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Roger Bacon: Richard Rufus' Successor as a Parisian Physics Professor

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Source: *Vivarium*, Vol. 35, No. 2, Roger Bacon and Aristotelianism (1997), pp. 222-250

Published by: [BRILL](#)

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Accessed: 01/01/2015 20:45

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REGA WOOD

Why did Roger Bacon despise Richard Rufus, calling him the worst and most famous among the foolish multitude? It is a question whose answer may have little to do with Rufus. Bacon disliked some of the most eminent, learned men of his time. Albertus Magnus and Thomas Aquinas earned Bacon's contempt just as Rufus did.<sup>1</sup> Still, Bacon's dislike of Rufus was not irrational. Bacon was opposed to the developments in what we now call "scholasticism" which are exemplified by Rufus.

Bacon was an accomplished linguist by the standards of the time and the author of Greek and Hebrew grammars; he was quite widely read in the literature of the Arabic philosophy; he was convinced of the value of mathematics; and he was committed to an allegorical approach to theology.—By contrast, Rufus probably could read only Latin; among the Arabs he felt a strong need to come to terms only with Averroes. In mathematics Rufus showed no special interest; even in logic, about whose importance they agreed, the two men disagreed. Rufus asserted and Bacon denied that correct assertions could be made about empty classes.<sup>2</sup>

And Rufus was to carry the day. Even the many later logicians who agreed with Bacon rather than Rufus on the question of empty sets saw the enterprise of philosophy and theology in the same terms Rufus did.

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<sup>1</sup> *Compendium studii philosophiae*, c. 5, ed. J.S. Brewer, London 1859, 426; *Compendium studii theologiae*, c. 4, n. 86, ed. T.S. Maloney, Leiden 1988, 86. Henceforth *Comp. ph.* and *Comp. th.*

Thanks are owed to Jeremiah Hackett for helpful replies to a series of questions about Bacon and for comments on this article.

<sup>2</sup> Bacon, *Comp. th.*, p. 2a, c. 4, n. 85, ed. Maloney, 86; Rufus, *Sent. Ox.*, III d. 21, as cited by F. Pelster, *Der Oxforder Theologe Richardus Rufus O.F.M. über die Frage: "Utrum Christus in triduo mortis fuerit homo,"* in: *Recherches de Théologie ancienne et médiévale*, 16 (1949), 259-80. See also d. 25, Oxford, Balliol 62, f. 230<sup>vb</sup>: "Nam tempus aliter est de essentia articuli, aliter de essentia enuntiabilis. Tempus enim est de articulo secundum essentiam suam, sed secundum differentias suas quae omnes eidem veritati et articulo inesse possunt est de essentia enuntiabilis, ergo etc. Ergo cum eadem veritas sit sub differentia praeteriti, praesentis et futuri, patet quod idem articulus est Christum esse natum in *a*, et nasciturum in *a*, et nasci in *a*, et tamen tria sunt enuntiabilia propter tres differentias temporis."

Like Rufus, they omitted allegorical moralizing from their lectures on theology. When lecturing on theology, they were preoccupied, as Rufus was, with metaphysical problems and even with topics in natural philosophy such as substantial change and beginning and ceasing. They shared Rufus' relatively narrow knowledge of the history of philosophy and his weaknesses in language and mathematics.

When we consider the big picture, Bacon appears as a defender of the breadth of early thirteenth century learning. Taking another more fine grained approach, however, a different picture emerges, a picture in which Rufus, not Bacon, defends a more old-fashioned early 13th century scholasticism. And it is that picture I want to sketch here. This approach starts with what Rufus and Bacon have in common: the period in their lives before they became Franciscans when they taught Aristotle's *libri naturales* at Paris.

Specifically, I am going to compare and contrast Bacon and Rufus as lecturers on the *Physics*, a task which they undertook about ten years apart: Rufus before 1238 and Bacon before 1247.<sup>3</sup> These lectures may have followed each other closely, since Bacon lectured for an exceptionally long period, as he himself reported and as is suggested by the fact that he prepared twelve major commentaries.<sup>4</sup> The lectures with which we will be concerned are stylistically as well as chronologically quite close: both are sets of brief questions on controversial points in the text, rather than running commentaries or synopses. Bacon prepared two such lecture courses. Many of the questions in both of these courses are longer and better developed than those of Rufus, and Bacon is often concerned with somewhat different issues. That is what we should expect, since Bacon was probably not Rufus' immediate successor, but very likely followed Robert Kilwardby. Still, there are enough points of contact for the contrast between Rufus and Bacon as physics professors to be instructive.

<sup>3</sup> 1247 is the date by which Bacon must have left Paris for Oxford, since he saw Thomas of Wales, probably when Thomas served as the Franciscan lector at Oxford, and Thomas departed Oxford as Bishop of St. David in Wales in 1247. I accept Crowley's contention that Bacon studied with Adam Marsh and also briefly with Thomas of Wales at Oxford after his first sojourn at Paris, cf. Crowley, *Roger Bacon*, Louvain 1949, 27-9. Since as Hackett has pointed out there is also good reason to believe that Bacon was at Paris until 1247, it seems to me that Bacon probably made the move in 1247. Cf. Hackett, *Scientia Experimentalis: From Robert Grosseteste to Roger Bacon*, in: J. McEvoy (ed.), *Robert Grosseteste: New Perspectives*, Steenbrugis 1995, 95.

<sup>4</sup> *Comp. ph.*, c. 8, p. 468; Bacon, *Quaestiones supra libros octo Physicorum Aristot.*, ed. F. Delorme, in: *Opera hactenus inedita Rogeri Baconi*, Vol. 13, ed. F. Delorme and R. Steele, (Oxford 1935), xxx. Hereafter citations of this work will take the form *Qso Physics*, XIII: page number.

The comparison will show two men with vastly different attitudes toward the old-fashioned neo-Platonic understanding of Aristotle, which preceded the introduction of the *libri naturales*, and toward Averroes. Surprisingly, as a physics professor, not only does Rufus defend old-fashioned scholasticism, but he, rather than Bacon, challenges Averroes' interpretation of Aristotle. That is the picture which emerges from the examination of five topics: Platonic ideas, final cause, the eternity of the world, projectile motion, and the place of the heavens.

### 1. Platonic Ideas

Scholastics were not free to accept Aristotle's complete rejection of Platonic ideas (*Met.* c. 11. 1, 1059b2)—or, as medievals would have described them, divine ideas. Still, views about divine ideas varied considerably. And on this issue, Rufus and Bacon represent two extremes.<sup>5</sup> Rufus believed God could be correctly characterized as the exemplary form of everything which is. He held that God as the first cause is the form of all things or their exemplar, just as a seal is the form of wax; the first cause is also the first form.<sup>6</sup>

Bacon explicitly considers this view, asking whether there is "one first form just as there is one first matter." His reply is negative, since for the physicist there is no one first form in nature. Only at the instant of creation is there a single exemplar form (*in primo exitu rerum . . . per creationem, una est forma, scilicet exemplar*). Subsequently (*in secundo exitu, scilicet in esse physico . . . per naturam*), in the natural world there is no first form.<sup>7</sup>

On the topic of the number of divine ideas, early scholastics were also divided. Most thirteenth century authors, influenced by Anselm, held that God has only one idea, just as he has one essence.<sup>8</sup> By contrast, Augustine,

<sup>5</sup> For a discussion of Bacon's reluctant and minimal acceptance of innate ideas, cf. Crowley, 167-80.

<sup>6</sup> Rufus, *In Phys.* I, Erfurt, Q. 312, f. 1<sup>vb</sup>: "Et quia causa prima est in triplici genere causae, ideo eius proprium est cognoscere per illas tres causas. Intelligendum quod prima causa est forma omnium sive [?] exemplar sicut sigillum est forma cerae." Hereafter *In Phys.*

Rufus, *In Metaph.* I (Vatican, lat. 4538, f. 1<sup>a</sup>; Oxford, New College 285, f. 194<sup>a</sup>): "Item, cum ipse sit causa in triplici genere causae: est enim causa finalis, quia omnium rerum creaturarum finis est; est etiam [autem O] causa formalis cum de ipso dicatur ipsum esse exemplar omnium rerum."

<sup>7</sup> Bacon, *Quaestiones supra libros quatuor Physicorum Aristot.*, I, ed. F. Delorme and R. Steele, in: *Opera hactenus inedita Rogeri Baconi*, vol. 8, Oxford 1928, 41-2. Hereafter citations of this work will take the form *Qsq Physics*, I, VIII: 41-2.

<sup>8</sup> Anselmus, *Monologion*, c. 15 et 37, ed. F. Schmitt, in: *Opera Omnia*, I, 28-9 et 55.

Peter Lombard, and the early Alexander of Hales posited a plurality of divine ideas. As Lombard puts it, citing Augustine, there is only one divine will, one divine power, and hence only one principal cause. But since the effects of that cause are many—everything which exists—the causes of those things in God are said to be many. Rejecting the assumption on which the opposite opinion is based, Lombard holds that not everything God knows is his essence.<sup>9</sup>

Directing his arguments in the first instance against Averroes, on this issue Rufus supports the position of Augustine and Lombard. And in some respects his position is more extreme than theirs. He argues that God not only has many ideas but even has ideas for each individual creature.<sup>10</sup> Though their ideas constitute a unity in God's mind, every single thing is understood in itself, with its own nature, by its own species or idea in God's mind.<sup>11</sup> Holding that God has only a single idea, Rufus' opponents object that this is too much to know, because infinite and hence unknowable. Quite the contrary, Rufus replies on Augustine's authority; indeed from the human perspective, God does know infinitely many things.<sup>12</sup>

Bacon confronts this position of Rufus' too, in his lectures on the *Physics*: "Some say that there are many diverse ideas in the first cause, finite in that they produce finite things." He rejects this unusual view

<sup>9</sup> Lombard, *Sententiae*, I d. 36 c. 1 & II d. 18 c. 5, ed. Brady, Quaracchi 1971, c. I: 259, 418. For the development of Alexander of Hales views on divine ideas, cf. R. Wood, *Distinct Ideas and Perfect Solitude: Alexander of Hales, Richard Rufus, and Odo Rigaldus*, in: *Franciscan Studies*, 53 (1993), 7-46. Henceforth, Wood, *Distinct Ideas*.

<sup>10</sup> Rufus, *De ideis*, tr. 1, Erfurt, Q. 312, f. 81<sup>va</sup>: "Numquid ipse Averroes sibi contradiceret in eodem passu (*Metaph.* XII t. 52) ubi et haec verba dixit? Ibidem enim dicit quod datio huius largae comprehensionis . . . a largo datore primo nobili, non nisi ex perfecta solitudine circa homines individuos provenit. Numquid ergo ille dator qui secundum Averroem est intellectus separatus a materia, cum sit sic sollicitus circa individua, et ipsa intelligit."

<sup>11</sup> Rufus, *De ideis*, tr. 4, f. 81<sup>vb</sup>: "Et quis dubitat naturam creatam vere et perfecte cognosci, si fuerit nota eius propria species et idea? Est autem causa prima singulorum creatorum ideae propriae." *De ideis*, Ad 1, f. 84<sup>ra-b</sup>: "Et ipsa species primo est intellectum, secundo illud obiectum cuius est illa species. Ergo quia tu omnia alia intelligis solum per te speciem . . . primum intellectum a tuo intellectu et tuus intellectus simpliciter idem <sunt>; secundario intellecta, id est illa obiecta quae per [*om. E*] te speciem intelligis, ineffabiliter a tuo intellectu <sunt> diversa. Et hoc dico secundum sua subiecta et secundum hoc quod sunt in se ipsis et suis subiectis et naturis, licet in quantum a te intellecta miro modo in una simplicissima specie adunata sint."

<sup>12</sup> *Sent. Ox.*, I d. 36, Oxford, Balliol 62, f. 80<sup>vb</sup>: "Item, melius est ponere finita quam infinita, . . . ergo videtur decentius et congruentius <ut> poneretur unica esse idea quam plures.—Supra tamen habitum est ex Augustino, *De civitate Dei*, quod 'in sapientia Dei sunt infinita quaedam.'"

summarily,<sup>13</sup> accepting instead the view of the vast majority of theologians in the first half of the thirteenth century, according to which there is a single idea from which everything is produced.<sup>14</sup>

Roger Bacon had no sympathy for Richard Rufus' old-fashioned Augustinian Neo-Platonism. He considered it simply mistaken. It is a case in which Bacon was in tune with the times and Rufus was not.

## 2. *Final causes*

Not all of Rufus' old-fashioned views were as unusual as his defense of a plurality of divine ideas. Some of the old-fashioned views he upheld were no more than scholastic truisms. One such view is that a thing's final and efficient causes mutually define each other. Bonaventure states the dictum succinctly: "the end moves the efficient [cause];" in the natural realm no cause is actual without the concurrence of the final with the efficient [cause].<sup>15</sup> An objection considered by Philip the Chancellor is based on the same truism: the "efficient cause is actualized by the final cause (*secundum eam [causam finalem] efficiens est in actu*)."<sup>16</sup>

Rufus states the view circumspectly both in his *Physics* lectures and in his commentary on the *Posterior Analytics*. Sometimes, as when stating an objection he uses the phrase "moving as an end: *movet ut finis*."<sup>17</sup> Elsewhere more precisely he speaks of the efficient [cause] "moving on account of an end" and of the efficient [cause] insofar as it is efficient existing in virtue of the end.<sup>18</sup> Rufus explains this language in an early work, his questions on the *Posterior Analytics*. Efficient and final causes mutually define each other because a potentially or habitually existing end moves the efficient cause, as a purpose moves an agent, while an efficient cause actualizes the end.<sup>19</sup>

<sup>13</sup> Bacon, *Qso Physics*, II, XIII: 113.

<sup>14</sup> See for example Alexander Nequam, *Speculum Speculationum*, ed. R. Thomson, Oxford 1988, 254-5; Guillelmus Altissiodorensis, *Summa aurea*, II, tr. 1 c. 2, ed. J. Ribailier, Paris-Grottaferrata 1982, III: 17 (Spicilegium Bonaventurianum 17); Philippus Chancellarius, *Summa de Bono*, ed. N. Wicki, Bern 1985, 56.

<sup>15</sup> Bonaventure, *Sent.*, II d. 1 p. 2 d. 1, Quaracchi 1885, II, 51.

<sup>16</sup> Philippus Chancellarius, *Summa de Bono*, ed. N. Wicki, Bern 1985, 6.

<sup>17</sup> Cf. Rufus, *In Phys.*, VIII, f. 13<sup>vb</sup>: "Et videtur quod debemus dicere utrumque ut efficiens, quia in agentibus inferioribus per apprehensionem ipsa res extra, propter quam agitur, movet ut finis."

<sup>18</sup> *In Phys.* II, f. 4rb: "Unde sicut efficiens propter finem movet et exit in actum propter finem, sic efficiens in ratione efficientis salvatur et est per finem."

<sup>19</sup> *In An. Post.*, Erfurt, Q. 312, f. 30<sup>ra</sup>: "Ad ultimum dicendum quod specialis causa secundum quam efficiens definitur per finem et e converso, est quod utrumque est causa

Incautiously stated, the problem with this view is that strictly speaking the final cause or end does not move at all. As Aristotle says in *De generatione*, 1. 7, 324b14-15, the end moves only metaphorically. And that is the objection Bacon raises. Instead of explaining how the final and the efficient cause mutually actualize each other, Bacon contrasts the final cause which moves only metaphorically with the efficient cause that is the true mover.<sup>20</sup> Bacon has no more patience with the language of mutual causation than he has with the notion of habitual existence—another of his bêtes noires.<sup>21</sup>

Here it is Bacon who challenges a consensus position. And though he does not adduce Aristotle's authority explicitly, having lectured on *De generatione*,<sup>22</sup> he not only knew the relevant text but even took it for granted. His criticism of the truism about the relation of final and efficient causes is a step towards establishing an Aristotelian orthodoxy and away from the complicated notions of causality which characterized earlier scholasticism. In this case, however, as when considering divine ideas, it is Rufus who maintains and explains the tenets of early scholasticism.

### 3. *The Eternity of the World*

Where Aristotle's views differed from those established by Christian theology, Christian philosophers had more to do than choose between glossing Aristotle and challenging his authority. At the outset they also had to determine whether Aristotle disagreed with Christian dogma.

Characterizing Aristotle's views on the eternity of the world was complicated for early scholastics; for some time they were not clear on the extent of the differences between the Philosopher and the tenets of Christianity. By 1292, when Bacon wrote his *Compendium studii theologiae*, the issue had been settled. Aristotle's position on the eternity of the world

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alterius, aliter tamen et aliter. Finis enim habitualiter et potentialiter existens est causa efficiens movens ipsum, sicut tegere ab intemperiebus etc. est causa movens architectorem; efficiens autem causa actualis existentiae ipsius finis."

<sup>20</sup> *Qso Physics*, II, XIII: 128.

<sup>21</sup> *Comp. th.*, p. 2<sup>a</sup>, c. 4-5, especially n. 101 and 128, ed. Maloney, 92, 106-8. Cf. Pelster as cited above. See also *In An. Post.*, f. 31<sup>ra</sup>: "Ad ultimo quaesitum dicendum quod hoc quod dico 'homo', et quaelibet species specialissima, dupliciter potest dividi per individua: aut per individua actualiter existentia, aut habitualiter. Licet ergo non semper dividatur [<sup>?</sup> *E*] per individua actualiter existentia, dividitur tamen per individua habitualiter [<sup>rep.</sup> *E*] existentia—ut homo in Sorte et homo in Platone. Et tango per hoc quod dico 'in' habitualement existentiam individuorum vel hominis in Sorte et in Platone."

<sup>22</sup> F. Delorme describes the probable order of the lectures in *Qso Physics*, I, XIII: xxx.



was a principal reason for the ban on the *libri naturales*.<sup>23</sup> But when the *libri naturales* were first being introduced, things were by no means so clear cut. Philip the Chancellor did not commit himself one way or the other. At the outset, he says that Aristotle “seems to intend” to argue for the view that the world is eternal. But in fact, according to Philip, Aristotle’s arguments support only the view that the world is perpetual, lasting for all time and commensurate with all motion; time, motion, and the world are coeval. The true intention of Aristotle’s philosophy, Philip concludes, is to show that the world is perpetual—leaving unexplained what view Aristotle himself actually held.<sup>24</sup>

Alexander of Hales is more forthcoming; he straightforwardly exculpates Aristotle. Writing before 1236, Alexander of Hales saw no great danger in Aristotle’s teaching. Aristotle and the ancient philosophers did not know about creation, which is above nature. But though limited, the ancient philosophers’ account of the natural world was correct: the world’s existence and its motion are commensurate with the whole duration of time.<sup>25</sup> Aristotle did not really hold that the world was eternal. In a turn of phrase adopted by Richard, Alexander claimed that this view had been imposed on Aristotle.<sup>26</sup>

In his *Physics* commentary, Richard agreed: Aristotle was denying only that before the world existed there was a preexisting potential world, or rather that the non-existence of the world had a temporal or quasi-temporal duration. Like Philip and Alexander, Richard held that Aristotle’s arguments justified only the conclusion that there was no time before the world existed. As was common, Rufus specifically disputed Aristotle’s claim that every instant is preceded by time and motion. And he chose to do so in an unusual way by appealing to God’s entirely simple and unchanging nature. Since God is simple, Rufus like his contemporaries makes an analogy between God and an indivisible point; he claims that time flows from God as from an indivisible. Rufus concludes that prior to the instant

<sup>23</sup> *Comp. th.*, p. 1<sup>a</sup>, c. 2 n. 14, ed. Maloney, 46.

<sup>24</sup> Philippus Chancellarius, *Summa de Bono*, ed. N. Wicki, Bern 1985, 47-9. Note that Philip is citing Boethius implicitly here, *De consolazione philosophiae*, V. 6. 14, ed. J. O’Donnell, Bryn Mawr, Pa., 1990, 123.

<sup>25</sup> *De materia prima*, Paris, B.N., lat. 15272, 16406, as translated by R. Dales, *Medieval Discussions about the Eternity of the World*, an unpublished classroom translation/transcription, Fall 1992, 96.

<sup>26</sup> Alexander de Hales, *De duratione mundi*, ed. D.M. Nathanson, Ph.D. Diss. Univ. of Southern California, May 1986, 80-1: “Verum est quod Aristoteli imponitur quod posuit mundum esse perpetuum et fuisse semper. Sed notandum est quod ‘mundum fuisse semper’ potest dici vel quia nunquam ceperit esse, et sic non est verum; vel quia se commenciatur toti tempori, et sic est verum mundum fuisse semper, et sic intellexit Aristotelis.”



of creation, there is no time or change, there is only God's unchanging being, in which there is no before and after. Rufus agrees that Aristotle's arguments demonstrate that there is no first instant of time. Rufus does not object since on his account creation is not part of time, it is rather the last instant of non-being. Rufus can thus both defend creation and concur with Aristotle that there is nothing in the world prior to time and no first instant of the being of created things.<sup>27</sup>

Before they come into being, however, created things exist with God; their non-being is with God, there is no change in that non-being and so no motion or time. Citing Boethius, Rufus holds that the creator is prior to creation by nature not "antiquity," in that there is no before and after in God. Similarly, the non-being of created things is not temporally but naturally prior to their being. By comparing the creator to a point, and time to a line flowing from a point, Rufus is claiming that time begins at eternity. Since time begins but has no first instant, its beginning is at the last instant created things do not exist. In other words, the initial limit of time is extrinsic; what is prior to time is another mode of being, durationless eternity.<sup>28</sup>

<sup>27</sup> Rufus, *In Phys.*, VIII, f. 12<sup>ra</sup>: "Et possumus respondere sic, ut communiter responderetur [respondet *E*], ut dicamus quod haec est falsa 'omne nunc est medium duorum temporum.' Sed contra . . . Si ergo ad esse mutatum praecedit motus, tunc ad omne nunc praecedit tempus. Ergo non potest poni primum nunc, et sit tempus ab aeterno."

"Et possumus dicere quod hoc non sequitur. Si enim intelligamus ens primum ut indivisibile, et esse temporalium ut quemdam fluxum ab ipso. Unde apparet quod ipse fluxus <est> ab alio, et tamen in ipso non est dicere [*ita forsitan pro: dare E*] primum. Sic est in creatione mundi vel motus, quod illud a quo est ille fluxus est sicut quoddam indivisibile, et in esse ipsorum non est dicere primum. Et sic est possibile dicere tempus incepisse, nec tamen esse primum <motus> nec temporis."

<sup>28</sup> Rufus, *In Phys.*, VIII, f. 11<sup>vb</sup>: "Et hic [?] dicit Boethius quod Creator non est prius creaturis temporis antiquitate sed simplicitate naturae, quia ipse cum sit simplicissimus, in eius esse non cadit prius et posterius. Sic ergo est prior aliis, quod alia sunt ex non-esse in esse, ipsum autem non. Et hoc non ponit alia esse aeterna, quia totum illud potest esse si omnia alia habuerunt principium et ipsum non habuit principium."

Alia autem est dubitatio circa primam rationem sumptam a natura temporis, quia aut dicemus mundum creatum aut non creatum. Et oportet dicere primum membrum. Et si hoc, tunc aut eius esse et eius non-esse fuerunt simul, et hoc non potest esse; aut non-esse praecessit, et hoc non potest esse cum non sit ibi prius.

Et potest responderi ita et dicere quod non-esse mundi fuit prius quam esse mundi uno modo, et tamen in ipso non-esse non cadebat prius et posterius. Et hoc sic possumus intelligere: non-esse creaturae non est nisi sola existentia eius apud Creatorem. Exitus ergo de non-esse in esse est fluxus eius a Creatore. Intelligamus ergo Creatorem ut aliquod indivisibile ut punctum, . . . et esse creaturae tamquam lineam fluentem ex puncto. Et intelligamus punctum sicut manens et totam lineam sicut fluentem, adhuc erit dicere quod in ipso puncto non cadit prius neque posterius, et tamen ipse punctus est prius quam ipsa linea vel aliquid ipsius. Et hoc modo est dicere quod non-esse mundi est prius quam suum esse, et tamen in suo non-esse non cadit neque prius neque posterius."

Agreeing with Aristotle that time has no first instant, Rufus even follows Alexander in claiming that it is imposing on Aristotle to say that he rejected the view that the world began. That this is the case, Rufus says, is clear from the recapitulation of argument at the end of book 8 of the *Physics*.<sup>29</sup>

Rufus leaves himself a narrow avenue of escape here, when he considers the relation between Aristotle's views and those of Plato. As Rufus understands Plato, Plato postulates duration before time. According to Rufus it is this view that Aristotle opposed and not the view that time and the world were created from nothing.<sup>30</sup>

Asking for the last time what Aristotle believed, Rufus suggests that it may be that Aristotle did believe the world was eternal *a parte post*. He had refuted Plato's argument for the existence of duration prior to the world's creation, but not Plato's argument against the end of the world. Rufus speculates that Aristotle's regard for Plato's authority and his acceptance of the claim that destroying what is best does not pertain to God may have persuaded Aristotle to believe in endless time. The difference between the ancient philosophers and Christians may be about the best disposition of the world. Thus Rufus holds that if Aristotle dissented from the truths of Christianity it was for a creditable reason.<sup>31</sup>

When he came to change his mind about Aristotle's views, however, Rufus did not avail himself of this escape route. Instead, he completely retracted his previous views, preferring instead those of Robert Grosseteste—

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<sup>29</sup> Rufus, *In Phys.*, VIII, f. 12<sup>ra</sup>: "An possimus concludere ex dictis Aristotelis quod mundus incepit: Quia imponitur Aristoteli quod ipse intellexit mundum non incepisse, cuius oppositum apparet ex sua recapitulatione, videtur quod possumus habere ex dictis Aristotelis quod mundus incepit."

For a further description of Rufus' contribution to the debate see R. Wood, *Richard Rufus on Creation: The Reception of Aristotelian Physics in the West*, in: *Medieval Philosophy and Theology*, 2 (1992), 1-30. Cf. also S. Brown, *The Eternity of the World Discussion at Early Oxford*, in: *Miscellanea Mediaevalia*, vol. 21, Berlin 1991-1992, 265.

<sup>30</sup> *In Phys.*, VIII, f. 11<sup>vb</sup>-12<sup>ra</sup>: "Et possumus dicere quod ipse non sic intellexit, sed intendit ostendere quod non-esse non potest esse prius hoc modo ut in ipso non-esse cadit prius et posterius. Et ita posuerunt philosophi cum posuerunt mundum fieri ex aliquo praeiacente et non ex nihilo. Ipsi enim posuerunt non-esse mundi et motus cum quadam duratione. . . . Et debemus intelligere quod ipse non intendit quin tempus processit [*E*] ex non-esse in esse. Sed hunc modum intendebat improbare eis ut eius non-esse esset cum dimensione aliqua et duratione. Et sic intellexit Platonem ponere."

<sup>31</sup> *In Phys.*, VIII, f. 12<sup>rb</sup>: "His et multis aliis rationibus contingit arguere ex dictis Aristotelis et per rationes physicas mundum incepisse. Sed forte crediderit mundum non habere finem iuxta illam auctoritatem Platonis bona ratione, conditum dissolvi velle non est Dei. Crediderunt enim mundum esse factum in optima dispositione, sed nos per fidem et vere credimus oppositum sicut resurrectionem et meliorem mundi dispositionem."

a fact which ought to have earned him Bacon's approbation. Rufus actually did what Bacon so strongly recommends in his *Opus maius*; he neither ostentatiously displayed his knowledge, nor concealed his error. Instead, he adopted the views of one of Bacon's heroes, praising Grosseteste as unreservedly as Bacon himself.<sup>32</sup> Grosseteste is not cited by name, but neither is his identity concealed in a phrase like *aliqui dicunt*. Rufus refers to him as *vir eminentissimus*.<sup>33</sup> No other author is accorded this recognition—certainly not Aristotle.

Under Grosseteste's influence, Rufus radically alters his outlook. Instead of condemning Aristotle's critics for the views they impose on him, Rufus now refers unfavorably to those who try to excuse Aristotle. He abandons the quasi-Aristotelean position presented in the *Physics* commentary, according to which time has no intrinsic limit, only an extrinsic limit which is God's atemporal mode of being. Instead, in the *Metaphysics* commentary, Rufus allows that time has an intrinsic limit. God created the world *ex nihilo* at the first instant of time. Rufus dissociates himself radically from his own former reply, describing it as worthless (*illud nihil est*).<sup>34</sup> Instead he borrows from Grosseteste a complicated semantic distinction between God's "speaking" and God's "making," which addresses the problem presented when we maintain that an immutable God created the world in time.<sup>35</sup> Rufus' embarrassment is palpable; not only does he drop his own arguments in favor of Grosseteste's, but he adds that this is the reply that should have been made to Aristotle's arguments in the *Physics*.<sup>36</sup> Like Rufus', Roger Bacon's views on this subject changed rapidly. The point

<sup>32</sup> *Opus majus*, III & IV d. 1 c. 3, ed. Bridges, London 1900, 67 & 108.

<sup>33</sup> Rufus, *In Metaph.*, II c. 1 t. 2, Vatican, Vat. lat. 4538, f. 4<sup>ra</sup>: "Ad illud respondebat vir excellentissimus in scientia. . ."

<sup>34</sup> Rufus, *In Metaph.*, XII, lect. 1, q. 2: "Alii volunt alio modo salvare ipsum sic. Linea habet principium intrinsecum sui, scilicet punctum. Motus autem habet principium extra se sed non intra, et hoc intendit Aristoteles cum dicit quod non est motus primus. In motu enim nihil est nisi motum esse. Et illud nihil est. Aristoteles enim vult quod tempus sit infinitum et motus infinitus, et non habet principium intrinsecum aliquod. Quia nunc est principium futuri et finis praeteriti, et secundum ipsum instans non potest esse principium temporis, ita quod ante ipsum instans non sit aliud tempus. Unde ponit tempus non habere finem nec principium, nec similiter motus [motum N]." (ed. T.B. Noone, *An Edition and Study of the Scriptum super Metaphysicam*, bk. 12, dist. 2: *A Work Attributed to Richard Rufus of Cornwall*, Ph.D. dissertation, University of Toronto, 1987, 181.

<sup>35</sup> See *Richard Rufus on Creation*, in: *Medieval Philosophy and Theology*, 2 (1992), 1-30. Rufus' account of the nature of truth in the *Metaphysics* commentary is also borrowed from Grosseteste.

<sup>36</sup> Rufus, *In Metaph.*, XII, c. 6, lect. 1, q. 3-4: "Penitus eodem modo respondendum est ad argumentum Aristotelis quod facit in octavo *Physicorum*." (ed. Noone, *An Edition*, p. 185).

of departure is radically different, however. Bacon begins by noting correctly that Aristotle holds both in book 6 and in book 8 that time neither begins nor ceases. What is more, Bacon at least comes close to espousing a doctrine of double truth, according to which, Aristotle's opinion is true "physically speaking."<sup>37</sup> The Christian account of creation transcends nature, according to Bacon, but he goes on to describe God's threefold operation in at least quasi-physical terms. First, there is creation in which substances are completely produced; second, there is concreation in which elemental forms and universals are brought into existence; and finally there is influx, in which the primary passions of complete beings proceed from God. Time, motion, and place are those primary passions.

So what does Bacon mean when he says that according to the Christian account, time begins with an operation transcending nature, the sudden mutation which is creation? Very likely it has nothing to do with the threefold operation of creation. Probably Bacon is simply claiming that creation is a supernatural, not a natural, phenomenon. This seems the most likely interpretation, since it is Hales' view: "creation is not a natural, but a supernatural mutation." Hales goes on to claim that since Aristotle deals only with natural mutations, his conclusions apply only to them.<sup>38</sup> Thus there is no first natural mutation, but there is a first supernatural mutation.

Supposing that is the correct interpretation, the argument is not appropriate to Aristotle's arguments for beginningless time, since they are founded not on physical but on logical impossibility. But it would mean that Bacon, like Hales, has an answer to the question how the two accounts can consistently be maintained. Hales says that Aristotle's statement is true only in a qualified manner. Most likely, Bacon means similarly that it is true that time has no beginning in the physical world. Probably that is how we should understand Bacon's claim that it is true both that time did not begin and also that it did, depending on whether one is speaking "physically" or not.

At any rate, this was not a position which Bacon espoused for long. When he next lectured on the *Physics*, Bacon argued that not only faith but also reason shows us that the world has not existed from eternity.

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<sup>37</sup> *Qsq Physics*, IV, VIII: 222: "Solutio: Ad primam istarum quaestionum dicendum quod sententia Aristotelis in 6. et 8. hujus est quod tempus non cepit nec in esse exivit. Et hoc verum est, loquendo physice. Sententia autem nostra est quod tempus exivit et cepit operatione tamen naturam transcendente, scilicet subitanea mutatione, quae est creatio."

<sup>38</sup> Alexander de Hales, *De duratione mundi*, 81.

Aristotle neither held that the world is eternal, nor were his arguments intended to demonstrate the timeless eternity of the universe.<sup>39</sup>

That Bacon changed his views radically, and did so without adverting to the change in his position, is not surprising. What is surprising is that apparently his position changed under Rufus' influence, at least indirectly. The question with which we shall chiefly be concerned is entitled: Whether Aristotle consents to the view that motion is eternal? And the answer is negative. The positive account is much like Rufus' first account: time has a beginning limit, but not an intrinsic limit; its extrinsic limit is God's atemporal mode of being—eternity. As Bacon puts it: there is nothing first in time which is a part of time; but prior to time is its *terminus a quo* from which it begins. Time terminates at eternity, and so it begins from eternity. Verbally there is not much similarity between Rufus and Bacon's *Physics* questions, but substantially the two accounts are very close. The basic position in both is that time begins at its extrinsic limit, which is eternity. Just as Rufus in his *Physics* commentary had claimed that Aristotle opposed only the view that before time there was duration, Bacon claims that Aristotle disputed only the claim that before motion there was time.<sup>40</sup>

Virtually all the arguments adduced by Bacon in favor of his position are anticipated by Rufus. In addition to what has already been said, there are three:<sup>41</sup> The first cites Aristotle against himself, saying that where there is no first there is no last. Here the claim is that it is obvious that there is a final moment here and now, and so there must have been a first. That parallels Rufus' third argument for a beginning of time.<sup>42</sup>

The second has a long history among Arabic and Jewish authors, but is not used in this form and context by Rufus. It claims that if time were infinite *a parte ante*, nothing could be added to it. But in fact each new revolution of the sun adds a day to past time, so the assumption must be rejected. Basically, this argument claims that if time were infinite, there

<sup>39</sup> *Qso Physics*, VIII, XIII: 391.

<sup>40</sup> *Qso Physics*, VIII, XIII: 387: "licet non sit ponere primum in tempore quod sit pars, tamen est ponere aliquid prius eo quod est tantum terminus a quo incipit: unde . . . incipit non a tempore, set ab eternitate. . . . Quod tamen ipse nichil contra fidem posuerit, videtur per intentionem eius . . . et sic videtur ipsum velle solum quod motus non inceptit in tempore, et hoc est verum."

Note that the claim that time has a beginning which is external to it is not original with Rufus. Cf. William of Durham, *Quaestiones de aeternitate* as printed by R. Dales and O. Argerami, *Medieval Latin Texts on the Eternity of the World*, Leiden 1991, 15.

<sup>41</sup> *Qso Physics*, VIII, XIII: 387-8.

<sup>42</sup> Rufus, *In Phys.*, VIII, f. 12<sup>ra</sup>: "Item, in *Libro Caeli et Mundi* dicit quod si non est primus terminus, non est ultimus. Ergo si est ultimus, est primus; sed temporis praeteriti usque ad diem istum est ultimus terminus; ergo est primus."

could be no arithmetical relations between different times—no adding, subtracting, multiplying or dividing.<sup>43</sup>

Bacon's final argument is Rufus' variant on the "no arithmetically related times" argument. As Bacon puts it, if time were infinite, the time between the first revolution and today would be equal to the time between the first revolution and tomorrow. Or in the words of Rufus' fifth argument, there would be no fewer days before tomorrow than today, and hence today would not come before tomorrow.<sup>44</sup>

Bacon concludes this question by conceding the arguments *in oppositum*. He affirms that those arguments conclude correctly that Aristotle is arguing only that there is no time before motion. In his reply, he offers as additional evidence of Aristotle's orthodoxy his "recapitulation," just as Rufus had.<sup>45</sup> In the following question, he adopts Rufus' distinction between the beginning and end of time. The beginning of time can be proven by necessary argument, the end of time is evident only to faith, mentioning in this context the resurrection as had Rufus. Thus both those who heard Rufus and those who heard Bacon's second lectures on the *Physics* would have heard that positing beginningless time is a philosophical error not espoused by Aristotle—to which Bacon adds that this view has been imposed on Aristotle by Averroes.<sup>46</sup>

As we know, this was not Bacon's final position. But it changed more gradually than one might have supposed. Even in the *Opus maius*, Bacon does not say that Aristotle was wrong. He says only that Aristotle was not sufficiently explicit on the subject of the eternity of the world.<sup>47</sup> This, then, is an odd sort of case. Bacon held more tenaciously to the old-fashioned exculpation of Aristotle characteristic of the early scholasticism of Alexander of Hales than did Rufus, and it was probably Rufus who persuaded him it was reasonable to do so. Rufus, himself, however soon adopted a more pessimistic view of Aristotle. Under the influence of Grosseteste, he accepted a more critical approach to Aristotle and Aristotelianism.

<sup>43</sup> For more on the history of these arguments, see Wood, *Richard Rufus on Creation*.

<sup>44</sup> Rufus, *In Phys.*, VIII, f. 12<sup>ra</sup>: "Iterum numerus dierum usque cras esset ab unitate in infinitum. Sed talis numerus non est unus numerus maior alio nec minor, et sic non sunt pauciores dies usque ad diem istum quam usque ad diem crastinum, nec minus tempus. Et tunc non citius veniret ista dies quam crastina. Priori enim respondet brevius tempus."

<sup>45</sup> *Qso Physics*, VIII, XIII: 388.

<sup>46</sup> *Qso Physics*, III, XIII: 148; IV, XIII: 223; VIII, XIII: 376.

<sup>47</sup> *Opus majus*, I c. 6, ed. Bridges, London 1900, 14.

This case shows us that Bacon was much more reluctant than Rufus to criticize Aristotle. Before 1238 Rufus was condemning those who sought to excuse Aristotle. In 1267 Bacon was still saying that all wise men approved of Aristotle. Though he did not reach the limit of wisdom, he was the most perfect of the philosophers.<sup>48</sup> Rufus did not share Bacon's veneration for Aristotle, whom he ordinarily calls quite simply "the author." Rufus believed Aristotle was wrong not only when he disagreed with Christian teaching but also in his dispute with Plato about forms.<sup>49</sup> As we shall see in the next section, Rufus did not hesitate respectfully to disagree with Aristotle, or even to correct him.

#### 4. *Projectile Motion*

Like the last problem, the case of projectile motion is one in which Bacon was influenced by Rufus, but to a lesser extent. It is a case in which Rufus radically departed from Averroes' reading of Aristotle and even corrected Aristotle. Rufus held that by itself the account of projectile motion in *Physics* VIII was both inadequate and inconsistent with Aristotelian principles. Rufus does not say, however, that Aristotle is wrong, he says only that Aristotle provided an incomplete account, perhaps because it was adequate for his purposes in book VIII.<sup>50</sup>

Rufus argued first that the account was inconsistent. In *Physics* VIII, Aristotle says that in projectile motion the original mover "gives the power of being a mover either to air or water or something else of the kind" (8.10, 267a3-4). When it loses contact with the thrower, the air continues to move, but ceases to be moved. The first layer of air moves the next layer, that layer in turn is first acted upon and then acting, and so on—this has been called the "air layer theory."<sup>51</sup> As Aristotle points out, projectile motion, so described, though apparently continuous, would actually be composed of consecutive discrete movements. That explains why such motion takes place only in a medium like air or water, he says. Some

<sup>48</sup> *Opus majus*, I c. 3, ed. Bridges, London 1900, 8.

<sup>49</sup> Cf. R. Wood, *Richard Rufus and the Classical Tradition: A Medieval Defense of Plato*, forthcoming in the proceedings of an International Conference held at Corfu (October 1995), under the Auspices of the Société Internationale pour l'Étude de la Philosophie Médiévale, Turnhout 1997, 229-51.

<sup>50</sup> Rufus, *In Phys.*, VIII, f. 13<sup>va</sup>: "Et si quaeratur propter quid Aristoteles . . ." quoted in R. Wood, *Richard Rufus and Aristotle's Physics*, in: *Franciscan Studies*, 52 (1992), 280. Henceforth *RAP*.

<sup>51</sup> J. Sarnowsky, *Die aristotelisch-scholastische Theorie der Bewegung: Studien zum Kommentar Alberts von Sachsen zur Physik der Aristoteles*, Münster 1989, 384.



say, he adds, that what happens is *antiperistasis* or mutual replacement—an allusion to Plato's *Timaeus*. Aristotle concludes his brief discussion of projectile motion by stipulating that no correct account of projectile motion can postulate the simultaneous motion of all parts of the medium; in other words, it is essential for the layers to move successively.

Rufus takes issue with Aristotle's claim that the air would continue to move in the absence of the mover. That would make air animate, an unmoved mover. And, as Aristotle himself holds, air is a body, and bodies as bodies do not move themselves. As Averroes puts it, Aristotle has just shifted the problem; now we have to account for the motion of the medium rather than the projectile. So if air moves after losing contact with the thrower, a further explanation is necessary. Tacitly rejecting Averroes' account of air's movement, Rufus argues that the fluidity of air does not explain the supposed ability of air to move itself, since fluidity is a passive not an active capacity.<sup>52</sup>

Rufus modifies Aristotle's explanation of the movement of the air, allowing a sense in which air is a mover, but giving it a more secure Aristotelian foundation by appealing, as Aristotle normally does, to the nature of the mover. When air is violently divided, Rufus says, that rarefies the air beyond the limits established by its nature. The form of air gives the parts of the air a certain density and orientation (*situs*) to each other. When its parts resume their natural inclination, air moves. Rufus describes this as accidental motion not motion *per se*, because it cannot be an initial motion; it is rather a reaction to the initial violent motion. Since this secondary motion is produced by the reinclination of the medium's parts, I will call it reinclination. Closely related to *antiperistasis* or replacement theory, it is an attempt to provide a mechanical explanation of the movement posited in the air. It somewhat resembles peristalsis, since it is a process of successive, violent distensions followed by contractions resulting from the air's natural inclination to resist distension. Rufus himself compares it the movement of strings of lyre (*cordae citharae*) when plucked.<sup>53</sup>

<sup>52</sup> Rufus, *In Phys.*, VIII, f. 13<sup>va</sup>: "In respondendo ad dubitationem . . ." quoted in *RAP*, 279.

<sup>53</sup> Rufus, *In Phys.*, VIII, f. 13<sup>va</sup>: "Dicendum est quod corpus in quantum corpus per se loquendo, per se non potest movere se localiter. Ex consequenti tamen et accidentaliter potest per hunc modum: Cum aer dividitur [?] violenter, fit in partibus aeris divisus maior rarefactio et distantia quam ei debeatur secundum suam naturam (forma enim talis dat partibus materiae talem rarefactionem et talem situm ad invicem), et propterea reinclinantur ad debitam inclinationem et approximationem ex natura sua partes huius corporis . . ." quoted in: *RAP*, 279.

Having revised Aristotle's account, Rufus then argues that even the revised account is inadequate, since projectile motion cannot be sufficiently explained in terms of the action of the medium. Motion imparted to the medium alone would not account for the appearances (*signa*). If by itself the action of the medium were an adequate explanation, then the action of the medium moving one projectile east would prevent another projectile from traveling west at the same time. Also someone throwing two projectiles of the same size and shape in the same way would throw them at the same speed, regardless of their weight or density. But in fact a pitcher forced to throw a baseball made of papier maché could not throw it as fast as a regulation ball, and as Rufus says, "the heavier (*gravius*) body is better projected." This too is a tacit rejection of Averroes, who held that diverse motions do not impede each other in a medium—that is, a quasi-spiritual body. Unlike Averroes, Rufus concludes that an adequate theory of projectile motion must supplement the Aristotelian account by saying something about the effect of the thrower on the projectile itself as well as on the medium.<sup>54</sup>

Rufus supplements Aristotle's explanation by postulating that violent motion has an effect on the projectile as well the surrounding medium, a greater effect on heavy than on light projectiles. According to Rufus, because they afford greater resistance, heavier projectiles receive more violence, and hence can be thrown better.<sup>55</sup> Violent motion produces an impression both in the medium and in the projectile. When that impression is strong it does two things: It gives the projectile a motion opposite to its natural motion and impedes that natural motion. The impression is continually weakened until it can perform only one function; it impedes the natural motion. Thus a rock thrown upward eventually stops moving upward, after which the impression ceases to function altogether and the rock falls, resuming its natural motion.<sup>56</sup>

One problem with Rufus' account of the action of projector on the projectile is to describe the impression it makes, the received violence. Rufus says that it is a form and a quality imprinted in the projectile by the thrower. Supplying a mechanical explanation of that action, Rufus suggests that it acts by transposing the parts of the projectile, presumably

<sup>54</sup> Rufus, *In Phys.*, VIII, f. 13<sup>va</sup>: "Sed ad hoc per plura signa . . .," in: *RAP*, 280.

<sup>55</sup> Rufus, *In Phys.*, VIII, f. 13<sup>va</sup>: "Et iterum, si quaeratur propter quid mediocriter grave melius proicitur . . .," in: *RAP*, 280.

<sup>56</sup> Rufus, *In Phys.*, VIII, f. 13<sup>vb</sup>: "Debemus ergo dicere, ut mihi videtur, quod haec impressio in medio et in proiecto . . .," in: *RAP*, 280-1.

that explains how it impedes the natural motion of the projectile.<sup>57</sup> Here Rufus apparently meets the challenge of fitting violence into an Aristotelian category, but as his successors would point out, the projectile imprint he posits is a problematic revision of Aristotelian natural philosophy.

Bacon does not raise an objection based on the nature of the imprint, but his objection is equally fundamental. As a good Aristotelian, Bacon refuses to entertain the idea of action at a distance. Following Averroes, but not Aristotle or Rufus, he gives major emphasis to accounting for projectile motion, rather than treating it as a brief digression in an argument about the first mover. And he does not even consider postulating any lasting action of the thrower on the projectile. Bacon himself makes a major contribution by subtly changing the terms of the debate. In rejecting an imprint theory, he refers not to unmoved movers, but to “virtual” as opposed to “substantial” contact between the mover and the moved body. Violent local motion, he stipulates, does not occur without substantial contact. But since Bacon cannot claim that projectile motion ceases when substantial contact does, the question remain: why does it continue? Rufus had claimed that projectile motion results from the impression made by the projector in the medium and on the projectile; the projector acts on medium and projectile in a similar fashion by causing a temporary transposition of parts.

Bacon rejects both these claims. The projector cannot act by producing an impression, and it cannot act on the projectile. It does not produce an impression, since alteration, not local motion continues motion by producing an impression, insinuation or immission.<sup>58</sup> It cannot act on the projectile at all, because the thrower loses contact with the projectile. Denying that virtual contact (*nec secundum virtutis influentiam est simul*) can substitute for substantial contact, Bacon has to explain projectile motion by the action of the medium alone. Since unlike the thrower, the medium never loses contact with the projectile, according to Bacon it alone can account for the continuation of violent motion characteristic of projectiles (*huiusmodi motus continuatur a medio et non a primo proiciente*).<sup>59</sup>

Having established to his satisfaction that the explanation of projectile motion can involve only the medium, Bacon devotes the next three questions to explaining the action of the medium. He considers two

<sup>57</sup> Rufus, *In Phys.*, VIII f. 13<sup>va-b</sup>: “Et videtur mihi quod hoc est verum, quod aliqua qualitas et forma sive aliquid ei imprimatur a proiciente . . .” in: *RAP*, 280.

<sup>58</sup> *Qso Physic*, VIII, XIII: 339.

<sup>59</sup> *Qso Physic*, VIII, XIII: 338.

alternatives: Rufus' (reinclination) and Averroes' (fluid retention). As summarized by Bacon, Averroes' view relies on the fluidity of mediums like air and water: because they are flexible, or, as Averroes puts it, shapeless and untermiated,<sup>60</sup> they retain rather than terminating violent motion. Bacon prefers Rufus' explanation, which he describes succinctly as accidental motion by reinclination, motion that weakens continually.<sup>61</sup> The continually weakening posited by Rufus is important to Bacon, since it is consistent with the description of violent motion which is strongest at the outset and weakens over time, by contrast with natural motion, which strengthens over time.<sup>62</sup> Bacon accepts Rufus' explanation and rejects Averroes' on the grounds that it better explains the direction of motion.<sup>63</sup> On Averroes' account, there is no reason to suppose that some parts of the medium would retain violent motion more than others, his account would provide no explanation for movement in one direction rather than another.

Here Bacon has accepted Rufus' revision of Aristotle's account of the action of the medium in projectile motion, but rejected the supplement he proposed. Though Bacon adduces more phenomena for which a theory which considers only the action of the medium will not account—such as projectiles moving upstream,<sup>64</sup> his adherence to the Aristotelian paradigm is so complete that anomalous cases do not lead him to reconsider basic principles. Moreover, he follows Averroes in making this anomalous case central to book VIII of the *Physics*. Bacon accepts a revision of Averroes' account for the sake of greater consistency with Aristotelian principles. Bacon himself focuses attention on the issue of contact.

##### 5. *Heaven's Place*

The last problem in natural philosophy which will concern us here is the place of the heavens.<sup>65</sup> As Averroes tells us (IV t. 43), Philoponus posed a perplexing dilemma for Aristotle's theory of place: if all motion is in a place, then the outermost, the eighth sphere according to Averroes,

<sup>60</sup> Averroes, *In Phys.*, VIII t. 82, Venice 1550, f. 195.

<sup>61</sup> *Q<sub>so</sub> Physic* VIII, XIII: 340-1.

<sup>62</sup> *Q<sub>so</sub> Physic* VIII, XIII: 343.

<sup>63</sup> *Q<sub>so</sub> Physic* VIII, XIII: 345.

<sup>64</sup> *Q<sub>so</sub> Physic* VIII, XIII: 340.

<sup>65</sup> A fuller account of this problem, Rufus' response of those his predecessors and successors will be found in R. Wood, *Richard Rufus: Physics at Paris before 1240*, in: *Documenti e Studi sulla Tradizione Filosofica Medievale*, 5 (1994), 87-127.

must be in a place since it is manifest that the heavens move. But place is defined as a dimension (the inner boundary) of the containing body, and nothing contains the outermost sphere, so it must not be in a place. According to Averroes, this argument seeks to compel us to admit either that something can move without being in a place, or that place is not a bodily dimension but a bodiless dimension or a vacuum.<sup>66</sup> Though Philoponus chose the second alternative, positing empty space as the place of the eighth sphere, he had no medieval disciples. After presenting and rejecting a number of replies to Philoponus, Averroes presents his own solution. He modifies the definition of place for the outermost sphere. That sphere is in a place accidentally, in virtue of the center of the world system, which is fixed.<sup>67</sup> Averroes' solution was accepted by many authors. More importantly, even those who rejected his view agreed with him that an acceptable solution to the problem of the missing container would have to provide a substitute which provides a fixed location for the outermost sphere. Accordingly, even authors who disagreed with Averroes provided an account of the "immobility" or stability of the universe.

Richard Rufus rejects Averroes' account. Why should we believe that center of world is the place of the outermost sphere, or the 9th orb? After all, when asked where it is, we do not point down. He wonders whether the center of the world is even a part of the outermost sphere. Could we not just as well describe the place of the outermost sphere in terms of its circumference without reference to the center?<sup>68</sup> And what

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<sup>66</sup> Averroes, *In Phys.*, IV t. 43, Venice 1550, f. 66: "Sphaera autem octava non contenta, si non accidit ei motus proprius, et totus orbis qui movetur motu diurno, accidit in eo magna quaestio: quoniam manifestum est ipsum moveri. Et cum omne motum sit in loco, necesse est ut totus orbis sit in loco. Ergo sumus inter duo: aut ponere quod aliquod motum non est in loco, aut ponere quod locus est inane et dimensio. Ioannes vero propter hoc obedit huic, scilicet locum esse et dimensionem et vacuum, non finem continentem, ut dicit Aristoteles."

<sup>67</sup> Averroes, *In Phys.*, IV t. 43, Venice 1550, f. 66: "Nos autem dicamus, quoniam cum sit fixum secundum totum, necesse est ut hoc modo sit quiescens. Et quia quies est ei propter quietem centri, quod est in terra, et quies est, quia est in loco essentialiter, ideo dicitur coelum esse in eodem loco, et non transmutatur ab eo per accidens, id est quia centrum eius est in loco essentialiter. Et haec est intentio sermonis Aristotelis dicentis quod coelum est in loco per accidens."

<sup>68</sup> Rufus, *In Phys.*, VIII, f. 6<sup>bb</sup>: "Videtur quod sententia sua peccet multipliciter. Est enim dicere uno modo centrum esse partem circuli, alio modo non. Si enim intelligamus per circumulum ipsam circumferentiam, tunc centrum non est pars circuli. Sed si dicamus spatium contentum intra, tunc centrum est pars circuli. Quo istorum modorum est caelum circumulus? Magis sicut circumferentia si loquamur de quinta essentia. Ergo est dicere centrum non esse partem eius; et si hoc, non <est> dicere caelum esse per accidens in loco quia centrum sit in loco."

about the other spheres? The sphere of Saturn and the sphere of the moon have the same center. Are they all in the same place? If not, how can Averroes account for their being in different places?<sup>69</sup>

Rufus' own account evolved in an attempt to meet these difficulties. At the outset he admits that the outermost sphere is not in a place in the same sense as the other spheres. It cannot be, since there is no containing surface. According to Rufus, the function ordinarily exercised by innermost concave surface of the containing sphere is performed in its absence by the outermost convex surface of the contained sphere. Its own outer skin rather than a distinct wrapper contains it. Rufus asks us to consider this surface not as a boundary, but as something moving at a constant distance from the center of the universe.

That leaves Rufus with a problem: His account appears to leave the universe with a moving, not a fixed place. To solve it, he asks: What makes the outermost surface parts of the place of the universe (UP)? Not, he says, being part of the sphere, but their relation to the center of the universe. Consider  $x$ , which is the easternmost part of UP at time  $t$ . It can be described either as  $x$  or as the easternmost part of UP. As the sphere rotates, so does the surface part  $x$ . But it is replaced by another part,  $y$ , which bears the same relation to the center, so that at  $t + 1$ ,  $y$  is the eastern most part. There is always an easternmost part which bears exactly the same relation to the center of the universe. At different times it will be a different part of the surface, but it will always be the same part of the place of the universe—that is, its easternmost part. Moreover, since the orbit is fixed, the same is true for each and every part of UP. Since being part of UP does not depend on being part of the ninth orb but on distance from and orientation to the center (things which do not change), in one sense UP is fixed; it is immobile by equivalence. The parts of the surface which constitute UP move, but its description remains constant; it can be described in exactly the same way the convex surface of the outermost orb would be described if it did not move.<sup>70</sup>

<sup>69</sup> Rufus, *In Phys.*, VIII, f. 6<sup>b</sup>: "Item, nonne est dicere hunc orbem esse hic et hunc non esse hic, sicut orbem Lunae esse hic et orbem Saturni non esse hic sed hic?"

<sup>70</sup> Rufus, *In Phys.*, VIII, f. 7<sup>a</sup>: "Debemus ergo scire quod haec circumferentia si consideretur non ut huius corporis terminus est, sed ut est quiddam ambiens, undique habens distantiam a centro, sic est locus universi ut communiter dicamus.

Contra: partes huius superficiei moventur, ergo loci partes moventur, quod est falsum. Propterea, debemus scire quod partes huius superficiei non sunt partes loci secundum hoc quod sunt <partes> superficiei, sed ut sic distant a centro, ut dicatur quod haec pars est

The immobility by equivalence solution also allows Rufus to address the more general problem of moving places which arises for the Aristotelian notion of place as a dimension of the containing bodies. Motion is defined in terms of a body which changes place over time. That is unproblematic when place, the inner surface of the containing body, is rigid, but not when it is fluid. Take the case of the *Ichneumon*, a boat at anchor in the Nile. Is it moving or stationary? Aristotle's own stance is not entirely clear. Once he says that place must be motionless, that it does not move when its contents move (*Physics* IV, 4, 212a18), which suggests that the *Ichneumon* is stationary. But some modern commentators think that he would maintain that it is moving—that is, in successively different places.<sup>71</sup> Rufus considered the second alternative absurd, and having at hand a notion of immobility by equivalence allowed him to avoid it. The watery parts of the river move, but as long as the *Ichneumon* is at anchor, it will always be bounded by water bearing the same relation to the universe. That allows Rufus to maintain that he can hold his hand still in the air, even on a windy day.<sup>72</sup>

Bacon seems have been the first to respond to Rufus, and he returned repeatedly to the problem over a period of forty years. Initially Bacon accepted Averroes' solution: the place of the universe is its center. There is no immobility by equivalence, only literal immobility will do, and that has odd consequences for what we can say in answer to the question, "where is the *Ichneumon*?" Bacon assigns seven definitions to place. Strictly speaking, the *Ichneumon* is in the Nile as a whole, since the Nile never moves and the boat never leaves it; then comes the water which flows

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ex hac parte centri, et haec ex hac. Hoc habito possumus videre cum aliqua pars circumferentiae est in tali respectu a centro, ipsa recedit; et cum advenit alia, tunc habet ipsa adveniens eundem respectum quem habuit pars prior a centro. Et propterea, si ex tali respectu fiat pars superficiei pars loci, ergo ex eodem respectu pars eadem, ergo pars adveniens et pars recedens sunt eadem pars loci, cum tamen sint diversae partes superficiei, tamen eundem respectum habent a centro. . . ."

<sup>71</sup> E. Hussey, *Aristotle's Physics, Books III and IV*, Oxford 1983, xxx.

<sup>72</sup> Rufus, *In Phys.*, VIII, f. 7<sup>ra</sup>: "Qualiter ergo debemus dicere de immobilitate loci? Debemus dicere sicut prius dictum est quod terminus huius aeris, non in quantum est huius aeris sed in quantum talem habet respectum ad universum, locus est; quia iste respectus manet idem recedente aere et adveniente aqua circa manum. Propterea terminus aeris et terminus aquae consequenter advenientis sunt idem locus manus meae, quia per eandem naturam sunt locus. Et hoc intelligendum est cum dicit 'terminus continentis immobilis' (212a20), quia hoc est dictu: terminus ipsius aeris continentis in quantum talem habet respectum ad universum, qui respectus manet immobilis et manet idem. Quia aer per suam propriam naturam non est locus aquae, quia aqua non sequitur aerem ubicumque fuerit, et sic ex natura sua non est locus aquae sed [secundum *E*] secundum respectum quem habet ad universum."



past the boat when it is anchored; the different parts of the watery course through which the boat moves down river constitute the least proper sense of "place."<sup>73</sup> This view somewhat implausibly implies that it is more proper to say that the boat is "in the Nile from Lake Victoria to Alexandria" than to say that it is "in the Nile at Cairo."

The second commentary, by contrast, is strongly influenced by Rufus—both positively and negatively. Bacon accepts Rufus' account of immobility, but still prefers Averroes on the place of the heavens. The influence is most unmistakable when Bacon is paraphrasing and rejecting Rufus' views on the question of heaven's place.<sup>74</sup> At the outset we learn that though Rufus' position is wrong, it is better than Themistius'.<sup>75</sup> Indeed Bacon devotes more attention to Rufus' arguments than to those of Averroes, whose opinion he himself espouses.

There is, for example, a whole question intended to explain why we do not point down, if asked where the heavens are, an objection against Averroes raised by Rufus. Here Bacon distinguishes between the surrounding place (*locus circa quem*) and the place in which motion takes place (*locus in quo*).<sup>76</sup> If a man were on the surface of the outermost sphere, it is true that he would not point to the center as the place where he was, but at parts of the sphere. That is because he would be indicating only the *locus in quo*, not the *locus circa quem*. That "here" and "there" are relative terms, Bacon tells us, explains why the man on the ninth orb refer to this aspect of place.

Bacon's main reason for rejecting Rufus' view is his intuition that place must be separable from the object it contains. Bacon presents Rufus' reply to this objection fairly: the containing surface can be separated conceptually from the body it limits, because being the limit of a body is not part of its quidditative definition. Surfaces, like points and lines, are simple quantities; they can be defined without reference to the body that they limit. Consequently the convex surface of the universe can be seen as its place; so conceptualized it is not a part of the outermost sphere.<sup>77</sup>

<sup>73</sup> Bacon, *Qsq Physics*, IV, VIII: 196-7.

<sup>74</sup> Parallel passages from the texts of Rufus and Bacon are presented in *Richard Rufus: Physics at Paris*.

<sup>75</sup> Bacon, *Qso Physics*, IV, XIII: 217-20. Bacon's views are fully and favorably discussed by P. Duhem, *Medieval Cosmology*, Chicago-London 1985, 144-8.

<sup>76</sup> Bacon, *Qso Physics*, IV, XIII: 219-220.

<sup>77</sup> Rufus, *In Phys.*, IV, f. 7<sup>rb</sup>: "Nec superficies hoc-quod-est est terminus corporis. Immo <linea et superficies> in se sunt quantitates simplices et prius natura, et huius signum est quod potest definiri . . . superficies non in respectu ad corpus. Quia ergo superficies caeli in se quantitas aliqua est et non solum terminus, contingit intelligere illud in se non ut huius est sed ut receptivum huius."

Immobility by equivalence still does not provide an entirely adequate account of celestial immobility—that is partly a function of the fifth element, quintessence. But immobility by equivalence is part of the explanation, and what is more Bacon states it more clearly than Rufus had, and he provides an example which is easy to follow.<sup>78</sup>

In Rufus, the prose is difficult to follow. After telling us that parts of the universe's containing surface are not parts of place in so far as they are parts of the surface, but only in so far as they are parts at this maximal distance from the center of the system, he adds a complicated reflection on what makes something "this" part: "*ut dicatur quod haec pars est ex hac parte centri, et haec ex hac.*" He explains that as the sphere rotates, one part takes the place of another and has the same relation to the center as the previous part. What makes a different part of the surface the same place is a constant relation to the center:<sup>79</sup> "If such a relation makes a part of the surface at part of the place, then the same relation makes it the same part. Hence the advancing and the receding part are the same part of place. And though they are diverse parts of the surface, yet they have the same relation to the center."

This difficult prose is typical of Rufus when he is still groping toward a solution. By contrast, Bacon's prose is polished. True, his is an account of the immobility of ordinary terrestrial place, not celestial place, but by itself this would not account for the improvement; Bacon's words show that he understood position better:<sup>80</sup> "Wherever the relation is identical, the place is immobile. My view is that relational identity is the completing differentia of the immobility of place, because we always posit the same relation in the containing <body>. Though the containing body is not the same, the relation is always the same, that is the relation to left and right, front and back, up and down."

This mature and well-developed theory is preserved virtually unchanged

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Bacon, *Qso Physics* IV, XIII: 218: "... illa ultima convexitas potest considerari dupliciter: vel in quantum est terminus celi, et sic non est locus ejus nec separabilis ab ipso; aut in quantum in se consideratur et diffinitur sine loco et secundum essentiam ejus in quantum est superficies, et sic est locus ejus."

<sup>78</sup> Bacon, *Qso Physics*, IV, XIII: 191.

<sup>79</sup> Rufus, *In Phys.*, IV, f. 7<sup>rb</sup>: "Si ex tali respectu fiat pars superficiei pars loci, ergo ex eodem respectu pars eadem, ergo pars adveniens et pars recedens sunt eadem pars loci. Cum tamen sint diversae partes superficiei, tamen eundem respectum habent a centro."

<sup>80</sup> Bacon, *Qso Physics*, IV, XIII: 192-3: "ubi<cum>que est identitas respectus, est locus immobilis. . . . Dico quod identitas respectus est differentia completiva immobilitatis loci, quia semper ponitur idem respectus in continente; et licet continens non sit idem, semper idem est respectus, scilicet ad sinistrum, dextrum, ante, retro, sursum, deorsum."

in the *Communia naturalium*, written after 1265,<sup>81</sup> at least fifteen years after the two *Physics* commentaries we have been discussing.<sup>82</sup> The main changes found in the *Communia naturalium* are the result of more fully integrating Rufus' relational account of the immobility of place. Bacon has completely given up explaining the immobility of place in terms of celestial nature, the fifth essence.

Relations are now incorporated into the very definition of place.<sup>83</sup> Place in its most proper sense is a containing surface, as related both to the dimensions within it and to the boundaries of the world. The most equivocal use of the term "place" applies to heaven, which has no containing surface, only the relation, first included in the definition of place by Rufus.<sup>84</sup>

Not only does Bacon revise the definition of place, but he changes his interpretation of Averroes. In the *Communia naturalium*, Bacon says that Averroes himself did not hold this view; it is a view that has been imposed on him.<sup>85</sup> Unwilling though he is, however, Bacon has in fact rejected Averroes and his own earlier account and accepted a theory closer to that of Rufus and Avempace. When Aristotle says that heaven is in a place accidentally, according to the late Bacon, this is because heaven does not essentially require a place. What is located must be *in* a place, and heaven is not *in* the center of the earth.<sup>86</sup> So heaven does not really have a place. This is at the opposite extreme from the first commentary, in which it is ordinary objects in movable containers which do not strictly speaking have a place.<sup>87</sup> The immobility problem having been solved, the containment function of place assumes greater prominence.

Still, Bacon does not entirely accept Rufus' account. He persists in his intuition that place must be separable from what it contains. Thus Bacon rejects the view that heaven's place is the convex outer surface of the outermost sphere. Since as Aristotle says (and Rufus says), properly speaking heaven is simply not in a place,<sup>88</sup> there is no reason we should seek

<sup>81</sup> J. Hackett, *s.v.* BACON, ROGER, in: *Dictionary of the Middle Ages*; S.C. Easton, *Roger Bacon and His Search for a Universal Science*, New York 1952, 111.

<sup>82</sup> Bacon, *Communia naturalium*, III, ed. R. Steele, in: *Opera hactenus inedita Rogeri Baconi*, Oxford 1911, 187, 199.

<sup>83</sup> Described in the second commentary as the *differentia completiva* not of place but the immobility of place (*Qso Physics* IV, XIII: 193).

<sup>84</sup> Bacon, *Communia naturalium*, 185-6.

<sup>85</sup> *Ibid.*, 188.

<sup>86</sup> Bacon, *Communia naturalium*, 187-9, 194, 230.

<sup>87</sup> Bacon, *Qsq Physics*, IV, VIII: 196-7.

<sup>88</sup> Aristotle, *Physics*, IV, c. 5, 212b14-7; Bacon, *Communia naturalium*, 194.

to identify a containing surface. Where there is no container, there is no containing surface.

Like the case of impetus, the problem of the place of the heavens prompted Bacon to compromise between Rufus and Averroes. In both cases, Averroes is the stronger influence, at least initially. Where Rufus eventually prompts Bacon to abandon Averroes, it is to achieve great consistency within the Aristotelian paradigm, not to challenge basic principles. And interestingly, in this case when the change occurs, it is accompanied by an exculpation of Averroes; this rejected view has been imposed on him.

### 6. Conclusion

Mention of Averroes brings us back to the question with which we started, since Averroes, like Rufus, was the object of Bacon's bitter attack in 1292.<sup>89</sup> And nothing we have seen thus far could explain the bitterness of either attack. What we have seen is a quite ordinary pattern of influence by one thirteenth century philosopher on another, where both shared a considerable regard for Averroes. Bacon often disagrees with Rufus, but also sometimes adopts his views. There is nothing here which would suggest that Bacon believes Rufus gave credence to the worst errors<sup>90</sup> or that Averroes destroyed Aristotelian philosophy. Indeed, the early Bacon shows more deference for Averroes than Rufus does. Rufus, was already writing treatises against Averroes before 1238.<sup>91</sup> By contrast, Bacon does not register a protest until the late 1260's when he wrote his *Communia naturalium*.<sup>92</sup> Even the late 1260's when Bacon acknowledges and condemns Averroes' teaching on the passive intellect, he prefers not to disagree.<sup>93</sup> Rather than disagree with Averroes on place, Bacon suggests that Averroes has been imposed upon and did not really hold the view the universe was in a place in virtue of its center. In the case of Bacon's dislike for Rufus, it is possible that Bacon did not know the views he adopted came from Rufus. Conceivably he knew these views only at second hand—perhaps as reported by Robert Kilwardby. But that seems

<sup>89</sup> *Comp. th.*, p. 2a c. 3 n. 72, ed. Maloney, 78.

<sup>90</sup> *Comp. th.*, p. 2a c. 4 n. 86, ed. Maloney, 86.

<sup>91</sup> *De ideis* and *De causa individuationis*, cf. R. Wood, *Individual Forms*, in: L. Honnefelder, R. Wood & M. Dreyer (ed.), *John Duns Scotus*, Leiden 1996, 253.

<sup>92</sup> D. Lindberg, *Roger Bacon's Philosophy of Nature*, Oxford 1983, xxv.

<sup>93</sup> *Communia naturalium*, 286.

unlikely since Bacon was at Paris not long after Rufus left and may even have arrived before his departure. Moreover, Kilwardby cited Rufus prominently enough (at least when discussing topics like the eternity of the world as a theologian) that it would be difficult to miss the reference.<sup>94</sup>

Another possibility which suggests itself is that the animosity is personal in origin: Rufus and Bacon might have learned to dislike each other while living together in a Franciscan convent. But that possibility, too, seems remote. It is unlikely in part because the two authors were almost never at the same convent. Between 1234 and 1238 when Rufus was at Paris, Bacon is supposed to have been in Oxford for most of the time. And though it is possible that Bacon arrived at Paris before Rufus left, since neither was a Franciscan then, they certainly did not live at the same convent. From 1238 to 1246 when Rufus was certainly at Oxford studying theology, Bacon was at Paris teaching philosophy most of the time.

Only from about 1246 to 1251 is it likely that the two authors were together for an extended period, perhaps studying theology together at the Oxford Franciscan convent.<sup>95</sup> Bacon was at Paris in the Spring or Summer of 1251,<sup>96</sup> but he is generally supposed to have been in Oxford from 1252 to 1257 continuously,<sup>97</sup> a period when Rufus was in Paris most of the time, returning to Oxford in 1256 not long before Bacon is supposed to depart for Paris. Finally, we suppose that Rufus died soon after 1259 allowing for no personal contact after 1260.

Consequently if there was personal animosity, the likelihood is that it dates from 1246-51. Supposing there was a personal problem, we would expect the most violent attacks in the works written closest to the period of their time together, perhaps as late as the *Opus Maius* of 1267. We would not expect forty years of silence followed by a bitter attack in

<sup>94</sup> Kilwardby, *Quaestiones in librum II Sent.*, q. 3, ed. G. Leibold, München 1992, 15.

<sup>95</sup> Conceivably Bacon was both at Oxford in 1250 and in Paris in 1252; that would account for his knowledge of the circumstances of Rufus' lecturers and increase the period of their contact. Recently J. Hackett (1995, 102) made a similar suggestion in an article which challenges the accepted account of Bacon's life. I agree with Hackett that much of the current reconstruction of Bacon chronology is not conclusively documented, but do not feel myself qualified to contribute to the debate. My purpose here is simply to get clear on what is uncontroversial about Bacon's encounter with Rufus—namely, that (1) there was not much contact before 1250 and (2) the bitter attack came more than thirty-five years after that contact. If Hackett's plausible suggestion that Bacon remained in Paris after 1251 is accepted, then there was more and somewhat later contact, but the attack still came more than thirty years after any personal contact was possible.

<sup>96</sup> *Opus Majus*, IV, ed. Bridges I: 401-2; Crowley, 25-9.

<sup>97</sup> D. Lindberg, *Roger Bacon's Philosophy of Nature*, Oxford 1983, xviii-xxi.

1292, the date of the *Compendium studii theologiae*. When he says that he knew Rufus best of all, Bacon is probably thinking of their years together studying theology. But what prompts the attack on Rufus was probably not something from student days.

More likely, it was the success of which Bacon complains which prompted the attack. Surely Bacon was angry precisely because he lacked the eager followers attracted in immense numbers by Rufus' philosophy. Very likely Averroes was attacked for a similar reason: because Bacon disagreed with Averroes about the agent intellect, and Averroes' interpretation attracted adherents while Bacon's did not. But the violent attack in 1292 should not tempt us to ignore Bacon's 1267 statement that Averroes was the greatest philosopher after Aristotle and Avicenna.<sup>98</sup> Bacon learned to understand Aristotle's *libri naturales* with the help of Averroes' commentary. Like every other scholastic he was immensely indebted to Averroes for his own understanding of Aristotelian physics. Indeed, the advances we can see in Bacon's lectures as compared to those of Rufus are owed in no small part to Averroes. And though Bacon's views in natural philosophy did change over time, their development followed an orderly course. There is, as Ferdinand Delorme pointed out,<sup>99</sup> more continuity than discontinuity in the views stated in the philosophical and the polemical pedagogical works. The sound views on Aristotelian natural philosophy which Bacon owed in large part to Averroes certainly were not abandoned in later years.

James Weisheipl believed that Bacon never really understood Aristotle,<sup>100</sup> because he interpreted Aristotle according to Avicenna and other Neoplatonic thinkers. Crowley's position is more nuanced.<sup>101</sup> He holds that Bacon tried to be an Aristotelian but failed, since his approach was too eclectic. Crowley claims that though Bacon did not consciously depart from Aristotle, Bacon also did not grasp the implications of Aristotle's views. The comparison just made between Bacon and Rufus suggests that such judgments are anachronistic. Bacon was far less Neoplatonic in his approach to physics than was Rufus; he rejected more tenets of old-fashioned scholasticism. More importantly it is consistency with the guiding principles of Aristotle's physics which dictates what revisions he accepts and what he rejects.

<sup>98</sup> *Opus majus*, I c. 6, ed. Bridges, London 1900, 14.

<sup>99</sup> Bacon, *Quo Physic*, XIII: xxvi.

<sup>100</sup> J. Weisheipl, s.v. *ROGER BACON*, in: *New Catholic Encyclopedia*.

<sup>101</sup> *Roger Bacon*, 178-81, 201-4.

Bacon had absorbed the paradigm of Aristotelian physics more fully than Rufus. That is why challenges to the basic principles of Aristotelian physics, such as Rufus' explanation of projectile motion, appeared absurd to him. Having absorbed the paradigm, Bacon was able to accept limited criticism of Averroes and even Aristotle, when they made for an account freer from anomaly and inconsistency, as in the cases of place and projectile motion. For the most part, however, Bacon preferred to gloss over such disagreements. Unlike Rufus, Bacon concurred with Averroes' strong emphasis on the substantial contact in violent motion and deferred to Averroes on the place of the heavens. It is sign of his regard to Averroes on the topic that when Bacon is eventually convinced to abandon Averroes' position, he does not acknowledge the disagreement but exculpates Averroes.

Bacon's stance on the eternity of the world is important in two respects. First, it shows his extreme reluctance to criticize Aristotle. Second, it shows that at least in that respect he was more a member of Alexander of Hales' generation than the generation following Robert Grosseteste. Bacon knew Aristotle's natural philosophy thoroughly—and *pace* Weisheipl—understood most of it. But he was not in a position to move far beyond it. In part because Rufus had absorbed the paradigm of Aristotelian physics less completely, and never gained the habits of deference characteristic of later scholasticism, he was more effective as a critic. That explains why his works were still fresh thirty years after Rufus died.

These are generalizations to which there are undoubtedly exceptions. One such exception is the case of the agent intellect, where Avicenna more strongly influenced Bacon than Rufus. But since these generalizations are based on an evaluation of Rufus' and Bacon's treatment of some of the great problems of Aristotelian physics, correcting them will not result in a return to past judgments. It is to be hoped that people will hesitate to present Bacon as incapable of understanding Aristotle or Rufus as a minor theologian inferior to Grosseteste in his grasp of Aristotelian physics. Instead, we may hope for more refined and precise presentations of the early days of Western Aristotelianism—where so much of what we know we owe to Bacon.

Not the least of what we owe to Bacon is the information he provides about Rufus. Adopting the intellectual humility Bacon preached but did not practice, Rufus almost vanished from the history books, as he probably wished to do. Bacon, by contrast, sought to escape obscurity by writing for the powerful and for posterity. Both men achieved their wishes to a considerable extent; we know almost nothing about Rufus' life. And it is a delicious irony that Bacon's rude remarks provide some of the



most important information we have on Rufus. Without Bacon's testimony, who would dare assert that a virtually unknown scholastic author attracted huge crowds of followers long after his death?

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