in place, the other in quality and consent: the one the mother of sedition and alteration, the other of peace and continuance: the one rather a confusion than an union, the other properly an union. Therefore we see those bodies which they call *imperfecte mista* last not, but are speedily dissolved (Bacon 1857–1874, X, 94).

'*Compositio*', he continued, was 'the joining or putting together of bodies without a new form: and *Mistio* is the joining or putting together of bodies under a new form' (Bacon 1857–1874, X, 94). Composing parts of a polity together could be achieved quickly, but it would not cohere over the long term. *Compositio* and *mistio* could be correlated with 'two several kinds of policy in uniting and conjoining states and kingdoms; the one to retain the ancient forms still severed, and only conjoined in sovereignty; the other to superinduce a new form agreeable and convenient to the entire estate'. The former was 'more usual' and 'more easy', but 'the latter is more happy' (Bacon 1857–1874, X, 95). Perfect mixture took time, for it was 'the duty of man to make a fit application of bodies together, but the perfect fermentation and incorporation of them must be left to Time and Nature; and unnatural hastening thereof doth disturb the work, and not dispatch it' (Bacon 1857–1874, X, 98).

In his essay 'On the True Greatness of the Kingdom of Britain to King James', Bacon also emphasized slow development over rapid expansion, even though the topic of his essay was the 'amplitude' of the state. He pointed out that expanding the borders of a state was only one of several necessary arts for a flourishing, enduring polity:

let no man so much forget the subject propounded, as to find strange, that here is no mention of Religion, Lawes, Pollicie. For we speake of that which is proper to the amplitude and growth of States, and not of that which is common to their preservation, happiness, and all other points of well being (Bacon 1734, 195).

Although defending his essay as discussing 'amplitude' rather than other political arts such as 'preservation' or 'happiness', Bacon in fact did describe a policy of preservation, and one, moreover, based upon happiness. Botero had argued that the art of expansion in a truly great way was the same political art as foundation, since expanding in a manner that would last entailed the establishment of solid foundations. Likewise, Bacon emphasized the slow, natural growth of the body politic rather than the unnaturally hasty composition of parts and factions into a new political body. Great bodies cohered through the perfect mixture of particular subjects, rather than through the violent disruptions of individual, free agents. He did not advocate poverty as the foundation of a long-standing polity, although he conceded that the 'presse of Povertie' and 'Adventures' of the barbarians had allowed them to quickly conquer the Roman empire. Nor did he advocate the consumption of luxuries by the super-rich, which he considered the origin of the fall of the Roman Empire, as did Botero. On the contrary, Bacon advocated the spreading of wealth throughout a polity. He argued that 'Treasure and Monies do then add true greatness and strength to a State' when 'the Wealth of the Subject be rather in many hands then in few'. States were least able to pay for wars when the nobility monopolized wealth, but most able to do so when it lay 'in the hands of Merchants, Burghers, Tradesmen, Freeholders, Farmers in the countrey and the like', as was the case in the Netherlands. He went on to suggest ways to increase the wealth of the royal treasury, including royal trade (Bacon 1734, 213).

Poverty was a particularly effective means to expand the bounds of empire quickly. Maintaining those bounds over the long term, however, required the conjunction of subjects by spreading wealth throughout the polity and encouraging slow, natural growth. As Bacon warned in his essay 'Of Seditions and Troubles', if 'Poverty, and Broken Estate, in the better Sort, be joyned with a Want and Necessity in the meane People, the danger is imminent, and great' (Bacon 1625, 81). Political dissatisfaction was, 'in the Politique Body, like to Humours in the Naturall, which are apt to gather a preternaturall Heat, and to Enflame'. Preventing such inflammation entailed the

Opening, and well Ballancing of Trade; The Cherishing of Manufactures; the Banishing of Idlennesse, the Repressing of waste and Excesse by Sumptuary Lawes; the Imrouement and Husbanding of the Soyle; the Regulating of Prices of things vendible; the Moderating of Taxes and Tributes; And the like (Bacon 1625, 83).

Good 'Policie' should be employed to prevent 'Treasure and Monyes, in a State' from being gathered 'into few Hands'; for 'Money is like Muck, not good except it be spread' (Bacon 1625, 85).

Concentrated wealth, like muck, would enfeeble the state, but spreading it around would fertilize and strengthen it. Rapid accession to and concentrated accumulation of wealth only gave the appearance of greatness. What Bacon sought for a long-term polity was neither the rapid conquest of wealth (which weakened the state), nor poverty (which would give rise to sedition), but a slow and widespread increase in

wealth. As he stressed in his essay ‘Of Riches’, ‘Riches gotten by Good Meanes, and Just Labour, pace slowly’: for instance, the ‘Improvement of the Ground, is the most Naturall Obtaining of Riches; For it is our Great Mothers Blessing, the Earths; But it is slow’ (Bacon 1625, 207).

Bacon’s views concerning the best means to develop greatness of state – not only the appearance of greatness, as in unnaturally composed bodies, but a true greatness – were in agreement with those of Botero. In fact, Bacon’s entire discussion of ‘true greatness’ as one of three divisions of political knowledge reformulated Botero’s three subjects of the reason of state (foundation, conservation, and expansion). According to Bacon in the *De augmentis scientiarum*, the arts of empire could be divided into three: ‘that a Kingdome or State be conserved’, ‘that it may become happy and flourishing’, and ‘that it may be amplified and the bounds thereof propagated and extended’. Notably, Bacon omitted foundation and distinguished between happiness and expansion.²³

Bacon’s reformulated political divisions map onto three types of appetite he identified as common to both man and state: ‘preserving and contynnuing their form’, ‘Advancing and Perfitting their fourm’, and ‘Multiplying and extending their fourme upon other things’ (Bacon, 1605, II, 74). Of these three, advancement and perfection best conjoined the good of the individual with the good of the state. Conserving a state and making it happy and flourishing, Bacon claimed, had already been treated well by other authors. As usual, he did not cite those to whom he referred. He placed only the third (the amplification of empire) on his list of *desiderata* requiring further research, as ‘Consul Paludatus, sive Doctrina de Proferendis Imperii Finibus’ (‘The Consul attired in Military robes, or the doctrine of extending the bounds of empire’).²⁴ He included an expanded version of his writing on ‘true greatness’, entitled a *Summary Treatise Touching the Enlarging of the Bounds of Empire*, as an example of this form of military knowledge. As only one of three forms of political knowledge, however, it did not counter the other two forms, including the art of making a state happy and flourishing.

The reason of state or ‘policy’ earned suspicion in early modernity as an expedient reckoning for dealing with the particulars of rapidly shifting political moments. By basing his version of the reason of state upon an extensive body of geographical and anthropological accounts, Botero had offered a version of the reason of state that appeared to have more solid foundations. His particular political advice, such as equating expansion with foundation, or prioritizing the conservation of states, also reflected the long-term view and the kind of ‘true greatness’ that his reason of state offered. Bacon likewise attempted to link policy to what he considered to be

²³ Bacon 1623, 439: ‘Cum Artes Imperii, tria Officia Politica, complectantur; Primo, ut Imperium conservetur; Secundo, ut Beatum efficiatur, et Florens; Tertio, ut amplificetur, Finesque eius longius proferantur’.

²⁴ The ‘Consul Paludatus’ corresponds to the contemporary distinction between *prudencia togata* (prudence clothed in a *toga*) and *prudencia sagata* (prudence clothed in a *sagum*, or military cloak). Compare Lipsius 2004, 387 and à Collibus [1615] 1658, 370.

the more universal and stable 'rules of nature' in order to offer counsel for a strong and enduring polity. Moreover, he emphasized both the durability and stability of his brand of political greatness and, in particular, the need to conjoin individual appetites in such a way that truly perfect political mixtures might slowly emerge.

11.4 The Political Charlatan and Particular Appetites: *Optativa and Magnalia Naturae*

If the application of the study of nature to policy helped make the policy more durable, certain and universal, conversely, the application of policy to the study of nature could make natural philosophy better able to negotiate contingency, probability and particularity. In the beginning of his *Advancement of Learning*, Bacon criticized '*Ragioni di stato*' for dealing only with the present. It was not a science; for it offered neither a knowledge of causes, a comprehensive method, nor an understanding of temperament. It promised dramatic cures with *ad hoc* secrets. Like false greatness within a state, such *ad hoc* cures might give the appearance of efficacy, but since they did not engage with the fundamental matter theory of politics, their cures could never endure. True learning prevented disease in the body politic by maintaining it in order, rendering the temporary, present-oriented cures of the 'Empirique Statesmen' unnecessary. As Bacon pointed out, learned men might well find a few pointers about 'accommodating for the present' within such *ragioni* (despite the fact that Pope Pius V, whose statecraft Bacon praised, had called them 'Inventions against Religion and the morall vertues'). 'Yet on the other side to recompence that', countered Bacon, learned (as opposed to 'Empirique') statesmen, who 'are perfitte in those same plaine grounds of Religion, Justice, Honour, and Morall vertue', would seldom need the 'use of those other, no more than of Phisicke in a sound or well dieted bodie' (Bacon 1605, I, 7–9). As a result, he urged 'seldom use' of these dangerous political cures, but did not reject the reason of state altogether. The very variability of the reason of state was one of its advantages, but also one of its perceived threats.

In order to dramatize both the appeal and the danger posed by the *ragioni di stato*, Bacon referred to what would become a common *persona*: the political empiric or charlatan. This figure first appeared in an anti-Catholic League libel of 1594 entitled *Satyre Ménippée de la Vertu du Catholicon d'Espagne*, as a Spanish charlatan hawking a reputed universal medicine and other supposed cures. Translated into English by 1595, it described how the charlatan displayed 'his knacks and juggling tricks, and keeping the bancke or seate, much like to many of those that a man may see at Venice in the place of S. Marke', before a salivating populace (Pleasant Satyre 1595, 9–10; Asholt 1989, 404–428). This theme of the political charlatan, hawking simulated cures and new inventions, captured both the lures and the dangers of exposing the body politic to, as it were, the medical marketplace of *ragioni di stato*. Picked up by the scholar of Tacitus, Trajano Boccalini in his 1612 *Advertisements*

of *Parnassus*, the satirical figure of the political charlatan would become enormously popular, dramatizing the dangers of contemporary instrumental reasoning.²⁵

Within this context, Bacon's discussion of 'Empirique Statesmen' in the *Advancement of Learning* represents an early and unusually ambivalent example. For someone who thought deeply about how to bring bodies with individual appetites together, as Bacon did, the vision of associating individuals, even if only temporarily, by offering to fulfill their most heartfelt desires had a certain cunning to it. As he suggested in the *Essays*, when true political satisfaction was not within reach, the simulation of satisfaction offered an effective means to preserve the state from discontents. The 'Politique and Artificiall Nourishing, and Entertaining of Hopes, and Carrying Men from Hopes to Hopes' offered one of the best 'Antidotes, against the Poyson of Discontentments' (Bacon 1625, 86). Continually hawking cures was itself a kind of cure. Maintaining individuals in a constant state of excitement and distraction prevented each from pursuing its own path to the fulfillment of particular appetites.

Bacon also noted the presence of charlatans within the folds of natural knowledge; those who tempted humankind with continual hopes, such as:

prolonging life, delaying old age, relieving pain, making good natural defects, deceiving the senses, binding and stimulating the affections, illuminating and extending the intellectual faculties, transmuting substances, reinforcing and multiplying motions at will, making impressions and alterations on the air, drawing down and managing celestial influences, foretelling things to come, representing things distant, revealing things hidden, and so on *ad infinitum* (Bacon 2004, 139).

Imposters such as these were a great threat to the advancement of knowledge. They damaged the claims of those offering genuinely new proposals and even 'encompassed the ruin of all greatness of spirit in enterprises of this kind' (Bacon 2004, 141). However, in one of the most suspect fields of natural knowledge, and the one most prone to such specious claims – natural magic – Bacon developed a technique for drawing upon just such an array of hoped-for things in order to unify humankind around shared desires.

Bacon thus proposed a collaborative wish-list that he believed could function as a form of 'natural prudence'. While the imposter proffered his own list of claims against the rest of humanity, a collaborative wish-list brought together the desires of all for shared examination by a large group. This in and of itself might extend the bounds of possibility. 'For I take it', wrote Bacon, that

those things are to bee held possible, which may be done by some person, though not by everie one: and which may be done by many, though not by any one: and which may be done in succession of ages, though not within the houre-glasse of one mans life: and which may be done by publique designation, though not by private endeavour (Bacon 1605, II, 7).

Extending the bounds of possibility within magic was of the utmost importance for the advancement of learning in general. Magic was the operative correlative of

²⁵ Bocalini's *Advertisements* enjoyed 120 editions within a century. See Bosold-DasGupta 2005; Firpo 1955 and Hendrix 1995.

metaphysics, and only metaphysics offered humankind the 'utmost possibility of superinducing' a desired nature 'upon any variety of matter'; that is, of making a perfect mixture. This was the knowledge possessed by the ancient Persian magi.²⁶

From where did Bacon derive this idea? In his *Occult Philosophy*, Heinrich Cornelius Agrippa von Nettesheim (1486–1535) had defined magic in language very similar to that which Bacon would later use. 'Natural magic', wrote Agrippa, 'is nothing other than highest power within natural sciences, which they call the highest peak of natural philosophy and its most complete perfection. And, as the operative part of natural philosophy, natural magic produces astounding works through the aid of natural virtues, their mixtures and opportune application... As Plato reports in *Alcibiades*, Persian princes were thoroughly trained in it in order to administer and shape both themselves and the republic according to the image of the universal republic, and as Cicero writes in *On divinations*, nobody was allowed to reign among the Persians who had not previously learned magic'.²⁷

Agrippa refers to Plato's very cursory mention of the training of the Persian princes in magic. Of the four royal tutors, the wisest taught the prince 'the magian lore of Zoroaster, son of Horomazes; and that is the worship of the gods: he teaches him also what pertains to a king'.²⁸ Although the wisest tutor taught both magic and how to be a king, these were not necessarily the same. The idea, which would prove fundamental to Bacon's notion of 'correspondence', that magic taught the princes how to shape both themselves and the state according to the shape of the world ('ut ad mundanae Reipublicae imaginem, suam et ipsi Rempublicam administrare distribuereque condiscant') did not appear in Plato. It did appear in Giovanni Pico della Mirandola's *Oration on the Dignity of Man* of 1486 and was repeated both by writers on magic such as Agrippa and by political writers such as Jean Bodin.²⁹

In order to recover this lost ancient magic, Bacon recommended drawing up a 'Kalender resembling an Inuentorie of the estate of man', which would contain 'all the inuentions, (being the works or fruits of Nature or Art) which are now extant, and whereof man is already possessed, out of which doth naturally result a Note, what things are yet held impossible, or not inuented' (Bacon 1605, I, 32). Two

²⁶ Bacon 1605, 24, and Bacon 1623, 173–174: 'Etenim Magia apud Persas, pro Sapientia sublimi et Scientia consensuum rerum Universalium, accipiebatur... Nos vero eam, illo in sensu intelligimus, ut sit Scientia, quae cognitionem Formarum Abditarum ad Opera admiranda deducat, atque, quod dici solet, Activa cum Passivis coniungendo, Magnalia Naturae manifestet'.

²⁷ Agrippa von Nettesheim 1550, 506: 'Naturalem Magiam non aliud putant, quam naturalium scientiarum summam potestatem, quam idcirco summam Philosophiae naturalis apicem, ejusque absolutissimam consummationem vocant. et quae sit activa portio Philosophiae naturalis, quae naturalium virtutum adminiculo ex mutua earum et opportuna applicatione opera edit, supra omnem admirationis captum... Nam Indi et Aethiopes et Persae hac maxime praecellere magia: qua idcirco (ut narrat Plato in Alcibiade) imbuuntur Persarum regum filii, ut ad mundanae Reipublicae imaginem, suam et ipsi Rempublicam administrare distribuereque condiscant: et Cicero in divinationum libris ait, neminem apud Persas regno potiri, qui prius Magiam non didicerit'.

²⁸ Plato 1955, 122a: 'ὄν ὁ μὲν μαγεῖαν τε διδάσκει τὴν Ζωροάστρου τοῦ Ὠρομάζου—ἔστι δὲ τοῦτο θεῶν θεραπεία—διδάσκει δὲ καὶ τὰ βασιλικά'.

²⁹ On Pico, Jeck 2004, 283. On Bodin, Häfner 2010.

further, balanced lists would serve to both motivate and limit investigation. Every ‘reputed impossibilitie’ would be listed alongside ‘what thing is extant, which cometh the nearest in degree to that *Impossibilitie*; to the ende, that by these *Optatiues* and *Potentialls*, Mans enquirie may bee the more awake in deducing direction of works from the speculation of causes’.³⁰ By engaging in speculation about causes, *optativa* were not limited to merely operative knowledge, but could be utilized in the speculative exploration of nature as well. As Bacon said in the *Novum organum* of 1620, ‘in the very work of Interpretation concerning particular subjects I always give a place to a List of things human, or List of Optativa. For to wish intelligently is as much a part of science as to inquire intelligently’ (Bacon 2004, 418–419). Again, in the 1622 *Alphabet of Nature*, Bacon recommended composing a list of *optativa*, alongside the approximations, in order to ‘stimulate human industry’.³¹

He did not, however, offer details of what would be contained within such a list. He did so in his model *Historia densi et rari*. One such optative, ‘various motions using the dilation and contraction of air through heat’, included as its approximations such inventions modern and ancient as the calendar glass (a kind of barometer), the temple doors invented by Hero of Alexandria (10–70 CE), which would automatically open when a fire was lit at the altar, and two highly publicized and debated inventions of Bacon’s contemporary in England, the Dutchman Cornelis Drebbel (1672–1633). These were Drebbel’s solar-powered musical instrument, and what Bacon called the ‘imposture of the imitation of the marine tide’, otherwise known as Drebbel’s perpetual motion.³² Given that Bacon claimed to be interested in recovering the lost true magic, rather than the false promises of contemporary philosophical charlatans, it is odd that he should include an object he himself considered to be a fake on his wish-list.

Bacon’s concept of true magic and techniques for its recovery grow still more surprising if one compares the list of *magnalia naturae* at the end of the *New Atlantis* with the list of imposters’ claims Bacon provided in the *Novum organum*. According to his editor William Rawley, Bacon had originally intended to include ‘the best State or Mould of a Common-wealth’ within his unfinished fragment, the *New Atlantis* (Bacon 1627, a2). Although one of his three key arts of empire, Bacon never described how a state could achieve happiness and prosperity. He has no essay on the topic, and in contrast to his ‘Consul clothed in Military Robes, or the art of extending the bounds of empire’, he does not address it at any length in *De augmentis scientiarum*. Unfinished though it may be, the *New Atlantis* thus offers us the best portrait of what a happy and flourishing state was supposed to look like according to Bacon.

He portrayed the civilization of Bensalem in the *New Atlantis* as one which preferred the expansion of the empire of knowledge over the expansion of actual

³⁰On *optatives*, see Keller 2012a.

³¹Bacon 2000: ‘Etiam optatiua eorum quae adhuc non habentur, vna cum proximis suis, ad erigendam humanam industriam proponimus’.

³²Keller 2012a, 237. Bacon 1623, 107: ‘Impostura de imitatione fluxus et refluxus maris et amnium’.

empire. Bensalem's preference for stable political control and the advancement of epistemic conquests might be contrasted with the civilization of the old Atlantis, whose ceaseless quest for expansion had, in Bacon's version of the story, led to the loss both of the empire and its 'Arts, Letters, and Civility'. Following the decline of Atlantis, it was King Solamona who decided to limit Bensalem's interaction with the outside world and, by implication, any attempts at the expansion of political empire. Witnessing the 'happy and flourishing Estate' of his land, it was Solamona's intent only 'to give perpetuities to that, which was already so happily established', by designing 'Fundamental Lawes' that combined both 'Humanity and Policy'. One might surmise that had Bacon included the model Rawley hinted at, it would have stressed not the military amplification of empire, but the maintenance of a flourishing society; that is, the Bensalemite preference for advancing epistemic empire over and above political empire.

As Rosalie Colie has described, Bacon incorporated many of the wonderful inventions which could be found in the Jacobean court into Salomon's House in the *New Atlantis* (Colie 1954). Importantly, however, Salomon's House also included many objects not found in contemporary London. They were located beyond the current bounds of epistemic empire in Bacon's world. The unfinished *New Atlantis* concluded with a list of such possessions of Salomon's House, what Bacon termed the natural *magnalia* especially designed for human applications (*magnalia naturae, praecipue quoad usus humanos*), which (implicitly) also provided the wish-list for a society that aspired to happiness. The *magnalia naturae* serve as a list of optatives, that is, of desired inventions within natural magic, according to Bacon's definition of magic in the *De augmentis scientiarum* as the ability to produce *magnalia naturae* through the superinduction of forms (as known to the Persian Magi) (Bacon 1623, 173–174). Tellingly, the *magnalia naturae* maps very closely onto the list of claims, which, according to Bacon in the *Novum organum*, were regularly put forward by imposters to natural knowledge. For example:

Imposters	<i>Magnalia naturae</i>
Prolonging life	The Prolongation of Life
Delaying old age	The Restitution of Youth in some Degree; The Retardation of Age; The Curing of diseases counted Incurable.
Relieving pain	The Mitigation of Pain; More Easie and less Loathsome Purgings
Making good natural defects	The Encreasing of Strength of Activity; the Encreasing of Ability to suffer Torture or Pain; The Alter of Complexions: and Fatness, and Leanness (etc.)... .
Binding and stimulating the affections	Greater Pleasures of the Senses
Deceiving the senses	Deceptions of the Senses
Illuminating and extending the intellectual faculties	The Increasing and Exalting of the Intellectual Parts
Transmuting substances	Version of Bodies into other Bodies; Making of New Species; Transplanting of one Species into Another

(continued)

Imposters	<i>Magnalia naturae</i>
Reinforcing and multiplying motions at will	Accelation of Time in Maturations; Acceleration of Time in Clarifications (etc.)
Making impressions and alterations on the air	Impressions of the Air, and raising of Tempests
Foretelling things to come; representing things distant; revealing things hidden	Natural Divinations

Through the advancement of epistemic empire, Bensalem achieved an internal advancement of their polity to a flourishing and happy state without the need for the military expansion of its borders at the expense of other polities. Botero had already suggested that there was more than one way to expand the forces and population of a state: one could either take the forces and population of others; or one could improve one's own state through agriculture, the arts, education, and plantations.³³ By distinguishing between internal advancement and external expansion as two different political arts, Bacon took this idea of improvement through knowledge rather than conquest even further than Botero had, however. According to Bacon, if one truly possessed the ability to superinduce forms upon nature and applied that knowledge to policy, one could superinduce a new form onto the body politic through a perfect mixture. This was the most durable art of empire, and the one most able to produce a 'happy and flourishing' polity, unlike the compositions which humans might easily invent. The list of *magnalia naturae* at the end of the *New Atlantis* showed that the Bensalemites did in fact possess true magic. With all of nature under their control, they had no need for a vast empire, as they could recreate artificially the *magnalia naturae* of the world at will. The description of Bensalem's extreme age suggests that Solamona did indeed succeed in establishing a truly great state, unlike the once great but now vanished civilization of Atlantis.

11.5 Conclusion

The way in which Bacon related politics to natural magic was far from new. What Bacon did differently was to infuse into this relationship a new type of reasoning which could be found in 'policie' rather than in the wisdom of Plato's philosopher king. Natural prudence did not attempt to sketch an enduring system evacuated of human frailty and contingency. Rather, natural prudence offered a temporary means to an end by drawing upon human appetite and deploying the idea of change for the

³³ Botero 1589 ('Due maniere d'accrescer la gente, e le forze'), 197: 'La gente, e le forze s'augmentano in due modi, col propagare il suo, e col tirare a se l'altrui: si propaga il suo con l'agricoltura, con le arti, col favorire l'educatione della prole, con le Colonie: si tira a se l'altrui, con l'agregare i nemici, col rovinare le Città vicine, con la communicatione della Cittadinanza, con l'amicitia, con le Leghe, con le condotte della gente, co' parentadi, e con gli altri simili modi'.

advancement of epistemic empire. In short, Bacon drew upon the most suspect tactics of political charlatans in order to aim at the highest epistemic goals. The historiographical reading of Bacon's 'policy' as 'government' or 'law', the interpretation of his political views as those of classical republicanism, and the division between his political and scientific thought sanitizes Bacon's philosophy, rendering his proposals for the advancement of epistemic empire far more respectable and far less daring than they actually were. The study and integration of human appetite into a formal survey of knowledge with extreme intellectual pretensions, such as Bacon's *Advancement of Learning*, ran counter to contemporary assumptions about system, method and universality in science.

Unlike Solamona, Bacon did not discover true magic. A gap thus remained for him, which ultimately undermined the prospect of a complete correspondence between the laws of nature and the rules of policy. Without having achieved the ability to superinduce new forms, the wish-list he had recommended as a part of 'natural prudence' was more akin to the claims of the imposters than to the fulfilled achievements of Bensalem. The crucial difference between the imposter's claims and Bacon's list, therefore, lay in the fact that Bacon had proposed his own list as a means to an epistemic end. The gap between proffered hopes and current abilities was, he believed, only a temporary one. Through collective desire, he aimed to expand epistemic empire in order to reach the utmost level of that which was possible, the discovery of forms.

Hope offered an instrumental means for whetting and directing appetite. Tempting humankind forward with a proffered list of hopes was a way of making 'Mans enquire' 'bee the more awake'. Furthermore, the list brought together the efforts of many people, thus expanding the limits of the possible. The association such a list prompted may indeed have been a 'meteor' that could never endure in perpetuity. Nevertheless, as a means of 'accommodating for the present', Bacon's wish-list offered a way to expand the boundaries of epistemic empire that held as its final goal the acquisition of a perfect knowledge of forms.

In an analysis of the successive editions of Bacon's *Essays*, Ian Box has argued for 'a growing disjuncture' between Bacon's 'aspirations for civil and natural philosophy' (Box 1982, 38). Subsequent editions elicit greater acceptance for human behaviors of which Bacon previously disapproved, such as ambition, cunning and vainglory. Box's argument that the proposed utilization of such behaviors in the later *Essays* demonstrates Bacon's political thought slipping away from his natural philosophy rests, however, on the assumption that Bacon would not have deployed such behaviors in order to advance epistemic empire. As his wish-lists show, this was not the case. The 'correspondence' between a knowledge of nature and a knowledge of policy was a two-way street. If Bacon had discovered the 'utmost possibility' of super-inducing forms, he could indeed have radically transformed policy. Short of that, Bacon still leaned heavily on policy. As he continued to fail to find the deepest principles of nature, utilizing instrumental thinking for the advancement of knowledge became ever more necessary.

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Chapter 12

Bacon's *Idola* in Vernacular Translations: 1600–1900

Marialuisa Parise

Abstract This chapter provides a comparative analysis of the various ways in which Bacon's technical term *idolum* was translated into some of the principal European languages. Concentrating on the French, Italian and English translations of the *Novum organum* and *De dignitate et augmentis scientiarum*, and taking into account the *Distributio operis*, this contribution intends to survey the occurrences of the lemma *idolum* in the vernacular editions of these two works. A set of synoptic tables is provided at the end of this chapter.

The Latin word *idolum* is a key term in Francis Bacon's philosophy (Fattori 1980, I, 217–218; II, 134; Giglioni's 'Introduction' to this volume). In the *Novum organum*, *idola* occurs twenty-six times, once in the *Distributio operis* and seventeen times in *De augmentis scientiarum*.¹ *Idolis* can be found four times in *Novum organum* and twice in *De augmentis scientiarum*. *Idolorum* occurs eight times in the *Novum organum*, once in the *Distributio operis* and eight times in *De augmentis scientiarum*.²

The following are the translations of the *Novum organum* I have examined for this chapter:

1. The unpublished first French translation of the *Novum organum* – a seventeenth-century partial translation, which only circulated in manuscript form with the title *Méthodes et conceptions du sieur Verulam, chancelier d'Angleterre*

¹For its occurrences, I refer the reader to the synopsis at the end of this chapter. In the synopsis I have not recorded the three occurrences of *idola* in the chapter summaries, the *Partitiones scientiarum et argumenta singulorum capitum* in Bacon 1857–1874, I, 425, on the grounds that they do not appear in all translations. I dedicate this chapter to my little Vittoria.

²Likewise, I have not recorded the two occurrences of *idolorum* in the chapter summaries, the *Partitiones scientiarum et argumenta singulorum capitum* in Bacon 1857–1874, I, 425, on the grounds again that they do not appear in all translations.

M. Parise (✉)

Sapienza Università di Roma, Rome, Italy

e-mail: marialuisa.parise@uniroma1.it

(Bibliothèque Nationale de France, MS FF 19096), recently published by Carlo Carabba (Bacon 2011).³

2. The first printed French translation of the *Novum organum* (1799–1800), by Antoine de Lasalle, published in his edition of the complete works of Bacon (Bacon 1799–1803, IV).
3. A French translation of selected aphorisms, contained in the *Précis de la philosophie de Bacon* by Jean-André De Luc (De Luc 1802, I, 101–111).
4. The first Italian translation of the *Novum organum*, originally printed as an anonymous publication in 1788 (Bacon 1788), and in 1810 in an edition with the name of his translator, Antonio Pellizzari (Bacon 1810).⁴ His work on Bacon was immensely influential in Italy and his translation of the *Novum organum* remained very successful among scholars.⁵ The publisher Domenico Oliveri reprinted the anonymous edition of 1788 three times in Palermo, in 1839, 1841 and 1844 (Deleo 1999, 125–140).
5. The 1733 edition of *The Philosophical Works of Francis Bacon*, edited by Peter Shaw (1694–1763), which includes the first complete translation of the *Novum organum* into English (Bacon 1733, II).⁶

I then have compared these translations with modern versions of the *Novum organum*: Michel Malherbe's French translation (Bacon 2010), Graham Rees's English one (Bacon 2004) and, finally, Paolo Rossi's Italian version (Bacon 1986, 515–795).

As far as *De augmentis scientiarum* is concerned, the following are the editions consulted:

1. The first translation into French, by Gilbert de Golefer (1632).⁷
2. Antoine de Lasalle's French translation of 1799–1800 (Bacon 1799–1803, II).
3. The first Italian translation by Antonio Pellizzari (Biblioteca Comunale di Treviso, MS 1408), published for the first time in 2013 with a critical commentary (Bacon 2013).
4. The first translation into English by Gilbert Watts in 1640 (Bacon 1640).⁸
5. Peter Shaw's 1733 English translation (Bacon 1733, I).

In Italian, the only existing translation of *De augmentis scientiarum* is the comparatively recent version by Enrico De Mas (Bacon 1965, II). The first French translation of the *Novum organum* is a partial translation by an unknown author, which

³This translation includes aphorisms 1 to 100 in Book 1, and aphorisms 1 to 11 in Book 2. The translation was first recorded by Fowler 1878, 144–145. See Sortais 1920–1922, I, 466, n. 4; Bacon 1986, 94–95; Fattori 2002, 236; 2005, 174; 2012, 420; Carabba 2014.

⁴For the synopsis I used this edition.

⁵See Menini 1841, 6; Crescimbeni 1836, VIII, iv; Rosmini Serbati 1986, 233.

⁶See Gibson 1950, n. 250. On Peter Shaw, see Golinski 2004, L, 116b–117b.

⁷Bacon 1632. There was a second edition in 1637. See Gibson 1950, n. 137.

⁸See Gibson 1950, n. 141a–b–c; Webster 2002 [1975], 49, 127–128; Lewis 2007, 10. On Gilbert Watts (?-1657), see De Quehen 2004, LVII, 723. For the occurrences I used the ed. 1674: Bacon 1674 (See Gibson 1950, n. 142).

can be dated to c. 1640–1650, although no information about its circulation is available. The term *idola* is regularly translated as *Idées*, and frequently paired to another noun using such hendyades as *Idées et Impressions* and *Idées et Formes*; only in one instance it is modified by an adjective in the phrase *faulses Impressions* (Bacon 2011, XV). The first two occurrences of the term, however, appear in the *Distributio operis* and rendered in the French text with the literal *Idoles*. Before proceeding to a comparative analysis of this version and the one by Lasalle, I would also like to signal the existence of another testimony for the term *idola* in seventeenth-century France, that is, Marin Mersenne's *La vérité des sciences* (1625), where in Chap. 16, entitled 'Whether Verulam, the former Chancellor of England, is right in rejecting the syllogism, and what opinions of his we can maintain', he regularly employs *idoles* (Mersenne 1625, 206–207).⁹ Although Mersenne's discussion is confined to the doctrine of the *idola*, which he presents as the *arcs-boutans* of Bacon's *organum*, this antecedent to the first French manuscript translation is nevertheless worth mentioning here (Mersenne 1625, 207). Gilbert de Golefer, author of the first French translation of *De augmentis scientiarum*, dated 1632, opted for the literal translation of *idola* as *idoles*, with only one exception to be discussed later (Bacon 1632).¹⁰

In the translations by Lasalle of both the *Novum organum* and *De augmentis scientiarum*, the term *idola* appears in the vast majority of cases as *fantômes*. In a certain number of aphorisms in the *Novum organum*, however, *fantômes* is paired with *préjugés*, which appears in brackets. In the preface, in the section entitled 'Extrait des deux premières parties du *Novum organum*', Lasalle gives an overview of the doctrine of the *idola* and of their several meanings, and here he uses the term *préjugés*:

Commençons donc par écarter les mauvais matériaux, et par nettoyer la place où nous voulons bâtir. On peut distinguer deux principales classes d'erreurs; savoir: les *erreurs fondamentales ou radicales*, et les *erreurs de détail*, ou *accidentelles*. La première classe peut encore se diviser en quatre genres; savoir: *préjugés de l'espèce*, *préjugés de l'individu*, *préjugés de commerce ou de société*, dont la principale source est l'*imperfection du langage*; enfin *préjugés d'école*, ayant pour causes l'excessive déférence pour les maîtres, et l'habitude des fausses méthodes (Bacon 1799–1803, IV, xv–xvi; emphasis added).¹¹

The use of *préjugés* in the text indicates its derivation from the *Analyse de la philosophie du chancelier François Bacon* (1755) by Alexandre Deleyre.¹² This latter work was printed anonymously and enjoyed great success; it was reprinted several times, and was largely responsible for establishing the reputation of Bacon as a materialist and non-believer.¹³ The *Analyse* is a digest of sorts, in which Deleyre, to quote Michel Malherbe's felicitous description, 'procède en recomposant la pensée

⁹Gibson 1950, n. 490. See Sortais 1920–1922, I, 468–469; Fattori 2000, 402–410; 2005, 173; 2012, 328–337.

¹⁰For a study of this translation, dedicated to the Marquis of Effiat, who commissioned it, see Le Doeuff 1984, 155–178.

¹¹On Antoine de Lasalle (1754–1829), see Blémond 2001, XIX, 1123.

¹²See Barbier 1882, I, 166. On Alexandre Deleyre (1726–1796), see D'Amat 1965, X, 818–819.

¹³Sortais 1920–1922, I, 482; Malherbe 1985, 391; Fattori 2003, 412–413; 2005, 179.

baconienne, et mélange extraits, paraphrases, collages, commentaires, sous des titres qui sont en partie de son cru: il ne cite jamais, ne passe pas au discours indirect, même quand l'emprunt est manifeste. Deleyre parle en lieu et place de Bacon' (Malherbe 1985, 391). In Chap. 15, entitled 'Des Préjugés', the *idola* are described as phantoms sent upon earth by a malevolent genius with the purpose of tormenting humanity: 'Les Préjugés sont autant de spectres et de phantômes qu'un mauvais génie envoya sur la terre, pour tourmenter les hommes; mais c'est une espece de contagion, qui, comme toutes les maladies épidémiques, s'attache sur-tout au Peuple, aux femmes, aux enfans, aux vieillards, et qui ne cède qu'à la force de l'âge et de la raison' (Deleyre 1755, 378). This passage is especially revealing about Deleyre's *modus operandi*, for, needless to say, there is nothing in the philosophy of Bacon which might correspond to a *mauvais génie* under any description. As for the statement concerning women's greater predisposition to be deceived by *idola*, this is taken up and reinforced by Lasalle in the 'Conclusion' to his preface, where he writes: 'De contribuer aussi quelque peu à l'instruction de cette moitié du genre humain, qui fait presque tout le bonheur ou le malheur de l'autre. Plus les femmes seront instruites, plus elles voudront et pourront contribuer à notre bonheur... La plupart de nos préjugés nous viennent des femmes dont nous avons été environnés dans notre enfance' (Bacon 1799–1803, IV, lxx–lxxi).

Lasalle also wrote an important footnote to Aphorism 39 of Part 1, where Bacon had described and named the four kinds of *idola*, remarking how the terminology devised by Bacon appeared to him both an example of bad taste and unhelpful. The terminological issue, and his pondered solution to the issue, are reasoned as follows:

J'ai rencontré des gens de lettres, de talens assez distingués, qui s'extasioient devant cette nomenclature qui nous paroît à nous de mauvais goût, et de plus, assez inutile; car nous ne voyons pas bien nettement en quoi elle peut aider à *interpréter* et à *imiter* la nature. Une *erreur*, un *préjugé* et un *fantôme* de l'esprit, ou une idée fantastique, ne sont pas précisément la même chose; une erreur est une opinion fausse; un *préjugé* est un jugement, vrai ou faux, porté avant l'examen; et un fantôme, une chimère, une idée fantastique ou chimérique, est une idée, et le plus souvent une image qui ne correspond à aucun objet réel, ou qui n'est point conforme à l'objet réel qu'elle doit représenter. Cependant, comme le but de ce premier livre est de préparer les esprits, en détruisant toutes les préventions, à ce mot *fantôme* qui pourroit déplaire à la plupart de nos lecteurs, nous substituerons (autant que le sens de l'original le permettra), le mot *préjugé*, qui, dans le langage reçu, a une signification beaucoup plus étendue que celle que je lui donne ici, en tirant sa définition de son étymologie; on le substitue assez généralement à celui d'erreur (Bacon 1799–1803, IV, 103–104).

The footnote was later quoted in full in the Appendix ('Concernant l'édition française des ouvrages de Bacon, par M. La Salle') to volume II of Jean-André De Luc's *Précis de la philosophie de Bacon* (De Luc 1802, II, 145–146).¹⁴ Shortly following the publication of the first two volumes of Lasalle's translation, De Luc published a pamphlet entitled *Bacon tel qu'il est*, arguing the need for a more accurate reading of Bacon's doctrines, from which he saw Lasalle to have 'deviated' frequently, in both the text and the commentary (De Luc 1800). Firstly, he observed

¹⁴On Jean-André De Luc (1727–1817), see Hoefler 1863, XXXII, 111–113.

that the encyclopaedists and the translator had purged Bacon's writing of all reference to religious questions; secondly, he criticized the terminology adopted by Lasalle in translating *idola*, a choice which could only lead to misunderstanding Bacon's philosophy: 'Toutes ces définitions sont claires, mais en traduisant par *fantômes*, le môt *idolum* employé par Bacon, M. La Salle a entièrement changé ses vues' (De Luc 1802, II, 146). De Luc argued that *idolum* should be translated in a literal way, for Bacon wanted the term to denote something more complex than mere prejudice; it was a figure of speech expressly devised to 'strike' the intellect and set his readers 'on guard': 'il vouloit désigner ces *préjugés* impérieux, qui dominent l'entendement humain, et qu'il encense comme des *idoles*; ainsi l'expression est très-propre en elle-même, et ce qu'elle a de frappant comme image, étoit destiné à réveiller l'entendement, à le faire tenir sur ses gardes' (De Luc 1802, II, 146. See Gemelli 1996, 53–97).

The first Italian translation of the *Novum organum* appeared in 1788 (Bacon 1788). Whereas the *Essays* had been translated into Italian as early as 1618 (Bacon 1618) (a state of affairs that almost exactly mirrors the one in France),¹⁵ the *Novum organum* and *De augmentis scientiarum* were both read in Latin. In the course of the eighteenth century, two editions of the *Novum organum* were published in Venice (Bacon 1762, 1775a) and two of *De augmentis scientiarum* (Bacon 1763, 1775b). When Antonio Pellizzari (1747–1845), a canon at Treviso, eventually undertook the translation of Bacon's Latin works, he remarked in his preface how the limited circulation of Bacon's work was partly a reflection of the coarse, barbarous Latin in which he wrote¹⁶:

However, since this classic author is perhaps not as known as he should, and since not everyone likes that the work is written in Latin, and indeed in a kind of Latin that is barbarous and coarse, I thought I might do a good service to our country, Italy, by translating the *Novum organum* into our language, for the work is a masterpiece that deserves to be read and studied by everyone.¹⁷

For the most part, Pellizzari translated the occurrences of *idola* in the *Novum organum* and *De augmentis scientiarum* as *idee* or *false idee*, though the effects of his translation of *De augmentis* are marginal in so far as it never came out in print. In a footnote to Aphorism 39, Part 1, Pellizzari explained his criteria in translating the four kinds of *idola* as *idee comuni* (the idols of the tribe), *idee personali* (the

¹⁵For a study of the 1618 edition as source for the first French edition of the *Essays* by Jean Baudoin (1619), see Fattori 2000, 388; 2002, 237; 2012, 312, 420–421.

¹⁶William Rawley in his *The Life of the Right Honourable Francis Bacon*, also remarked that '[i]n the composing of his books he did rather drive at a masculine and clear expression than at any fineness or affectation of phrases' (Bacon 1857–1874, I, 11). One reason is, as noted by Brian Vickers, 'for the Augustans he represented the style of an archaic, indecorous taste, and therefore had to be rejected' (Vickers 1968, 248).

¹⁷Bacon 1810, v: 'Nondimeno perché questo classico autore non è forse noto quanto dovrebbe; e perché a tutti per avventura non piace, ch'egli sia scritto in latino, anzi in un latino barbaro e duro; ho giudicato di far cosa utile alla nostra Italia col trasportare nell'idioma nostro il *Nuovo Organo*; opera veramente magistrale, e degna d'esser letta e studiata da tutti'. On Antonio Pellizzari, see Parise 2004, 237–250; Bacon 2013, 15–23.

idols of the cave), *idee di convenzione* (the idols of the market-place) and *idee di setta* (the idols of the theatre), and argued that the intent was to attenuate somehow the harshness of the terms: ‘I tried to smooth the words used by the author, as I did in many other places’ (‘Ho procurato di raddolcire i nomi, di cui si serve l’autore, come ho avuto cura di fare lo stesso in moltissimi altri luoghi’). Pellizzari, however, was concerned that, when it came to the *idola* which Bacon regarded as innate, the Italian rendering as *idee innate* could cause misunderstandings. In the *Distributio operis*, in which the distinction of *idola adsciticia* and *innata* is drawn, Pellizzari translated these terms with *idee avventizie o quasi innate*, taking pains in a footnote to clarify that these had to be understood as something separate and different in nature from the innate ideas of other philosophers: ‘I have defined them as “almost innate” rather than “innate”, as the author calls them, for they are not the innate ideas advocated by certain philosophers and banished by Locke’ (‘Si sono dette quasi innate piuttosto che innate, come le chiama l’autore, perché non sono le idee innate difese da alcuni filosofi, e sbandite dal Locke’). In the same footnote to Aphorism 39, Pellizzari clarified the importance of Bacon’s innate ideas:

Everyone sees that, although the author calls some of these ideas ‘innate’, he only intends to say that they originated with man. Let us compare the intellect to an eye that looks at objects through lenses. These objects will appear to the eye larger or smaller, elongated or shortened, sometimes variously coloured, sometimes changed in myriad different ways, following the changes of the spyglass and the lenses. The objects are the way they are; the images, however, undergo myriad variations. The fault of the lenses is that which is innate in the intellect.¹⁸

Pellizzari then took up the same question in his note to Aphorism 61, Part 1. Here he specified that the innate ideas discussed by Bacon were not to be confused with those in Descartes and Malebranche.

There is, however, only one occurrence in Pellizzari’s translation of the *Novum organum* (Aphorism 57, Part 1) in which *idola* is rendered as *prevenzioni*. The choice of the term *prevenzioni* might indicate a possible borrowing from Giacinto Sigismondo Gerdil (1718–1802), author of the 1755 *Introduzione allo studio della religione* (‘Introduction to the Study of Religion’), which we know was part of Pellizzari’s library (Gerdil 1755).¹⁹ In Part 1 of Gerdil’s book, entitled ‘On the prejudices (*prevenzioni*) contrary to religion’, the term *prevenzioni* indeed appears in the discussion about the ‘confused notions called “idols” by Bacon’ (Gerdil 1755, 10, 19–20). Gerdil explains that what he meant by the term *prevenzioni* was the suppositions which *soprapprendono* (i.e., catch one by surprise, unawares), and thereby

¹⁸ Bacon 1810, 44: ‘Ognun vede poi, che sebbene l’autore chiami innate alcune di queste idee, non intende dire se non che hanno l’origine loro sino dalla prima esistenza dell’uomo. Si assomigli l’intelletto all’occhio, che mira gli oggetti col mezzo di lenti. Questi gli compariscono ora più grandi, ora più piccioli, quando allungati, e quando accorciati, alle volte diversamente colorati e alterati in mille guise secondochè muta cannocchiale e lenti. Gli oggetti sono quelli che sono, ma le immagini loro soggiacciono a mille variazioni. Il difetto delle lenti è ciò ch’è innato nell’intelletto’.

¹⁹ On Giacinto Sigismondo Gerdil, see Stella 1999, LIII, 391–397; Borghero 2001, 31–61; 2011, 23–41; Valabrega 2004. See also Bacon 2013, 494 n. 52.

impose themselves on the minds of men as convictions. Thus confounded, men are prone to mistake falsehoods for truths, and become all too hasty in their assent: the apparent firmness in their judgement is merely an effect of insufficient consideration (Gerdil 1755, 10). Suppositions of this kind originate from a confused notion as to the nature of things – the same confused notion of things which, in Gerdil's opinion, Bacon had judiciously termed *idola*. The passage in which Gerdil introduces Bacon's theory of *idola* is worth quoting in full:

These unqualified and confused notions, being fallacious images of things, were named 'idols' by the wise Bacon of Verulam. As he says, the mind is so besieged by them, on every side and from all directions, that it is most difficult for the truth to penetrate therein; and should the truth reach the mind, even so those idols never refrain from appearing frequently, as from without, and reclaim the mind's attention and deflect it from the application needed to study the truth in a profitable manner. This shall infallibly occur, unless man stands always on the alert, suspiciously, and takes great care and diligence in countering the vexing appearance of these idols and their assaults. In order for them to be identified more easily (for, if we consider these spectres, it is sufficient to know them to make them vanish), that most illustrious man divided them into four classes, and he called the first *idola tribus*, which is to say idols of the *species*, for they are common to humankind and proceed from human nature, it being the case that man's mind, like a mirror that is not quite adjusted to the nature of things, will at times alter and distort the images of things while receiving them... The second class he called *idola specus*, which is to say idols of the *individual*, because besides the common imperfections of all of mankind, each man has a particular way of imagining and thinking which in him turns into a cave, wherein the pure light of the truth becomes liable to be affected in specific manners. The third he named *idola fori*, which means of *society*, and these are the ones which proceed from the ways in which men communicate and deal with each other, and from the abuses of the common speech which also flow into the disputes of the philosophers. Last are the *idola theatri*, i.e., of the systems.²⁰

According to Gerdil, the four classes of idols account for the several forms of mental biases (*prevenzioni*) against religion. Unlike Lasalle, who had found Bacon's

²⁰Gerdil 1755, 19–20: 'Ora coteste indeterminate nozioni e confuse, siccome immagini fallaci delle cose, furono con gran giudizio chiamate idoli dal savio Bacone di Verulamio: da questi viene l'animo, come dice Egli, d'ogn'intorno e per ogni parte cinto di sì stretto assedio, che riesce difficile assai alla verità il potere in esso penetrare; ed anche avendovi penetrato, con tutto ciò non tralasciano quegl'idoli di mostrarsi frequentemente, come al di fuori, ed a se richiamare l'attenzione dello spirito, e così divagarlo dall'applicazione richiesta, per proseguire con frutto lo studio del vero. Il che succederà senza fallo, quando l'uomo non istia sempre in sospetto e sull'avvertita, e non adoperi una particolare cura e diligenza in ribattere le moleste apparizioni e gli assalti di quegl'idoli. Per dare maggior facilità di riconoscerli, giacché, riguardo a sì fatti spettri, basta conoscerli per fargli sparire, li divise quel grandissimo Uomo in quattro classi, e li primi chiamò *idola tribus*, cioè idoli della *spezie*, che sono comuni al genere umano, e dall'imperfezione dell'umana natura procedono, essendo che l'animo dell'uomo, come specchio non del tutto proporzionato alla natura delle cose, nel riceverne l'immagini le modifica talvolta, le altera e le guasta... Il secondo genere chiamò Bacone *idola specus*, cioè idoli dell'*individuo*; perché oltre all'imperfezioni comuni a tutta la spezie umana, ha ogni uomo una particolare fantasia ed un particolare carattere di pensare, che diviene in lui, come una spelonca, in cui è soggetto il puro lume del vero a ricevere particolari alterazioni. I terzi Egli disse *idola fori*, cioè della *società*, e sono quelli, che procedono dalla vicendevole comunicazione ed usanza degli uomini fra loro, e dall'abuso del favellar comune che scorre anche nelle dispute de' filosofi. Gli ultimi *idola theatri*, o sia de' *sistemi*'.

terminology distasteful and pointless, Gerdil praised it as a tool by which to identify prejudices against religion and their origin. Although his work precedes the earliest Italian translation of the *Novum organum*, Gerdil is, nevertheless, an important figure in the vernacular history of *idola*. The same Aphorism 57 also contains the only occurrence of *idola* to have been translated as *preventions* by Lasalle. Given that Lasalle's translation follows Pellizzari's by eleven years, we must rule out the possibility that the French could have been a source for the Italian; it is also unlikely that Lasalle had access to the work of Gerdil, but the latter could plausibly have been a source for Pellizzari. Finally, Pellizzari's translation was reproduced almost verbatim, including the notes, in Giovanni Battista Menini's (1809–1874) *Scelti aforismi del Nuovo organo delle scienze di Francesco Bacone*, a collection of select aphorisms from Bacon, together with a number of philosophical and juridical definitions from the works of Gian Domenico Romagnosi (Menini 1841). Given the fundamentally derivative nature of this work, it has not been taken into account in compiling the synopsis.²¹

In the first English translation of the *De augmentis scientiarum* by Gilbert Watts (1640), the Latin term *idolum* is kept, except in two instances where Watts uses the phrase *fictions and idolaes* (Book 5, Chap. 4: see synoptic tables, Table 6) and *ideas* for *idola* (Book 5, Chap. 1, see Table 5). In both the translations of the *Novum organum* and *De augmentis scientiarum* Peter Shaw opted for the literal translation of *idola* as *idols*, with only one exception (*De augmentis scientiarum*, Book 5, Chap. 1), as we are going to see at the end of this chapter.

I will conclude now by discussing some examples from the synopsis appended to the end of this chapter, beginning with the occurrence of *idola* in Part 2 of the *Distributio operis* (see Table 1), where Bacon distinguishes acquired from innate idols – a distinction which is not made in the *Novum organum*, and which presented a problem for some translators. The seventeenth-century French translation has the hendiadys *idoles et les formes* for *idola*; thus adding the explicative term *formes*, which occurs again to translate *idola* in Aphorism 59, this time in the hendiadys *formes et Impressions*. This is one of only two instances in which the translator uses *idoles* – the other being the translation of *idolorum*, again in the *Distributio operis*. He then translates the Latin 'quibus occupatur Mens' with 'dont l'Intellect est pre-occupé' and, interestingly, *innata* with *naturelles*. Lasalle, who translates *idola* with *fantômes*, distinguishes between '*fantômes venus du dehors*' and '*fantômes innés*', and translates the Latin term *mens* with *esprit*, as does De Luc, whose choice for *idola* is *idoles*. In the translation of Aphorism 61, however, in which Bacon clarifies that the *idola theatri* are not innate, Lasalle replaces 'innate' with a periphrasis: 'ils y ont, pour ainsi dire, fait leur entrée en plein jour et publiquement'. Pellizzari, for his part, chose to translate *idola* with *idee*; then, fearing that this might lead to confusion with the innate ideas of Descartes and Malebranche, he decided to translate *innata* with *quasi innate*, and in a footnote alerted the reader to this through an

²¹ On Giovanni Battista Menini, see Albergoni 2006, 402, 404; Berengo 1980, 203–204, 217, 248, 253; Cattaneo 2001; 2005, 272, 273, 532, 659, 661. On Menini's *Scelti aforismi*, see Fattori 2000, 151; 2005, 183; 2012, 300–301.

explanation of the specific sense of the expression in Bacon. When the term occurs again in the *Distributio operis*, in a section where Bacon rules out the possibility that the other kind of idols, i.e., the innate ones, can be eradicated, Pellizzari chose to translate *idola* with *idee fattizie*.

Interesting observations can be made from the comparative analysis of the translations of Aphorism 39 (see Table 3) where Bacon mentions the four kinds of *idola*. The French translator, who renders *genera Idolorum* with *Sortes d'Idées* (although in the preface to the *Novum organum* and *Distributio operis* he had translated *genus* with *espece*),²² calls them 'Idées de la tribu où notion, de la fosse où caverne, du marché, du theatre où des philosophes'. Carlo Carabba interprets the phrase 'de la tribu où notion' as a copyist error which should be amended to *nation* (Bacon 2011, xviii, and 76 n. 5); the addition becomes even more significant if we think that in the *Valerius Terminus* (an unfinished manuscript treatise published in 1734 by Robert Stephens), Bacon had in fact qualified the *idola* of the first class as 'Idols of the Nation or Tribe' (Bacon 1857–1874, III, 242). Although the parentheses used to qualify the definitions of the idols of the second and third class are an addition to the previous formulations in the *Novum organum*, they are nevertheless consistent with Bacon's thought, and derive from Aphorisms 42, 43 and 44 of Part 1. In the aphorisms that follow, the translator tends to omit the full denominations of the *idola* systematically, and instead opts for the generic formulas *Idées de la premiere espece*, *Idées de la Seconde espece*, *Idées de la troisieme*, or for periphrases such as *Idées et Impressions qu'un chascun à en Son particulier* and *Idées et erreurs Introduites par une multitude de Sectes*. In Lasalle they become instead '*fantômes de race* (préjugé de l'espèce)', '*fantômes de l'antre* (préjugé de l'individu)', '*fantômes de commerce* (préjugé de langage)', '*fantômes de théâtre* (préjugé d'école)'. In the important footnote to this passage discussed above, Lasalle remarks that he is aware that his readers may find the term *fantômes* disagreeable: wherever possible, as such, he endeavours to replace it with *préjugé* – a term which in his opinion is easier to understand. This explanation, however, occasioned the harsh criticism of De Luc. Peter Shaw regularly uses the term *idols*. As for the Italian translation, we have already reviewed the solution devised by Pellizzari for *idola*, which he, too, discussed in a footnote. Since he thought that the term sounded too harsh to the ears of his contemporaries, he used such Italian words as *idee comuni*, *idee personali*, *idee di convenzione*, *idee di setta*.

Aphorisms 23 and 124 (see Tables 2 and 4) in which the idols of the mind are contrasted with the ideas in the mind of God, must have posed an interesting problem for those translators who had generally translated *idola* as *idee*. In the French manuscript translation we have Aphorism 23 only; the opposition between man and God is neutralized in so far as the phrase *Idées et les formes* refers to both: what still holds is the fundamental distinction between the 'decretz et maximes uaines et Inutiles et les urays marques, Signatures et Impressions'. By contrast, Lasalle opposes the '*fantômes de l'esprit humain*' to the '*idées de l'esprit divin*', and with the complex relative clause 'qu'on y apperçoit quand on sait les observer et les

²²Bacon 2011, 40 and 48.

voir’, he translates the plain Latin verb *inveniuntur*. Shaw opposes *idols* to *ideas*, translating ‘inter placita quaedam inania, et veras signaturas’ with ‘betwixt certain vain Conceits, and the real Characters’. Pellizzari, finally, who consistently translated *idola* with *idee* or *false idee*, in order to safeguard the distinction between man and God, in these two aphorisms translates *idola* with *fantasmi*.

The two instances which stand apart from all others, and seem to have led all translators to take greater interpretative liberties with the text, are the first two occurrences of *idola* to appear in *De augmentis scientiarum*, Book 5, Chap. 1 (see Table 5). Golefer, who always translates *idola* with *idoles*, here employs *representations* and then renders *phantasia* as *imagination*. The same device appears in Lasalle, Watts and Shaw. In a footnote Lasalle argues that here Bacon must have confused memory and imagination. Only the Italian translators Pellizzari and De Mas preserve the term *phantasia*. Both Lasalle and Pellizzari have, respectively, *images* and *immagini* for *idola*.²³ Watts, who in the vast majority of cases employs the Latin term *idolum*, in this instance translates *idola* with *ideas*. Shaw, who always translates *idola* with *idols*, here uses *notions*.

Appendix: Occurrences of *idolum* in *Novum organum* and *De augmentis scientiarum* (and Their English, French and Italian Translations)

Table 1. *Distributio operis*

BACON (2004, 34)	<i>Idola</i> autem, à quibus occupatur Mens, vel Adscitia sunt, vel Innata.
ms. BNF FF 19096 (Bacon 2011, 39)	Or les Idoles et les formes dont l’Intellect est preoccupé Sont où estrangeres, où naturelles.
LASALLE (Bacon 1799–1803, IV, 18)	Or, la partie <i>destructive</i> , qui est la première de notre division, se subdivise en trois autres répondantes aux trois espèces de <i>fantôme s</i> qui assiègent l’esprit humain. En effet, ce son ou des fantômes <i>venus du dehors</i> [...] ou des <i>fantômes innés</i> et comme inhérens à la substance même de l’entendement.
DE LUC (1802, I, 102)	Les idoles, (dit-il) dont l’esprit humain est obsédé, sont ou <i>adventives</i> ou <i>innées</i> .
MALHERBE (BACON 2010, 80)	Or les idoles qui accaparent l’esprit sont ou importées, ou innées.
REES (BACON 2004, 35)	Now the Idols which occupy the mind are either extrinsic or innate.

(continued)

²³ Graham Rees remarks that the English translation in Bacon 1857–1874, IV, 405–406 uniformly renders *idola* as ‘images’. See Bacon 2004, 506.

PELLIZZARI (BACON 1810, 19)	Le idee poi, dalle quali è occupata la mente, o sono avventizie, o quasi innate(b). (b)(Si sono dette quasi innate piuttosto che innate, come le chiama l'autore, perché non sono le idee innate difese da alcuni filosofi, e sbandite dal Locke. Leggasi la nota (d) all'Afor. 39).
ROSSI (BACON 1986, 536)	Gli idoli che occupano la mente umana sono o acquisiti o innati.

Table 2. *Novum organum*, Book 1, Aphorism 23

BACON (2004, 72)	Non leve quiddam interest inter humanae mentis Idola , et divinae mentis Ideas , hoc est, inter placita quaedam inania, et veras signaturas, atque impressiones factas in creaturis, prout inveniuntur.
ms. BNF FF 19096 (Bacon 2011, 70)	Il n'y a pas peu de différence entre les Idées et les formes de l'Intellect humain et divin c'est a dire entre ces decretz et maximes uaines et Inutiles et les urays marques, Signatures et Impressions faites es Creatures comme elles Se trouuent en uerité.
LASALLE (Bacon 1799–1803, IV, 85)	Ce n'est pas une légère différence que celle qui se trouve entre les fantômes de l'esprit humain et les idées de l'esprit divin; je veux dire entre certaines opinions frivoles et les vraies marques, les vrais caractères empreints dans les créatures, et qu'on y apperçoit quand on sait les observer et les voir telles qu'elles sont.
DE LUC (1802, I)	–
MALHERBE (Bacon 2010, 106)	La différence n'est pas mince entre les idoles de l'esprit humain et les idées de l'esprit divin, entre de certains dogmes creux et le vraies marques empreintes dans les créatures, telles qu'on peut les découvrir.
SHAW (Bacon 1733, II, 348)	There is a wide Difference betwixt the Idols of the human Mind , and the Ideas of the divine Mind : that is, betwixt certain vain Conceits, and the real Characters and Impressions stamp'd upon the Creatures, as they are found.
REES (BACON 2004, 73)	Great is the gulf between the Idols of the human mind, and the ideas of the divine, i.e. between certain empty opinions and the true signatures or impressions stamped on created things as we find them.
PELLIZZARI (Bacon 1810, 41)	Differiscono per immenso tratto i fantasmi della mente umana dalle idee dell'intelletto divino; cioè certe vane immaginazioni, dalle impronte vere e reali e da' suggelli.
ROSSI (BACON 1986, 556)	Non è lieve la differenza fra gli idoli della mente umana e le idee della mente divina, cioè tra fallaci opinioni e i veri sigilli e le impronte impressi da Dio sulle creature così come si trovano.

Table 3. *Novum organum*, Book 1, Aphorism 39

BACON (2004, 78)	Quatuor sunt genera <i>Idolorum</i> quae mentes humanas obsident. Iis (docendi gratiâ) nomina imposuimus; ut primum genus, <i>Idola Tribûs</i> ; secundum, <i>Idola Specûs</i> ; tertium, <i>Idola Fori</i> ; quartum, <i>Idola Theatri</i> vocentur.
ms. BNF FF 19096 (Bacon 2011, 76)	Or Il y a quatre Sortes d' Idées qui tiennent l'Intellect comme assiégé, lesquelles pour plus facile Instruction nous baptirons chacune de leur nom propre, Celles de la premiere Se nomment Idées de la tribu où notion , de la Seconde de la fosse où caverne , C'est a dire de l'Interieur de l'homme en Son Individu, de la troisieme du marché , comme qui dirait du Commerce et trafic des hommes, de la quatrieme et derniere du theatre où des philosophes .
LASALLE (Bacon 1799–1803, IV, 102–103)	Ces <i>fantômes</i> qui obsèdent l'esprit humain, nous avons cru devoir (toujours pour nous faire mieux entendre) les distinguer par les quatre dénomination suivantes: <i>fantômes de race</i> (préjugés de l'espèce), <i>fantômes de l'antré</i> (préjugés de l'individu), et <i>fantômes de commerce</i> (préjugés de langage); <i>fantômes de théâtre</i> (préjugés d'école)(1). (1)(J'ai rencontré des gens de lettres, de talents assez distingués, qui s'extasioient devant cette nomenclature qui nous paroît à nous de mauvais goût, et de plus, assez inutile; car nous ne voyons pas bien nettement en quoi elle peut aider à <i>interpréter</i> et à <i>imiter</i> la nature. Une <i>erreur</i> , un <i>préjugé</i> et un <i>fantôme</i> de l'esprit, ou une idée fantastique, ne sont pas précisément la même chose; une erreur est une opinion fausse; un préjugé est un jugement, vrai ou faux, porté avant l'examen; et un fantôme, une chimère, une idée fantastique ou chi mérique, est une idée, et le plus souvent une image qui ne correspond à aucun objet réel, ou qui n'est point conforme à l'objet réel qu'elle doit représenter. Cependant, comme le but de ce premier livre est de préparer les esprits, en détruisant toutes les préventions, à ce mot <i>fantôme</i> qui pourroit déplaire à la plupart de nos lecteurs, nous substituerons (autant que le sens de l'original le permettra), le mot <i>préjugé</i> , qui, dans le langage reçu, a une signification beaucoup plus étendue que celle que je lui donne ici, en tirant sa définition de son étymologie; on le substitue assez généralement à celui d'erreur).
DE LUC (1802, I, 105)	Ces <i>idoles</i> dont l'esprit humain est obsédé, sont de quatre sortes, et pour le distinguer, nous les nommerons: Idoles de tribu, idoles de l'antré (ou de l'individu), idoles de commerce, idoles du théâtre (idola tribus, idola specus, idola fori, idola theatri).
MALHERBE (Bacon 2010, 110)	De quatre genres sont les idoles qui assiègent l'esprit humain. Pour plus de clarté, nous leur avons donné des noms distincts: nous appellerons celles du premier genre les idoles de la race , celles du second les idoles de la caverne , celle du troisième les idoles de la place publique , et celles du quatrième genre les idoles du théâtre .
SHAW (Bacon 1733, II, 351)	There are four Kinds of <i>Idols</i> that possess the Mind of Man. In order to be the better understood, we will assign Names to them; and call the first Kind, <i>Idols of the Tribe</i> ; the second, <i>Idols of the Den</i> ; the third, <i>Idols of the Market</i> ; and the fourth, <i>Idols of the Theatre</i> .
REES (Bacon 2004, 79)	There are four kinds of <i>Idols</i> wich beset human minds. To these (for instruction's sake) I have given names, so that the first kind are called <i>Idols of the Tribe</i> ; the second <i>Idols of the Cave</i> ; the third <i>Idols of the Market</i> ; the fourth, <i>Idols of the Theatre</i> .

(continued)

PELLIZZARI (BACON 1810, 44)	Quattro maniere d' idee ci ha, che viziano le menti umane. Per meglio spiegarsi le appelliamo co' seguenti nomi; la prima maniera: idee comuni ; la seconda: idee personali ; la terza: idee di convenzione ; la quarta: idee di setta (d) *. * (d) (Ho procurato di raddolcire i nomi, di cui si serve l'autore, come ho avuto cura di fare lo stesso in moltissimi altri luoghi. Ognun vede poi, che sebbene l'autore chiami innate alcune di queste idee, non intende dire se non che hanno l'origine loro sino dalla prima esistenza dell'uomo. Si assomigli l'intelletto all'occhio, che mira gli oggetti col mezzo di lenti. Questi gli compariscono ora più grandi, ora più piccoli, quando allungati, e quando accorciati, alle volte diversamente colorati e alterati in mille guise secondochè muta cannocchiale e lenti. Gli oggetti sono quelli che sono, ma le immagini loro soggiacciono a mille variazioni. Il difetto delle lenti è ciò ch'è innato nell'intelletto).
ROSSI (BACON 1986, 559–560)	Quattro sono i generi di idoli che assediano la mente umana. Per farci intendere abbiamo imposto loro dei nomi: chiameremo il primo genere idoli della tribù ; il secondo idoli della spelonca ; il terzo idoli del foro ; il quarto idoli del teatro .

Table 4. *Novum organum*, Book 1, Aphorism 124

BACON (2004, 186)	Sciant itaque homines (id quod superius diximus) quantum intersit inter humanae Mentis Idola , et divinae Mentis Ideas .
ms. BNF FF 19096 (Bacon 2011)	–
LASALLE (Bacon 1799– 1803, IV, 408)	(the aphorism is numbered as 123) Que les hommes conçoivent donc une fois (et c'est ce que nous avons déjà dit), quelle différence infinie se trouve entre les fantômes de l'entendement humain et les idées de l'entendement divin.
DE LUC (1802, I)	–
MALHERBE (BACON 2010, 177)	Que les hommes sachent (nous l'avons dit plus haut) quelle différence il y a entre les idoles de l'esprit humain et les idées de l'esprit divin.
SHAW (Bacon 1733, II, 411)	and therefore, let Men well consider, and understand, the <i>difference there is between the Idols of the human Mind, and the Ideas of the divine Mind.</i>
REES (BACON 2004, 187)	So let men know (as I have said above) how great is the gulf between the Idols of the human mind, and the Ideas of the divine.
PELLIZZARI (BACON 1810, 118)	Intendano gli uomini, lo ripeto ancora, quanto sieno differenti i fantasmi della mente umana dalle Idee dell'intelletto divino.
ROSSI (BACON 1986, 630)	Comprendano dunque gli uomini (come già abbiamo detto) quanto sia grande la differenza che intercorre fra gli idoli della mente umana e le idee della mente divina.

Table 5. *De dignitate et augmentis scientiarum*, Book 5, Chap. 1

BACON (1857–1874, I, 61)	Nam sensus idola omnigena Phantasiae tradit, de quibus postea Ratio judicat: at Ratio vicissim idola electa et probata Phantasiae transmittit, priusquam fiat executio decreti.
GOLEFER (Bacon 1632, 323)	Car le Sens presente à l'Imagination toute sorte de representations , sur lesquelles la Raison donne son iugement; apreselle renuoye à la mesme Imagination, celles qu'elle a chosi & approuué, auparavant que mettre en effect ce qui a esté resolu.

(continued)

LASALLE (Bacon 1799–1803, II, 229)	Car le sens livre à l'imagination (1) les images de toute espèce; images dont ensuite la raison juge. (1)(Il prend ici la mémoire pour l'imagination)
WATTS (Bacon 1674, 140)	For <i>Sense</i> sends over all sorts of Ideas unto the <i>Imagination</i> , upon which, Reason afterwards fits in Judgement: And <i>Reason</i> interchaengeably sends over selected and approved Ideas to the <i>Imagination</i> before the Decree can be acted.
SHAW (Bacon 1733, I, 114)	Sense commits all sorts of Notions to the Imagination; and the Reason afterwards judges of them. In like manner Reason transmits select and approved Notions to the Imagination, before the Decree is executed.
PELLIZZARI ms. Biblioteca Comunale di Treviso 1408 (Bacon 2013, 241)	Imperocchè il senso trasmette alla fantasia ogni maniera d' immagini , delle quali poi giudica la Ragione: ma anche la ragione a vicenda rimanda alla Fantasia le immagini ch'ella ha trascelte ed approvate, prima che sia mandata ad effetto la presa determinazione.
DE MAS (Bacon 1965, II, 240)	Infatti il senso manda alla fantasia idoli di ogni genere, dei quali poi la ragione giudica; e viceversa la ragione trasmette alla fantasia gli idoli , prescelti e approvati prima che avvenga l'esecuzione della decisione presa.

Table 6. *De dignitate et augmentis scientiarum*, Book 5, Chap. 4

Bacon (1857–1874, I, 644)	Neque enim credibile est (si singula percurrantur et notentur) quantum agmen Idolorum philosophiae immiserit naturalium operationum ad similitudinem actionum humanarum reductio
Golefer (Bacon 1632, 372)	Car l'on ne sçauroit croire, si l'on considere toutes choses par le menu, combien d' Idoles a mis dans la Philosophie, la reduction des operations naturelles à la similitude des actions humaines
Lasalle (Bacon 1799–1803, II, 326)	Car il ne pas croyable (pour peu qu'on veuille entrer, sur ce sujet, dans certains détails), quelle armée de fantômes a introduit dans la philosophie ce préjugé, d'après lequel on s'imagine que <i>les opérations de la nature ressemblent aux actions humaines</i>
Watts (Bacon 1674, 160)	for it is not credible (if all Particulars were scann'd and noted) what a troop of Fictions and Idolaes the reduction of the operations of Nature, to the similitude of humane Actions, hath brought into <i>Philosophy</i>
Shaw (Bacon 1733, I, 133)	'Tis incredible what a number of Idols have been introduced into Philosophy, by the reduction of <i>Natural Operations to a correspondence with human Actions</i>
Pellizzari ms. Biblioteca Comunale di Treviso 1408 (Bacon 2013, 263)	Imperciocchè non può credersi qual immensa turba di false idee (87); l'uso voglia altri ad una ad una tutte numerarle e notarle, introdusse nella Filosofia il richiamar le naturali operazioni alla simiglianza colle azioni umane (87) (Quantunque negli altri luoghi sia stato traslatato il vocabolo <i>idola</i> in idee, con vocabolo generico, lasciando al leggitore che intenda delle false, o come alcuni le chiamano pregiudizj, qui però abbiam creduto bene Specificarle per maggior chiarezza)
De Mas (Bacon 1965, II, 277)	Non si può credere, per quanto si scenda nei particolari e si esaminino uno per uno, quale schiera d' idoli abbia introdotto nella filosofia il pregiudizio di considerare le operazioni naturali a somiglianza delle azioni umane

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List of Contributors

Miranda Anderson is a Research Fellow at the University of Edinburgh and she is the initiator of the AHRC-funded project ‘A History of Distributed Cognition’ (www.hdc.ed.ac.uk). Recently claims have been made in philosophy of mind and cognitive science that the mind is distributed or extended across the brain, body and world. The HDC project explores the historical nature of this notion through an examination of philosophical, scientific and cultural works from classical antiquity to the mid-twentieth century. Anderson’s latest book, *The Renaissance Extended Mind* (Houndmills, Basingstoke: Palgrave Macmillan, 2015), similarly explores parallels (and contrasts) between recent philosophical theories on the extended mind and analogous ideas in philosophical, scientific, cultural and literary works circulating between the fifteenth and early-seventeenth century. She was awarded a Leverhulme Trust Early Career Fellowship (2011–2013) which enabled the research that led to this paper. The author can be reached at miranda.anderson@ed.ac.uk.

Daniel C. Andersson was educated at St. John’s College, Oxford and the Warburg Institute, London. He is currently a Research Fellow at Wolfson College, Oxford, and teaches part-time at the Ecole Normale Supérieure, Lyon. He has wide-ranging interests in philology, philosophy and the history of religion. He is also editing, with Rhodri Lewis and Sophie Weeks, a volume in the Oxford Francis Bacon series.

Sorana Corneanu is Associate Professor of English (English Department) and researcher in early modern studies (Foundations of Modern Thought Research Centre) at the University of Bucharest. She is the book review editor of the *Journal of Early Modern Studies* (Zeta Books). In addition to articles on early modern philosophy, literature and intellectual history, she is the author of *Regimens of the Mind: Boyle, Locke, and the Early Modern Cultural Animi Tradition* (Chicago: University of Chicago Press, 2011) and co-editor, with Guido Giglioli and Dana Jalobeanu, of *Francis Bacon and the Medicine of the Mind: Late Renaissance Contexts*, special issue of *Perspectives on Science* (Cambridge, MA: MIT Press,

2012), and *Francis Bacon and the Reconfiguration of Early Modern Natural History*, special issue of *Early Science and Medicine* (Leiden: Brill, 2012).

Marta Fattori is Emeritus Fellow at the University of Rome ‘La Sapienza’. She has published widely on Francis Bacon and on the terminology of early modern philosophy (sixteenth and seventeenth centuries). In 1980 she published the *Lessico del Novum Organum di Francis Bacon*, followed by many articles, which have now been collected in *Linguaggio e filosofia nel Seicento europeo* (Florence: Olschki, 2000). Her studies on Bacon have also appeared in French as *Études sur Francis Bacon* (Paris: PUF 2012). Her research in the Archive of the S. Uffizio led her to find and publish all the documents concerning the condemnation of Bacon’s *De augmentis scientiarum*. In addition, she has produced several articles about the censures involving Thomas Hobbes, Bayle’s *Nouvelles de la république des lettres*, Peter Alvinczi’s *Machiavellizatio* and Leonardo Di Capua. Since 1993, she has been the Principal Investigator in a PRIN project on ‘Scientific and Literary Correspondences’. She is the editor of the homonymous series published by Olschki (Florence). Since 1998, she is a member of the editorial board of the Oxford Francis Bacon.

Guido Gigliani teaches Renaissance Philosophy at the Warburg Institute, School of Advanced Study, University of London. His research is focused on the interplay of life and imagination in the early modern period. He has published on such authors as Girolamo Cardano, Tommaso Campanella and Francis Glisson. Together with Sorana Corneanu, Dana Jalobeanu and James A. T. Lancaster, he took part in the European Research Council (ERC) project on ‘The Medicine of the Mind and Natural Philosophy in Early Modern England: A New Way of Interpreting Francis Bacon’ (2009–2014).

Dana Jalobeanu is Reader in Philosophy and Director of the Institute of Research in the Humanities, University of Bucharest (IRH-UNIBUC). Her work on the emergence of experimental philosophy combines the History and Philosophy of Science perspective (HPS) with history of science and history of philosophy. She is co-editor of the *Journal of Early Modern Studies*, executive editor of *Society and Politics* and co-organizer of the Princeton-Bucharest Seminar in Early Modern Philosophy. She is the Principal Investigator of the research grant *From Natural History to Science: The Emergence of Experimental Philosophy* (PCE Research Grant 2011–2016). Among her recent publications, *The Art of Experimental Natural History: Francis Bacon in Context* (Bucharest, Zeta Books 2015) and (with Peter Anstey, eds), *Vanishing Matter and the Laws of Nature: Descartes and Beyond* (London: Routledge 2011).

Vera Keller (AB Harvard ’02; PhD Princeton ’08) is an Assistant Professor of History at the Robert D. Clark Honors College, University of Oregon. A historian of science and an early modern Europeanist, Keller is interested in the co-production of science and politics. She has published over a dozen articles, and her first book, *Knowledge and the Public Interest, 1575–1725*, was published in 2015 by Cambridge University Press. She is currently a Rare Books School-Mellon Fellow in Critical

Bibliography and an American Council of Learned Societies' Charles A. Ryskamp Research Fellow.

James A.T. Lancaster is an intellectual historian, who received his PhD from the Warburg Institute in London. He is currently a Teaching Fellow in the Department of History at Royal Holloway, where he is in the process of writing a book on the interrelation of religion and the natural world in the thought of Francis Bacon. In addition, as a board member of the Oxford Francis Bacon (OFB), James has been responsible for compiling the most comprehensive bibliography to date of both editions of the works of, and secondary sources on, Francis Bacon. His publications include: 'The Semantic Structure of Evolutionary Biology as an Argument Against Intelligent Design' in *Zygon: The Journal of Religion and Science*; 'Natural Knowledge as a Propaedeutic to Self-Betterment: Francis Bacon and the Transformation of Natural History' in *Early Science and Medicine*; and 'Natural Histories of Religion: A (Baconian) "Science"?' in *Perspectives on Science*.

Silvia Manzo is Professor of Early Modern Philosophy in the Department of Philosophy, National University of La Plata (Argentina) and Research Fellow of the National Research Council (CONICET). Her publications include *Entre el atomismo y la alquimia: La teoría de la materia de Francis Bacon* (Buenos Aires: Biblos, 2006), 'Certainty, Laws and Facts in Francis Bacon's Jurisprudence', *Intellectual History Review*, 24, 4 (2014), 457–478; 'Probability, Certainty and Facts in Francis Bacon's Natural Histories: A Double Attitude Towards Skepticism', in *Skepticism in the Modern Age: Building on the Work of Richard Popkin*, ed. by John Christopher Laursen, Gianni Paganini and Jose Maia Neto (Leiden: Brill, 2009); 'Francis Bacon's Natural History and Civil History: A Comparative Survey', *Early Science and Medicine*, 17 (2012), 32–61; 'Francis Bacon: Freedom, Authority and Science', *The British Journal of the History of Philosophy*, 14 (2006), 245–273. She has published translations into Spanish of Nicholas of Cusa, Francis Bacon and G. W. Leibniz. She is also the author of the general introduction to Francis Bacon, *Scritti scientifici*, ed. by Benedino Gemelli (Turin: UTET, 2010). Currently, she is investigating the early modern concept of laws of nature and is working on a book project dealing with the reception of Francis Bacon.

Marialuisa Parise received her PhD in History of Philosophy and History of Ideas from the University of Rome, 'La Sapienza' and in 2014 she was the recipient of a five-month fellowship offered by the Accademia Nazionale dei Lincei in partnership with the British Academy. She works on the European legacy of Francis Bacon, especially in Italy, concentrating on issues of translation and philosophical lexicography. She is the author of *La prima versione italiana del De dignitate et augmentis scientiarum di Francis Bacon tradotto da Antonio Pellizzari* (Rome: L'Erma' di Bretschneider, 2013). Among her articles: 'Moderni contro moderni: L'uso di Bacon e di Galilei nell'apologetica cattolica tra Sette e Ottocento', in *Pensare la modernità*, ed. by Giorgio Grimaldi (Villasanta: Limina Mentis, 2012), pp. 433–474; 'Lettere inedite a Francesco Colangelo nei manoscritti Ferrajoli 867 e 941 della Biblioteca Vaticana', *Giornale Critico della Filosofia Italiana*, 91 (2012), pp. 44–60.

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