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THE DIVISION OF LOGIC.

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PROPOSITIONES

1. - Fortuna est causa per accidens in his quae fiunt secundum propositum propter finem in minori parte.
2. - Virtus prudentiae sine virtutibus moralibus haberi non potest.
3. - Syllogismus dicitur per posterius de syllogismo ex hypothesi et syllogismo inductivo.
4. - Syllogismus demonstrativus constituitur ex principiis necessariis, per se, et universalibus.
5. - Mathematica est de his in quorum definitione materia sensibilis non cadit, licet esse non possint nisi in materia sensibili.

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CHAPTER I.

DIVISION OF JOHN OF ST. THOMAS.

1 The first seven chapters of St. Albert's Commentary on the Predicables form an introduction to the whole of logic. In these chapters St. Albert considers such fundamental questions as whether logic is a science, and what kind of a science it is, whether it is a part of philosophy, its need and utility, and its subject. Lastly, he divides logic.

2 In the introductory sentences, in which he sums up the matter of these first seven chapters, he mentions the reason for dividing logic : "ut habitis omnibus partibus ipsius, sciatur quando est perfecte vel imperfecte tradita vel descripta."⁽¹⁾ By way of elaboration of this reason, it may be pointed out that logic is the instrument of philosophy and that if it is to be an adequate instrument, it is necessary that none of its essential parts be omitted; the whole cannot be perfectly known unless all the parts are perfectly known. The correct identification of the parts, therefore, is essential for the perfection of the instrument.

3 A second reason for the necessity of the right division is found in the consideration that it is the division which indicates the proper order of procedure in logic. In the measure that some parts cannot be understood without a prior knowledge of other parts, the proper order of procedure is essential for a distinct knowledge of the whole. But the mode of procedure is unknown at the beginning of logic and can be discovered only by an inspection of the parts, in which must be found the principle

(1) - De Praedicabilibus, Tract. I, ch. 1.

indicating the order of their consideration; the right determination of the parts, therefore, is essential.

④ Two distinct divisions of logic will be here contrasted : the current division and the division of St. Thomas and St. Albert. The first proposes as the primary division that into formal and material. It then divides the subject of formal logic according to the three operations of the reason into the consideration of the term, the proposition, and the simple syllogism, or syllogistic form. This part has come to be called minor logic and, to a great extent, to be regarded as the whole of logic; where this is the case, material logic is retained only in name, as epistemology is called material logic; where material logic is retained, it consists in the consideration of the predicaments and the demonstrative syllogism. St. Thomas and St. Albert, on the other hand, do not divide logic into formal and material. Although their divisions are made from different principles, they both terminate in a division into three parts whose subjects are the definition, the enunciation, and argumentation; only in indicating the diverse considerations which are to be made of the third subject do they recur to a principle in the line of form and matter. Once these divisions are made, reflection on each of the parts reveals that the logic of the first operation is material, that of the second formal, that of the third both formal and material. Although the difference between the subjects given by the current division and those given by the divisions of St. Thomas and St. Albert may seem negligible at first sight, the fact is that the current division is the principle of omissions, of a faulty order of procedure, and of errors of doctrine that terminate in the production of an instrument that is inadequate for its end.

5 The current division is clearly given and explained in the Ars Logica of John of St. Thomas. Moreover, the various subjects named in this work as constituting the parts of formal logic are those generally accepted as such and the order of their treatment indicated by John of St. Thomas is that generally followed. For these reasons the Ars Logica may serve as a certain exemplar for the brief consideration of the current division which will form the subject of this chapter. The following chapters will be concerned with the divisions of St. Thomas and St. Albert, explaining them and pointing out their necessity, then proceeding to the consideration of certain fundamental questions attached to each of the three subjects, as each constitutes a part of the whole subject of logic. On the occasion of the presentation of the various points of doctrine from St. Thomas and St. Albert, remarks will be made on the errors of John of St. Thomas with respect to these same points.

⑥ John of St. Thomas divides logic in the prologue to the above-mentioned work. He introduces the division with the observation that in any art there are two principal objects of consideration : first, there is the matter, which is given and presupposed to the operation of the art, as the subject in which the art operates; secondly, there is the form, which is induced in the matter by the art and whose induction is the principal object of the art :

"In omni arte duo sunt praecipue consideranda, scilicet materia, in qua ars operatur, et forma, quae in tali materia inducitur, sicut in facienda domo materia sunt lapides et ligna, forma autem est compositio, quia ista inter se coordinantur in una figura et structura domus. Materiam artifex non facit, sed praesupponit, formam vero inducit, quae quia proprie educitur ab arte, est etiam principaliter intentata ab illa, utpote factura eius" (1).

(1) - Ars Logica, Prologus Totius Dialecticae, Praeludium Secundum, (edit. Reiser) p. 5.

After offering this observation on the double consideration common to all art, John of St. Thomas gives the definition of logic as "ars quaedam, cuius munus est dirigere rationem, ne in modo discurrendi et cognoscendi erret".⁽¹⁾ Since, then, the word art appears as genus in the definition of logic, it is to be expected that two principal objects, in the line of a matter and a form, will divide the study of the logician.

⑦ As his next step, John of St. Thomas turns to that word in the definition which signifies the subject of the direction of logic - the word reason; he must determine just what is meant by reason when it is said that logic directs the reason. He finds that by reason in this context is meant the act of judgment, in which the reason proceeds resolutely, arriving at the knowledge of some truth by resolving it into its principles; hence for logic to direct the reason means no more nor less than to direct its resolute process :

"Et quia ratio ad discurrendum et ferendum iudicium procedit per modum resolutionis, hoc est, in sua principia deducendo et probationes, quibus manifestatur, discernendo. idem est Logicam dirigere rationem, ne erret, ac dirigere, ut recte et debite resolvat" (2)

But resolution is effected by the fulfilment of certain conditions : one on the part of the form ^{taken on} assumed by the operation of the reason, namely, that it be right; and one on part of the matter, that it be certain.⁽³⁾

John of St. Thomas thus explains what is meant by matter and what by form in this context : "Materia sunt res seu objecta quae volumus recte cognoscere. Forma autem est ipse modus seu dispositio, qua connectuntur objecta cognita."⁽⁴⁾

(1) *Ars Logica, Prologus Totius Dialecticae, Praeludium Secundum*, (edit. Reiser) p. 5.

(2) *Ibid.*

(3) "Fit autem recta resolutio tum ex debita forma, tum ex certitudine materiae" (*Ibid.*).

(4) *Ibid.*

⑧ Since, then, the work of logic is the direction of resolute reasoning, and since such reasoning involves a form which must be right, and a matter which must be certain, John of St. Thomas finds that the consideration of the logician must accordingly be divided into two parts, of which that which is concerned with the form precedes that which looks to the matter :

"Hinc ergo sumimus divisionem artis logicae et facimus duas partes : In prima agemus de omnibus his quae pertinent ad formam artis logicae et ad prioristicam resolutionem... In secunda vero parte agemus de his, quae pertinent ad materiam logicalem seu ad posterioristicam resolutionem" (1).

⑨ The reasoning that leads to his division, then, may be briefly resumed by pointing out that it is founded on two words, art and reason, which belong to the definition of logic. Because logic is an art, we should expect that something in the line of matter and form should fall under its consideration; then, because to direct the act of reason is to direct resolution, which involves a right form and certain matter, the art of logic is actually divided into a part which considers the conditions pertaining to right form and one that determines those pertaining to certain matter. It may here be pointed out that John of St. Thomas does not himself use the terms formal and material logic; but the doctrine contained in the part concerned with the resolution ex parte formae is that to which the name formal logic is attached. It may also be remarked that the division into formal and material is not always founded on the observations made by John of St. Thomas; it is often based simply on the declaration that in reasoning there are two objects of consideration - its rectitude and its truth.

(1) - *Ibid.*

(10) Once this primary division has been made, the next question is : what are the subjects of each of these parts, and what is the order of their consideration ? John of St. Thomas finds the response in the consideration that the ^(i.e. resolution) advance of the reason from the known to the unknown, which is the subject of the direction of logic, involves three operations - simple apprehension, composition and division, and discourse. Accordingly, the best order to observe is to divide logic according to ⁽¹⁾ these three operations.

(11) Clearly the mention of the three operations does not sufficiently specify the parts; psychology, for instance, also considers the three operations of the reason. What must still be determined is just what, in the case of each operation, constitutes the subject of the formal part of logic. John of St. Thomas presents the answer in this brief formula : "Primum ergo apprehendo terminos, deinde compono ex illis propositionem, denique formo ex propositionibus discursum". ⁽²⁾ The three subjects, then, of the formal part of logic, are the term, the proposition, and the discourse, and John of St. Thomas divides this part into three books, one of which looks to each of these three subjects (the last,

(1) - "Cum Logica dirigat modum recte ratiocinandi et sint tres actus rationis in quibus de uno proceditur in alium... non potest melior ordo observari, quam ut tractatum Logicae per has operationes distribuamus. Prima operatio nostri intellectus vocatur simplex apprehensio... Secunda est compositio aut divisio, cum videlicet ita cognosco rem, ut illi aliquid attribuiam vel negem... Tertia operatio est discursus, ut cum ex aliqua veritate nota infero et colligo aliam non notam... Primum ergo apprehendo terminos, deinde compono ex illis propositionem, denique formo ex propositionibus discursum" (*Ibid.*).

(2) - *Ibid.*, p. 6.

discourse, includes syllogism and induction). ⁽¹⁾

(12) The explanation of his identification of these three as the subjects is evidently found in an original ^{initial} conception of this part of logic as being itself a resolution of the form of resolute reasoning. That a science resolve implies that it arrive at a complete and distinct knowledge of its subject by breaking that subject up into its constituent elements and then considering each of these elements. This part of logic, therefore, since logic is a science, must break up the form of reasoning into its elements, which are the term, the simple and ultimate element with which the resolution terminates, and then the proposition, which is first composed of terms. Lastly logic considers the whole as such, which is the discourse.

(13) This interpretation of the conception which leads John of St. Thomas to determine the above three subjects is supported by certain remarks he makes in arriving at his definition of the term. After pointing out that logic is a science, and therefore resolute in mode, he mentions ⁽²⁾ that there must be some ultimate element at which the resolution ends, which element is the term; these considerations indicate the conception mentioned above, namely, that this part of logic consists in the resolution of the form of reasoning.

(1) - "Sic ergo in hac prima parte distribuimus tres libros : Primum pro his quae pertinent ad primam operationem, ubi agemus de simplicibus terminis. Secundum pro secunda operatione, ubi agemus de oratione et propositione eiusque proprietatibus. Tertium pro tertia, ubi agemus de modo discurrendi et formandi syllogismos et inductionem ceteraque pertinentia ad ratiocinandum" (*Ibid.*).

(2) - "Cum enim mens nostra in scientiis resolutorie procedat, et praesertim in Logica, quae Analytica ab Aristotele dicitur, oportet quod sit designabile ultimum elementum seu terminus huius resolutionis, ultra quod non fiat resolutio ab arte" (*Ibid.*, I P. Summul., Lib. I, ch. 1, p. 7).

14 Since the term is the last element of the resolution (and therefore called term), it is first in the order of composition. As the effect of the simple apprehension it pertains to the first operation, and as the first and simple element presupposed to all composition, it forms the proper starting point of the logician's consideration. (1) John of St. Thomas defines it as "id ex quo simplex conficitur propositio", (2) and explains that this definition signifies the most common element, in which all logical composites are ultimately resolved, and which is therefore susceptible of contraction, as a kind of genus, to the noun and verb, subject and predicate, major, minor and middle terms. (3) John of St. Thomas' consideration of the term does little more than manifest its divisions. In Chapter III certain strictures will be placed on the term as subject of that part of logic which looks to the first operation.

15 A point of importance with respect to John of St. Thomas' identification of the subject of the formal logic of the first act as the term is that it is determined, as indicated above, by the analysis of the form of reasoning into its elements; this identification is in no way founded on the nature of the first operation itself, nor of its object, nor on the determined means by which it attains its object.

- (1) - "Hoc igitur attendentes dicimus nos agere in praesenti de termino sub conceptu ultimi elementi, in quod terminatur omnis resolutio compositionis logicae, etiam ipsius propositionis et orationis, quia ab hoc ut a primo et simpliciori convenit incipere" (Ibid.).
- (2) - Ibid., p. 8.
- (3) - Cf. Ibid., left column for a description of this ratio communissima termini. John of St. Thomas actually treats the noun and verb, the first contraction of the term, in the part dealing with the first operation (Ibid., cc. 5, 6).

16 In view of what will follow in subsequent chapters, the omission of the definition and of the predicables and predicaments from John of St. Thomas' formal logic of the first operation may here be remarked. These omissions are underlined for two reasons: first, because both are often included, together with the term, in the subject matter of the formal logic of the first operation; secondly, to introduce certain observations relative to John of St. Thomas' treatment of both.

17 With respect to his consideration of the definition, it may first be noted that although he does study it in the formal part of his logic, and although he does admit that it is a modus sciendi pertaining to the first operation, (1) he is prevented from considering it as subject of the first part because he has already identified the subject of this part as the term, for it is accidental to the term as such that it be a definition, and accidental to the definition that it be a term. (2) Consequently, John of St. Thomas attaches the consideration of the definition to the second part, treating it in the introductory chapters to the consideration of the proposition, with which the definition shares a common genus, discourse (oratio); (3) it may be remarked that the same holds true for division. (4) With regard to the predicables and predicaments, John of St. Thomas considers these in his material logic of the first

- (1) - Cf. ibid., I P. Summul. Lib. II, c. 2, p. 18; Quaest. Disp., q. 4, a. 2, p. 134.
- (2) - Cf. for instance, ibid., I P. Summul. Lib. I, c. 4, p. 13, "Quarta subdivisio termini", where he points out that the complex term may be an imperfect discourse, and also ibid., Quaest. Disp., q. 4, a. 2, p. 134, where he teaches that the definition is materially a complex term, as, for instance, when it is predicate of a proposition.
- (3) - Ibid., I P. Summul. Lib. II, c. 3, p. 19.
- (4) - Ibid., c. 4, p. 20.

operation, as they are ordered to demonstration.⁽¹⁾ Attention is drawn to these points in view of the doctrine contained in Chapter III in which it will be pointed out that there is no formal logic of the first operation, that the subject of this part of logic is the definition, and that the predicables and predicaments form an essential part of the art of definition.

(3) The part of formal logic that looks to the second operation considers that logical composition which is first composed of terms, and of which the form of reasoning is itself in turn composed - this is the proposition. Noteworthy in this part of John of St. Thomas' formal logic is that he takes proposition and enuntiation as the same, that is, as one sole subject of consideration: "sumimus pro eodem propositionem et enuntiationem, quia sic obtinuit usus etiam inter sapientes."⁽²⁾ Although he confesses that "propositio addit supra enuntiationem, quod proponatur ad inferendum aliquid in argumentatione,"⁽³⁾ he disregards this added relation and treats the two per modum unius. This identification of the two as one subject will be commented upon in Chapter IV. This part of his logic consists in manifesting the divisions of the proposition, its matter (subject and predicate), its properties, and so on.

(4) The formal logic of the third operation looks to the form which is last in the order of composition, being composed of propositions; this is argumentation, or consequence.⁽⁴⁾ In John of St. Thomas' treatment

- (1) - Cf. ibid., I P. Quaest. Disp., q. 1, a. 1, p. 86; II P., Proemium, pp. 250-251.
- (2) - Ibid., I P. Summul. Lib. II, c. 6, p. 23.
- (3) - Ibid.
- (4) - For John of St. Thomas argumentation and consequence are the same thing. Cf. ibid., I P. Quaest. Disp., q. 8, a. 2, p. 158.

thereof, three points may be noted in view of comment in subsequent chapters. First of these is his conception of consequence ("oratio in qua uno dato aliud sequitur")⁽¹⁾ as a genus divided into induction and syllogism as its species.⁽²⁾ Second is his introduction of the principle dici de omni et nullo to explain syllogistic consequence⁽³⁾ prior to any consideration of the universal (an order determined by his original division). Third is his definition of major, minor, and middle term:

Maiores extremitas est illa, quae sumitur in maiore et ponitur in conclusione. Minor extremitas est, quae sumitur in minori et ponitur in conclusione. Medium est terminus bis positus in praemissis, non vero in conclusione (4).

20 The second division of his logic looks to the direction of resolute reasoning from the part of the matter. The condition required in the propositions is that they be necessary and connected per se; and accordingly such propositions form the subject of this part of logic.⁽⁵⁾ Since per se propositions are those in which essential predicates or proper passions are predicated of the subject, the first task of this part of logic is to explain the predicamental order, in which all things are disposed in their genera;⁽⁶⁾ the establishment of this order manifests the essential predicates of all subjects. ^(but not proper passions) The material part of John of St. Thomas' logic, therefore, is composed principally of the matter of the

- (1) - Ibid., I P. Summul. Lib. III, c. 1, p. 59.
- (2) - Ibid., I P. Quaest. Disp., q. 8, a. 2, p. 158.
- (3) - Ibid., I P. Summul. Lib. III, c. 5, p. 64.
- (4) - Ibid., c. 4, p. 63.
- (5) - Cf. ibid., II P., Proemium, p. 250.
- (6) - Ibid.

Predicables of Porphyry and the Predicaments of Aristotle, which constitute the material logic of the first operation, and of the Posterior Analytics of Aristotle. With respect to the latter, it may be pointed out that John of St. Thomas finds in it both the subject matter of the second operation, namely, immediate and per se propositions, and of the third, which is the demonstrative syllogism; ⁽¹⁾ he considers the propositions (under the heading of the praecognita to demonstration), prior to demonstration itself, and then, following demonstration, science. ⁽²⁾

21 This brief consideration of the logic of John of St. Thomas contains the broad lines of the current division of logic into formal and material, at least with respect to the formal part. Its three subjects are the term, the proposition, and the syllogism. The following chapters will give the divisions of St. Thomas and St. Albert. The former divides logic according to that which is to be directed, namely, the operations of the reason; the latter divides it according to the end of the direction provided by logic, which is knowledge of the unknown. Neither takes into consideration any principle in the line of matter and form until, after having divided logic into three parts, the third part is divided according to form and matter.

The division of St. Albert immediately identifies the three subjects of

- (1) - "... tota materia artis logicae, de qua in hac secunda parte agimus, in tribus continetur, scilicet:
In praedicabilibus, quae sunt modi praedicandi, in quibus distinguitur modus essentialis et quidditativus a modo accidentalium vel qualificativo; deinde in decem praedicamentis, ad quae tanquam ad decem classes et summa genera reducuntur omnes naturae rerum earumque gradus atque essentialia praedicata; et tandem in libris Posteriorum, in quibus docentur formae propositiones necessariae et per se et fieri demonstrationes scientificae" (Ibid., p. 251).
 Per se and immediate propositions, ibid., II P., q. 24, a 4; demonstration, ibid., q. 25; science, ibid., q. 26. This order may be contrasted with that of Aristotle for whom science comes first as the principle of knowledge of the matter of the demonstrative syllogism, which is true and proper principles (cf. St. Thomas, In I Post. Anal., lectiones 4, 5).

logic; these are not term, proposition, and syllogism, but definition, enumeration, and argumentation. Only in the consideration of the syllogistic form, which pertains to the consideration of the third operation, do proposition and term enter into the subject of logic.

ST. THOMAS' AND ST. ALBERT'S DIVISIONS.

1. - St. Thomas' Division.

(1) St. Thomas divides logic in his introduction to his commentary on Aristotle's Posterior Analytics. His purpose is to distinguish the parts of logic and to assign to each of the books of the Organon its proper subject and proper place in the ensemble of books. Prior to the division he makes known what it is that is to be divided. He does this first by defining the art of logic from its end, thus distinguishing it from all other arts, then by pointing out that logic is a science and indicating its subject matter. In the subject matter he finds the principle that divides the science of logic.

(2) All the arts share a certain common end, which is to direct the operations of man's faculties so that man in those operations may proceed as he should proceed, without making mistakes, and with ease, to the attainment of some particular end. (2) A particular art, therefore, can be defined by indicating the faculty whose operations it directs and the end of the direction it provides to those operations. Thus, carpentry is the art which directs the operations of the hands so that man may proceed as he should and with ease so as to produce good chairs and the

- (1) - He divides it also in the proemium to his commentary on the Perihemeneias, but there he makes no mention of parts as such. (In Perihem., [edit. Marietti], proemium, nn. 1-2).
 (2) - "Nihil aliud ars esse videtur, quam certa ordinatio rationis quomodolibet determinata media ad debitum finem actus humani perveniendi" (In I Post. Anal., [edit. Marietti], proemium, n. 1).

like. In the case of logic, the faculty whose operations are to be directed is the reason itself; St. Thomas, therefore, thus defines the art of logic :

"...ars quaedam necessaria est, quae sit directiva ipsius actus rationis, per quam scilicet homo in ipso actu rationis ordinate, facilius, et sine errore procedat. Et haec ars est logica." (1)

St. Thomas does not here mention the end of the direction provided by logic to the operation of the reason - the end which corresponds to the production of good chairs in the case of carpentry; but this end is the end of the reason itself, which is speculative science. (2)

(3) From the definition of the art of logic follows the determination of the subject matter of the science of logic. For logic can direct the operations of the reason only by making known the proper mode of operation of the reason. It must, therefore, study the act of reason; this is its proper subject :

- (1) - Ibid.
 (2) - St. Thomas brings this out elsewhere in his works. For instance, he teaches that logic must be learned previously to the other sciences because it teaches the mode of procedure in the other sciences : "Et quia non est facile quod homo simul duo capiat, sed dum ad duo attendit, neutrum capere potest; absurdum est quod homo simul quaerit scientiam et modum qui convenit scientiae. Et propter hoc debet primo addiscere logicam quam alias scientias, quia logica tradit communem modum procedendi in aliis scientiis" (In II Metaphys., lect. 5, [edit. Marietti], n. 335).
 Again, he teaches that logic is the instrument of speculative science : "...scientiae speculative...sunt de illis quorum cognitio quaeritur propter seipsa. Res autem de quibus est logica, non quaeruntur ad cognoscendum propter seipsas, sed ut adminiculum quoddam ad alias scientias. Et ideo logica non continetur sub philosophia speculativa quasi principalis pars, sed sicut quoddam reductum ad eam, prout ministrat speculationi sua instrumenta, scilicet syllogismos et definitiones et alia huiusmodi, quibus in speculativa scientiis indigemus. Unde secundum Boetium...non tam est scientia quam scientiae instrumentum" (In de Trinitate, [edit. Marietti], lect. 2, q. 1, a. 1, ad 2um).

"Et haec ars est logica, idest rationalis scientia, quae non solum rationalis est ex hoc, quod est secundum rationem, (quod est omnibus artibus commune); sed etiam ex hoc, quod est circa ipsum actum rationis, sicut propriam materiam" (1).

(4) In the subject matter of the science of logic St. Thomas finds the principle that divides logic. Since logic is concerned with the acts of the reason, then the diversity of the acts of reason causes the division of the science of logic; since there are three operations of the reason, then logic is to be divided into three parts, each of which has for its subject one of these operations :

"Oportet igitur logicae partes accipere secundum diversitatem actuum rationis."

Sunt autem rationis tres actus : quorum primi duo sunt rationis, secundum quod est intellectus quidam.

Una enim actio intellectus est intelligentia indivisibilium sive incomplexorum, secundum quam accipit quid est res... Et ad hanc operationem ordinatur doctrina, quam tradit Aristoteles in libro Praedicamentorum. - Secunda vero operatio intellectus est compositio vel divisio intellectus, in qua est iam verum vel falsum. Et huius rationis actui deservit doctrina, quam tradit Aristoteles in libro Perhermenias. - Tertius vero actus rationis est secundum id quod est proprium rationis, scilicet discurrere ab uno in aliud, ut per id quod est notum deveniat in cognitionem ignoti. Et huius actui deserviant reliqui libri logicae" (2).

(5) St. Thomas does not explain why the diversity of operations of the reason causes the division of the science of logic into three parts. From the consideration, however, that logic directs the operations, it follows that its subject is the acts of the reason in so far as they are susceptible of, and require, direction. From an analysis of this subject, namely, the operations of the reason as dirigible, emerges the necessity of the division.

- (1) - In I Post. Anal., proemium, n. 2.
(2) - Ibid., m. 3-4.

6 St. Thomas points out that all learning is acquired only from some knowledge already possessed. (1) St. Albert teaches the same when he states that there is one common mode of the reason in all sciences, which

is to advance from the known to the unknown. (2) Nature provides the first known notions - being, one, good, and the like, and the composite first

principles formed upon knowledge of these simple notions - from which the advance begins. In advancing from the known to the unknown the reason, because it abstracts its concepts from the phantasm, can proceed only by

ordering its concepts to one another and composing them; this is its

natural mode of procedure. (3)

As St. Albert points out, however : "Imperfectus est qui in natura est, perfectior per artem adhibitam." (4) Nature

does not determine the reason to order its concepts as they must be ordered for the attainment of truth; man does not instinctively form

perfect definitions, for example, or demonstrative syllogisms. Consequently, it is the work of ordering and composing concepts in advancing from the

known to the unknown that is to be perfected by the direction of an art.

The reason has the power to reflect on itself so as to discover its own proper mode of composition; when this mode is learned, the habitual

- (1) - "...inducit (Aristoteles) universalem propositionem propositum continentem, scilicet quod acceptio cognitionis in nobis fit ex aliqua praexistenti cognitione. Et ideo dicit : omnis doctrina et omnis disciplina, non autem omnis cognitio, quia non omnis cognitio ex priori cognitione dependet : esset enim in infinitum abire. Omnis autem disciplinae acceptio ex praexistenti cognitione fit" (Ibid., lect. 1, n. 9).

- (2) - "...est tamen unus communis modus scientiae per quodam commune quod est in omni scientia. Ad hoc est quod per investigationem rationis ex cognitio devenitur ad cognitionem incogniti : hoc enim fit in omni scientia quocumque modo dicta, sive sit demonstrativa, sive non demonstrativa" (De Praedicabilibus, Tract. I, ch. 1).

- (3) - For the explanation of the need of the reason to know by ordering and composing its concepts, see Sheila O'Flynn, "The First Meaning of 'Rational Process' according to the Expositio in Boetium de Trinitate", in Laval Théologique et Philosophique, Vol. X (1954), pp. 175 ff.

- (4) - De Praedicabilibus, Tract. I, ch. 1.

knowledge of it constitutes the art of logic. Since the end of the art of logic is the direction of composition in the operations of the reason, then when it is said that the subject of the science of logic is the acts of the reason, this means the order or determined relations that hold good between the concepts, governing their composition in those acts.⁽¹⁾

7 The concepts of the reason are by their very natures inter-related in a definite fashion; the order that holds good among them is a necessary order, determined by the nature of the concepts as they are abstracted by the reason.⁽²⁾ The relations constituting this order, because they are found to exist between concepts, or between concepts and reality, are in the strictest sense relations of reason; their cause is the reason, they⁽³⁾

- (1) - "...Alius autem est ordo, quem ratio considerando facit in proprio actu, puta cum ordinat conceptus suos ad invicem, et signa conceptuum, quae sunt voces significativae" (*In I Ethicorum*, lect. 1, [edit. Marietti], n. 1). "Ordo autem quem ratio considerando facit in proprio actu, pertinet ad rationalem philosophiam, cuius est considerare ordinem partium orationis ad invicem, et ordinem principiorum ad invicem et ad conclusiones" (*Ibid.*, n. 2).
- (2) - For an explanation of the order which is the subject of logic, see O'Flynn, op. cit., pp. 177 ff.
- (3) - "...Sicut realis relatio consistit in ordine rei ad rem, ita relatio rationalis consistit in ordine intellectuum; quod quidem dupliciter potest contingere. Uno modo secundum quod iste ordo est adinventus per intellectum, et attributus ei quod relative dicitur; et huiusmodi sunt relationes quae attribuntur ab intellectu rebus intellectis, prout sunt intellectus, sicut relatio generis et speciei; has enim relationes ratio advenit considerando ordinem eius quod est in intellectu ad res quae sunt extra, vel etiam ordinem intellectuum ad invicem" (*Q. D. de Potentia*, q. 7, a. 11). "...ens est duplex: ens scilicet rationalis et ens naturae. Ens autem rationalis dicitur proprie de illis intentionibus, quas ratio advenit in rebus consideratis; sicut intentio generis, speciei et similibus, quae quidem non inveniuntur in rerum natura, sed considerationem rationis consequuntur. Et huiusmodi scilicet ens rationalis, est proprie subiectum logicae" (*In IV Metaphys.*, lect. 4, n. 574).

accrue to objects only as they are known and not as they are in reality, they cannot be attributed to objects as they are in reality. Because these relations, as properties of concepts, presuppose the presence in the mind of objects known, which are first intentions, they are called second intentions.⁽¹⁾ The science of logic studies these modo resolutorio, defining and dividing them, demonstrating their properties of them, and the conclusions of this science assume the character of certain principles or rules which direct the reasoning processes in the other sciences.

8 Since second intentions are the subject, to divide the science of logic is to divide second intentions. For St. Thomas the diversity of operations of the reason clearly causes such a division. The reason for this becomes manifest upon the consideration that second intentions are relations, but relations are divided according to their foundations. Thus, for instance, in the real order there are three different kinds of relations because there are three different foundations - quantity, action and passion, and measure.⁽²⁾ But, since second intentions accrue to objects known, their foundation is the object known as it is known, or the first intention. Then, since the mode of the object as it is

- (1) - "Prima enim intellecta sunt res extra animam, in quae primo intellectus intelligendo fertur. Secunda autem intellecta dicuntur intentiones consequentes modum intelligendi: hoc enim secundo intellectus intelligit in quantum reflectitur supra se ipsum, intelligens se intelligere et modum quo intelligit" (*Q. D. de Potentia*, q. 7, a. 9). "Ex hoc enim quod intellectus in se ipsum reflectitur, sicut intelligit res existentes extra animam, ita intelligit eas esse intellectas; et sic, sicut est quaedam conceptio intellectus vel ratio - cui respondet res ipsa quae est extra animam - ita est quaedam conceptio vel ratio, cui respondet res intellecta secundum quod huiusmodi; sicut rationi hominis vel conceptioni hominis respondet res extra animam; rationi vero vel conceptioni generis aut speciei respondet solum res intellecta" (*Ibid.*, q. 7, a. 6). Cf. *In V Metaphys.*, lect. 17, m. 1001-1005.

known by any of the operations differs from its mode as it is known by the others, the foundation of the intentions differs according to the three operations and the operations themselves, therefore, are the principle of the division of the second intentions. There are, in other words, certain second intentions proper to the first act, others proper to the second, and others proper to the third; for the direction of all three operations, all of these intentions must be known.

9 In presenting his division of logic in the passage cited above, St. Thomas points out that the first two operations pertain to the reason as it is a certain intellect, intellectus quidam, while the third is proper to it as a reason. By this is meant that only in the third operation is there an advance from one truth to another; there is no such advance in the first two operations. But the human mind is a reason in all three of its acts; all involve some compositive activity not naturally determined to one and, in so far as they do so, all require, in themselves, the direction of logic.

10 There is a passage in the Summa Theologica which serves as a convenient point of reference for a summary of the natures of the three operations and their necessity.

"Intellectus humanus necesse habet intelligere componendo et dividendo. Cum enim intellectus humanus exeat de potentia in actum, similitudinem quandam habet cum rebus generalibus, quae non statim perfectionem suam habent, sed eam successive acquirunt. Et similiter intellectus humanus non statim in prima apprehensione capit perfectam rei cognitionem, sed primo apprehendit aliquid de ipsa, puta quidditatem ipsius rei, quae est primum et proprium obiectum intellectus; et deinde intelligit proprietates et accidentia, et habitudines circumstantes rei essentiam. Et secundum hoc necesse habet unum apprehensum alii componere, et dividere, et ex una compositione ad aliam procedere; quod est ratiocinari" (1).

(1) - Ia, q. 85, a. 5, c.

The potential character of human reasoning, therefore, requires that it advance to perfect act, which is perfect knowledge of the whole being of the object, by a succession of operations.

11 By its first operation the intellect grasps something of the essence of the object, or, at most, the whole essence perfectly; but it grasps no more than the essence, leaving aside all else that pertains to the being of the object. Elsewhere St. Thomas speaks of this operation as that by which the intellect "format simplices rerum quidditates, ut quid est homo, vel quid est animal." (1) Here attention is drawn to the word format; in the measure that the knowledge of the essence involves a certain formation, or composition of representations that is not determined to one, the first operation requires the direction of logic. For this reason the role of the logic of the first operation is the manifestation of those second intentions attached to simple representations which must be known to form the similitudes of the essences of things.

12 Because the first operation leaves the intelligence still in potency with respect to all that pertains to the being of the object but not to its essence, the reason has need of its second and third operations. It must multiply its representations, knowing by separate apprehensions the accidents of the object. Then it has no way of knowing that the accident pertains or does not pertain to the object other than through two further operations. In its second it composes the accident with the object, or divides it from it by means of

(1) - "Intellectus enim nostri duplex est operatio. Una qua format simplices rerum quidditates; ut quid est homo, vel quid est animal" (Q. D. de Veritate, q. 14, a. 1, c.).

(1) predication, then it has need of its third, in which it has recourse to a middle term, forming an argumentation through which the necessary inherence of the accident in the object is seen. (2) As soon as the reason composes or divides in its second operation, affirming or denying something of something else, that composition is either conformed with reality or it is not, that is, it is either true or false. The logic of the second operation, therefore, is concerned with those second intentions that accrue to the object as it is known under the form of affirmation or negation, or, in other words, with the second intentions that must be known for the constitution of ens verum, and those that

- (1) - "Attende autem, quod praedicare idem est quod attribuere per notam compositionis: quando enim unum alteri attribuitur mediante compositione, quam significat hoc verbum est, tunc praedicatur et quando unum ab altero dividitur mediante negatione talis compositionis, sicut cum dicitur homo non est lapis: tunc lapis dividitur ab eo. Et hoc fit in intellectu componente et dividente: in re enim ipsa sine nota compositionis vel divisionis, unum in altero est vel non est. Sed intellectus componens vel dividens hic sine nota compositionis vel divisionis, hoc significare non potest: et, ut hoc significet, invenit modum compositionis unius cum alio; et hoc est praedicare unum de alio, vel negare unum de alio" (St. Albert, De Praedicabilibus, Tract. III, ch. 3).
- (2) - Here St. Thomas mentions only predication of accidents of the object because his purpose is to manifest the necessity of the second operation, which has its root in the imperfection of the first. This does not mean that the second operation does not also compose essential notes of the object, known to pertain to it by the first operation, with the object.

(1) follow upon the constitution of ens verum. The logic of the third operation considers all those second intentions that govern argumentation.

2. - St. Albert's Division.

① St. Albert divides logic in the introductory chapters of his commentary on the Predicables. The division is ordered, as was mentioned at the beginning of the preceding chapter, to the discovery of the parts of logic so that it may be known when the whole has been treated. The understanding of his division is dependent on two points relative to the subject and nature of the science of logic which he has established previously to his division. For this reason a brief summary of these points is a prerequisite to the consideration of his division.

(2) At the beginning of his introduction, St. Albert is concerned with establishing that logic is a science in itself, distinct from all

- (1) - "Intellectus autem habet duas operationes, quarum una vocatur indivisibilem intelligentiam, per quam intellectus format simplices conceptiones rerum intelligendo quod quid est uniuscuiusque rei. Alia eius operatio est per quam componit et dividit. Verum autem et falsum, etsi sint in mente, non tamen sunt circa illam operationem mentis, qua intellectus format simplices conceptiones, et quod quid est rerum. Et hoc est quod dicitur, quod 'verum et falsum, circa simplicitate et quod quid est, nec in mente est.' Unde relinquatur per locum a divisione, quod ex quo non est in rebus, nec est in mente circa simplicitate et quod quid est, quod sit circa compositionem et divisionem mentis primo et principaliter; et secundario vocis quae significat conceptionem mentis. Et ulterius concludit, quod quaecumque oportet speculari circa ens et non ens sic dictum, scilicet prout ens significat verum, et non ens falsum, etiam in libro de anima, et in logicalibus. Tota enim logica videtur esse de ente et non ente sic dicto" (In VI Metaphys., lect. 4, m. 1232-1233).

others. This he manifests by pointing out that the subject of logic, which is the common mode of the reason as it advances from the known to the unknown in any science, is proper to logic alone. (1) This mode is the subject of a science because it is a necessary mode, determined in its own nature by the abstractive character of the reason, and because it has its own parts, and these have their own definitions and principles, and properties which may be demonstrated of them :

"...Investigatio enim, sive ratio investigans ignotum per notum, specialis quoddam est, quod passiones habet et differentias et partes et principia, quae dum de ipso probantur, ars et scientia efficitur specialis, cuius usus postea omnibus adhibetur scientiis" (3).

(3) The second point of importance is the indication of a certain property of logic, following from the nature of its subject, namely, that logic is characterized by a particular intentio. By this is meant that logic tends to a definite end or object. Because the subject of logic is the mode of the reason as it advances from the known to the unknown, the principles and conclusions of the science of logic are marked by a unique character; that is, they assume the form of rules to direct the advance of the reason from the known to the unknown. For this reason, the intention of logic, or the object toward which it tends, is to teach how knowledge of the unknown is acquired : "...Logica docet qualiter ignotum fiat notum"; (4) it is for this reason that its "usus postea omnibus adhibetur scientiis."

- (1) - De Praedicabilibus, Tract. I, ch. 1.
- (2) - Ibid.
- (3) - Ibid.
- (4) - Ibid., ch. 3.

(4) This explanation of what is meant by the intention of logic is prerequisite to St. Albert's division, because the division is founded on this intention :

"Divisio autem logicae, et quae sunt partes ipsius... accipienda sunt ex intentione ipsius. Sicut vero iam ante dictum est, logica intendit docere principia per quae per id quod notum est, devenire potest in cognitionem ignoti. Est autem incomplexum, de quo quaeritur quid sit : aut completum de quo quaeritur an verum vel falsum sit. Sciri autem non potest incomplexum de quo quaeritur quid sit, nisi per diffinitionem. Complexum autem, de quo quaeritur an verum vel falsum sit, non potest sciri nisi per argumentationem. Istae ergo sunt duae partes logicae" (1).

(5) The intention of logic is to teach how to advance from the known to the unknown. Reflection on the operation of the reason reveals that in its quest for science it encounters two kinds of unknown. The first is the simple unknown, which is the object of a simple apprehension; knowledge of such an unknown is attained when the reason knows the essence and can answer the question : what is it ? The second is a composition or division of the mind, signified by an enumeration. Since every composition or division is either conformed with reality or not, such an unknown is known when the answer can be given to the question : is it true or false ? Or when, in other words, it has been judged. Since, therefore, the intention of the whole of logic is to teach how to arrive at knowledge of the unknown, and since there are these two kinds of ignota, known through answers to two different kinds of questions, it follows that the science of logic is divided into two parts, one which tends toward the provision of principles governing the acquisition of knowledge of the simple, and one which tends toward provision of

- (1) - Ibid., ch. 5.

principles to direct the attainment of knowledge of the composite.

⑥ Each of these two kinds of ignota is made known by a means of knowing proper to itself. The simple is known when the reason is in possession of its definition. The truth or falsity of a composition is known by some comparison of its terms with a third term, that is, through argumentation of some kind. These two means of knowing differ from one another in their internal structure, and their formation is governed by different principles. They constitute, therefore, two subjects of logic and divide the science into two parts, one of which tends toward the direction of definition, the other toward the direction of argumentation :

"Ista ergo sunt duae partes logicae : Una quidem ut doceatur principia per quae sciatur definitio rei et quidditas : ita quod per principia illa doceatur quae sit vera rei, definitio, et quae videatur esse et non sit. Alia vero ut doceatur principia qualiter per argumentationem probetur enuntiationis veritas vel falsitas" (1).

⑦ With respect to the first part, this must teach all that the speculative scientist must know about the instrument for attaining knowledge of the essence of things, or the work to be constructed by the reason in attaining such knowledge :

"...logicus docens quaerere scientiam incomplexi, docet instrumentum quo accipitur nobilita illius secundum definitionem, et ea quae ad definitionem faciunt, et quae definitionem circumstant, et quae definitionem perficiunt, et ea quae definitionem mutant" (2).

As St. Albert points out, no complete treatise on the art of definition has come down to us from Aristotle; (3) this does not mean, however, that

(1) - Ibid.
(2) - Ibid., ch. 7.
(3) - Ibid., ch. 5.

there is no extant work of Aristotle on the first operation of the reason.

⑧ The second part must provide knowledge of all the principles governing the formation by the reason of the syllogism and other forms of argumentation, which are instruments for arriving at knowledge of the truth or falsity of an ignotum complexum. In this part the logician

"...sic docens accipere scientiam complexi, docet syllogismum qui est illius proprium instrumentum, et docet alias species argumentationum, et principia syllogismi, et ea quae circumstant ipsum, et principia ipsius, et partes, et materiam in qua ponitur forma syllogismi, et aliarum argumentationum forma, et quae syllogismum mutant" (1).

⑨ This division of St. Albert may be paraphrased thus : attainment of knowledge of each of the two kinds of unknown involves the construction by the reason of a certain work proportioned to the object; since these two works are irreducible to one another and the principles governing the construction of one do not govern the construction of the other, these two works constitute two separate subjects and divide the science of logic into two parts.

⑩ St. Albert's division from the intention of logic, therefore, identifies two subjects of logic. As St. Albert points out, however, the second part must itself be divided, and this subdivision reveals a third subject. The syllogism, and all forms of argumentation, are composed of enuntiations; the true cannot be concluded except from truths stated, or enuntiated. But the enuntiation, as such, independently

(1) - Ibid., ch. 7.

of, and prior to, syllogistic reasoning, has its own material and formal principles and properties. Accordingly, it is in itself a separate subject of logic, a part of which tends toward the provision of directives for the formation of the enunciation, and of knowledge of its divisions and properties. Since these are retained in the syllogism, and play a role with respect to its consequence and powers, the enunciation must be known prior to the syllogism and the part of logic concerned with it precedes the consideration of the syllogism :

"Quia vero syllogismus non scitur an sit compositum et complexum quid, nisi sciatur ex quibus et quot et qualibus est, et qualiter conjunctus, ideo habet agere logicus de enuntiatione et partibus et qualitatibus et compositione enuntiationis" (1).

From this subdivision it follows that the whole of logic is divided according to the consideration of three works formed by the speculative reason, each of which forms a subject of a part of logic :

"...logica in tria ordinetur, scilicet in scientiam incomplexorum, quae per definitionem habetur... et in scientiam interpretationis eorum per quae deventur in complexorum notitiam, et in scientiam syllogismi per quam quis ducitur ad complexorum cognitionem" (2).

3. - Comparison of St. Thomas' and St. Albert's Divisions.

① There is a passage in the Summa Theologiae which may serve as focal point for manifesting both the diversity and the agreement of St. Thomas' and St. Albert's divisions. Here St. Thomas remarks :

"...sicut in actibus exterioribus est considerare operationem et operatum, puta aedificationem et aedificatum, ita in operibus rationis est considerare ipsum actum rationis, qui est intelligere et ratiocinari, et aliquid per huiusmodi actum

(1) - Ibid.

(2) - St. Albert, In I Periherm., Tract. I, ch. 1.

constitutum; quod quidem in speculativa ratione primo quidem est definitio; secundo enuntiatio; tertio vero syllogismus vel argumentatio" (1).

It is clear that St. Thomas, in making his division, turns his attention to the actus rationis; from the fact that there are three operations of the reason, differing from one another in nature, it follows that the subject of logic, which is second intentions, must be divided into three parts. Thus, for St. Thomas, in sum, the fact that there are three operations is the cause of the division. St. Albert, on the other hand, makes no reference to the acts; from the intention he passes directly to the kinds of unknown and from these to the identification of the opera constituta. It is the opera constituta that are the subjects of logic, for logic directs the reason by teaching precisely how to form them. For this reason St. Albert's division adds to St. Thomas' in the measure that it explicitly identifies the works of the reason that are the three principal subjects.

② If the corresponding parts of the divisions are compared, it is only in the case of the first part that any difference appears. In speaking of the second, St. Thomas mentions that Aristotle's Perihermeneias deals with this; but the subject of this book is the enunciation. With respect to the third, St. Thomas mentions in order all the forms of argumentation that pertain to its subject. The corresponding first parts of the two divisions are partially in agreement in so far as for both this part deals with the attainment of knowledge of the essences of things; they differ, however, in so far as St. Thomas speaks of Aristotle's Predicaments as being concerned with this operation and

(1) - Iallae, q. 90, a. 1, ad 2.

makes no mention of definition, while St. Albert names the definition as subject and says nothing of the Predicaments. This difference is explained, however, by the consideration that St. Thomas is interested in establishing the order of the books of the Organon; but the only extant work of Aristotle pertaining to the first operation is the Predicaments. Moreover, in the text just cited from the Summa, St. Thomas mentions the definition as the work formed by the first operation, and, in addition, the Predicaments are ordered to definition, as will be explained in the following chapter. In sum, therefore, the only difference in the two divisions is in the principles from which they are made; they terminate in the same three subjects.

③ That is most to the point here is the consideration that neither St. Thomas nor St. Albert gives as the first division of logic that into material and formal. Moreover, in determining the subjects of logic neither takes into consideration any principle in the line of matter and form. Lastly, the three subjects which emerge from their divisions as the subjects of logic - definition, enumeration, and argumentation - greatly differ from those given as the subjects of formal logic - term, proposition, and syllogism.

4. - Criticism of John of St. Thomas' Division.

① John of St. Thomas defines logic as "the art which directs the reason so that it may not err in discoursing and knowing." He founds his division on two terms in this definition - art and reason; since in all arts the two principal considerations are the matter in which they operate and the form which they introduce into that matter, then

it is to be expected that the art of logic will be divided according to the consideration of a certain matter and of the form to be introduced into that matter; the act of the reason to be directed is the process of resolutive reasoning. In John of St. Thomas' acceptance of both of these terms there is error. In the first place, he does not first determine the sense in which logic is an art, but seems, from his example of the builder's art, to assume that art is said of logic in the same sense as that in which it is said of the servile arts.

Secondly, his definition of resolutive reasoning as this is taken as the whole subject of logic is too narrow a meaning of resolutive reasoning. The second of these errors is the fundamental mistake; for if resolution, understood as he describes it, were the whole subject of logic, then there would be grounds for the division of logic into formal and material; John of St. Thomas' observations on art, moreover, are rather introductory to the division than the principles from which the division proceeds. For this reason the second error will be considered first.

② In his definition of logic, John of St. Thomas teaches that it directs the act of reason so as to prevent error in discoursing. He then states that the reason in discoursing and judging proceeds resolutive (per modum resolutionis), so that for logic to direct the act of discourse means no more nor less than to direct resolution so as to prevent error therein. In his analysis of the subject of the direction of logic, therefore, there is an identification of the act of discourse, judgment, and resolution. He describes resolution as the process by which the enumeration to be judged is reduced into its prin-

ciples and the proofs by which it is manifested are discovered. Next he points out that resolution is twofold, that on the part of the form, which is the subject of Aristotle's Prior Analytics, and that on the part of the matter, which pertains to the Posterior Analytics. Logic, therefore, is divided into two parts, one of which considers the form of resolutive reasoning and the other its matter.

(3) If the subject of logic were resolutive reasoning as John of St. Thomas describes it, then it would be true that logic is divided into a formal part, which considers the simple syllogism, resolving it into proposition and term, and a material part, which considers the demonstrative syllogism. But, in fact, the discourse of the reason which is the subject of the direction of logic is broader than the discourse of judgment which is effected by resolution into principles. This is evident from St. Albert's division according to the two kinds of unknown: in attainment of knowledge of the simple unknown, a certain discourse is necessary; similarly, prior to the formation of a resolutive syllogism the reason must be able to enunciate the true and must know the nature and properties of the enunciation; the discourse of the reason which is the subject of the direction of logic, therefore, includes the acts of the first two operations in themselves, as well as the judicative discourse of the third operation. To accept the act of judgment as the entire subject of logic is, effectively, to exclude the first two operations from the subject of logic. Thus, when John of St. Thomas divides the subject of his formal logic into three parts according to the three operations of the reason, he determines the subjects of the parts that consider the simple apprehension and composition

and division according to something accidental to these operations, that is, as their objects form part of further compositions of the reason; it is accidental to the first operation that its object be a term in a proposition, and accidental to the second that its object be a proposition in a syllogism.

(4) There is a sense in which resolutive reasoning may be said to be the entire subject of logic, since logic is the instrument of speculative science and speculative science is resolutive in mode. But resolution understood thus includes the resolution of the object into its material and formal principles by division and definition, and then the formation of enunciations prior to judgment through resolutive syllogisms; all three of these operations require the direction of logic.
(1)

(5) It may here be remarked that the division of logic into formal and material founded on the diversity between the rectitude of reasoning and its truth implies the same error as that just described, namely the acceptance of syllogistic reasoning as the whole subject of logic. Only in the case of argumentation is there a form that must be right and a matter that must be true.

(6) The second point regarding John of St. Thomas' division which remains to be considered is his inference that because logic is an art we are to expect that it be divided according to the consideration of form and matter.

(1) - On the nature of resolutive reasoning, see Edmund Dolan, F.S.C., "Resolution and Composition in Speculative and Practical Discourse," Laval Théologique et Philosophique, VI, (1950), 9-62.

7 Art, the recta ratio factibilium, is a habit which enables the reason to direct the making of things as they should be made and with ease. Since those objects which are produced in physical matter which, because of its passivity, lends itself most readily to a certain making or formation, are most properly makeable objects, art according to the strictest meaning of the word is attributed to those arts which direct the making of material objects :

"factibilia dicuntur illa quae procedunt ab agente in extraneam materiam, sicut scammum et domus : et horum recta ratio est ars" (1).

Such arts are called servile arts. (2)

8 It is clear that logic is not an art in this strict sense of the word, since in logic there is no question of transitive activity which introduces a form into external matter. It is, however, art in a secondary sense. From the very nature of its subject, as explained above, its intention is the direction of the composition of concepts. It is accordingly concerned with the perfect production of "something in the manner of a certain work," (3) something, that is, which partakes of the nature of a makeable object in the measure that it results from a

- (1) - Q. D. De Veritate, q. 5, a. 1, c.
- (2) - For the explanation of the imposition of this name, see O'Flynn, op. cit., p. 170.
- (3) - "...etiam in ipsis speculabilibus est aliquid per modum cuiusdam operis, puta constructio syllogismi, aut opus numerandi aut mensurandi. Et ideo quicumque ad huiusmodi operationis habitus speculativi ordinantur, dicuntur per quendam similitudinem artes" (IaIIae, q. 57, a. 3, ad 3).

certain composition, which composition is governed by determined rules of procedure :

"...omnis applicatio rationis rectae ad aliquid factibile pertinet ad artem... Quia ergo ratio speculativa quaedam facit, puta syllogismum, propositionem, et alia huiusmodi, in quibus proceditur secundum certas et determinatas vias, inde est quod respectu horum potest salvari ratio artis" (1).

Since, therefore, art is not univocal as said of the servile arts and of logic, it cannot be assumed that the diverse elements pertaining to the construction of material objects which may serve to divide the consideration of the craftsman, will also divide the science of logic.

9 Since the servile arts, by definition, are concerned with a material object, it is true that in them both the matter, that which is presupposed, and the form to be introduced, must be known by the craftsman to the extent that knowledge of both is necessary for the

- (1) - IaIIae, q. 47, a. 2, ad 3. For the various meanings of the word 'art', and a more complete explanation of the sense in which logic is an art, see O'Flynn, op. cit., pp. 168-175. It may be noted that there is no opposition between this definition of the common notion of art and that which St. Thomas gives at the beginning of the Posterior Analytics (supra p. 14). In the former St. Thomas defines art through the notion of a work to be made; in the latter through direction of operations which must be done in a certain determined way. But the production of anything in the manner of a certain work calls for operations which must be done in a certain determined way. In the Posterior Analytics St. Thomas omits mention of any work to be made because his aim is to define logic simply through the faculty whose operations it directs.
- (2) - It does not follow, however, as John of St. Thomas seems to imply, that the consideration of the artist is adequately divided by these two. As St. Thomas teaches (In II Ethicorum, lect. 2, nn. 255-256), practical reasoning is comparative in mode and must take into consideration all those movements by which the object may be brought into existence. Division is a mode of knowing proper to speculative science, not to practical. From this point of view, too, John of St. Thomas' reference to the servile arts for the principle of the division of logic is badly chosen.

(1) production of the object. But in logic, it must first be determined what the makeable objects are which the reason must construct in its advance to science; only after these are known can any question of their composition of a form and a determined matter, and of the relevancy of both of these to the consideration of the logician in each case, be answered. It is these makeable objects that divide logic.

10. These observations on the sense in which logic is an art permit the manifestation of a certain difference between St Thomas' and St. Albert's divisions not mentioned above. Although St. Thomas' initial considerations, ordered to the definition of logic from its end, regard logic as an art, still, when he divides logic, he divides it according to a mode of division proper to science. He mentions that logic is a science (rationalis scientia) and then divides it by discovering in the subject matter a principle of division of that subject matter.

St. Albert, on the other hand, divides logic rather from a principle pertaining to it as it is an art, for he divides it from its intention, which is the provision of principles to direct the making of certain works of the reason which must be made in a determined way for the attainment of an end. Since there are three such works to be made, logic is divided into two parts, and then into three because the second of the first two presupposes the making of a third.

- (1) - On the knowledge which the artist must possess of the matter and the form, see In II Physicorum, lect. 4, [edit. Pirrotta], n. 345.

5. - Material and Formal Logic.

① The burden of the preceding pages has been the manifestation of the proposition that logic is to be divided according to the works made by the three operations of the reason and not according to the consideration of the form and matter. It does not follow, however, that the terms formal and material logic are meaningless. There is in the subject of logic a definite foundation for these terms, and their use can be of service in the understanding of that subject.

(2) As has been pointed out, the subject of logic is second intentions, which are relations of reason that accrue to the object in its state of being known. In the act of knowing, however, two elements may be distinguished: the form which the operation of the reason assumes, and the determined matter, or object, represented by that form. Because of these two elements, relations of reason of two different kinds accrue to the object known; certain ones by reason of the form of the operation, others by reason of what is represented. Those parts of logic which consider second intentions of the first type are called formal logic; where the subject is relations of the second type, logic is material.

(3) The two kinds of second intentions are exemplified in the enunciation man is rational. Here the form is that necessarily assumed by the second operation of the reason in the speculative order - predication of something of something else. Owing to this form, certain relations accrue to man and is rational, namely, subject and predicate. But there is another, entirely different, kind of relation to be found in the same enunciation: since what is here predicated of man is some-

thing that pertains to his essence, the predication is per se; if, however, is white were predicated, then the predication would no longer be per se, but per accidens, although in both cases the form is the same. The second kind of relation, therefore, is clearly founded on what is represented.

④ This distinction between formal and material logic cannot serve as a principle for dividing logic by determining its subjects. Rather it is known only subsequently to the division; once the subjects have been determined, then the consideration of them discovers this difference between the kinds of second intentions. The terms formal and material, understood as explained, are of some help as principles of knowledge of the natures of the second intentions to be considered when the different parts of logic are approached. For example, knowing that the Prior analytics is formal logic, while the Posterior Analytics is material logic, is of some initial assistance in understanding the difference between proposition and principle, and between predicate as the term of the resolution of the simple syllogism and predicate as the term of the resolution of the dialectical syllogism.

5 When the distinction between formal and material logic is thus based on the foundation of the second intentions under consideration, it becomes clear that the logic of the first operation is material, for the definition requires no direction on the part of its form; rather, knowledge of the essence is effected entirely by composition of concepts governed by relations founded on what is represented by those concepts. The true and the false, on the contrary, are the effect of a form which remains the same independently of what is represented therein; accordingly, the logic of the second operation is entirely formal. The attainment of

certain knowledge through syllogistic reasoning, however, requires that the operation of the reason assume a certain form, namely, the syllogism, and also that certain relations hold good on the part of the matter represented under that form; both the form and the conditions on the part of the matter fall under the consideration of the logician, and accordingly the logic of the third act is both formal and material.

6 John of St. Thomas, in determining what is meant by the matter and what by the form, as these divide logic, first points out that in any art the matter is presupposed; not made, by the artist, while the form is induced. Applying this to logic, he identifies the matter as the things or objects that we wish to know, while the form is the mode or disposition by which the objects known are connected. Since he teaches elsewhere, however, that the subject of logic is second intentions, it may be assumed that what he has in mind as the subject of the resolution ex parte formarum are second intentions founded on the form and as subject of the resolution ex parte materialium, second intentions founded on what is represented by that form. What is misleading, however, is his assimilation of logic to the servile arts in that its principle work is conceived as the induction of a form into matter that is presupposed. The servile arts attain their end when such an induction has been effected; the end of logic, however, is knowledge of the unknown, and this demands not only the induction of a form into concepts, which is the work only of formal logic, but also the induction of necessity of consequent, which is part of the work of material logic. In this way, both formal and material logic can be said to make something from a matter that is presupposed, namely, simple concepts; the former makes the first-figure

sylogism, for instance, and the latter the definition and per se propositions. For this reason "that which is presupposed" cannot serve to distinguish the subject of material from that of formal logic. The "making" of logic, moreover, is entirely different from that of the servile arts, for logic makes only by knowing. Its whole subject, second intentions, both those founded on the form, and those founded on determined matter, are given, their natures determined by that of the reason; logic can do no more than know them modo speculativo.

6. - Certain Difficulties concerning St. Albert's Division.

I
a St. Albert divides logic into the consideration of definition and of argumentation, as has been explained, in the fifth chapter of his commentary on the Predicables. Moreover, he repeats this same division at the beginning of his commentaries on the Predicaments.⁽¹⁾ and on the Perthemenias.⁽²⁾ Yet in the chapter of the De Praedicabilibus immediately preceding that in which he divides logic he teaches that the whole subject of logic is argumentation :

"...de argumentatione igitur vel syllogismo est logica tota ut de subiecto" (3).

Hence, what is given as the whole subject in one chapter is named as part of the subject in the chapter immediately following.

b This apparent contradiction can be explained by an examination of the context in which argumentation is designated as the whole subject

- (1) - De Praedicamentis, Tract. I, ch. 1.
- (2) - In I Perihierm, Tract. I, ch. 1.
- (3) - De Praedicabilibus, Tract. I, ch. 4. Cf. also ibid., ch. 1, where "ratiocinium sive argumentatio" is named as the subject of logic.

in the fourth chapter of the De Praedicabilibus. Here the purpose of St. Albert is so to designate the subject of logic as to exclude two errors in its regard. The first error limits the subject to the syllogism, excluding other forms of argumentation, such as induction and enthymema; the second makes of logic a general science concerned with words, such that it is composed of four parts - poetry, rhetoric, grammar, and dialectic - all having a common subject, oratio congrua. To refute these errors, St. Albert has only to establish that the subject of logic is broader than the syllogism and its subject is not the word. But showing that the subject is argumentation suffices for this; there is no need to mention definition.

c Further, there is a sense in which argumentation is rightly said to be the whole subject of logic. The end of logic is science, but science is the habitus conclusionum and conclusions are known by argumentation. For this reason the definition and the enunciation are not studied for themselves, but as ordered to argumentation, which is impossible without them, and in this sense they can be said to be parts of argumentation. Thus, even when considering definition and enunciation, the logician is concerned with argumentation. It remains true, however, that the definition, enunciation, and argumentation are three distinct works of the reason, and three different subjects of logic.

II
a A second difficulty is found in certain passages in which St. Albert gives a division of logic entirely different from that into two parts concerned with definition and argumentation. This second division is that into inventive and resolutive reasoning :

"Est enim (Logica), ut dicit Boethius in Topicis, ratio dis-
serendi, hoc est, docens qualiter de quolibet disserendum
est, quae in duas, ut dicit, distribuitur partes, scilicet
scientiam inveniendi, quam Topicam Graeci vocaverunt : et
scientiam iudicandi, quam Graeci analyticam, Latini autem
resolutoriam nuncupaverunt" (1).

Here again the passage must be taken in its context. The purpose of this
chapter is to manifest the necessity of logic : "Summe autem necessaria
et utile est logica philosophiae." (2) For this end, St. Albert points out
that reasoning is of two kinds - resolutive and inventive - and proceeds
to show that the direction of logic is needed for both, which procedure
suffices for the purpose of the chapter. He repeats the same division
in his commentary on the Prior Analytics :

"Attendendum est autem, cum omnis et tota logica sit scientia
differenti, et haec dividatur in scientiam inveniendi, et in
scientiam iudicandi quod inventum est" (3).

Here his purpose is to explain the place in logic of the Prior Analytics,
which work is studied as the formal part of resolutive reasoning. At
this point all the doctrine contained in the Predicables, Predicaments,
and Perihemeneias on the first two operations of the reason is presupposed,
and the division is a division of the processes of the third operation.
What is most important is that the division into inventive and resolutive
is a division of logic according to the kinds of reasoning; (4) it is not
a division into its subjects. Resolution presupposes discovery and the
formation of an inventive argument presupposes definition and enunciation,
so that definition, enunciation, and argumentation are the three subjects.

- (1) - De Praedicabilibus, Tract. I, ch. 3.
- (2) - Ibid.
- (3) - In I Prior Anal., Tract. I, ch. 1.
- (4) - On these two kinds of reasoning, see infra, ch. 5.

III. There is a passage in St. Albert's commentary on the Prior
Analytics from which a third difficulty arises. Here, as in the De Prae-
dicabilibus, he teaches that logic provides principles for attaining
knowledge of two kinds of unknown, but makes an addition to the modes of
knowing them :

"...datum enim determinatum est, quod logica est scientia
docens per notum devenire ad ignoti cognitionem. Hoc autem
est aut incomplexum, vel complexum. Et si est incomplexum,
devenitur in cognitionem ipsius diffinitione, vel divisione,
vel utroque modo, sicut in scientia divisionum dictum est.
Et si est complexum, devenitur in cognitionem ipsius argu-
mentatione" (1).

The subject of St. Albert's consideration in this part of the Prior Analy-
tics is conversion of subject and predicate in the same proposition,
which kind of conversion is a principle of the consequence in imperfect
syllogisms; in the section beginning with the passage just cited,
St. Albert's purpose is to manifest that conversion is not in itself a
mode of knowing. To this end he points out in the above passage that
there are three modes of knowing - definition, division, and argumentation.
The difficulty, clearly, is that here a mode of knowing, namely division,
is introduced that was not mentioned in the division of logic made in the
De Praedicabilibus; since the other two modes each constitute one of the
parts of logic, it would seem that there should be a third part whose
subject is division.

In response to this difficulty it may first be considered
that division is in itself a mode of knowing because by means of division
the reason passes from the known to the unknown in so far as it attains
a distinct knowledge of what was previously known as a confused whole by

- (1) - In I Prior Analytics, Tract. I, ch. 8.

distinguishing the parts that constitute that whole. Division, as a mode of knowing in itself, is distinct from definition; first, because their objects are different: by definition the essence of the object is known; division, however, of itself can never manifest the essence. A second essential difference between division and definition would seem to be their modes: St. Thomas, in the Metaphysics, distinguishes two modes of knowing - the resolutive and the compositive modes; whereas division pertains to the former mode, because it proceeds from a composite to simples, or from a whole to parts, definition, considered formally, apart from the divisions that necessarily precede it, seems to be compositive in mode, since it is formed by the composition of the proximate genus and specific difference. (2) That division cannot be reduced to argumentation is clear because argumentation is the means for knowing the truth or falsity of an enunciation, but no division can produce such knowledge.

C As an example of what St. Albert means when he says that the ignotum incomplexum can be known by definition or division or both, the consideration of the syllogism in the Prior Analytics begins by resolving

- (1) - "...Est autem duplex via procedendi ad cognitionem veritatis. Una quidem per modum resolutionis, secundum quam procedimus a compositis ad simplicita, et a toto ad partem, sicut dicitur in primo Physicorum, quod confusa sunt prius nobis nota. Et in hac via pericitur cognitio veritatis, quando pervenitur ad singulas partes distincte cognoscendas. - Alia est via compositionis, per quam procedimus a simplicibus ad composita, qua pericitur cognitio veritatis cum pervenitur ad totum" (In II Metaphys., lect. 1, n. 278).
- (2) - For instance, St. Thomas maintains that Aristotle in the De Anima proceeds to the definition of the soul composingo (In I De Anima, lect. 1, n. 9), similarly St. Albert says that every definition colligitur ex divisione (In I Perihermeneas, Tract. I, ch. 1).

it into its proper integral parts, or material principles, proposition and terms. Following this resolution, the syllogism is defined as a discourse in which certain things being placed, etc. The division and definition together result in a knowledge both of the material and formal principles of the object.

Division, since it is ordered to the distinct knowledge of a simple object, that is, a whole of some kind, pertains to the first operation of the reason.

e St. Albert himself does not explain why division does not constitute a separate part of logic; it is not clear to what work he is referring when he speaks of the scientia divisionum in the text cited above. The response, however, seems to be contained in the consideration that while definition and argumentation are modes of knowing that terminate the operation of the reason in their respective lines of knowing, division, although it is a mode of knowing irreducible to the other two, does not terminate the operation of the reason seeking perfect knowledge of the object, but is always ordered to something further; division possesses the character of a certain step toward knowledge of the essence. Definition, as the term in line of knowledge of the essence, depends upon certain praecognita; these praecognita are provided by division, as will be explained a bit more fully in the following chapter. In sum, for the attainment of science, two questions must be answered, quid est and an verum est; the first is answered by definition, which presupposes division, the second by argumentation. Division, because it pertains to the first operation of the reason and is ordered to definition, falls under the consideration of the part of logic which considers the definition.