The words modus and size pertain to continuous or dimensive quantity. Any particular area of space (e.g., a field), though needing dimensions, could always be of a different size; consequently the modus or size is accidental to the area of which it is the size. The size admits of variation, of being bigger or smaller, of containing more or less space, without the notion of the field being destroyed. Furthermore, once the size of a field has been determined or fixed, there is nothing more to be said about the quantity of the field : the actual size of a field is its ultimate determination. Finally there is always implied a relationship between the measured and its measure.

In resumé, modus and size seem to contain the following notes or characteristic elements :

1. There is always presupposed a subject or a nature of which the modus or size is said, and in which it is assumed to be.
2. The subject or nature is a dimensive quantity; that is, it has parts outside of parts with a common boundary. The parts exist simultaneously.
3. There is a possibility of variation of the modus or size, which does not involve the destruction of the presupposed subject or nature.
4. The modus or size is a limit, a fixed determination.
5. The modus or size is an ultimate limit.
6. There is a relationship between the measured quantity and the measure.

As all of these elements seem to be essential to the primary meaning of the word, they must be submitted to a rigorous analysis. This will be attempted in the next chapter.

CHAPTER FOUR

ANALYSIS OF THE ELEMENTS IMPLIED IN MODUS

1. - Remarks on the word Mensura

It must not be overlooked that the TLL entitled the entire first chapter of its research as modus idem quod mensura. This fact may be taken as indicating the best starting point for the analysis of the elements contained in the meaning of the word. In English and French the three words 'nature', 'figure' and 'measure' are used only with the second proper imposition that their Latin ancestor possessed. Indeed the fact that English and French speaking people have difficulty in trying to turn back to their first meanings helps to explain the equivocation that has already been mentioned in Chapter Two.

The Latin ending -tūra (-sūra) refers, first of all, to the (1)

(1) "Les substantifs en -tūra sont... tirés du type en *-to- : statūra ne concorde pas avec statūrum, statūrus, mais avec status; natūra est tiré de nātus" (p. 363). "Substantifs latin en -tūra (-sūra), exprimant l'action et souvent de caractère technique : cultūra, statūra, natūra, pictūra, scriptūra, quaestūra, censūra, rasūra, tonsūra, etc. Ils se développent à l'époque impériale" (p. 387). Cf. also p. 397. It is further noted on p. 373, "des noms d'action (exprimant l'action aussi bien passivement qu'activement)..." A Meillet and J. Vendryes, Traité de Grammaire Comparée des Langues Classiques. Even the ancient grammarian Charius pointed out that these nouns of actions should not be confused with the feminine form of the future active participle : "Videndum erit ne appellationes quae in formam participiorum incidunt participia putentur, ut recens frequens decrepitus hastatus togatus palliatus barbatus.

action of doing whatever activity is indicated by the stem of the word; thus, natura is 'the activity of being born'; figura, 'the activity of shaping or modeling in clay'; mensura, 'the action of measuring'. For this reason, it has already been said in passing that mensuro, -are, is a denominative verb, that is, a verb derived from a noun indicating an action; nor must it be forgotten that the noun of action mensura was derived from an already existing verb : metior, metiri, mensus.

Haec enim et similia speciem habent participiorum, sunt tamen appellationes, quia nullius in se verbi vim continent. At in femininis quaedam speciem participiorum habent, quaedam etiam ipsam vim, ut pictura, litura scriptura. Sunt enim appellationes et participia futuri temporis in masculinis liturus scripturus picturus. At cum dico 'in verbo litura est' et 'bona scriptura' 'pictura mirabilis' fiunt appellationes binasque habent significationes. Nam et ars ipsa pictura appellatur et opus quod pictum est." Instit. Gram., Lib. II. Keil, Grammatici Latini, Vol. I, pp. 179-180.

(1) The same is true for the Greek word for natura, φύσις. Even the slightest consideration of the value of the ending: -σις would have enabled Burnet and Ross to avoid the disastrous misinterpretation of the word rediscussed in W. D. Ross, Aristotle's Metaphysics, A Revised Text with Introduction and Commentary, Vol. I, p. 296. It is further to be noted that they assume that the logical order of the meanings of φύσις is the historical order. Rather the two orders are opposed. Cf. Ernout and Meillet, op. cit., under fuam where it is pointed out that Greek was the only IE language to keep the concrete sense of growth (and birth).

The second imposition of these three nouns refers to some circumstance of the action. The circumstance may be found either at the starting point of the action or at its stopping point. Noting the history of the word genus at this point will make clear to what degree the logician and the philosopher must pay attention to the order of impositions. Genus is a noun derived from the verb gigno, gignere, genui, genitus.(1) As such, the primary meaning of the word refers to activity of living beings begetting offspring. The logician can content himself by considering as the first imposition of the word its reference to the term of the action : the collection, group or multitude of individuals begotten by a common ancestor.(2) The next imposition is with regard to the principle of the action : genus signifies the common ancestor from which a particular group of beings are begotten, or the place of birth considered as a cause. Only then is the logician ready to discuss the nature of a logical genus.

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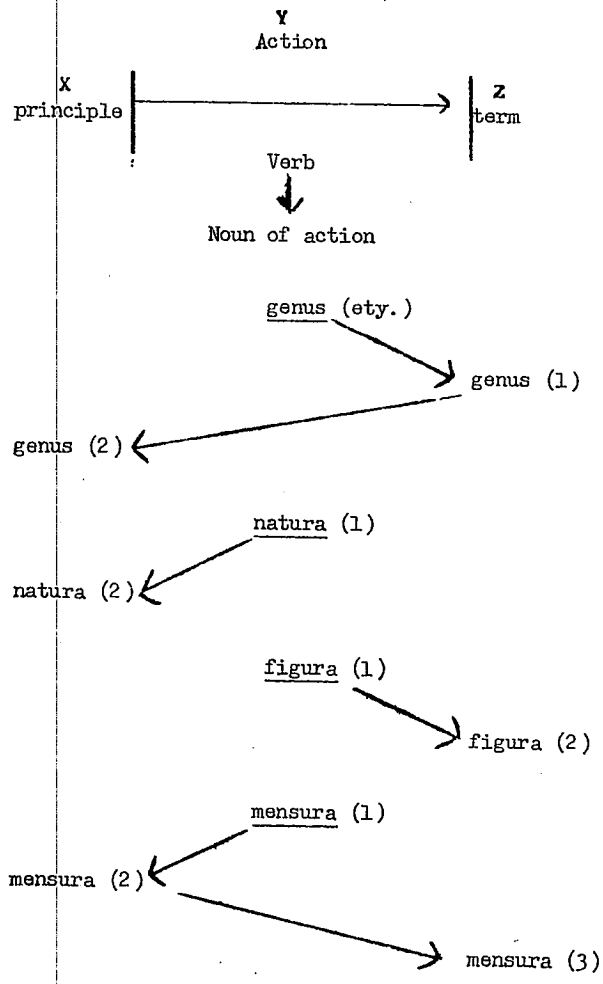
(1) Cf. St. Thomas, 3 Sent., q. 8, a. 1, ad 1. for a beautiful example for insisting that genero, generare comes from genus, which in turn comes from gigno, gignere.

(2) Meillet and Vendryes, op. cit., p. 399, give "fait de naître, naissance, race" as the first meaning. Here it is assumed that for Porphyrius writing in Greek or Boethius and St. Albert the Great writing in Latin this meaning could be assumed as so well known by the audience whose mother-tongue was Greek or Latin that the first imposition could be considered as "the group engendered". For those studying logic in a modern language, the word genus has to be explicitly taken back to the action from which the name derives. It is curious to obvious that as logic is dominated by the notion of genus so philosophy of nature is dominated by natura. Things are begotten before they are born; and this seems to indicate the order of teaching.

From this example, it may be recognized as a common trait of nouns of action that they can readily refer to the principle or the term of an action. A condition that encourages this transfer of names is the fact that often the principle or term is more permanent than the action. Thus the individual that procreates and the individuals that are procreated are more permanent and, in a sense, more concrete than the activity of procreation; in this way, with respect to the word genus, procreation is no longer the meaning of the word, it is only the etymology, the starting point of the naming process.

Now to apply this to the words natura, figura, and mensura. The second imposition of natura is 'the principle of the activity of growth or birth', which guarrantees the per se unity of the thing that is born. If space allowed, interesting observations on the name 'philosophy of nature' could be made because the starting point of the imposition, seemingly an ambiguous anthropomorphism, is from life, i.e. from quantitative movement. The second imposition of figura is with regard to the term of the action; thus the 'figure' of a thing is the result of the creative activity of an artist in his work of art. The word mensura, in its second imposition, refers to the principle of the action of measuring, that is, to the unit or instrument of measuring. A diagram might help fix these details in mind :



To the explanations already given, it can now be noted that the third imposition of mensura is the quantity of the object measured as related to the measure. This is the least proper use of the word mensura, for it refers to the quantity as manifested and not to the activity or principle of manifestation as happens in the first two impositions.

Modus is a synonym of mensura only in the third meaning of the latter word. The word modus refers to the quantity or dimensions of a field precisely as they are known by measuring. The quantity of the field is named neither by something that belongs to the field as a natural region nor by something that belongs to the field as quantity, but only by reference to human knowledge about quantity.

2. - Mensura considered as an action.

The meaning of 'measure as an action' must be made clear. Measuring is an intellectual activity; as such, it is an immanent operation whose perfection is that of the agent performing the operation.(1) However, according to our human mode of knowing and naming, it is conceived by us in a manner analogous to a transient action whose term or result is outside of the agent. The perfection or result of the transient action is in the patient. In order that the nature of modus and its relation to measuring be completely perceived, a physical action, such as that of heating, must be considered.

A. - Action and passion in Calefacere

'Heating' is an activity which has a correlative in 'being heated'. The activity involves an agent which communicates heat and a patient which receives it; also, there is the form of heat

(1) Cf. I Sent., d. 40, q. 1, a. 1.

itself. Finally, as a result of the action and passion certain relationships are established. Since this action is a physical, qualitative motion, which presupposes local movement, it takes place in space and time. Consequently, the agent and patient can properly be considered prior to, during, and after the process of heating. The various elements may be presented in a diagram :

	Ante →	In Motu →	Post
Agens	Calefactivum	Calefaciens	(having heated) postquam calefecit
Actio Passio		(Calefacere) Calefactio (Calefieri) →	Calor (forma)
Patiens	Calefactibile	Calefiens (Calescens)	Calefactum Calens Calidum esse

The action of heating in Latin may be designated by the active infinitive, and the corresponding passion by the passive infinitive : calefacere, calefieri. The noun formed from the verb is calefactio;(1) it designates the action, the passion, or the motus of heating, but not the term. In the active sense, calefactio signifies actio ut ab hoc, the heating as an activity coming from the heating element, calefactio ignis. In this case the word ignis is a subjective genitive. In the passive, calefactio designates the passio ut in hoc, the reception of heat by the subject being heated, calefactio aquae. In this case aquae is an objective

(1) Cf. St. Thomas, In Octo Libros De Physico Auditu (ed. Pirotta), Bk 3, l. 2, no 559.

genitive.[1]

Also it must be noted that the entire process of being heated is named with reference to the term of the process, namely, that of 'heat', 'calor. Calor... est quaedam passio vel passibilis qualitas.[2] Caution must be taken here to understand the new imposition on the word passio in this text. Heat is not a movement, but the term of movement, and the term of movement itself is not moved.[3] Thus, calor and calefactio can be properly distinguished : calor designates the term of movement of heating while calefactio, passively taken, designates the reception of heat.

B. - The term of Calefacere is a quality[4]

Insofar as heat is a species of quality, special problems of naming are involved : the change of quality that the patient undergoes is denominated from the stopping point and not the starting point :

> imutatio magis denominatur a termino ad quem quam a termino a quo, sicut corruptio dicitur mutatio in non esse... (5)

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(1) Ibid., no 566. Cf. Meillet and Vendryes, op. cit., p. 561 for an interesting discussion of subjective and objective genitive.

(2) Ibid., Bk 5, l. 1, no 1245.

(3) Consequently it is indivisible. This characteristic is important for the next section.

(4) Op. cit., Bk. 8, l. 15, no 2326.

(5) Ibid., Bk 5, l. 1, no 1244; Bk 3, l. 2, no 563; l. 5, no 630.

The movement by which a quality is brought into being has only one name. Thus there is a contrast with quantitative movement where there are two species of movement and two names : augmentation and diminution. There is a further contrast with the two movements that terminate in the genus of substance : generation and corruption. In the genus of quality, the attainment of the perfect term, such as pure white, or the attainment of the term imperfectly, more or less white, is only an accidental differentiation, which does not necessitate any second name because the movement does not terminate in a new species. Following Aristotle, St. Thomas speaks only of alteratio vel simpliciter vel sic[1] because the notion of contrariety that is found in the genus of quality is according to the proper notions of the species of quality. That is, the contraries that are properly contrary/are qualities. The contrariety that is found in the genus of quantity is not found according to the proper notion of the species; thus each species is free to receive a new specific name. In résumé, contrariety is found specifically in each species of quality, but commonly in the genus of quantity.

This distinction concerning contrariety is of extreme importance. Though the movement of alteration terminates in a quality formally because of this notion of a term specifically contrary, it is nevertheless related to the material dispositions of the subject of the term. For a quality, an immobile form, is

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(1) Ibid., Bk 5, l. 4, no 1321.

brought into being by an efficient cause which alters the quantitative dispositions of the subject; consequently, alteration as a movement presupposes quantity, i.e. an order of parts.

Furthermore, the notion of contrariety of form precisely as form entails the notion of the same presupposed subject.

> Est enim motus de forma in forma; quia et in alteratione subiectum non est contrarium subiecto, sed forma formae. (1)

This contrariety or otherness of form pertains to the proper notion of alteration according to the proper notion of contrariety. In the following passage St. Thomas delineates contrariety :

> Contrarietas differentiarum, quae est in omnibus generibus, attenditur secundum communem radicem contrarietatis, quae quidem est excellentia et defectus, ad quam oppositionem omnia contraria reducuntur... Omnes enim differentiae dividentes aliquod genus hoc modo se habent, quod una earum est ut abundans et alia ut deficiens respectu alterius. Propter quod Aristoteles dicit ... quod definitiones rerum sunt sicut numeri, quorum species variantur per additionem et substractionem unitatis. Non tamen oportet quod in quolibet genere sit contrarietas secundum propriam rationem huius et illius speciei, sed solum secundum communem rationem excellentiae et defectus. Quia enim contraria sunt quae maxime distant, oportet quod in quocumque genere invenitur contrarietas, quod inveniantur duo termini maxime distantes, inter quos cadunt omnia quae sunt illius generis. Nec hoc sufficeret ad hoc quod in illo genere esset motus, nisi de uno extremo in aliud contingeret continue pervenire. (2)

(1) Ibid., Bk 5, l. 3, no 1277.

(2) Ibid., nos 1280-1281.

Thus there are two conditions that are necessary to constitute the proper notion of contrariety. If either one or both are lacking, the genus is said to lack contraries. Only in qualities of the third species do we have a perfect type of contrariety; precisely because only in this sort of quality are both conditions found :

> In qualitatibus autem tertiae speciei manifeste apparet contrarietas secundum utramque rationem ; et quia qualitates possunt intendi et remitti, ut sic possit esse continuus motus de qualitate in qualitatem; et quia invenitur maxima distantia in uno genere inter duo determinata extrema, sicut in coloribus inter album et nigrum, in saporibus inter dulce et amarum. (1)

In numbers and substance there is excellence and defect without "maxima distantia" while in quantity and locus there is "maxima distantia" without excellence and defect.

Notice that in this context the word 'quantity', which indicates the genus of which numbers, or discrete quantities, are species, is here restricted to the inferiors species, dimensive quantity, because of the similitude between the order parts which have a common term (species) and the order of parts which is <u>indifferent</u> to a common term or to a distinct term (genus). In this way it can be observed that the two conditions of contrariety which are found together in quality are found separated in quantity. The property of excellence and defect is found in discrete quantity while the <u>maxima distantia</u> is found in continuous quantity. The names are both quantitative in their origin.

(1) Ibid., no 1285.

This dependence upon quantity is also indicated in another place where St. Thomas, commenting on Aristotle, points out clearly that there are four elements to be considered in any discussion of alteration : 1) that which causes the alteration; 2) the thing altered; 3) the quantity of the passion according to which the alteration is accomplished, for alteration exists in its subject according to more or less; 4) finally, the quantity or length of time it takes to accomplish the alteration. These four elements are also found in local motion.(1)

Qualities of the third species are very special in their signification, precisely because they signify a determined indivisible limit or term while they imply the possibility of accidental variation between two extremes; also because they presuppose certain quantitative conditions as regards the passion by which they are received and in the subject in which they exist.

> in generatione non habemus aliquid quod possit variari per duo, secundum quae attendatur aliqua alteritas; sicut in alteratione accidit dissimilitudo per hoc quod una et eadem qualitas variatur secundum magis et minus : substantia enim, cujus est generatio, non recipit magis et minus. (2)

C. - Conclusion : Heat is not signified as an effect

The distinction between the passio, which constitutes a separate predicament and is said to be actus patientis, and the

(1) Ibid., Bk.7, l. 9, nos 1960-1961. Cf. Bk.8, l. 5, no 2122.

(2) Ibid., Bk. 7, l. 8, no 1944.

passio which is a quality and a term of the passive reception of the act should now be sufficiently clear.(1) If the difference is neglected, equivocations are inevitable. For those things which are placed in the predicaments of action and passion include the notions of cause and effect, while the passion, which is the third species of quality, does not include in its proper notion the notion of effect.(2) Thus calor does not include the notion of an effect while calefactio does include the relationship of effect to cause.(3)

Furthermore, the passion, which is a term of movement, precisely considered as a term, is ultimate and indivisible. It keeps these two conditions even if it does not include the notion of cause and effect. Because of this characteristic of being an indivisible term, a quality admits of accidental variations for the variation finds its source in the divisible nature of the subject which participates in the term. Because it is divisible, the subject includes the notion of quantity; for the notion of divisibility belongs properly to quantity.(4)

(1) Cf. Bk. 3, l. 5, no 601. Note that both actio and passio are defined by the word actus. Cf. Meillet and Vendryes, op. cit., p. 397, "En latin au contraire, le suffixe *-teu- a fourni un nom d'action (masculin) à nombre de verbes : actus, "fait d'agir"...

(2) This sentence is to be considered as the climax of the thesis, for the proper interpretation of the word modus depends upon it.

(3) Cf. Bk. 3, l. 5, no 629.

(4) Cf. footnote (2) above, no 1938; also Bk. 6, l. 7, no 1612.

To return now to the action of heating (calefactio) : heating and its name imply the notion of cause and effect. The term of the action can be signified without the notion of cause and effect; however, it presupposes certain quantitative conditions on the part of its subject.

In contrast to the notion of heating, measuring is not a transient action. It does not involve the notion of efficient causality and its correlative effect. The term of measuring is the possession of knowledge about the quantified object. The object is said to be measured as a result of the activity of measuring. It seems to be designated by a name which stands only for a relationship of reason. For, just as a 'seen' object is designated by a name which stands for only a relation of reason, so too a quantified object seems to be named because it is known when measured.

If then the word mensura, taken in the third sense and synonym for modus, refers to the term of the activity of measuring as an effect, then it seems to signify only a relation of reason. If, however, it refers to the term of the measuring without implying the notion of effect, it can signify the very act by which the quantitative object is able to be known and thus it may designate something real.

3. - Mensura considered as mensura

The notion of measure considered as such is ordinarily accepted without comment as implying an id quo, that by means of which something is measured. And this definition in modern authors is immediately interpreted as referring to the instrument, the second imposition of the word without explaining that it is a second imposition. The task of understanding what a measure is does not become any easier because of the neglect of observing how words work. How much clearer and more pedagogical it is to observe that the activity of measuring is more known because it is some sort of movement and that the movement implies an instrument as its proper starting point. For indeed a standard of measurement is the instrumental principle of the activity of measuring. The instrument receives the name of and participates in the proper notion of the activity, for each one is an id quo.

In one place St. Thomas institutes a comparison between measuring and motion :

> Sicut omnis motus reducitur ad movens, quod non est motum neque a se, neque ab alio; ita omnis mensuratio reducitur ad unum primum, quod nullo modo est mensuratum, sed est omnium mensura; et hoc Deus est... (1)

Just as movement depends upon the immobile, so measuring depends upon something unmeasured. So too, for example, the certitude of

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(1) I Sent., d. 19, q. 1, a. 1, ad 4.

the logical process of proceeding from the known to the unknown depends upon the prior immobility of the known to the movement by which the unknown is attained. From this text of St. Thomas the conclusion becomes certain that some quantities must be known prior to the movement by which other quantities are known. Only when the fact that quantity is more knowable than motion is grasped, does the following text of St. Thomas becomes clear :

> Sicut motus magnitudinem imitatur in quantitate et continuitate et divisibilitate, ita et tempus imitatur motum; haec enim in motu inveniuntur propter magnitudinem et in tempore propter motum. Mensuramus autem et magnitudinem per motum et motum per magnitudinem. Dicimus enim multam esse viam quando percipimus motum nostrum fuisse multum; et e contra, quando consideramus magnitudinem viae dicimus motum nostrum fuisse multum.(1)

Whenever the quantity of one element is considered as known, it may be taken as the measure of the other.

The fact that quantity is known prior to movement is made clear in St. Thomas' commentary on Aristotle's De Sensu et Sensato :

> Omnia autem haec, quae dicuntur sensibilia communia, pertinent aliquo modo ad continuum, vel secundum mensuram eius ut magnitudo, vel secundum divisionem ut numerus, vel secundum terminationem ut figura, vel secundum distantiam et propinquitatem ut motus [et quietus]. (2)

Movement is perceived by the senses only according to distance : for,

(1) In De Phys. Aud., Bk. 4, l. 19, no. 1147.

(2) Ed. Spiazzi, no 29.

to be perceived by the senses, an object must be a certain magnitude; then it must be perceived as first in one place and then in another before it may be said to be perceived in movement. But when it is perceived in the first place, it is already perceived as quantified. Quantity then is the immobile principle for the sense perception of all movement. It is because of the primordial importance of the relatively immobile position of quantity in our way of knowing that the first genus man knows is corporeal or quantified substance, commonly called corpus or body.

This characteristic of stability and permanence as prior to movement is also implied in St. Augustine's terse statement : mensura omni rei modum praefigit. A mode is immobile because it is the term of some movement while a measure is immobile because it is the principle of some movement. Elsewhere St. Thomas indicates that the activity of measuring is always implied in the notion of modus : modus mensurationem quandam importat.(1) Furthermore, mensuratio ponit terminationem.(2) The permanence or stability of a mode is indicated by such words as terminatio or determinatio, which are results of a measuring.

> Praeexigitur autem ad formam determinatio sive commensuratio principiorum, seu materialium, seu efficientium ipsam : et hoc significatur per modum, unde dicitur quod mensura modum praefigit. (2)

(1) III Sent., d. 27, q. 3, a. 3; IV Sent., d. 16, q. 3, a. 1, q. 2, a. 6.

(2) S. T., I, q. 5, a. 5.

Finally, St. Thomas notes that commensuratio non est unius quantitatis ad se, sed duarum.(1) Both the measure and the measured are two quantities. If then a mode is a commensuration, it is the termination imposed upon one quantity when measured by another. Understanding measure and quantity as the necessary groundwork which lays the foundations for the analogical uses of modus assumes importance; for otherwise, if God is the measure of all things, then He is one quantity which is the first measure of all other quantities.

The notion of quantity implies the order of parts.(2) In fact, the same thing is said when quantity is described as that which has position because "position which is the order of parts in the whole is included in the ratio of quantity."(3) One of the properties of quantity is its measurability insofar as the quantity of a thing is related to an intellect, for a measure is "that by which we know the quantity of a thing."(4) In the process of knowing, the intellect is the principle cause of its own knowing. But the intellect must make use of subsidiary principles, which are formal in nature. Measure, as a formal principle of knowing, is commonly described as the unit by which the quantity of a thing is known.

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(1) I Sent., d. 19, q. 1, a. 1, ad 4.

(2) S. T., I, q. 14, a. 12, ad 1.

(3) C. G., IV, 65.

(4) Aristotle, Meta. X, 1, 1052 b 20. Cf. St. Thomas, In De Caelo, Bk. II, l. 6 : "mensurare est certificare quantitatem..."

Properly spoken of in quantity, measure is first of all found in numbers. (Similarly, commensuration is said to be a proper passion of number.)(1) In the second place, measure is spoken of in magnitudes, and the word modus finds its first imposition in the species of continuous quantity. Thirdly, measure is found in the genus of quality and all other praedicaments. However, since it is defined as an instrument, id quo, it is a means to an end. It can, consequently, be understood only in relation to the actions that lead to the end.

A measure then is an instrument to the action of measuring, which action is said to be "an act of the intellect, applying certain principles to examine propositions."(2) In this quotation the action of measuring is used in a common sense because propositions are not quantities; but the notion of measuring is preserved to the degree that the action of measuring is ordered to the end of knowing the conclusion which depends upon the principles of the conclusion as the instrumental principles of the intellect's understanding the conclusion scientifically.

In its strict sense, measuring is an act of intellect, applying a unit to examine and to know another quantity, which is bigger, smaller than or equal to the first unit. Illustrating this

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(1) Cf. In Lib. Meta., Bk. 5, l. 18, no 1021 where it is stated that the passions of numbers are commensuration and proportion.

(2) Cf. S. T., I, q. 79, a. 9, ad 4.

definition by the first and proper instance of numbers where the second quantity is always larger, we see that the measure, which is the indivisible unit, is the principle of knowing a larger number. Because it is known with certitude in regard to itself, the first unit finds its usefulness in manifesting the whole to which it is related as the known to the unknown; for by using one part, which is already known, the mind is in a position to count off or to mark off (parcourir) the number of parts which composes the whole, and in this way it arrives at the knowledge of the whole.(1) Another way of describing measurement is to say that it is an act of the intellect applying certain and determined quantitative elements to proposed quantified objects for the purpose of determining their quantity.

When the question is asked why quantity can be measured and also be a measure, the answer lies in the first formal effect of quantity : having parts outside of parts. But, if both continuous and discrete quantity have parts outside of parts, why does measure first arise in number or discrete quantity ? The application of the general principle that a thing is known only to the degree that it is in act is necessary. The parts of a continuous quantity are only partes in potentia; that is to say, only the whole actually exists while the parts (of which there is an indefinite and thus unknowable number) exist only by virtue

(1) Cf. In I Post. Anal., l. 41.

of the whole. On the other hand, the parts outside of parts that constitute discrete quantity are separated or discrete parts, partes in actu. Such parts enjoy existence separately because each part has its own actualized limit. Now the parts in act are prior in knowledge to the parts in potency. By a knowledge of the distinct parts, a distinct knowledge of the sum-total or whole is obtained.

Nevertheless, the answer is not quite so simple as might be supposed since continuous quantity is known prior to discrete quantity. The efficient cause of number is division; that is to say, numbers are engendered by a division performed by dividing discrete quantity. Continuous quantity is the starting point of the movement of division whereas number is the material stopping point, the formal stopping point being figure.(1) How then can number be more known than continuous quantity ? The answer lies in the opposition of whole and part and of confusion and distinction. Continuous quantity is known first as a whole, but it is also known confusedly because its parts are partes in potentia. The movement of division destroys the confused continuous whole and gives distinction to each of the parts, and it is this distinctness of part as part found at the term of division that enables one part to be considered as a measure of the other parts. Insofar as number is engendered by division and is the material aspect of the term of division, number formally considered implies indivisibility. For, found at the term of division, the engendered

(1) Cf. footnote (2), page 92.

part is not considered as in potency to further division; and that which is not in potency to division is actually indivisible.(1) In the light of this distinction, it may be said that a multitude is a group of indivisibles, and any one of the indivisibles may be used to count up the sum when the indivisibles are considered as parts of a whole. Thus, something is said to be one because it is not divided; but this proposition may be understood in three ways : 1) something is one because, if seen at the term of one division, it is not seen as in potency to further division; 2) another thing is one because, even though it may be divided, it is considered prior to the act of division which would destroy its unity; 3) another thing is one because it is prior to and impossible of division.

Continuous quantity might thus be said to prefigure measure because it is known prior to measure and reveals confusedly the notion of unity insofar as it is undivided and actually indivisible as long as the movement of division is not performed. Yet it does not reveal the full notion of measure because its unity cannot be used to arrive at a distinct knowledge of another quantity. It is only the part which actually exists at the term of the movement of division which has the needed clarity; for it is undivided and indivisible because it has been divided.

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(1) Notice that it is even correct to say that the continuum is indivisible because it is actually undivided. This is possible merely because when its actual lack of division is considered, the possibility of division is not being considered. Cf. S. T., I, q. 85, a. 8. Also Aristotle, De Anima, Bk. 3, c. 6, 430 b 6 sqq.

It is only when it has been seen how number is engendered that the three properties of measure are seen as necessary. As seen at the term of division, that which has been divided is 1) simple and indivisible, since it is not seen as in potency to further division; 2) invariable and uniform, because it has received its actuality by the act of division; 3) homogeneous, because it was once a continued part of a continuous whole.(1)

Measure and its properties are first found properly in discrete quantity, because only there will be found something clearly and distinctly known which the intellect can accept as a starting point for knowing other quantities distinctly. Thus, too, it is seen that the knowledge of continuous quantity precedes the knowledge of discrete quantity and necessarily so in conformity with man's nature which obliges him to know the confused before the distinct. Once known, the distinct part becomes an instrument by which the intellect gains a clear knowledge of the confused whole. Discrete quantity is not measure as such, for it implies plurality of actual parts; only the first indivisible in discrete quantity is a measure.(2) One particular part of discrete quantity becomes a measure only when it is taken by the intellect to know clearly a multitude, for the intellect uses one discrete part to arrive at the knowledge of a whole. Because number means an actual distinction

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(1) To be justified two pages later.

(2) "Plurale dicitur aliquid ex hoc quod est divisibile vel divisum". Quoted in Super De Trin., q. 4, a. 1, from Aris. Meta., 1054 a 22.

or separation of parts and the actual termination or limit of each part brings clarity and certitude to the mind, the intellect can institute a new comparison in virtue of the homogeneity of the part with the other parts to form a whole in knowledge. A measure is not a measure because it is part of the measured, but because it is the first numbered part. It is the notion of being first that constitutes the part as measure of the genus; thus, the maxim that a measure is always the first in the genus. The continuity of discrete parts which is called homogeneity is not continuity in the strict sense of the word. In this way, it is clear that all measuring which is performed in continuous quantity is derived from numbers even though the names and the relations which are according to continuous quantity are attributed to number.(1) By designating certain parts of the continuous whole, the mind can see that, just as the distinct parts of discrete quantity can compose a sum-total which is an accidental whole, so too the designated parts, which are continuous parts in the proper sense, partes in potentia, can be counted up so as to obtain a distinct knowledge of an actual, continuous, per se whole. The important word here is "designation'.

More remains to be said. Number, as noted above, is engendered by a division of the continuum, which is a totum in actu. As an actual whole, a continuum is known prior to number. By an act of division, at least two parts are actualized when the

(1) In Lib. Meta., Bk. 5, l. 17, no 1007.

whole is destroyed. These parts can be counted for three reasons. 1) By their relation to the whole that has been destroyed and thus reduced to a state of potency, the parts are recognizable by what they had in common previously, one form which acted as a common term. 2) By their homogeneity which they still share in some way, i.e., the common nature which is now divided, as when two pieces of the same pie or the same stone still share in the nature of pie or stone. They are still recognizable by what they still have in common. 3) By their distinctness, since each part is recognizable by what each does not have in common, its new form or limits. Each part has its own limits, its own actual boundaries which give it new and specific characteristics. Thus, for example, if by a simple act of division, a square is cut diagonally, two triangles are produced, specifically distinct from but parts of the destroyed square. These three reasons justify the three properties of a measure already mentioned above.

Common English speech recognizes that measure is found both in continuous and discrete quantity. The use of the article in English follows exclusively the distinction between what is measurable but not countable and what is measurable and countable; thus, we say 'milk', 'sugar', and 'wood' without an article; and 'a hat', 'a book', and 'a house' with an article. The distinction is repeated by 'much', which is a measure of something considered as continuous; thus, 'much milk', 'much sugar', and 'much wood'; and by 'many', which is a measure of something considered as discrete; thus 'many eggs', 'many books'. In Latin these

aspects of counting and measuring are distinguished by the singular and plural of the same adjective, multus, multa, multum.(1)

The elements of homogeneity implied in measure seems to be more proper to continuous quantity. In other words, though measure arises first in discrete quantity, the language proper to continuous quantity seems to be imposed even on discrete quantities. For each number is specifically distinct and thus seems to lack homogeneity, properly speaking.

Measuring may be described as the assigning or designating of the parts of a whole which is either actually extended or imaginatively extended. By running through mentally (parcourir) or counting the parts, the sum-total is known distinctly. The measurability, the capacity of being measured, may be discussed from an active viewpoint referring to 1) the action of measuring, 2) the instrument or unit of measure, 3) the agent which measures. Or again, it may be considered from a passive viewpoint referring to 1) the capacity of undergoing the assignment as an extended part or 2) the actualization of this capacity.(2)

At this point it is important to remember that the unity, which is the principle of number and thus the principle of measure in the genus of quantity, signifies a certain added nature with regard to the substance of which it is an accident.(3) Furthermore,

(1) For an admirable discussion of the numerical and non-numerical aspects of nouns in Latin, cf. Varro, De Lingua Latina, Lib. IX, nun. 63-68.

(2) Cf. S. T., II-II, q. 27, a. 6.

(3) Cf. In Lib. Metaph., Bk. 10, l. 3, no 1981.

the notion of unity and of measure are diametrically opposed to the proper notion of quantity, for quantity implies an order of parts which entails the notion of divisibility. On the contrary, one as the principle of number implies a complete lack of parts and consequently indivisibility; consequently, two is the first number. In continuous quantity, the measure must be 'assumed' as indivisible, because it is considered as known prior to the act of division (the act of measuring off, or sizing up) by which the total continuous quantity is distinctly known.

Thus there appears to be a kind of contradiction in the genus of quantity. The genus of quantity is established by divisibility (the having of parts outside of parts). Why must that by which quantity is distinctly known be indivisible ? Why does indivisibility constitute the very notion of oneness ?

One, as the principle of number, is indivisible because it is potentially every number; and that which is potentially every number is actually no number. Thus, the notion of one, as a principle of number, is not properly contained in the genus of number, but must be reduced to it, just as the material and formal principles of substance are reduced to the genus of substance.

The need for the word terminus or term arises when the indivisibility of oneness and of measure are seen as giving rise to the certitude of distinct knowledge regarding quantity. For the common limit or term of continuous quantity is indivisible in relation to the partes in potentia. Likewise, the separate terms

or limits, which constitute discrete quantities are also indivisible. Thus, it is seen that the terminus of quantity is not quantitative; rather terminus and figura must be considered as being in the fourth species of quality.

The modus or size of a field implies as a correlative a measure which is the indivisible principle of unity by which the field can be distinctly known. The modus or size of a field presupposes the partes in potentia which constitute essentially the quantitative nature of the field. The modus or size of the field is the common indivisible term of the partes in potentia; and, properly speaking, modus is not quantitative.

4. - Terminus, limes, figura are not quantities

The words 'limits' and 'limitation' come from the Latin word limes which reveal clearly the workings of the imagination in the development of words whose meanings imply some kind of negation.(1) A limit implies a stopping of something that is extended. Only that which is not extended can effectively interrupt the projection of part outside of part which is the very nature of quantity. The purpose of this section is to show how such a word as 'limit' came into existence.

According to Roman Law, the fields of each farmer were to be separated by pathways of fixed width. These pathways, always

(1) Ernout and Meillet, Op. cit., p. 359.

perpendicular to the principal highways, represented for each farmer the first place beyond which his own property did not extend. The pathway or limes was an extended area which belonged by right neither to farmer A nor to farmer B. In those regions where the pathways (strictly, byways) were used infrequently, slowly each farmer encroached on the pathway until it came to be non-existent. The term limes thus lost all reference to an extended area and retained only the aspect of being the invisible, indivisible barrier which legally separated the land of two farmers. This etymology enables us to see that even though the limes was materially quantitative, it had a non-quantitative value formally. It is a general law of our way of knowing that all words referring to something indivisible have their origin in words having reference to that which is properly divisible.

The word terminus means first of all the 'stake' used to(1) mark off distances or land. The stake is only relatively an indivisible in the sense that the stake is non-land; it is not part of the extended object which it marks off. Thus we see vividly the truth of the observations of St. Thomas that the first elements of the notion of division are affirmation and negation.(2)

As we have seen, the word figura comes from the action of modeling in clay. The figura existing as a term in the clay, how-

(1) Ernout and Meillet, Op. cit., p. 686.

(2) Cf. Super De Trin., q. 4, a. 1.

ever, is not a quantity.

> Figura dicitur tripliciter : scilicet qualitas resultans ex terminatione quantitatis, imago et omne signum. (1)
>
> Forma dicitur quae dat esse specificum artificiato, figura vero dat terminationem quanti : tamen sunt idem, vel propinque. (2)
>
> Figura est forma quanti, inquantum hujusmodi. (3)
>
> Figura proprie est tantum in corporeis. (4)
>
> Figura nullius actionis vel passionis est principium. (5)

Figure is a quality which results when a quantity is terminated; thus we see that the form of a quantified thing as quantified is extrinsic to the genus of quantity.

Our knowledge of qualities is related to our knowledge of quantity, but, because these properties are related, they should not be identified. Thus, the notion of termination, found first of all in the genus of quantity, pertains to quantity as a quality of quantity.(6) For nothing prevents the properties or passions of

(1) III Sent., d. 16, q. 2, a. 1, ad 1.

(2) C. G., Bk. 3, c. 105; cf. In de Physico Aud., Bk. 7, l. 5.

(3) S. T., I, q. 7, a. 1, ad 2; art. 3;

(4) S. T., III, q. 63, a. 2, ad 1.

(5) II-II, q. 96, a. 2, ad 2.

(6) Cf. St. Albert, In Libros Meta., Bk. 5, tr. 3, c. 1, p. 257 b; also, c. 6, p. 265 b (ed. Col.).

quantity from being qualities (that is to say, non-quantities). As already mentioned at the end of Chapter One, aside from substance, only quantity can be divided into its proper parts; the termination of quantity is related to the parts (which constitute the essence of quantity) as a proper passion. But this proper passion is a quality. Thus divisibility demands its contrary, indivisibility.

If figure itself is a quality, how then are the figures of quantity, such as triangle, circle, and other geometric figures, species of quantity ?

Lines, triangles and circles are substantially quantities because they are signified after the manner of a substance and of a subject; consequently quantity enters per se into their definition. Yet the forms of these "substantial" quantities are not quantities, for the termination of quantity considered as such does not contain divisible parts.

In brief, the form, the limit, or the term of quantity is not quantity, even though it gives form, being, and perfection to quantity.

The size of the field considered as the form, the limit, or the term of the field is not a quantity, but a quality.

5. - Conclusion

An analysis of the principle elements implied in the original notion of modus as the size of the field is now complete. In the next chapter, the proper notion of modus will be opposed to the common notion of the term.

Chapter Five

THE PROPER AND COMMON NOTIONS OF *MODUS*

1. - The proper notion of *modus*

At the end of Chapter Three, a list containing six aspects which seemed to be implied by the first meaning of *modus* was presented. *Modus* was stated to presuppose (1) a subject which has (2) quantitative parts. The parts had a common limit which can be known by being subjected to (3) a measure. There was admitted as possible (4) the variation of the modus, without necessitating the destruction of the subject. The *modus* is (5) a determination of the subject, and by this very fact (6) something ultimate.

All of these aspects can now be seen to be justified by the analysis of measuring, measure, and term, carried out in Chapter Four. For the form of continuous quantity is a term or termination; it is a quality in relation to quantity which has parts. The whole object can be measured because it has terminated parts. Though the term is indivisible, the quantified object can possess a greater or lesser number of parts without undergoing a substantial change. Finally the notion of term as such implies a limit, which *per se* is always ultimate.

The analysis of measure and term brought to light the distinction between quantity and quality; so that to these six

aspects must now be explicitly added the characteristic of 'being accidental'. The aspect of 'accidental' is contained implicitly in the possibility of variation. The notion of *modus* is then, properly speaking, the accidental ultimate determination of a subject which is *per se* quantitative. *Modus* is found, first of all, in the genus of quantity, because the genus of quantity consists substantially, essentially, or *per se* in the divisibility of parts. *Modus* is accidental to this essential consideration of quantity; it is a quality of quantity. Nothing prevents this quality of quantity from coming into a *per se* consideration in the genus of quality. Thus when *modus* is considered as a quality, and when quality is analysed *per se* for the sake of what it is in itself, then it is seen to be an indivisible term, which is ultimate, because it is as a *posterius* to a *prius*. The variations which are possible to the quality as quality come from the material dispositions of the subject and thus the material dispositions are accidental to the quality as a *prius* to a *posterius*.

It might be useful to anticipate certain discussions by pointing out the difference between quantity and quality as accidental determinations of substance. Quantity is the determination that a substance has parts outside of parts (the word 'outside' implies an order of parts), but quantity does not determine the parts themselves. The parts that the quantity gives to substance along with the order that they be extrinsic (extra) to each other are left undetermined within their own genus. The parts can be terminated only by something which is posterior to them.

In this way, quantity is seen to be related to quality as matter is to form. For quantitative parts can be terminated (determined) by something that is formal and indivisible. Thus it is seen that quality has greater right to the name of "accidental determination" that quantity.

Modus, strictly speaking, is in the line of terminus and not of principium, because, as pertaining to the fourth species of quantity, it is not the principle of any action or passion. But here a distinction must be made; and, to do so, the first definition of the TLL must be reconsidered : Modus sensu strictiore idem quod extensio metiendo definita. When it is said that modus in its stricter sense is the same as extension defined by measuring, the extension of the extended object is considered to be actually fixed or limited to certain dimensions; for example, the field before it is actually measured is assumed to have fixed limits by which the total quantity of the field can be known by the activity of measuring. In this way, the terms or limits of the field become the principles of our knowledge of the field. The limits can be considered as known or as knowable. If they are designated as known, they are designated by a relation of reason; when they are designated as knowable, they are designated as something real to which a relation of reason can follow. In this latter case is found what St. Thomas calls a relativum secundum dici.(1) Thus, it

(1) Cf. De Ver., q. 21, a. 6; S. T., I, q. 13, a. 7, ad 1; I Sent., d. 26, q. 2, a. 1; d. 30, a. 2; II Sent., d. 1, q. 1, a. 5, ad 8; De Pot., q. 7, a. 10, ad 11.

can be seen that modus is something real and not merely a relation of reason; for the relation of reason is consequent to and outside of the essence of that which is denominated relativum secundum dici.

A further observation must be made. Aristotle in his Metaphysics(1) points out that the meanings of the word terminus correspond to the meanings of principium. There is a way in which modus as terminus is a principium. In the example of the field, the terms or the limits which are the principles of knowing the extension of the field are always certain principles of the being of the field. But among the various principles, the limits of the field are the ultimate principles of determination. The essence of the field may be considered as the quantitative parts outside of parts (presupposing the nature of dirt, rock or sand). To the essence of the field is added the term of a particular size; but precisely as being the ultimate principle, the word modus has a special right to the notion of term.

The proper and first notion of modus demands the actual continuity of parts or continuity in space. This is implied in the very word extensio : 'a being stretched out'. Extension is the primary characteristic of dimensive quantity. The notion of continuity seems to be applied univocally to solid bodies and liquids, even though the container of a liquid is needed to maintain the

(1) Bk. 5, c. 19. The commentaries of St. Albert and St. Thomas must also be read.

unity of the liquid. Thus by knowing the size of the quart bottle, we measure the quantity of the milk that is or can be contained in the bottle. Too, the quantity of grains is known by reducing them to the continuity of the container. Even though modus first and most clearly applies to surfaces and solids, its use in reference to liquids and grains seems to be univocal because of the continuity of the container. Thus, one has a quart of milk when all of the parts of the milk are in the quart, or a bushel of wheat when all of the separate grains are in the container.(1)

The first use of the word modus which extended beyond the proper notion of continuity is clearly indicated by the TLL as follows : translative de spatiis cogitatis. Those things which can be imagined as occupying space after the manner of continuous quantities can be referred to by the word modus. The first important usage is with regard to the sounds by which music and poetry are produced.(2) Quantity is involved, but the parts which constitute these wholes do not exist simultaneously. The simultaneous existence of parts pertains essentially to the notion of what is a per se continuum. Nevertheless, the parts of certain objects do not exist simultaneously, but they can and have to be imagined as existing simultaneously in order to measure and arrange them. Thus, musical modes imply a series of sounds which are spaced at

(1) The outline of the meanings provided by the TLL and given in Chapter Three is to be consulted.

(2) Cf. St. Thomas, In Lib. Meta., Bk. 10, l. 2, no 1948.

fixed intervals; the different variations of the patterns of the intervals between sounds are called modes and form the basis of producing different psychological and emotional effects. Among the Greeks, the names of the modes were often derived from the people who enjoyed melodies which made use of the structure of a given modal pattern. Now, properly speaking, sound is a quality and not a quantity; how then can the word modus be applied to sound ?

The analysis that we have made of the motion of heating and its qualitative term heat provides the answer. Though heat as a term is indivisible, it presupposes certain material dispositions (quantitative parts) on the part of the patient-subject which has been heated. The agent which heats produces its effect by altering the material dispositions. So too, sound is a quality, properly speaking; nevertheless it presupposes material dispositions. The organization of these sounds is possible because of the material disposition of the subject of sound. There is thus a certain continuity among a series of sounds, but there is no longer the simultaneous existence of the tones of a mode. Rather they exist successively.

The same problem arises with time. The parts of time : past, present and future, do not exist simultaneously. The only part of time which actually exists is not a part, but a point of time. The parts of time have simultaneous existence only in the imagination. The ablative modo became an adverb of time meaning 'now', because it is considered as measured by being close to the

speaker. From this adverb, came the word modernus and all of its derivatives.

Sounds (consequently, music and poetry as well as language in general) and time may be measured then because they have or presuppose parts in their subject. The parts have a common limit and thus have some sort of continuity; thus any given tone is a point which separates all of the possible lower tones from the possible higher tones, and the present point of time separates the past and the future from each other. As long as we have parts in a proper sense, we can have modus in a proper sense. But here it must be noted that the analogical use of modus has already been established.

2. - The analogy of modus

The first and proper use of modus implies that the subject of the modus contains quantitative parts essentially; thus, a field contains parts essentially and has consequently a given size. Containing quantitative parts essentially supposes that the parts exist simultaneously. When for the first time the word was extended to refer to that which has parts which do not exist simultaneously, modus was used improperly or metaphorically. The metaphorical usage became permanent; the new signification became a new imposition, presupposing the first imposition as more known. The new imposition was a proportional or analogical meaning. For the word modus, the imposition supposes a comparison between that which has continuous, simultaneously existing parts and that

which has parts which do not exist simultaneously. Modus, in its second sense, signifies that which is thought of, spoken of, or imagined as having simultaneously existing parts. In reality it does not have such parts. Modus has retained the common ratio or notion of something which has parts, but the condition of the parts have changed.

At this point, there is need to distinguish a proper and less proper sense of the word. In the proper sense, the quantitative parts must be continuous and simultaneously existing; in the less proper sense, it suffices that the parts be truly quantitative, even if not existing simultaneously. Implied is the distinction between what is quantitative per se and quantitative per accidens. In the proper sense, modus is a determination of a subject that is per se quantitative whereas, in the less proper sense, modus is a determination of a subject that is only per accidens quantitative. (This is the distinction between the fourth and the third species of quality). In the less proper sense, the parts, even if truly quantitative are only material dispositions of the subject; in the proper sense the parts constitute the essence of the subject.

If other examples of the use of the word modus are considered (e.g., modus scientiae debet inquiri secundum conditiones materiae), it can be seen that the analogical use of modus has been extended even further. Again in this case, modus is the determination of a subject which has parts, but the conditions or

the nature of the parts have changed. The parts which may be called the material dispositions of the subject are not truly quantitative parts. That is to say, the subject has no parts properly speaking. Science as a immaterial quality of the spiritual intellect has no partes extra partes. Nevertheless it has conditions which must be spoken of, thought of, or imagined as being material parts. Science is considered as a whole whose unity and perfection can be kept intact only by respecting its conditions which are as parts of the whole. This usage of the word modus is a new and permanent imposition constituting a still more common ratio of modus. Modus signifies a determination of a subject which has certain material dispositions considered as quantitative parts. But these material dispositions are not quantitative parts.

The farthest limit of the extension of its usage is to employ the word modus as the determination of a subject in that case where there is no subject at all. For modus, according to its proper, less proper or common notion, always implies the accidental determination of a subject. Where there is no subject, there can be no modus consequent upon the subject. To use modus in this latter way is to use it with a new imposition which St. Thomas might have qualified minime proprie, nihil nisi metaphorice.(1)

In summary then, it is probable that the following principal impositions must be distinguished :

(1) Cf. "Minimum autem de proprietate motus, et nihil nisi metaphorice invenitur in intellectu." St. Thomas, In De Anima, Bk. 1, l. 10, no 160 (ed. Mar.); Cf. S. T., I, q. 67, a. 1.

Four Proper Impositions

First	proper	- The accidental determination of a subject which is essentially quantitative, e.g. modus agri.
Second	less proper	- The accidental determination of a subject which has quantitative parts accidentally, e.g. modus tonorum.
Third	common	- The accidental determination of a subject which has no quantitative parts, but material dispositions, e. g., modus scientiae in intellectu nostro.
Fourth	minime proprie nihil nisi metaphorice	The determination of a subject where there is no subject, e.g., modus scientiae in Deo.

3. - Modus found at the heart of analogy

In one sense, nothing new has been discovered by the analysis of modus. Rather something has been rediscovered; namely, the distinction of quantitas molis and quantitatis virtutis. This distinction lies at the heart of man's proportional knowledge of certain aspects of reality. Those things which are not material as well those aspects of material beings which are not immediately known by the senses must be spoken of as though quantitative. The proportional aspects of quantity are the relationship of whole and part that is established by division. De ratione autem continui est quod dividatur; divisio autem constituit rationem totius et partis, quia pars est in quam dividitur totum.(1) The very notionsof whole and part are founded upon

(1) In De Nominibus Divinis, no 385 (ed. Marietti).

the notion of division. The specific type of division will be dependent upon the nature of the kind of part that exists in the term of division. The most knowable type of part is the integral part or quantitative part, which the continuous whole contains intrinsically before the act of division; and this kind of whole is quantitas molis. Furthermore other things which are indivisible forms may be considered as wholes and may be divided into parts; yet the parts into which the whole is divided are extrinsic to the indivisible form. The parts come from either the subject which possesses the form or from the object which specifies the form. This division is made in order to reveal the 'complex' perfection of the form, which cannot be seized in a single grasp by the intellect. This is called quantitas virtutis.

> Dicendum, quod est duplex quantitas, scilicet molis vel dimensiva : et huiusmodi totalitas attenditur respectu partium in quas dividitur. Est etiam quaedam quantitas virtutis, cuius totalitas attenditur respectu obiectorum : et talis est totalitas in potentiis animae.
>
> Item videtur quod una non sit aequalis in omnibus : quia omne totum est maius sua parte.
>
> Dicendum, quod hoc verum est de totalitate quantitatis dimensivae, vel numeralis, quae eiusdem rationis sunt; et non de totalitate quantitatis virtualis : potest enim contingere quod una virtus potest in tot obiecta, in quot aliae plures, quarum quaelibet in omnia illa obiecta potest; tamen una earum non tot modis potest in illa obiecta, sicut alia. (1)

Because the notion of terminus is first known by us in the genus of quantity, it has to be transposed to the other genera of being to

(1) I Sent., d. 3, expos. secun. part.

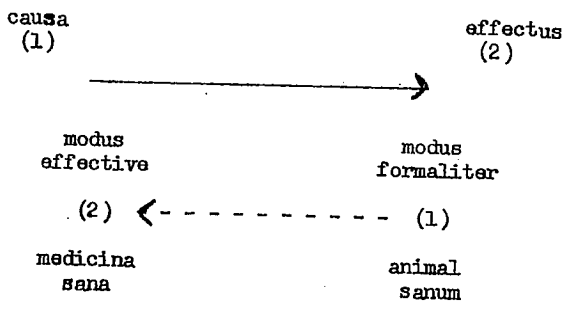
signify the perfection of the forms found. Thus terminus as indicating the perfection of unity of continuous quantity is transferred to other genera which contain no integral parts but must be spoken of as having integral parts. And this kind of transfer of meaning constitutes the analogical or proportional use of many words. Thus, when a word is said to be used univocally, its application to two inferiors is such that the inferiors are considered as quantitatively equal; on the other hand, when a word is used analogically, its application shows that the two inferiors are unequal. One of the two inferiors shares less in the application of the meaning of the word. It is for this reason that certain texts are found in St. Thomas' works, and in those of St. Albert as well, which indicate that as the word differentia (or species) is correlative to genus, so the word modus is correlative to analogia.(1) When a word is used analogically or proportionally, each secondary application must be 'measured off' by a special comparison with the first or univocal application.

(1) "Aequivocum enim dividitur secundum res significatas; univocum vero secundum differentias, sed analogum dividitur secundum diversos modos." I Sent., d. 22, q. 1, a. 3, ad 2. "Duplex est divisio : una qua dividitur genus univocum in suas species, quae ex aequo participant genus... alia est divisio communis analogi in ea de quibus dicitur secundum prius et posterius..." De Malo, q. 7, a. 1, ad 1. Cf. S. T., I-II, q. 88, a. 1, ad 1. Cf. also St. Albert, In Libro Meta., Bk. 6, l. 9, p. 420 b (Vol. 6, ed. Bor.); De Praedicamentis, Tr. I, p. 4-10 (Ed. Doyon).

Or again, it might be said that each secondary application involves a 'modification' of the original meaning. If the distance between the first and other meanings is not carefully calculated, the proper order of knowing is obscured and confusion (the assumption of a univocal meaning where there is none) is the only result.

4. - Modus contains an imperfection

The term modus refers to something that can be seen at the term of the activity of measuring. As such, it properly implies the existence of a prior, upon which it is someway dependant. If the word keeps this proper sense, it can never be properly applied to God because of the imperfection of the meaning. The word modus can refer to the measure itself by denomination, illustrated as follows :



Just as health is a form properly found in the living organism and medicine can be denominated heathful because it is the cause of health, so too modus is the form found in the measured thing and can denominate the cause of the measured thing. In this way we have the interpretation of the passage : Deus dicitur effective modus omnium rerum. For thus omnia modificantur ab eo qui modum rebus imponit. Modus considered formally is in the very thing which it modifies.(1)

The distinction between modus effective and modus formaliter is a proportional use of the word modus that is equally applicable to the proper notion, the less proper notion and the common notion, for any measure can be called the modus of a thing 'effectively', whereas modus formally taken, is only in the thing modified.

Modus contains an imperfection because it implies a division. The word modus implies unity, but only that sort of unity which is consequent upon division. With this clarification, the distinction between the transcendental names of 'being' and the transcendental name of 'created being' can be perceived.(2) With the name 'being' something is placed or posed (note the words

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(1) I Sent., d. 3, q. a. 3, ad 3. Cf. In De Div. Nom., no 200. Consider also the importance of these two texts : "Terminus non est nisi eius cuius est terminus." St. Thomas, In De Phys. Aud., Bk. 4, l. 18, no 1136. "Logica est modus philosophiae... nullus rei modus, cum re cujus modus est venit in generis sui divisionem." This is an objection in St. Albert, De Praedicabilibus, p. 3 b.

(2) Cf. De Ver., q. 21, all six articles; S. T., q. 5, all five articles, but in particular the first objection of q. 6. Neglect of this distinction seems to be the cause of much confusion in most modern manuals on Metaphysics.

that refer to existence in place) as existing; that which is posed as existing is referred to an act of division, to an act of intellect, and to an act of will. When that which is posed as being is considered as prior to the act of division, it is undivided and receives the name of 'unity'; it is 'one'. Again, when that which is posed as being is considered in relation to an act of knowledge, it receives the name of truth; it is 'true'. Finally, when that which is posed as being is considered in relation to the act of will, it receives the name of goodness; it is 'good'. Thus, there is a ready but rough similitude between the transcendental names : 'a being', 'one,' 'true', and 'good' and the four causes : material, efficient, formal and final. It is a similitude because the names and notions of the four transcendentals are prior to the notion of causality.

However, when the distinction between creature and creator has been made, the name 'a created being' still retains a certain universality.(1) A created being has its own proper unity because of its dependence upon the efficient cause which is the cause and the conserver of its being. This unity is seen as a term of the division which separates creator from creature. This creaturely unity is called modus. Again, the being of a creature may be considered in relation to an intellect; creaturely truth is called species. Finally, the being of a creature may be considered under

(1) Contra Errores Graecorum, c. 1. "omne causatum sub universitate creaturarum comprehenditur..."

the aspect of goodness; creaturely being is called ordo. This notion of ordo is given two different interpretations by St. Thomas : in De Veritate,(1) the ordo is considered from the viewpoint that any creaturely being may be sought as a final cause, because it is; in the Summa Theologiae,(2) creaturely being is seen as ordered to a final cause.

The relation between unum and modus should now be clear. Unum is unity, a lack of division prior to any consideration of division. Modus is unity, a lack of division posterior to the notion of division. Insofar as affirmation and negation are the first notions contained in the notion of division, modus contains in its own ratio the notion of negation, that is to say, imperfection. Consequently, St. Thomas is always careful to avoid putting any modus in God formally, because modus implies a diversity or division :

> Ad evitandum igitur errorem Arii vitare debemus in divinis nomen diversitatis et differentiae, ne tollatur unitas essentiae... ne autem tollatur simplicitas divinae essentiae, vitandum est nomen separationis et divisionis, quae est totius in partes. (3)

Thus, it can be seen that when some terms of quantity become analogical, they refer to a perfection which has been abstracted from

(1) q. 21, a. 6.

(2) I, q. 5, a. 5.

(3) I, q. 31, a. 2.

any notion of imperfection, thus God is said to be great; other terms, however, become analogical and yet contain some element of imperfection by which they remain contracted to the lesser universality of creaturely being. And modus is of this sort, for, if it ceases to imply division and whole and part, it has become purely equivocal.

5. - Qualitas proprie importat modum

This remark of St. Thomas in the treatise on habits can now be commented upon.(1) Quality as quality is that by which something is said to be such. Here the term such is to be interpreted simply. For though a thing is constituted in its being by its substance form, it is constituted such by an accidental form. The accidental form supposes its subject as already essentially determined. The accidental form itself is indivisible, containing in itself no parts or sources of differentiation. The accidental form will be simply one or many according to some measure. The four species of quality are constituted immediately by four extrinsic notions which serve to measure or pre-fix the mode. The measures are 1) quantity, 2) action and passion, 3) the remote principles or powers of operation, and 4) the nature of the substance which is the subject. In this context, modus is always related to something as to a measure. Is it, however, related to the measure as to a cause, for the notion of measure

(1) I-II, q. 49, a. 2.

does not always imply the notion of cause and effect ? Indeed, it must not be overlooked that, when creatures measure an object already constituted in existence, they do not produce any real effect in the object measured, even though the object measured does cause a real effect in the one who measures.

Thus it is seen how the foundations for the first and third kinds of relation are distinguished. In a comparison, two terms are always necessary. When the two terms of comparison are two quantities, real relations are established such as equal and unequal; however, no relationship of cause and effect exists between the two compared quantities. In the third sort of relationship, the two terms are not necessarily quantities; one term is the knower and the other is known. The activity of knowledge places no real effect in the thing known.

Two questions arise : how are the qualities which are called modes related to their measures ? is the modus a real effect or one of reason ?

The observations of Emile Benveniste are of value at this point; for in Chapter Three it was noted that he distinguished between a measure of mensuration and a measure of moderation. This distinction, made by one who is professionally not a philosopher but a linguist, can be seen to imply a distinction between a measure which is not an efficient cause (mensuration) and a measure that is an efficient cause (moderation). This interpretation does not appear to be too forced because modus

is more closely related to medeor 'to heal' than it is with metior, 'to measure'. Doctors are efficient causes of health even if they are only instrumental causes or ministers to nature. Modus would then seem to imply and presuppose causality. Also the notion of causality is implied in the verb moderor, for 'to moderate' implies measuring for the sake of effective control.

It is important to reflect on the consequences of distinguishing between a measure that is a cause and a measure that does not cause a real effect in the measured. In the latter case, the modus which is the form existing in the subject at the end of the measuring activity is nothing more than a reason of relation; consequently, the implication would be that whatever is modal is not really distinct from the modified.

Yet a second type of argument can be brought forward to avoid such a conclusion. It must not be forgotten that, in the analysis of heating where efficient causality is involved, the form of heat found in the heated subject is an effect even though it is not signified as an effect. So too, modus may be an effect, even though it is not signified as one. Whether modus is something real or rational must be solved in each instance : is the measure of the mode a cause which produces a real effect or not ?

Qualities then are said to be modes; as real accidents, they depend upon efficient, material, formal, and final causes. Thus they are effects even if they are not signified as effects.

If the word modus is taken as indicating the proper notion of quality, then it would seem to be a multipliciter dictum in the univocal sense of the word, just as qualitas itself is univocal. This distinction in no way prevents the word modus from having other meanings which are analogical to this particular usage. Indeed, in the order of knowing, it is the third species of quality (color, sound, etc.) which is first known. Through the sensible qualities, the fourth species of quality is known. The name modus is seen to arise in the genus of quantity and in the fourth species of quality, because figure is the quality of quantity. From the name found in this species, the whole genus of quality later receives its name of modus. Too, it can be seen that all the accidents are modes of substance to the degree that, commonly speaking, each accident is a termination or determination of substance.

6. - Species est qualitas generis

In at least two passages St. Thomas points out that there are substantial modes as well as accidental modes. The question may now be asked : how does the notion of modus always keep the note of being 'accidental' ?

The reply to this question involves us immediately in certain texts where a doctrine of modus is being used and the word itself does not appear. In Chapter Two of this thesis, a text was cited : ratio sacramentalis gratiae se habet ad gratiam commu-

niter dictam sicut ratio speciei ad genus... non aequivoce dicitur animal communiter dictum et pro homine sumptum. In order to explain grace, something accidental, St. Thomas makes use of logical relationships and exploits the ones which exist between the substantial notions : animal and man.

For John of St. Thomas, this text presents valid proof that sacramental grace is only modally distinct from grace commonly speaking. Why ? The answer lies in a correct analysis of the relationship of a species to a genus. Fortunately St. Albert the Great analyses the relationship quite explicitly in commenting on the proposition : differentia est qualitas generis.

> Quod autem qualitas generis dicitur differentia et non speciei, ideo est, quia ipsa non est qualitas eius cui dat esse et ipsum in esse constituit, speciei autem dat esse et ipsam in esse constituit, et ideo ipsius speciei est substantia propria, genus autem non constituit in esse nec dat ei esse, sed consequitur ipsum. (1)

A difference is not said to be the quality of that to which it gives existence, but only of that to which it is consequent and therefore accidental. A difference is a quality only with regard

(1) In Lib. Metaph., Bk. 5, tr. 6, c. 13,p. 294 (ed. Col.). Cf. also St. Thomas, In Lib. Metaph., Bk. 5, l. 9, no. 889, "Nam differentia, cum non participet genus, est extra essentiam generis." Quaest. Quod., q. 6, a. 1, "Omne quod est extra essentiam rei, accidentaliter advenit."
Cf. I Sent., d. 33, q. 1, ad 5.

to the genus which is prior, and not in regard to the species which is posterior.

So too a species can be considered as a quality of the genus because it is related to the genus as to a prior. The distinction is not an essential one, but an accidental one. But here the word 'accidental' refers to a predicable accident, and not a predicamental accident. (1)

In this way, the doctrine of modus is conserved. A mode is established only by the consideration of something with a prior from which it may be distinguished by being at least a predicable accidental. In this way both difference and species may be called modes with relation to the genus. Difference and species will not be called modes when considered in relationship to their inferiors which come after them.

Thus we see how mode and species may be used as synonyms. When for example St. Thomas, following Aristotle, (2) first divides causes into the modes of causes, he refers the species of cause to the genus of causality as to something prior. In this case, the species are posterior and accidental. In the consequent consideration, when the species of cause are being considered properly as species, the new accidental divisions which are discovered are in turn called modes, and more properly so, because

(1) Quaes. Quod., q. 2, a. 2, ad 1.

(2) In De Phys. Aud., Bk. 2, l. 5, and 6.

they are posterior and accidental and do not give rise to new species.

Thus it seems that modus always guards its characteristic of being accidental. Some modes are both predicable and predicamental accidents; others are only predicable accidents, because they must be reduced to the genus of substance, without pertaining to this category as essential parts. For in the genus of substance, there are realities which are only 'terms' of substantial 'parts'. It is clear how everything that is proper to substance must be spoken of as quantitative : parts that are terminated.

In conclusion to this section, it must be observed that species in relation to a genus is 'something accidentally modified', whereas the difference is the 'accidental mode' by which the modified is formally modified. The accidental mode comes out of the genus by way of division. Thus a mode contains its own perfection : it is what it is by way of affirmation; but as divided, it bespeaks a certain negation for it is not what the other difference is. Thus modus, being a term that adds perfection, is also a term that contains and limits.

7. - Deficere dicitur per respectum ad terminum a quo (1)

Up to this point, no mention has been made of the meaning of the word modus, defined by the TLL, as the notione aucta, the

(1) In De Phys. Aud., Bk. 6, l. 7, no 1590.

pregnant sense of the word : significatio approbandi, restringendi, obligandi, ut sit idem quod modus iustus vel opportunus, quem supergredi, vel infra quem remanere non licet. This meaning of the word modus implies a comparison between what actually is and what ought to be. Thus, for example, a field will have a certain size; yet when measured by the desires of a prospective buyer, it may be judged to be 'not large enough'. Failure or defect, according to St. Thomas, is evaluated in relationship to a measure, that is the terminus a quo. The efficient cause whose duty it is to bring the subject to the desired terminus ad quem is not judged in the light of the terminus ad quem which he actually reaches in the order of execution. Rather he is judged by the terminus ad quem considered as first in the order of intention. Thus the final cause, id cujus gratia aliquid fit, becomes the measure because it is first in the order of intention. The finis in executione is related to the finis in intentione as a mode to the measure. For between the two arises the efficacy of the efficient cause which has a capacity or obligation to achieve a certain term. When the end is achieved as the measure requires, the mode is judged good; when it is not achieved, the mode is judged bad. The merit of the efficient cause is evaluated by the degree of responsibility involved in the achievement or non-achievement of the desired end.

8. - Modus est determinatio sive commensuratio principiorum seu materialium, seu efficientium. (1)

This definition of St. Thomas can be seen to be an adequate expression of the common notion of modus. A mode is established by a measure, but a measure formally considered is always extrinsic to the mode. When the mode is a real effect, it depends upon measures that are causes. Among the four causes, two suffice as measure. It is not necessary to enumerate the final cause, since an efficient cause operates only by virtue of the final cause. For the final cause is the form of the efficient cause precisely as the cause is efficient, as indicated in section 7 above. The mode of a thing cannot depend upon a formal cause as such, since the nature of the subject which has a mode is established by the formal cause. The mode is consequent upon the formal cause because the mode does not contribute to the esse of the subject as subject. The mode then is determined by two measures : one efficient and the other material. It is determined by the material cause, since by reason of the material cause, the subject has parts. The disposition of parts will be a certain determination. The disposition of parts is outside of the nature of the subject considered universally. The disposition of parts is due to the individuated nature of the singular which is consequent to the formal nature constitutive of the formal esse. The formal nature must be determined and therefore limited because it is received.

(1) S. T., I, q. 5, a. 5.

The receiver and the received are distinct by way of division which implies affirmation and negation. The formal nature of the subject gives only perfection, but this perfection must be measured out by the material cause which receives and by the efficient cause which induces the nature of the subject. Consequently, the efficient and the material causes have the right to be called measures of their effect which latter is denominated by the word modus.

CONCLUSION

MODUS AND QUANTITY IN PHILOSOPHY

When one stops to consider that in English (or French), the word 'mode' is nothing more than a synonym for style or fashion, he can readily perceive one reason why the philosopher has gained the reputation of living in a ivory tower. For the word 'mode' no longer suggests the harsh reality of quantity upon which philosophy depends for its own vigorous and rigorous development. In the first chapter of this thesis, it was seen that St. Thomas pointed out explicitly that quantity is a constant factor in man's process of giving names to everything that he knows by his intellect. For indeed this principle is nothing more than a refined application of the more general principle that all of man's intellectual knowledge takes its origin in the senses and that all of his science must in some way be reduced back to the senses. Since quantity plays : an important role among the proper and the common objects of the external senses, and since quantity cannot be laid aside by the internal senses, then man must never neglect its importance in his pursuit of knowledge about beings that are non-quantitative. For to neglect the proper importance of quantity is either to identify all substance with quantity or to reduce quantitative material being to a shadow of reality. The fact that modus is a word with proportional meanings is an indication that man can successfully use quantity to acquire knowledge about non-quantitative realities.

The most important observation to be drawn from the research so far conducted is this : the philosopher has a serious obligation to search out the primary meanings and the etymologies of the common words that form his philosophical heritage. To neglect observing how the "philosophical" meanings grew out of and were superimposed upon words derived from everyday life is to sever man's intellect from its natural condition of depending upon the imagination.

Neglecting a careful study of Latin and Greek words is to put in danger one's intellectual life. One must study the conditions of language that enabled the Greeks to arrive so rapidly at the pinnacle of abstract thought; one must also observe the slower development of the Latin language that prevented the Romans from achieving the same success so readily, for Latin did not become a successful "philosophical" language until long after its "classical" period.(1)

Using such "abstract" words as 'mode', 'subsistence', or 'abstraction' in English is dangerous to the degree that the original sensible meanings of these words in Latin is not also

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(1) Cf. Roland Poncelet, Cicéron Traducteur de Platon. This is an excellent study discussing the weakness of the Latin system of prepositions. The author maintains that it was not until centuries later that the prepositional system became supple enough to be adapted to the needs of philosophy.

retained. Original meanings can be retained in two ways : 1) as already mentioned, by an arduous and sustained study of Latin and Greek as source languages; 2) by studying more attentively English as a mother tongue in order to see in what way ordinary meanings of everyday words are capable of serving as starting points for secondary impositions necessary for the development of abstract thought. In brief, a word which has no contact with sensible reality is useless in philosophy because it does not respect the instrument of knowledge, the imagination. For this reason, a philosopher has little right to "create" words, jargon or terminology.

Admitting the importance of a study of words is not necessarily the same thing as falling into a futile nominalism. Rather, it is admitting that the human intellect is 'human' ; dependant upon and nourished by the internal and external senses. Further, it is admitting that there is a movement of thought between an etymology and a first imposition and that this movement is from the more known to the less known; similarly that there is another movement from a first to a second and then to a third imposition, which is also a movement from the more known to the less known. Attempting to deny these intellectual movements and refusing to consider their importance in the teaching of philosophy because their analysis is time-consuming or for other practical reasons is to destroy to a great degree the understanding of abstract problems ; it is nothing other than putting oneself into an ivory tower and locking the door from the inside.

In Chapter Two, many of the problems implying the word modus were mentioned, such as personality, sacramental grace, not to mention the possibility of a modal distinction between existence and essence. All of these problems seem to be needlessly obscure as long as one does not know that the first meaning of modus is size. While modus importat commensurationem is obscure, the proposition : 'The size of the shoe should be commensurate to the size of the foot' is obvious. Again, another axiom is self-evident in English : 'Whatever is received, is received according to the size (modum) of the receiver.' In his second Eclogue, Vergil asked a question long before St. Bernard : For what might be the size of love ? (Quis enim adsit modus amori?)(1)

Nor was St. Augustine scandalized by the fact that our knowledge of spiritual things depends on a knowledge of material quantity. Having entitled one book : De Quantitate Animae, it is not likely that he would have penned this remark : aestimatione "barbarica" de modo corporum mensuram virium metiens.(2) For him, there was nothing barbaric about measuring the size of spiritual things after the size of bodies. On the contrary, he realized that all words of measurements were capable of two kinds of meanings : Sed nomina mensurae et numeri et ponderis, quisquis nonnisi visibiliter novit, serviliter novit.(3) Intellectual

(1) L. 68.

(2) Julius Valerius, Res Gestae, 3, 17 (cited in the TLL).

(3) De Genesi ad litteram, Bk. 4, c. 4, 9.

development is measured by the degree that one goes beyond the first meaning without forgetting the first meaning.

The danger of the modern use of the word mode is that it is too "angelic", that it is too hard to replace in its proper perspective with regard to our order of knowing and our dependence on quantity.

St. Thomas Aquinas, as has been seen, never lost sight of the element of commensuration or of 'sizing up' in his use of the word. Most of the modern manualists who speak of the word at all never bother to mention the initial dependence on quantity. This negligence is indicative of a lack of a proper understanding of the meaning of all problems involving modus.

It would perhaps be not too far wrong to say that most students of philosophy do not become aware of the word modus until confronted with such grave and obscure problems as the modes of being. Because they are not sufficiently versed in the way in which such problems are to be approached, they cannot but feel frustrated with the hopelessness of trying to understand.

Why must being be divided up into different modes ? Rather, why must being be divided into different sizes ? This question can only be answered by distinguishing the meanings of the word and also by insisting on how our intellectual knowledge of reality is constantly dependent upon a naming process that is connected to continuous quantity.

The study of the word modus is far from complete as even the TLL indicates. This present thesis pretends to reorient future discussion by insisting that one must try to discuss all of the problems which involve modus by relating them to the order of knowing that is proper to the human intellect as dependent upon the internal and external senses. In brief, this means that, before people begin reading the seventh, eighth and ninth books of the Metaphysics of Aristotle, they must read the first six books attentively and that, in particular, they spend much time meditating on Book Five which deals with the names of being.

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Le 27 avril 1963.