

CHAPTER II

AQUINAS AND AVICENNA ON THE RELATIONSHIP BETWEEN FIRST PHILOSOPHY AND THE OTHER THEORETICAL SCIENCES (In *De Trin.*, q. 5, a. 1, ad 9)

In recent decades considerable progress has been made in investigating and identifying earlier philosophical sources for the thought of Thomas Aquinas. Among these sources Avicenna stands out as one whose work must be considered by anyone interested in the historical origins of Thomistic metaphysics. In addition to groundbreaking studies by Etienne Gilson illustrating the general influence of Arabic philosophy on Latin scholasticism,¹ a number of more recent efforts have been directed to particular examples of the Avicennian influence on Thomas himself. Some of these have investigated the Avicennian influence on particular doctrines while others have concentrated on Avicenna as a source for particular Thomistic works.²

1. "Pourquoi saint Thomas a critiqué saint Augustin," *Archives d'Histoire Doctrinale et Littéraire du Moyen Age* 1 (1926-1927), pp. 5-127; "Avicenne et le point de départ de Duns Scot," *ibid.* 2 (1927), pp. 89-149; "Les sources gréco-arabes de l'augustinisme avicennisant," *ibid.* 4 (1929), pp. 5-149.

2. See for instance, G. Smith, "Avicenna and the Possibles," *The New Scholasticism* 17 (1943), pp. 340-57; A. Lobato, *De influxu Avicennae in theoria cognitionis Sancti Thomae Aquinatis* (Granada, 1956); B. Zedler, "Saint Thomas and Avicenna in the 'De Potentia Dei,'" *Traditio* 6 (1948), pp. 105-59; "St. Thomas, Interpreter of Avicenna," *The Modern Schoolman* 33 (1955-1956), pp. 1-18; L. De Raeymaeker, "L'être selon Avicenne et selon s. Thomas d'Aquin," *Avicenna Commemoration Volume* (Calcutta, 1956), pp. 119-31; "La esencia avicenista y la esencia tomista," *Sapientia* 11 (1956), pp. 154-65. For a list of explicit citations of Avicenna by St. Thomas see C. Vansteenkiste, "Avicenna-Citaten bij S. Thomas," *Tijdschrift voor Philosophie* 15 (1953), pp. 457-507. For further bibliographical indications concerning Avicenna and his influence on Latin scholasticism see G. C. Anawati, *Essai de bibliographie avicennienne* (Cairo, 1950), section 4, "Les Travaux Sur Avicenne En Langues Autres

At the same time, qq. 5 and 6 of Thomas's Commentary on Boethius's *De Trinitate* contain his most extensive treatment of the division and nature of the speculative sciences and their respective methods. Renewed interest in these questions is indicated by the relatively recent appearance of two important editions of these questions,³ by two English translations,⁴ and by a series of articles treating of the Thomistic theory of abstraction and separation developed therein.⁵ Finally, S. Neumann has devoted a monograph to the object and method of the theoretical sciences as found in these same questions.⁶ However, although considerable attention has understandably

Que L'Arabe," and for a résumé of this bibliography in French his "La tradition manuscrite orientale de l'oeuvre d'Avicenne," *Revue thomiste* 51 (1951), pp. 407-40; also his "Chronique avicennienne 1951-1960," *Revue thomiste* 60 (1960), pp. 630-31; and "Bibliographie de la philosophie médiévale en terre d'Islam pour les années 1959-1969," *Bulletin de philosophie médiévale* 10-12 (1968-70), p. 361. Now also see his "Saint Thomas d'Aquin et la Métaphysique d'Avicenne," in *St. Thomas Aquinas 1274-1974: Commemorative Studies* (Toronto, 1974), Vol. 1, pp. 449-65 (with references to other studies); *La Métaphysique du Shifā' Livres I à V. Introduction, traduction et notes* (Paris, 1978), pp. 63-78 (with some additional references). Also see L. Gardet, "Saint Thomas et ses prédécesseurs arabes," in *St. Thomas Aquinas 1274-1974*, Vol. 1, especially pp. 435-38; A. Judy, "Avicenna's *Metaphysics* in the *Summa contra gentiles*," *Angelicum* 52 (1975), pp. 340-84, 541-86; and vol. 53 (1976), pp. 185-226. Also see Gilson, "Avicenne en Occident au Moyen Age," *Archives d'Histoire Doctrinale et Littéraire du Moyen Age* 36 (1969), pp. 89-121.

3. Thomas von Aquin, *In librum Boethii De Trinitate, Quaestiones Quinta et Sexta*, P. Wyser, ed. (Fribourg-Louvain, 1948); *Sancti Thomae de Aquino Expositio super librum Boethii De Trinitate*, B. Decker, ed., 2d ed. (Leiden, 1959). In addition to being an edition of the entire Thomistic Commentary rather than merely of qq. 5 and 6, Decker's work has the added merit of having consulted other codices in addition to the autograph manuscript used by Wyser. See Decker, *op. cit.*, pp. 33ff.

4. *St. Thomas Aquinas, The Division and Methods of the Sciences: Questions V and VI of His Commentary on the De Trinitate of Boethius, Translated with Introduction and Notes*, A. Maurer, tr., 3d rev. ed. (Toronto, 1963); *The Trinity and The Unicity of the Intellect by St. Thomas Aquinas*, Sr. Rose Emmanuella Brennan, tr. (St. Louis, 1946), pp. 8-197 for a translation of all six questions of Thomas's Commentary on the *De Trinitate*. Maurer's translation is based on the autograph edition of Wyser, but in the third edition Decker's edition has also been used. See Maurer, pp. xxxix-x1. Although the Brennan translation is not restricted to qq. 5 and 6, it appeared before the Wyser and Decker editions and hence is not based on the better text now available.

5. For reference to many of these and for discussion of this issue see Ch. IV below.

6. S. Neumann, *Gegenstand und Methode der theoretischen Wissenschaften nach Thomas von Aquin aufgrund der Expositio super librum Boethii De Trinitate*, in *Beiträge zur Geschichte der Philosophie und Theologie des Mittelalters* 41:2 (Münster, 1965). Since the original appearance of my article in 1973, another book-length study of Thomas's Commentary has appeared: L. Elders, *Faith and Science: An Introduction to St. Thomas' Expositio in Boethii De Trinitate* (Rome, 1974). Moreover, H. Weidemann

been given to Aristotle and to Boethius as sources for Thomas in his writing of this commentary, Avicenna has received relatively little notice. Nonetheless, a comparison of q. 5 in particular with certain sections of the Latin Avicenna, above all with the opening book of the *Metaphysics* of his great encyclopedia of philosophy (*al-Shifā'*), suggests that the latter may also have to be numbered among the principal sources for this part of Thomas's commentary.⁷ Rather than attempt to demonstrate this point in the present

has concentrated heavily on Thomas's Commentary in his *Metaphysik und Sprache: Eine sprachphilosophische Untersuchung zu Thomas von Aquin und Aristoteles* (Freiburg-Munich, 1975).

7. Thus Neumann, in the work cited in n. 6 above, devotes pp. 19-36 to Aristotle and pp. 36-57 to Boethius as background material for Thomas's Commentary. With rarest exceptions such as pp. 115 and 152, Avicenna is completely disregarded. Nonetheless, Vansteenkiste lists ten explicit citations of Avicenna by Thomas in this Commentary and four from questions 5 and 6 (q. 5, a. 1, ad 4; q. 5, a. 1, ad 9; q. 5, a. 4c; q. 6, a. 3c), *op. cit.*, pp. 458-60. In the footnotes of his edition Decker has indicated a number of further parallel passages between Avicenna and Aquinas in addition to the explicit citations. More recently, Elders has also noted a number of points in the Commentary where Thomas is influenced by Avicenna (*op. cit.*, Index), though he does not single out the passage which is of primary interest to me in the present chapter. Also, for some references to Avicenna and to my article see Weidemann, *op. cit.* The Avicenna known to Thomas and to which I shall here be referring is the Latin Avicenna, that is, the Latin translation of the *Metaphysics* of Avicenna's most important philosophical work, his *Kitāb al-Shifā'*. Although a major part of the original Arabic text was translated into Latin in the Middle Ages, this translation activity occurred in different stages. Moreover, certain sections were simply not translated at all. For an outline of the various parts of the *Shifā'* and a description of the various steps involved in the medieval Latin translation of the same, see M.-T. d'Alverny, "Avicenna Latinus I," *Archives d'Histoire Doctrinale et Littéraire du Moyen Age* 28 (1961), pp. 282-88. The most important step seems to have occurred at Toledo after the year 1150 and included an *Introduction*, *Isagoge*, ch. 7 of section 2 of the *Second Analytics*, *Physics* (in part), *De Anima*, and *Metaphysics*. Only a relatively small part of the *Logic* (about one-fourteenth) was translated into medieval Latin. See Anawati, "La tradition manuscrite orientale," p. 417. Both the Latin *Logic* and *Metaphysics* may be found in a 1508 edition: *Avicennae perhypatetici philosophi ac medicorum facile primi Opera in lucem redacta ac nuper quantum ars niti potuit per canonicos emendata* (Venice, 1508; repr. Frankfurt am Main, 1961), ff. 2-12 (*Logica*); ff. 70-109 (*Philosophia prima*). The *Metaphysics* is also available in a 1495 edition: *Metaphysica Avicennae sive eius Prima Philosophia* (Venice, 1495; repr. Louvain, 1961). More recently a critical edition of the Latin *Metaphysics* has appeared in two volumes: *Avicenna Latinus, Liber de Philosophia Prima sive Scientia Divina I-IV*, S. Van Riet, ed.; G. Verbeke, "Introduction doctrinale" (Louvain-Leiden, 1977); *V-X* (Louvain-Leiden, 1980). While forced to rely on the earlier noncritical editions and on an important manuscript contained in Godfrey of Fontaines' library and dating from ca. 1280 (Paris, Nat. Lat. 16.096) when originally writing the present article, here I shall follow the critical edition.

essay, however, I shall here limit myself to one issue and to one text wherein the Avicennian influence clearly appears and is, to some extent at least, explicitly acknowledged by Thomas. Analysis of this text in the light of parallel passages in Avicenna will not only enable me to study in some detail Thomas's usage of Avicenna but will also, it is to be hoped, cast some light on an apparent ambiguity in the Thomistic text itself.

Near the end of the corpus of q. 5, a. 1 of his Commentary on Boethius's *De Trinitate* Thomas indicates that three names may be applied to that branch of speculative knowledge which treats of things that do not depend upon matter for their being. It is known as theology or divine science because the foremost of those things studied in it is God. It is known as metaphysics or as "beyond physics" (*trans physicam*) because it is to be learned after physics. It is also known as first philosophy in that the other sciences receive their principles from it and come after it.⁸ Avicenna also assigns this final function to first philosophy.⁹

8. Decker ed., p. 166. (All citations will be from this edition.) "De quibus omnibus est theologia, id est scientia divina, quia praecipuum in ea cognitorum est deus, quae alio nomine dicitur metaphysica, id est trans physicam, quia post physicam discenda occurrit nobis, quibus ex sensibilibus oportet in insensibilia devenire. Dicitur etiam philosophia prima, in quantum aliae omnes scientiae ab ea sua principia accipientes eam consequuntur." Cf. also q. 6, a. 1, of this same Commentary (*op. cit.*, p. 212). In the latter context, after having designated the method of reason as typical of natural science and the method of learning as characteristic of mathematics, Thomas assigns the method of intellectual consideration to divine science. Divine science gives principles to the other sciences inasmuch as intellectual consideration is the principle of rational consideration. Because of this divine science is also called first philosophy. He also notes in this same context that divine science is learned after physics and after the other sciences in that rational consideration terminates in intellectual consideration. For this reason it is described as metaphysics in that it is, as it were, *trans physicam*, since it comes after physics in the order of resolution. If in these passages Thomas names metaphysics first philosophy because it gives principles to the other sciences; in other contexts he assigns this same title to it because it treats of the highest being or of the first cause(s) of things. Cf. in particular his Commentary on Aristotle's *Metaphysics*, *Prooemium*, and elsewhere, where this reason for the title first philosophy or first science appears as a common theme. See J. Doig, "Science première et science universelle dans le 'Commentaire de la métaphysique' de saint Thomas d'Aquin," *Revue philosophique de Louvain* 63 (1965), pp. 43-46. For my attempt to resolve this apparent discrepancy in Thomas's reasons for naming metaphysics first philosophy, see Ch. III below.

9. In the opening chapter of Bk. I (*Tractatus Primus*) of his *Metaphysics*, after having first raised the question concerning the subject of this science, Avicenna notes that the reader is acquainted with the notion that it is the most certain philosophy, that it is first philosophy, and that it is the science which verifies the principles of the other sciences. See Van Riet ed., p. 3: "Et etiam iam audisti quod haec est philosophia certissima et philosophia prima, et quod ipsa facit acquirere verificationem principiorum

Given this view that metaphysics or first philosophy or divine science provides other sciences with their principles, an apparent difficulty arises. As Thomas puts it in the ninth objection of this same article, that science upon which others depend should be prior to them. But all other sciences depend upon divine science, since it pertains to the latter to establish their principles. Therefore divine science should be placed before and not after the other sciences.¹⁰ Since Thomas explicitly refers to the text of Avicenna in replying to this objection, I shall present the texts from the two authors in parallel columns so as to facilitate comparison between them:

ceterarum scientiarum, et quod ipsa est sapientia certissime." While considering the divisions of this science in ch. 2 of this same Bk. I Avicenna writes that one part treats of the principles of the particular sciences. The principles of a less general science themselves are questions or problems to be investigated by a higher and more general science. Thus the principles of medicine are investigated by a higher science, natural philosophy, and the principles of measure are worked out in geometry. Consequently, it pertains to first philosophy to study the principles of the individual sciences and to establish their subjects. Their function will be to investigate that which follows from their subjects: "Contingit igitur ut in hac scientia monstrantur principia singularium scientiarum quae inquirunt dispositiones uniuscuiusque esse" (*op. cit.*, p. 15). Shortly thereafter he observes that this science is first philosophy because it is the science of the first cause of being. In addition to this he notes that that which is first from the standpoint of universality is being (*esse*) and unity. "Igitur quaestiones huius scientiae quaedam sunt causae esse, in quantum est esse causatum, et quaedam sunt accidentaliter esse, et quaedam sunt principia scientiarum singularium. Et scientia horum quaeritur in hoc magisterio. Et haec est philosophia prima, quia ipsa est scientia de prima causa esse, et haec est prima causa, sed prima causa universitatis est esse et unitas" (pp. 15-16). In light of all of this, three reasons might be offered to justify describing this science as first philosophy: (1) because it gives principles and subjects to the particular sciences; (2) because it studies the First Cause of all being; (3) because it studies that which is most universal, being and unity. It is true, however, that Avicenna explicitly connects the name first philosophy with the second reason. Assumed here is the point that he has already established in this same chapter, namely, that metaphysics has as its subject being as being. For references see note 12 below. In his discussion of the usefulness of first philosophy in ch. 3 Avicenna again assigns a certain *utilitas* to it insofar as it contributes principles to the particular sciences and establishes knowledge as to what they are (*quid sint*) with respect to things that are common to the particular sciences even when they are not causal principles therein: "Utilitas igitur huius scientiae, cuius modum iam demonstravimus, est profectus certitudinis principiorum scientiarum particularium, et certitudo eorum quae sunt eis communia quid sint, quamvis illa non sint principia causaliter" (p. 20).

10. *Op. cit.*, p. 163. "Praeterea, illa scientia, a qua aliae supponunt, debet esse prior eis. Sed omnes aliae scientiae supponunt a scientia divina, quia eius est probare principia aliarum scientiarum. Ergo debuit scientiam divinam aliis praeordinare."

Thomas, *op. cit.*, ad 9 (p. 172)

Ad nonum dicendum quod quamvis scientia divina sit prima omnium scientiarum naturaliter,¹¹ tamen quoad nos aliae scientiae sunt priores. Ut enim dicit Avicenna in principio suae *Metaphysicae*, ordo huius scientiae est, ut adiscatur post scientias naturales, in quibus sunt multa determinata, quibus ista scientia utitur, ut generatio, corruptio, motus et alia huiusmodi.

According to Avicenna and Thomas, then, metaphysics should be learned after the natural sciences because various points are established in the latter which are presupposed by metaphysics. Thomas cites generation, corruption, motion, and things of this type, and to this Avicenna adds place, time, the axiom that whatever is moved is moved by another, knowledge of those things that are moved with respect to the first mover, etc. In each text the implication is that metaphysics is in some way dependent on the natural sciences for its awareness of such items. Receiving this data from the lower sciences, therefore, metaphysics will then be in a position to pursue its analyses from another point of view, that of being as being.¹²

Thomas continues to follow Avicenna in noting that metaphysics should also be studied after mathematics.

Thomas, *ibid.*

Similiter etiam post mathematicas. Indiget enim haec scientia ad cognitionem substantiarum separatarum cognoscere numerum et ordines orbium caelestium, quod non est possibile sine astrologia, ad quam tota mathematica praexigitur.

Avicenna, *Metaphysica* I, ch. 3
(Van Riet ed., pp. 20-21)

Ordo vero huius scientiae est ut discatur post scientias naturales et disciplinales. Sed post naturales, ideo quia multa de his quae conceduntur in ista sunt de illis quae iam probata sunt in naturali, sicut generatio et corruptio, et alteritas, et locus, et tempus, et quod omne quod movetur ab alio movetur, et quae sunt ea quae moventur ad primum motorem, et cetera.

Avicenna, p. 21

Post disciplinales vero, ideo quia intentio ultima in hac scientia est cognitio gubernationis Dei altissimi, et cognitio angelorum spiritualium et ordinum suorum, et cognitio ordinationis in compositione circulorum, ad quam scientiam impossibile est perveniri nisi

11. Here I have changed the punctuation of the Decker edition slightly by placing the comma after *naturaliter*. For the same interpretation see Maurer, *op. cit.*, p. 16, and n. 44.

12. On being as being as the subject of metaphysics in Aquinas see, for instance, the texts cited above in Ch. I, notes 86 and 87. For Avicenna see his *Metaphysics*, Bk. I, chs. 1 and 2. Note in particular: "Igitur ostensum est tibi ex his omnibus quod ens, in quantum est ens, est commune omnibus his et quod ipsum debet poni subiectum huius magisterii, et quia non eget inquiri an sit et quid sit Ideo primum subiectum huius scientiae est ens, in quantum est ens; et ea quae inquirunt sunt consequentia ens, in quantum est ens, sine conditione" (pp. 12-13).

per cognitionem astrologiae; ad scientiam vero astrologiae nemo potest pervenire nisi per scientiam arithmeticae et geometriae.

In shortened form Thomas again retains the essentials of the Avicennian text. According to each writer metaphysics should be studied after mathematics. As Thomas presents it, a knowledge of separate substances pertains to metaphysics. Such knowledge presupposes astronomy, which in turn requires mastery of mathematics. According to Avicenna the ultimate purpose of first philosophy is to arrive at a knowledge of God as supreme ruler as well as at knowledge of the angels and their orders and at knowledge of the heavenly spheres. In his text also one finds knowledge of astronomy laid down as an essential prerequisite for this together with the view that astronomy itself presupposes arithmetic and geometry. Needless to say, each author here assumes that angels or separate intelligences in some way move the heavenly bodies.¹³ If such were the case, knowledge of the heavenly spheres and their movements would be regarded as essential for knowledge of the separate intelligences themselves. In brief, if metaphysical investigation should end in knowledge of God and the separate entities, and if an investigation of the heavenly spheres is required for such knowledge, then mathematics as presupposed by astronomy will also be presupposed by metaphysics.

Here it may be helpful to recall the opening lines of Thomas's reply to the ninth objection. There he distinguishes between the order of nature and the order of discovery (*naturaliter* and *quoad nos*). Metaphysics is prior to the other sciences in the order of nature. But as far as we are concerned it should be learned after physics and after mathematics, for it receives certain data from each of these sciences. Although Avicenna does not explicitly advert to this distinction in the immediate context under consideration here, it is presupposed by his discussion. In fact, some lines farther on, after a somewhat involved consideration of a possible objection to the view that metaphysics depends in some way on physics and mathematics, Avicenna refers to a similar distinction. There he notes that in the order of nature (*in ipsis rebus*) there is another way of proceeding. Rather than move from sense

13. On this view in Aristotle and Thomas see Maurer, *op. cit.*, p. 17, n. 46. For more on Thomas's views concerning the movers of the heavenly bodies see T. Litt, *Les corps célestes dans l'univers de saint Thomas d'Aquin* (Louvain-Paris, 1963), pp. 99-109; and J. Collins, *The Thomistic Philosophy of the Angels* (Washington, D.C., 1947), pp. 305-10. Also, for some interesting comments on this first part of Thomas's reply to objection 9 and for some reference to Avicenna, see G. Klubertanz, "St. Thomas on Learning Metaphysics," *Gregorianum* 35 (1954), pp. 10-13.

experience of an effect to knowledge of its cause, he mentions a deductive approach whereby one would arrive at a knowledge of a necessary being by application of self-evident universal propositions which would immediately lead to such knowledge. He then comments, however, that because of the weakness of our knowing powers we cannot follow this deductive route from principle to conclusion or from cause to effect except in certain restricted cases. Normally we must reason from effect to cause rather than from cause to effect. Because of this, therefore, although metaphysics is prior to the other sciences when it is viewed in itself, insofar as we are concerned it comes after the other sciences. The priority of physics and mathematics with respect to metaphysics applies to the order of learning or the order of discovery, not to the order of nature.¹⁴ Once more we find Thomas in agreement with the thought of Avicenna.

Further comparison of the Thomistic and Avicennian texts reveals that the close parallelism continues.

Thomas, *ibid.*

Aliae vero scientiae sunt ad bene esse ipsius, ut musica et morales vel aliae huiusmodi.

Avicenna, *ibid.*

Musica vero et particulares disciplinalium et morales et civiles utiles sunt, non necessariae, ad hanc scientiam.

Again Thomas shortens the text of Avicenna. He simply notes that other sciences such as music and moral philosophy contribute to the perfection of metaphysics. The implication would seem to be that they are not necessary for one to arrive at metaphysics. Avicenna notes that music and the particular mathematical sciences as well as moral and political sciences are useful but not necessary for metaphysics. His text is more explicit than that of Thomas on this final point.

At this juncture an interesting objection is raised by Avicenna. Awareness of the same difficulty accounts for the corresponding Thomistic passage.

Thomas, *ibid.*

Nec tamen oportet quod sit circulus, quia ipsa supponit ea, quae in aliis probantur, cum ipsa aliarum principia probet . . .

Avicenna, *ibid.*

Potest autem aliquis opponere dicens quod, si principia scientiae naturalis et disciplinalium non probantur nisi in hac scientia et quaestiones utrarumque scientiarum probantur per principia earum, quaestiones vero earum fiunt

14. *Op. cit.*, pp. 23-24. Note in particular: "Sed nos propter infirmitatem nostrarum animarum non possumus incedere per ipsam viam demonstrativam, quae est progressus ex principiis ad sequentia et ex causa ad causatum, nisi in aliquibus ordinibus universitatis eorum quae sunt, sine discretione. Igitur ex merito huius scientiae in se est, ut ipsa sit altior omnibus scientiis; quantum vero ad nos posterioratur post omnes scientias" (p. 24).

principia huius, tunc haec argumentatio est circularis et per ultimum eius fit manifestatio sui ipsius.

Although it appears in shortened form in the Thomistic text, the objection is fundamentally the same. If, as both writers have maintained, metaphysics presupposes both the natural sciences and mathematics in that it derives certain points from them and if, at the same time, these sciences receive their principles from metaphysics, how avoid the conclusion that circular reasoning is involved? One seems to be asserting that certain conclusions of the lower sciences are adopted by metaphysics for its own purposes and that it uses them as principles to arrive at conclusions which will serve as principles in the same lower sciences. If the original conclusions of the lower sciences follow from such principles given to them by metaphysics, it will follow that these conclusions have now become their own principles of proof.

Thomas develops his first reply to this objection in the following lines:

. . . quia principia, quae accipit alia scientia, scilicet naturalis, a prima philosophia, non probant ea quae idem philosophus primus accipit a naturali, sed probantur per alia principia per se nota; et similiter philosophus primus non probat principia, quae tradit naturali, per principia quae ab eo accipit, sed per alia principia per se nota. Et sic non est aliquis circulus in diffinitione.¹⁵

Because this text admits of two different interpretations I shall consider it according to the following steps:

First Reading:

1. The principles which another science such as natural philosophy receives from first philosophy:

- a) are not used to prove those points which the first philosopher receives from the natural philosopher;
- b) rather they (the principles) are proved by means of other self-evident principles, and apparently in first philosophy.

2. In like fashion, as regards the principles which the first philosopher gives to a particular science, that is, natural philosophy:

- a) they are not proved by means of principles derived from the natural philosopher
- b) but by means of other self-evident principles.

Conclusion: Therefore there is no vicious circle. This conclusion follows from step 1 as well as from step 2. According to step 1-a there is no vicious circle because the principles which the particular science receives from

15. *Op. cit.*, p. 172.

metaphysics are not used to prove those things which metaphysics derives from the particular science. According to step 2 there is no vicious circle because these same principles are not proved by means of principles derived from the particular science, but by means of other self-evident principles. Hence they will not be used to prove themselves, as might happen if they were established by means of conclusions of the particular science. In that case such conclusions might themselves derive from these same principles.

A certain difficulty follows from this reading; however, with respect to the role of step 1-b in the argumentation. In step 1-a our attention is directed to the function of principles given by metaphysics to a particular science, that is, natural philosophy. Such principles are not used to prove those things which first philosophy derives from the natural philosopher. But in step 1-b attention is shifted to the origin of these same principles. They are proved by means of other self-evident principles. The break in thought is rather surprising, and step 1-b hardly seems necessary in order to refute the argument about circular reasoning. Moreover, granted the presence of step 1-b, step 2-b seems to be repetitious. If according to step 2-a these same principles (which the first philosopher gives to the natural philosopher) are not proved by means of principles derived from natural philosophy, it is because they are derived from other self-evident principles (cf. step 2-b). But this has already been asserted in step 1-b. Again, step 1-a states that the principles given by first philosophy to a lower science are not used to prove the principles that first philosophy receives from that science. The question remains unanswered as to how the latter principles (those received by metaphysics from the lower science) are themselves established. However, it should be noted that in step 3 (see below) where a second argument appears, the demonstrations of natural philosophy will be grounded in sense experience.

To assume that *principia* is also the subject of *probantur* appears to be the more natural reading, at least at first sight. It is also the reading implied by A. Maurer in his translation of the same:

For the *principles* that another science (such as natural philosophy) takes from first philosophy do not prove what the same first philosopher takes from the natural philosopher, but *they* are proved through other self-evident principles.¹⁶ (Italics mine)

However, another reading is possible:

For the principles that another science (such as natural philosophy) takes from first philosophy do not prove *those things* which

16. *Op. cit.*, p. 17.

the same first philosopher takes from the natural philosopher, but *they* (the latter) are proved through other self-evident principles.

According to this reading the subject of *probantur* would not be the principles that another science receives from first philosophy but rather those things which the first philosopher receives from the natural philosopher. It is these that are proved through self-evident principles. Recalling our previous analysis of the text ("First Reading"), we find that this interpretation would lead to another reading.

Second Reading:

1. The principles which another science such as natural philosophy receives from first philosophy:

a) are not used to prove those things which the first philosopher receives from the natural philosopher.

b) Rather, the latter (those things which the first philosopher receives from the natural philosopher) are proved by means of other self-evident principles. Such proof, according to this reading, would take place in natural philosophy itself.

Step 2 would remain the same as in the First Reading.

Relative merits of the two readings:

According to the Second Reading, step 1-b now has a more logical function in the argumentation. It tells us precisely why the principles which another science receives from first philosophy are not to be used to prove the conclusions that first philosophy takes from the particular science. Such is true because the latter type of conclusion, that which first philosophy derives from a particular science such as natural philosophy, is proved by means of other self-evident premises within the particular science itself.¹⁷ Then in step 2 attention is directed to the manner of proof for the principles of step 1-a. The principles that first philosophy gives to a particular science

17. Vernon Bourke translates the sentence at issue as follows: "In fact, the principles that another science, say, natural philosophy, takes from first philosophy do not prove the points which the first philosopher takes from the natural philosopher; rather, they are proved by means of different principles that are self-evident." See *The Pocket Aquinas* (New York: Washington Square Press, 1960; 6th printing, 1968), p. 152. While nicely capturing something of the ambiguity of the Latin text, this translation appears to support the Second Reading I am defending here. The same appears to be true of Klubertanz's rendering: ". . . the principles which another *scientia*, that is, natural *scientia*, received from first philosophy do not prove those things which the first philosopher accepts from the natural *scientia*, but they are proved by other principles which are known per se . . ." (*op. cit.*, p. 9).

are not only not to be used to prove those conclusions that first philosophy receives from natural philosophy. In addition they are not to be proved by means of principles derived from natural philosophy. They too are rather proved by means of other self-evident principles, and in metaphysics itself.

According to this Second Reading both steps enter into the refutation of alleged circularity, with each making a distinctive contribution. Step 1-b notes that those principles that first philosophy receives from natural philosophy themselves derive from self-evident principles and not from other premises in natural philosophy which themselves would be given to it by first philosophy. Steps 1-a, 2-a, and 2-b deal with those principles that first philosophy gives to a particular science such as natural philosophy. If such principles are not used to prove conclusions that metaphysics receives from natural philosophy (step 1-a), in like fashion they are not themselves proved by means of such conclusions (cf. step 2-a). Rather they too follow from other self-evident principles.

Moreover, this interpretation allows for a certain autonomy of the particular theoretical sciences. Granted that they do receive principles from metaphysics, in some way they can also discover their own starting points or first principles by grounding them in that which is self-evident. In the immediately following context Thomas develops this final point in what is really another argument or another reply to the objection about circular reasoning.

Praeterea, effectus sensibiles, ex quibus procedunt demonstrationes naturales, sunt notiores quoad nos in principio, sed cum per eos pervenerimus ad cognitionem causarum primarum, ex eis apparebit nobis propter quid illorum effectuum, ex quibus probabantur demonstratione quia. Et sic et scientia naturalis aliquid tradit scientiae divinae, et tamen per eam sua principia notificantur.¹⁸

In this passage, which I shall describe as *step 3*, Thomas notes that the demonstrations of natural science depend on certain effects available to sense experience. These effects are more evident to us in the beginning, that is to say, they are prior with respect to us in the order of discovery. Presumably these sensible effects may also be described as "principles" in a broader sense, since they serve as starting points for demonstrations in natural philosophy. By means of them one comes to a knowledge of first causes. When this happens one will only have knowledge *quia* concerning these effects and concerning their causes. One will know *that* they exist but not *why*. However, Thomas suggests that when one has come to such

18. *Op. cit.*, pp. 172-73.

knowledge of their causes and has analyzed the knowledge of said causes in metaphysics, then one may be in position to reason back from the cause to the effect. That is to say, one will then have *propter quid* knowledge of the sensible effects, the starting points or principles of the natural science. In this way, concludes Thomas, natural philosophy may contribute something to divine science (knowledge concerning the existence of a cause or causes) and divine science may in turn contribute something to natural philosophy (knowledge of the reason for the effects in terms of the causes from which they follow, which effects themselves had served as starting points or as principles in natural philosophy).¹⁹

This argument (step 3) differs somewhat from that presented in steps 1 and 2. According to the earlier argumentation there is no vicious circle because different principles are involved. The principles that metaphysics gives to the particular science are not proved by means of principles derived from that science but by means of other self-evident principles. And according to our suggested reading, the principles that metaphysics receives from the particular sciences are not proved by means of principles given by metaphysics to that science but likewise by means of self-evident premises. In the present argument, however, it seems that one and the same "principle," a fact of sense experience, for instance, may be discovered by the particular science on the basis of experience and then reaffirmed by metaphysics in terms of *propter quid* knowledge of it as an effect following from its proper cause. According to this line of reasoning a vicious circle is avoided in that the "principle" of the particular science can be established in two different ways.

To return to the text of Avicenna, one finds a similar development there. However, since his reply is somewhat extended and more or less seems to repeat itself, I shall present it in three sections. In each section essentially the same reasoning reappears, although there is some development and the three steps involved in that reasoning are brought out most distinctly in Section C.

Section A:

Dico igitur quod principium scientiae non est principium sic ut omnes quaestiones pendeant ex eo ad demonstrandum eas in actu vel in potentia, sed fortasse accipietur principium in demonstratione aliquarum. Possibile est etiam esse quaestiones in scientiis in quarum demonstrationibus non admittuntur ea

19. For more on this distinction between demonstrations *quia* and *propter quid* see Maurer, *op. cit.*, pp. 17-18, n. 47; W. Wallace, *The Role of Demonstration in Moral Theology* (Washington, D.C., 1962), pp. 17-22; John of St. Thomas, *Cursus Philosophicus Thomisticus*, Vol. 1, *Ars logica*, B. Reiser, ed. (Turin, 1930), II, 25, 4, pp. 785-91.

quae posita sunt principia ullo modo, quia non admittuntur nisi propositiones quae non probantur ad hoc ut principium scientiae sit principium verissimum, per quod ad ultimum acquiratur certissima veritas, sicut est illa quae acquiritur ex causa. Si autem non acquirat causam, non dicetur principium scientiae sic sed aliter, quia fortasse dicetur principium, sicut sensus solet dici principium, eo modo quo sensus in quantum est sensus, non acquirat nisi esse tantum.²⁰

According to this passage (1) in order for something to be regarded as a principle of a given science it is not necessary for all the conclusions of that science to follow from it. It may merely serve as a principle for demonstrating some of the conclusions of that science. (2) Again, certain points may be demonstrated in a particular science without using "principles" at all but merely by depending on undemonstrated premises, presumably because they are self-evident. (3) Finally, that alone is a "principle" of a science in the truest sense which leads to most certain knowledge as of a conclusion in terms of its cause. If it does not lead to such knowledge of the conclusion it should not be described as a principle of the science in this sense but from some other point of view, as for example, when one refers to sense knowledge as a "principle" insofar as the senses lead to a knowledge of *esse*, i.e., that something is.

Section B:

Soluta est igitur quaestio, quoniam principium naturale potest esse manifestum per se, et potest esse ut manifestetur in philosophia prima per id per quod non fuerat probatum antea, sed per quod in illa probantur aliae quaestiones ita, quod est propositio in scientia altiori ad inferendum in conclusionem illud principium, non in hoc assumatur principium ad concludendum illud, sed assumatur alia propositio. Possibile est etiam ut scientia naturalis et disciplinalis acquirant nobis demonstrationem de an est, et non acquirant nobis demonstrationem de quare est, sed haec scientia acquirat nobis demonstrationem de quare est, et praecipue in causis finalibus remotis.²¹

This section more or less repeats the reasoning of Section A, but with fuller development of certain points. (1) A principle of natural philosophy may be self-evident in itself. See Section A-2 above. (2) Such a principle may also be established in first philosophy by means whereby it was not previously proved, but by which (means) other conclusions are proved therein. Hence that which serves as a premise (*propositio*) in a higher science (first philosophy) to establish this principle (of natural philosophy) will not

20. *Op. cit.*, pp. 21-22.

21. *Op. cit.*, pp. 22-23.

be assumed in order to establish it. Some other premise will be assumed.²² (3) In Section A-3 Avicenna had remarked that only that which leads to certain knowledge of a conclusion in terms of its cause is a principle of a science in the strict sense. Here he observes that natural science and mathematics may simply result in a demonstration that something is (*an est*) rather than in a demonstration as to why it is (*quare est*). But first philosophy may lead to knowledge as to why it is, particularly in terms of remote final causes.

Section C:

Manifestum est igitur quod de quaestionibus scientiae naturalis id quod est principium huius scientiae aliquo modo, (1) vel non manifestabitur ex principiis quae manifestantur in hac scientia, sed ex principiis quae sunt per se nota, (2) vel manifestabitur ex principiis quae sunt quaestiones in hac scientia, sed non convertuntur ut fiant principia illarum earumdem quaestionum sed aliarum, (3) vel illa principia erunt principia aliquorum huius scientiae quae significarunt illud esse de quo quaeritur manifestari in hac scientia quare est. Constat igitur quod, cum ita sit, non erit praedicta probatio circularis ullo modo, ita ut ipsa sit probatio in qua aliquid idem accipiatur in probatione sui ipsius.²³

As regards a principle derived from a lower science such as natural philosophy and employed by metaphysics, the three steps of the above reasoning are now proposed by Avicenna as three possibilities. (1) It may be that the principle in question is not derived from premises which are established in metaphysics but rather from self-evident principles. Cf. Sections A-2 and B-1 above. (2) It may be that such a principle is derived from premises which are *quaestiones* to be established in metaphysics. So long as these *quaestiones* are not used as principles to establish themselves but to establish other conclusions, there will be no vicious circle.²⁴ See Section A-1 above. (3) It may happen that such a principle of a lower science will be used by metaphysics to establish the factual existence of that whose reason for existing is to be determined by metaphysics on other grounds. Cf. Avicenna's distinction above

22. This is a difficult passage even in the Latin critical edition. Thus in lines 3-4 ("sed per quod in illa") the *quod* might be taken to refer to the principle of natural philosophy or to the metaphysical premise which is used to establish that natural principle in metaphysics. I have here taken it in the latter sense. In the Van Riet edition, the following literal translation is offered from the Arabic for the section running from "non in hoc" to "illud": "(ce qui est prémissé dans la science supérieure) ne sera pas pris en considération . . . en tant qu'il produit ce principe: (au contraire celui-ci aura une autre prémissé)." For a slightly different rendering of the Arabic, see Anawati, *La Métaphysique du Shifā'* . . . , p. 99.

23. *Op. cit.*, p. 23.

24. Perhaps this is the point the difficult text in Section B-2 is attempting to make. See note 22.

between demonstrations *an est* and *quare est* and between causal and non-causal knowledge of a conclusion in Sections A-3 and B-3. Avicenna concludes by observing that in each of these situations circular reasoning will be avoided.

In addition to serving as a key for more clearly singling out the steps in the reasoning of Sections A and B, this passage is also helpful as a frame of reference for comparing the Avicennian text with that of Thomas. The parallel between the Avicennian passages and the Thomistic text is not perfect. Aquinas has greatly abbreviated Avicenna's rather extended presentation. Moreover, Thomas focuses his discussion on those principles which a lower science receives from first philosophy. The Avicennian passages concentrate on the principles which first philosophy receives from the lower science. By concentrating on the latter type of principle in reading the Thomistic text, however, one finds the essentials of the Avicennian reasoning.

Before making this comparison, it may be helpful to recall these steps once more. According to Avicenna, then: (1) A principle of a lower science such as natural philosophy (which is also used by metaphysics) may be self-evident in itself. Insofar as it does not lead to knowledge of conclusions in terms of their causes it is not a principle of that science in the strict sense but according to broader usage (cf. A-2, B-1, C-1). (2) Such principles may be used by metaphysics to arrive at certain conclusions therein. Such principles may also be established in metaphysics itself, but never in such a way that the metaphysical premise used to establish a principle is itself derived from that same principle (cf. A-1, B-2, C-2). (3) Such a principle of a lower science may only serve to establish the fact that something is (demonstration *an est*), its reason for existing being determined in metaphysics by knowledge of it in terms of its cause (demonstration *quare*). Cf. A-3, B-3, C-3.

As suggested above, one finds these three basic points in Thomas's text and more completely so according to the Second Reading which I have proposed. As regards the principles which first philosophy receives from natural philosophy Thomas holds: (1) They are not proved by means of the principles that first philosophy has given to natural philosophy. According to the First Reading of the Thomistic passage the discussion as to the origin of such principles ends with this observation, the remainder of steps 1 and 2 concentrating rather on the origin of those principles which first philosophy gives to a lower science. According to the Second Reading proposed above, however, Thomas goes on to note that such principles (taken by first philosophy from a lower science) are proved by means of other self-evident principles. The parallel with step 1 of Avicenna's reasoning as outlined above is more perfectly maintained by this Second Reading. (2) If Thomas again seems more interested in the principles which first philosophy gives to other sciences, he also writes that they are not themselves proved by means

of principles derived by metaphysics from other sciences but by means of other self-evident principles. While apparently concentrating on those particular principles that metaphysics borrows from lower sciences, Avicenna also writes that they too may be established in metaphysics (cf. step 2 above). But like Aquinas he warns that the grounds for establishing such a principle in metaphysics must not themselves derive from that same principle. Here Thomas seems to have generalized Avicenna's reasoning so as to apply it to any principle of a lower science that metaphysics can establish. Avicenna's texts seem to be concerned more directly with principles taken from a lower science by first philosophy for its own purposes, which principles first philosophy may also be in position to demonstrate according to its proper method. Fundamentally the same argumentation is present in both authors, however. (3) Aquinas notes that the demonstrations of natural science proceed from sensibly observable effects. By reasoning from them one may conclude to the existence of their causes. At this point, however, one would only know that these effects are. One would not yet know the reason for their existence, the *why*. By examining their causes in first philosophy, one might then be in position to reason back from cause to effect, thus establishing the reason for their existence. This reasoning reproduces that found in step 3 of Avicenna's text, but again in shortened form. Avicenna has indicated that the demonstration *quare* provided by metaphysics should give knowledge of the effect in terms of its cause, above all in terms of its final cause. While Thomas speaks of a knowledge of first causes as providing *propter quid* knowledge of the effect, he does not here single out any one cause for special emphasis.

In conclusion, then, the preceding analysis suggests two points with respect to Thomas's reply to this ninth objection in his Commentary on Boethius's *De Trinitate*. First, his dependence on Avicenna is far greater here than the brief reference in his text might indicate.²⁵ He appears to be heavily dependent on Avicenna both for the objection concerning possible circular reasoning and in formulating the various steps of his reply to that objection. Second, as to interpreting the difficult passage cited above in Thomas's text, added evidence appears for the Second Reading as I have proposed it in light of his general dependency on Avicenna in this context. This dependency of itself does not suffice to prove that Thomas reasoned in the way suggested here. Nevertheless, if I am correct in finding the Second Reading more likely on the grounds of internal consistency, then the similarity between the reasoning implied by that Reading and the general argumentation found in the Avicennian text serves as a supporting argument for my view.

25. See p. 42 of my text above.