



An Essay on *Experimentum* (I)

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An Essay on *Experimentum*

Within Aristotelian-Thomistic usage the word "experience" (*experimentum*¹ or *ἐμπειρία*) takes on a variety of meanings — extending, in St. Thomas's vocabulary, to uses in the context of Sacred Doctrine. Some of these meanings we shall attempt to account for in the course of this essay. At the outset we shall eliminate others from our considerations. In addition to those meanings associated with Sacred Doctrine, we have in mind to leave aside some added notes about *experimentum* as it is associated with prudence,² as well as notions of *experimentum* as it is related to a kind of skill which comes from repeatedly operating in a certain way.³ Of principal concern is *experimentum proprie loquendo*, a kind of knowledge that is an important element in the order of the discovery of human science.

For even in contemporary English usage, the word "experience," while a name for knowledge, is not taken in more authentic uses to refer to just any kind of knowledge. Scientific knowledge of a thing, even though it is commonly admitted that such knowledge must be supported by experience and is in that sense experimental, is not itself experience. Experience seems rather to be associated with the beginnings of human knowledge; and so it is that the external senses and the knowledge proper to them are often referred to as "experimental." In English usage there is no hesitation, for example, in referring to a single act of hearing as the "experiencing" of this sound or to a single act of seeing as the "experiencing" of this color, this figure, etc. Yet in English usage (and in the usage of the philosophical tradition to be explored) "experience" can be and is taken to imply more than that, more, that is, than a simple passivity with respect to a singular sensible thing making a single

1. The Latin has available two words to translate what the Greeks called *ἐμπειρία*: *experimentum* and *experientia*. (In the manual edition [Marietti, 1950] of St. Thomas's commentary on the *Metaphysics* the Latin version of Aristotle's first chapter has as translation of *ἐμπειρία* both *experimentum* [980 b 29] and *experientia* [981 a 2].) So far as we can judge, no important shift in meaning is involved here. St. Thomas does in fact use the words interchangeably. (See, for example, *De Malo*, q.16, a.7, obj. 12 and ad 12.) — If in the course of this essay we favor, at least in a quantitative way, the Latin *experimentum*, it is because this is the word chosen by St. Thomas when he says what we judge to be the most important and formal things about experience.

2. *IIa IIae*, q.47, a.16, ad 2: "...experimentum prudentiae non acquiritur ex sola memoria, sed ex exercitio recte praeciendi."

3. *Ia IIae*, q.40, a.5, ad 1: "...experientia in operabilibus non solum causat scientiam; sed etiam causat quendam habitum, propter consuetudinem, qui facit operationem faciliorem." Cf. also the *corpus articuli*.

impression upon external sense ; for there is no reluctance about saying that a man's experience comes from many experiences. In this latter meaning "experience" obviously refers to a product of several observations made over a period of time. But if "experience" means a collection of observations or of observed "facts," it is not always used to name just any collection of observations. One can imagine — to help make clear an additional and at the same time more authentic meaning of the word — two men who have been witness to the very same phenomena. Basing himself on his observations, one of them may be capable of judgments valuable in his practical or speculative endeavors, while the other may well be incapable of any such judgments at all. It is true, of course, that according to one use of the name both can be said to be men of experience : they have both undergone the same phenomena. But there is another use of the name reserved for this collection of phenomena in the man who indicates that he is capable of making use of it. A sign of this is that one who speaks English would not be uncomfortable about saying of the man without judgment that, while he witnessed the same things as the first imaginary man, he did not use the opportunity to gain experience. In this use the second imaginary man could not be called a man of experience. In English, then, the word "experience" can be used to signify a collection of observations which is not simply a product of the agency of the things which act upon our knowing powers. While in this latter meaning "experience" does bring to mind the external world and the sense qualities by means of which that world acts upon touch, taste, hearing, etc., it also suggests that man has done something with these observations, that he has not been wholly passive in the face of them. Acting upon his observations, he has put them together in such a way that they may be of some use in making practical judgments about the way his life is to be conducted and his works constructed or speculative judgments about the kinds of things confronting him. In this use "experience" means an *ordered* collection of observations ; it is a knowledge that is at once the product of external things acting upon external sense and of man, the rational knower, acting upon and ordering the data presented by sense.

What English designates by "experience" in this latter sense — and it seems defensible that in English this is experience properly speaking — is, we hold, precisely what the Aristotelian or Thomist wishes to signify by *ἐμπειρία*, *experientia*, or *experimentum proprie loquendo* : in this signification all the things said of experience come together, it is here that all are verified. If *ἐμπειρία*, *experientia*, and *experimentum* are used in distinct but related ways, they are used less properly.

At this juncture some brief etymological considerations of the Greek *ἐμπειρία* and its Latin cognates will perhaps help to link ancient

to more modern usage of the word "experience." Such considerations will also provide an introduction to a more proper understanding of what the traditional philosophy understands by these terms.

The Greek verbs *περάω* and *ἐμπειράζω* and their Latin cognates *perior* and *experior* — respectively the sources of *ἐμπειρία* and *experimentum* — are taken to mean "make an attempt on," "try out," "put to the test." The prefixes *ἐμ*, and *ex*, suggest a kind of thoroughness. There is, however, some expert disagreement about the sources of these words as well as about the notions behind the sources.¹ Some word studies indicate that the root *per* is shared by the Sanskrit *piparti*, a word which in turn suggests "passing through."² This root, as shared by the Sanskrit *piparti*, is found in the Greek *πέλω*, which means "traverse" or "bore through," and in the Greek *πόρος*, whence a "pore" of the skin; it is found in the Latin *porto*, which originally meant "bring forward." The root, so interpreted, is also identifiable in the Gothic *far*, whence the English "farewell" or "welfare." If this interpretation of the root stands, one can see in *ἐμπειρία*, *experimentum*, or "experience" the notion of passage or movement toward a term. Such a notion is in accord with the common view that experience is not the ultimate term in human knowledge, but rather a stage or step in the process toward that ultimate term, scientific knowledge.

Walde and Pokorny, however, maintain that the root *per* is not related to the Sanskrit *piparti* nor to the Latin and Greek cognates of *piparti*.³ Rather, they fasten upon it as a distinct root meaning "make trial of," "test," "run a risk" (whence the Latin *periculum* meaning "danger" and the Gothic verb *fraisan* meaning "to lead into temptation" or "to tempt").

In any case, the verbs which lie at the base of the word "experience" are all translated by notions that touch upon "trial" or "attempt on." They uniformly suggest activity and — to go a step further — activity on the part of the knower in gaining knowledge. Such notions tend to support what we have already proposed as a more proper or fuller meaning of "experience" in the uses of both ancient and modern languages: the experimental knower, while dependent upon things for knowledge and so passive with respect to things, is actively engaged in getting, or perhaps better, in organizing

1. Compare Émile BOISACQ, *Dictionnaire étymologique de la langue grecque* (4th ed. augm. : Heidelberg : C. Winter, 1950) pp.756-758 and p.770, and Alois WALDE, *Vergleichendes Wörterbuch der Indogermanischen Sprachen*, Herausgegeben und Bearbeitet von Pokorny (Berlin and Leipzig : Walter de Gruyter & Co., 1927), II. Band, pp.28-29, s.v. *per*.

2. Cf. BOISACQ, *loc. cit.* ; Walter W. SKEAT, *An Etymological Dictionary of the English Language* (4th ed. rev. ; Oxford : At the Clarendon Press, 1910), p.204, s.v. *experience* and p. 442, s.v. *peril*.

3. WALDE, *loc. cit.*

the knowledge called "experience," *ἐμπειρία*, or *experimentum*.¹ *Experimentum* is taken, not just received ; while not the ultimate term in human knowledge, it is nonetheless a term of a process implying activity on the part of the knower. "Tentare," says St. Thomas, "est experimentum sumere."²

I. A PRELIMINARY CONSIDERATION OF "EXPERIMENTUM"
AS A KIND OF KNOWLEDGE

The Aristotelian corpus provides two texts fundamental to our investigation, that is to say, texts wherein, in our judgment, *experimentum proprie loquendo* is at issue (that it is at issue in these texts is a matter, we hope, which will unfold) : the very beginning of the *Metaphysics*³ and the last chapter of the *Posterior Analytics*.⁴

The principal subject of the latter treatise is the demonstrative syllogism. Book Two is devoted to a consideration of the principles from which such a syllogism proceeds.⁵ In the concluding chapter, after having treated the medium of demonstration, Aristotle takes up how and by what habit man comes to know the first, immediate, and indemonstrable principles upon which such syllogisms depend. The most common principles (e.g., that a thing can not both be and not be at the same time and in the same respect) present an especial problem ; for they seem so natural, their terms are so common, and assent to them is so spontaneous that their origin in experience may be called into question. It is for this reason that Aristotle takes special pains in the last chapter of the *Posterior Analytics* to show the origin in sense and experience of the habitual knowledge of first principles. For the Stagirite there are no innate species in the human mind, a mind that awaits and depends upon the determination of sense and experience.

In the first chapter of the *Metaphysics*, a chapter that is but a part of a proem to the whole work, Aristotle seeks to establish that first philosophy or wisdom is about causes ; and that purpose entails a discussion of the range of cognitive perfections in beasts and men and of the dependence of some of these perfections on others.

1. The Greek shows a preference for the use of the middle voice of the verb "to experience." (The Latin verb is a deponent.) While suggesting passivity, the use of this voice also suggests (in the causative reflexive) that the subject causes an action to be done for or to itself.

2. And St. Thomas continues : "Nullus autem experimentum sumit de eo de quo est certus. Et ideo omnis tentatio ex aliqua ignorantia vel dubitatione procedit" (*I Ia* *I Ia*e, q.97, a.2). — Cf. also *Ia*, q.114, a.2 ; *In II Sent.*, d.21, q.1, a.1.

3. *I*, c.1, 980 a 22-982 a 3. Cf. ST. THOMAS, lect.1.

4. *II*, c.20, 99 b 15-100 b 18. Cf. ST. THOMAS, lect.20.

5. Cf. *In II Post Anal.*, lect.1 (ed. Marietti), n.407.

Significantly, Aristotle first introduces experience as knowledge that somehow accounts for human art ; the beasts, he observes, can be said to have "but a small share of experience."¹

A. "*Experimentum*" :

Some Common Differentiating Principles

The Stagirite's remarks at the beginning of the *Metaphysics* (as well as at the end of the *Posterior Analytics*) make plain that he regards experience as a cognitive step in the process leading the human knower to what is common or universal, a universal that is the proper concern of the scientific man. From external sense, he tells us, comes memory, from memory comes experience, and from experience come art and science.² Having a role in the order of the generation of human science (an order sometimes referred to as the order of discovery or invention) is not, of course, a proper difference ; for it is a role that *experimentum* shares with both sense and memory.

But priority in the order of generation is not the only distinguishing characteristic of *experimentum* when contrasted with art and science. The latter are concerned with the universal, *experimentum* touches the singular.³ This, too, is a common difference, one which *experimentum* shares with sense and memory.

Attention to the location of *experimentum* in the order of knowledge reveals a third characteristic which is perhaps not so evident as the first two. Art and science presuppose *experimentum*, but *experimentum* itself presupposes both sense and memory. It is in view of this that Aristotle remarks that "... the man of experience is thought to be wiser than the possessors of any sense perception whatever..."⁴ *Experimentum*, when compared to both sense and memory, represents an advance toward a more perfect state of knowledge, toward wisdom. Wisdom, of course, inevitably means distinct knowledge, a knowledge that is the result of some kind of discourse. In his treatise *On Sophistical Refutations* the Philosopher observes that "... the inexperienced are like those who view things from a

1. *Metaph.*, trans. H. Tredennick (The Loeb Classical Library ; London : William Heinemann Ltd., 1955), I, chap.1, 980 b 26. — In the course of this essay we shall use translations of Aristotle's works taken from the Loeb Classical Library and from *The Works of Aristotle* translated into English, edited by W. D. Ross (12 vols. ; London : Oxford University Press, 1908-1932). We shall henceforth only indicate the name of the translator and add the edition (Loeb or Oxford) in parentheses.

2. Cf. *ibid.*, 980 b 28-981 a 6.

3. Cf. *ibid.*, 981 a 7-10.

4. *Metaph.*, trans. W. D. Ross (ed. Oxford), I, c.1, 981 b 30-31.

distance."¹ Things seen from a distance are seen confusedly.² Inexperience, then, means confusion. To be sure, when compared to art and science, *experimentum* has less the character of wisdom ; but, inasmuch as it implies something beyond first sense impressions and the simple memory of these, it emerges as a kind of distinct knowledge, compared to which sense and memory stand as confused.

*B. Toward an Understanding of the Proper Differences
of "Experimentum"*

There are, then, three common differentiating characteristics of *experimentum* which emerge from our considerations thus far : it belongs to the order of the generation of human art and science ; it is knowledge of the singular ; and it is a kind of distinct knowledge. An even closer examination of Aristotle's text and of St. Thomas's commentary, however, will provide starting points for a more proper understanding ; for, as we have already suggested, there are indications in this first chapter of the *Metaphysics* that Aristotle views "experience" as sharing with words such as "art," "prudence," and "learning" a more proper imposition to a human perfection. We mean to say that for the Philosopher "experience," properly taken, names a human noetic perfection. If this be so, *experimentum* — in the Aristotelian-Thomistic tradition — must be associated with knowing powers that overcome or surpass nature far more than does any sense knowing power of the brutes.³

We take the first indication to be the very evident reserve with which Aristotle places experience among the possible perfections of brute knowledge. The beasts, he tells us, "have but a small share of experience . . ."⁴ His caution can be taken to suggest that he regards what is found in the brutes only as a foreshadowing of what is a human perfection, just as sense itself foreshadows and imitates intellect and animal prudence foreshadows and imitates what is more properly prudence.

After remarking that the beasts share but little of experience, he immediately adds that what characterize human life are reason and its perfection, art.⁵ It is only then that he begins to give account of experience itself, first explaining the genesis of experience and of art through experience, and then continuing with a comparison of

1. Trans. E. S. Forster (ed. Loeb), c.1, 164 b 26-27.

2. Cf. *In I Phys.*, lect.1, n.11 ; *Ia*, q.85, a.3.

3. Cf. *De Unit. Int.*, c.1 (ed. Marietti, 1954), nn.191 and 218.

4. *Metaph.*, trans. H. Tredennick (ed. Loeb), I, c.1, 980 b 27. The Greek is *ἐμπειρίας δὲ μετέχει μικρόν*. — We shall return to this important text when we analyze more closely the passages in both the *Metaphysics* and the *Posterior Analytics*.

5. *Metaph.*, I, c.1, 980 b 28.

experience to art, whose principle it is. What is significant here is that Aristotle chooses to give account of experience in the context of human knowing, a knowing that is set off from the world of the beasts by reason. This we take as another sign that for Aristotle experience names a properly human perfection.

If, of course, *experimentum* is a properly human cognitive perfection, its propriety with respect to man must be rooted in its association with the most radically proper function of man, reasoning itself. St. Thomas is of especial assistance here: *experimentum*, he says, proceeds "ex collatione plurium singularium in memoria receptorum."¹ Collation of this kind, he adds, is proper to man. To collate (*conferre*) is, in the language of the scholastic tradition, the proper and connatural activity of human reason. "Conferre unum alteri est proprius et connaturalis actus rationis."² Such an activity, it is important to add, depends upon the rational soul,³ a soul which, through the immaterial power of reason capable of reflection upon itself, manifests an interiority which no plant or brute soul can achieve.⁴

Aristotle continues by attending to the similarity of experience to art and science.⁵ (St. Thomas is again of considerable help here: they are alike, he says, because both involve a kind of unity, an "una acceptio.")⁶ Next the Philosopher points out important differences.⁷ Art and science have to do with what is common or universal. On the other hand, experience, while its considerations are neighbor to and in some way principle of the universal, along with sense and memory bears upon the singular. (This involvement with the singular is the source of the value of *experimentum* for action, which always takes place in the singular.)⁸ But knowledge of the singular is proper to sense, whether external or internal. Somehow involved in *experimentum*, then, must be a cognitive power that is a form of an organ. And yet *experimentum*, a kind of knowledge, does not seem to be the same as the act of external sense or simple memory; it is rather from a collation of the data of these powers that it is produced. St. Thomas is once more of help: the collation leading to *experimentum* is, he says, that of an internal sense power called particular reason (sometimes called the cogitative power), the human counterpart of the brute estimative power.⁹

1. *In I Metaph.*, lect.1, n.15.

2. *Ia IIae*, q.32, a.8. Cf. also *In de Divinis Nominibus*, c.4, lect.7, n. 377; *De Ver.*, q.26, a.9, ad 7.

3. Cf. *IIIa*, q.11, a.3, s.c.

4. Cf. *Cont. Gent.*, IV, c.11.

5. *Metaph.*, I, c.1, 981 a 3-4.

6. *In I Metaph.*, lect.1, n.17.

7. *Metaph.*, I, c.1, 981 a 4-12.

8. Cf. *In I Metaph.*, lect.1, nn.20-22.

9. Cf. *ibid.*, n.15.

In our judgment, St. Thomas's attention here to the cogitative power and its collation points out the road to be followed in order to gain a more distinct knowledge of *experimentum*. It is the *collatio* of this power that is responsible for *experimentum*. It is this *collatio*, too, which will explain *experimentum* as a cognitive perfection proper to man. Accordingly, before attempting a closer analysis of the beginning of the *Metaphysics* and the end of the *Posterior Analytics* with a view to a definition of *experimentum*, we shall indicate, at least, what the Aristotelian-Thomistic tradition understands by *collatio*, an activity which it insists is proper to man. Further, since the *collatio* at issue with respect to *experimentum*, while proper to man, is nonetheless the *collatio* of an internal sense power, it will be necessary to attend to the differences between human and brute sensation ; and that inevitably involves some investigation of the relationship between sense and reason in man.

II. "COLLATIO" IN INTELLECT AND SENSE

A. *Universal Reason and Its "Collatio"*

It is one thing to be mindful that we know, and quite another to know what mind and its proper activities are.¹ Human naming processes, however, do reflect the common experience and the common argument.² And so the names given human mind and its acts can be expected to indicate that to which the human mind first compares itself and its activities. The Latin *conferre*, which St. Thomas insists is proper to reason, first of all is taken to refer to the gathering of something like grain into one place.³ It is only later taken to mean an act of mental comparison, as in the phrase *proprium est rationis conferre*.⁴ *Cogitare*, from which an internal sense known as the cogitative is named, has a similar semantic cargo. Marcus Terentius Varro, a Roman grammarian of the first century before Christ, describes it as "a cogenda dictum, mens plura in unum cogit."⁵ The Greek *λόγος*, from which so many names applied to mind come, is a

1. Cf. *Ia*, q.87, a.1.

2. Cf. *In V Metaph.*, lect.1, n.751 ; *Ia IIae*, q.7, a.1.

3. Cf. *Thesaurus linguae latinae* (Leipzig : Teubner, 1900), vol.IV, p.174.

4. Cf. *ibid.*

5. *De Lingua Latina*, 6, 43. — St. Augustine (in his *Confessions*, trans. John K. Ryan [Garden City, N.Y. : Doubleday-Image, 1960], Bk. X, chap.11, pp.240-241) says that human thinking is termed "cogitation." "For," he continues, "*cogo* (I bring) and *cogito* (I cogitate) have the same mutual relation as *ago* (I do) and *agito* (I do constantly) and *facio* (I make) and *facito* (I make often). But the mind has appropriated this word to itself, so that what is collected together (*colligitur*), that is, brought together (*cogitur*), in the mind but in no other place, is now, properly said to be cogitated." — Cf. *Ia IIae*, q.180, a.3, ad 1.

verbal noun proceeding from λέγω (cognate of the *lego* that appears in *intelligere*);¹ and word-experts assert that initial to this verb is the note *rassembler*, gather together.² Among the Latins *ratio*, the proper name for the human mind,³ has the early meaning of "account" — a composite of what one owes and what one is owed.⁴ The collative, compositive, or rational character of the human mind is also indicated by English usage; for we readily speak of the "calculating man," of the need for "figuring out," of "giving an account," and of "collecting or gathering evidence." What these names all clearly show is that the mind sees a similarity between its own activities and more manifest activities such as gathering many sensible, physical things into one heap, the latter activity normally involving several separate acts before the heap has been brought about.⁵ In insisting that man, a rational knower who is in the shadows when compared to purely intellectual knowers,⁶ is one who must gather the truth,⁷ the Aristotelian-Thomistic tradition makes no assertion that goes beyond the evidence provided by the names men use. If the common experience is worth anything, reason, a *potentia complectendi*,⁸ is that "quae multa ad unum convolvit."⁹

And just as the collation of the physical order calls for a multiplicity of separate acts before an *unum ex multis* is achieved, so, too, the collation of reason as it moves toward a more perfect understanding of things demands a multiplicity of acts: the simple apprehension of the "what" of the thing, composition or division in which the truth is grasped, and reasoning — the third supposing the second and the second, in its turn, supposing the first.¹⁰ But the collative character of the human mind is not completely described by attending to the three operations needed to acquire an ultimate judgment of things. An even closer look at these acts reveals how

1. Cf. LIDDELL and SCOTT, *A Greek-English Lexicon*, revised by Jones and McKenzie (9th ed.; Oxford: University Press, 1940), p.1057.

2. Cf. BOISACQ, *op. cit.*, p.563.

3. Cf. *De Ver.*, q.15, a.1.

4. Cf. Albert YON, *Ratio et les mots de la famille de reor*, ed. Édouard Champion (Paris: Librairie Ancienne Honoré, 1933).

5. *Cont. Gent.*, I, c.59: "Intellectus . . . noster, apprehendendo incompleta, nondum pertingit ad ultimam suam perfectionem, quia adhuc est in potentia respectu compositionis vel divisionis: sicut et in naturalibus simplicia sunt in potentia respectu conmixtorum, et partes respectu totius."

6. Cf. *In I Sent.*, d.25, q.1, a.1, ad 4.

7. Cf. ARISTOTLE, *On the Soul*, III, c.6, 430 a 26-31; ST. THOMAS, lect.11, nn.746-751; *Q.D. de Anima*, q. un., a.15; *Ia*, q.91, a.3, ad 3; *ibid.*, q.76, a.5; *Ia IIae*, q.27, a.2, ad 2.

8. Cf. *In II Metaph.*, lect.5, n.334.

9. *In de Divinis Nominibus*, c.7, lect.2, n.714.

10. Cf. *Ia* q.85, a.5; *In I Periherm.*, prooem., n.1; *In I Post. Anal.*, prooem., n.4.

profoundly collative the human mind is; for each of these acts is either itself a collation or can suppose one. And in each case the collation aims at a kind of judgment, a judgment which is the grasp of an *unum ex multis*.¹

Reasoning, the operation in which the mind moves from truth to truth, aims at the understanding of a conclusion. In the case of the scientific process, to give example, this ultimately means the grasp of cause as cause.² And knowing a cause as cause, a judgment, clearly supposes a prior multiplicity of apprehensions by which that which is the cause and that which is the effect are known separately.³ The second operation of the mind, signified by the proposition, obviously requires a collation; for it precisely "consistit . . . in quadam duorum comparatione conceptorum . . ."⁴ These concepts are the issue of two prior apprehensions which are clearly supposed to seeing that one thing is in fact predicated of another. Truth is in the mind *ex collatione*. In the first operation, too, the human mind is precisely *ratio* in attaining a more distinct knowledge of the "what" of a thing; it must collate before achieving a kind of judgment (*ultima sententia*) with respect to the essences of things.⁵ Definitions, ordered groups of words reflecting an order or composition in the mind,⁶ must be collected or gathered together; reason here collates the parts of the formula, parts which suppose a multiplicity of prior apprehensions. Therefore, supposed to any advance in the knowledge of things in each of these acts is an initial grasp (*intellectus*) followed by a *collatio* or discourse that terminates in a more complete understanding (*intellectus*) worthy of the name "judgment."⁷ "Ratio ab uno incipiens, per multa procedens, ad unum terminatur . . ."⁸ And that *unum* toward which the minds proceeds is an *unum ex multis*: ". . . rationis proprium circa multa diffundi et ex eis unam simplicem cognitionem colligere."⁹

1. The word "judgment" signifies what is *completivum cognitionis*. (Cf. *IIa Iae*, q.173, a.2; *De Ver.*, q.12, a.3, ad 1, ad 2; *ibid.*, a.7; *ibid.*, q.28, a.3, ad 6; *In IV Sent.*, d.47, q.1, a.1.) As is clear in its first impositions in the order of justice (cf. *IIa Iae*, q.60, a.1), the word "judgment" stands for a term of a prior collation or of a comparative process.

2. Cf. *In I Post. Anal.*, lect.4, n.32.

3. Cf. *De Ver.*, q.2, a.3, ad 3; *Ia*, q.14, a.7; *ibid.*, q.108, a.7, ad 2; *In I Post. Anal.*, lect.2, nn.19-21.

4. *In VI Metaph.*, lect.4, n.1241. Cf. *In I Periherm.*, lect.3, n.26.

5. Cf. *In III Sent.*, d.35, q.2, a.2, q.1a.1; *Cont. Gent.*, III, c.108; *Super Joan.*, c.1, lect.1, n.26; *De Ver.*, q.4, a.2; *Quodl.* VIII, q.2, a.2; *Ia*, q.58, a.5; *In II de Anima*, lect.1, n.233.

6. Cf. *In VII Metaph.*, lect.9, n.1460.

7. Cf. *De Ver.*, q.15, a.1; *IIa Iae*, q.8, a.1, ad 2; *In Boethii de Trin.*, q.6, a.2.

8. *In de Divinis Nominibus*, c.7, lect.2, n.713.

9. *In Boethii de Trin.*, q.6, a.1, ad tertiam quaestionem.

To this point we have been discussing universal reason, an immaterial power, and its collation of common natures. These St. Thomas calls *ratio proprie* and *collatio proprie*,¹ even though, according to the order of our knowledge, we first know and name the cognitive *collatio* of sense,² where there is a manifest collecting of singulars.

What hand gathers and the way it gathers are obviously different from what *ratio proprie* gathers and the way it gathers. If there is an *unum ex multis* in each case, in the former it is an *unum materiale ex partibus materialibus* and in the latter an *unum intelligibile ex partibus quae sunt quaedam intellectae*.³ Now the *unum intelligibile* which reason terminally apprehends is in some way one and in some way many. What reason first of all and principally knows at this juncture is something one, an ordered whole. But insofar as the whole known is ordered, the mind can be said to know many *ex consequenti*; for it precisely knows *plura ut unum*.⁴ In knowing the *quid* distinctly, the human mind knows one thing through one species or form; and, though *ex consequenti*, it simultaneously knows many.⁵ Knowing the *quid* of something means knowing its difference;⁶ and when the mind knows the difference as difference, it knows "utrumque differentium vel comparatorum sub ratione ipsius comparationis vel differentiae; sicut dictum est quod cognoscit partes sub ratione totius."⁷ Similarly, when the intellect compares one concept to another "quasi apprehendens coniunctionem aut identitatem rerum, quarum sunt conceptiones,"⁸ then, in considering the proposition, it knows subject and predicate simultaneously because it knows them as one.⁹ Finally, the judgment terminating the third operation of the mind involves a similar grasp of *multa ut unum*. If the mind composes principles in order to the conclusion,¹⁰ it obviously does so in order to see the conclusion in the principles.¹¹ It simultaneously considers both.¹²

1. Cf. *De Ver.*, q.15, a.1.

2. Cf. *In III Sent.*, d.23, q.2, a.2, q.1, ad 3.

3. Cf. *IIa IIae*, q.8, a.1, ad 2.

4. Cf. *Quodl.* VII, q.1, a.2; *Ia*, q.85, a.4.

5. *In III Sent.*, d.14, a.2, q.4: "Si aliqua cognoscuntur per unam speciem, illa nihil prohibet simul cognosci; sicut homo intelligens quidditatem hominis, simul intelligit animal et rationale." — *Ibid.*, ad 1: "... quando plura intelliguntur in uno, omnia illa sunt ut unum intelligibile..."

6. Cf. *Ia*, q.87, a.1.

7. *Ia*, q.85, a.4, ad 4. — *Quodl.* VII, q.1, a.2: "... cum intelligit similitudinem vel differentiam aliorum, simul intelligit ea quorum est similitudo vel differentia."

8. *In I Periherm.*, lect.3, n.26.

9. Cf. *De Ver.*, q.8, a.14, c.; ad 2; *In III Sent.*, d.14, a.2, q.4; *Quodl.* VII, q.1, a.2.

10. Cf. *De Ver.*, q.15, a.1, ad 5.

11. Cf. *Ia*, q.14, a.10.

12. Cf. *Cont. Gent.*, I, c.57.

The *unum intelligibile* here is precisely the order of principles to conclusion. Collation being supposed, the human mind “*simul cognoscit multa ad invicem composita vel relata ut unum quiddam.*”¹

B. Sense and “Collatio”

1. Sense, a Non-collative Power

The distinction between the collation made by something like the hand and that made by the mind is clear enough. However, in comparing universal reason (which is reason properly and whose collation of common natures is collation properly) to sense, St. Thomas maintains that the latter is precisely a non-collative power. “. . . *Vis sensitiva non est collativa diversorum, sicut ratio . . .*”² We interpret the Common Doctor to mean that any and all sense — human as well as brute, internal as well as external³ — is, when compared to universal reason, non-collative. St. Thomas’s insistence on the non-collative character of sense may seem a little strange in view of what he has said relative to the principal subject of this essay: *experimentum* comes from the collation of an internal sense power, the particular reason, and this collation is something proper to man. Further, St. Thomas even attributes a certain *conferre* to the *sensus communis*.⁴ The common sense, a power with an organic basis distinct from but related to the external senses,⁵ equips its possessor not only with the capacity of sensing its sensing⁶ but also of discerning the objects of the external senses (which are its instruments⁷) from one another. And with respect to the taking of knowledge from what is extrinsic to the knower, this is the power to which “*ultimum iudicium et ultima discretio pertinet.*”⁸ This judicial capacity supposes a *kind* of *collatio*; for the common sense, in order to achieve this judgment, must know a multiplicity of objects simultaneously.⁹ But while there is a *kind* of *collatio* in the common sense and in the cogitative power, there is no *collatio* in these powers or in any sense power in the way in which it is found in universal reason.

It seems to us that what specifies the *collatio* of universal reason is discovered in what is in fact the term of its *collatio*. “. . . *Etsi*

1. *Cont. Gent.*, II, c. 101.

2. *Ia*, q.82, a.2, ad 3.

3. Cf. *In II Sent.*, d.25, q.1, a.1, ad 7.

4. Cf. *De Ver.*, q.15, a.1, s.c.4.

5. Cf. *In III de Anima*, lect.3, n.611.

6. Cf. *De Ver.*, q.1, a.9; *Ia*, q.78, a.4, ad 2.

7. Cf. *In III de Anima*, lect.3, n.609; *In de Sensu et Sensato*, lect.19, n.287.

8. *In III de Anima*, lect.3, n.613.

9. Cf. *ibid.*, nn.604-605.

vires sensitivæ cognoscant res aliquas absolute, ordinem tamen unius rei ad aliam cognoscere est solius intellectus aut rationis.”¹ The object of intellect or reason is order as such. Only intellect can know relation; only intellect can attain to the *ratio* of a thing. It is precisely this that moves us to see intellect as something distinct from sense; for sense can only apprehend something *simpliciter unum*.² Now, as we have seen with respect to all three acts of reason, the apprehension of order or relation is dependent on collation; that is to say, it is dependent upon a gathering of a multitude of prior *apprehensa* and so upon a multitude of prior intelligible operations. And, it is important to repeat, the issue of these many and separately attained *intelligibilia* is the knowledge of something new in kind, an order or relation. That sense cannot attain to a relation as relation, order as order, is a matter of experience and a theme constantly repeated in the texts of St. Thomas. Thus, in comparing intelligence and reason on the one hand to sense on the other, St. Thomas, in his commentary on the *Divine Names*, speaks of “. . . cognitio sensitiva, quæ circa multa diffunditur, sed uniformitatem cognoscere non valet.”³ While in its own fashion a sense power can know *plura simul ex consequenti*,⁴ the *unum* which it knows *primo et principaliter* is not attained as order or relation.⁵

The human intellect, precisely because it is collative or discursive, “non se habet aequaliter ad omnia intelligibilia.”⁶ It comes to know something new, an order — whether that be a *quid* or nature (which, in the case of the natures first known to us, is a *principle* of operation), truth, or cause — with a dependence upon knowing prior intelligibles. Not so the sense of sight, for example, which does not know order as order: *visus aequaliter se habet ad omnia visibilia*.⁷ Only intellect or reason gathers with a view to knowing an order.⁸ That is why, at the beginning of the *Posterior Analytics*,

1. *In I Eth.*, lect.1, n.1.

2. Cf. *Ia*, q.82, a.2, ad 3.

3. *In de Divinis Nominibus*, c.7, l.2, n.714. Cf. *Ia*, q.16, a.2; *Cont. Gent.*, II, c. 101. — *In VI Metaph.*, lect.6, n.1235: “Licet . . . in cognitione sensitiva possit esse similitudo rei cognitæ, non tamen rationem huius similitudinis cognoscere ad sensum pertinet, sed solum ad intellectum.”

4. Cf. *Quodl.* VII, q.1, a.2.

5. The eye sees one line. Intellect, however, according as it attains the line as indivisible in act, understands it “. . . ut unum quid constans ex multis partibus, et sic intelligit eam simul” (*In III de Anima*, lect.11, n.753). Intellect grasps one as proceeding from many.

6. *De Ver.*, q.11, a.1, ad 12.

7. Cf. *ibid.*, q.2, a.3, ad 3; *Cont. Gent.*, I, c. 57.

8. Thus, to give further instance to our point, in order to know the real relation of similitude existing between two things extrinsic to the knower, at least two things must be known in advance of knowing the real relation. (Cf. *De Ver.*, q.2, a.2, ad 3; *In X*

Aristotle emphasizes that all doctrine and discipline must proceed from pre-existent *intellectual* knowledge.¹

If, then, *collatio* is attributed to a sense power on the ground that it can somehow attain *simul plura*, it remains true that, inasmuch as sense is an organic, material power capable only of attaining the singular and incapable of reflecting upon its own act, it cannot know order as order. For this same reason no sense power, external or internal, can be said to be collative in the sense in which intellect or reason is collative: though it may have a *kind* of discernment, it can never attain comparison or order as such. In sum, there can be no *collatio* in sense if *collatio* is taken to mean a process ordered to a sense-perception of some order as order.

But if such a *collatio* is impossible in any sense power, in what fashion is there a *collatio* proper to human internal senses — a *collatio* that seems integral to an understanding of *experimentum*? The answer to this question demands at least a summary view of the relationships between human sense and reason.

2. Sense and Reason

a) *The Role of Sense in Human Intellection.* In the first chapter of the *Metaphysics* and in the last chapter of the *Posterior Analytics* the Aristotelian doctrine is clear: the generation of the principles of art and science is dependent upon sense and the sensible; all our intellectual knowledge takes its origins there. From sense comes memory, from many memories comes experience, and from many experiences comes the universal.² Man's intellectual grasp of a principle is dependent upon his having seen things *in singulari* — “. . . ex rebus visis per viam experimenti accipitur universale, de quo est

Metaph., lect.4, nn.2006-2012.) — What we have said of the collative nature of the human mind points to its active character, especially when compared to the knowing capacities of the beasts. Thus St. Thomas repeatedly speaks of *forming* the *quid* (cf., e.g., *De Ver.*, q.1, a.3, ad 1; *ibid.*, q. 14, a.1; *ibid.*, q.10, a.6; *I Sent.*, d.19, q.5, a.1, ad 7) and *forming* the proposition (cf. *De Ver.*, q.15, a.1, ad 5; *Cont. Gent.*, I, c.58).

1. St. Thomas comments: “Addit . . . intellectiva ad excludendum acceptionem cognitionis sensitivae vel imaginativae. Nam procedere ex uno in aliud rationis est solum” (*In I Post. Anal.*, lect.1, n.9). — The capacity of the intellect to know order, relation, or proportion *ut sic* is rooted in its capacity to reflect upon its act and upon itself. St. Thomas makes this clear in the context of his discussion of the capacity of intellect to know truth, a relation. (Cf. *De Ver.*, q.1, a.9; *Ia*, q.16, a.2.) This is a capacity which sense does not possess. (Cf. also *Cont. Gent.*, IV, c.11; *Ia*, q.87, a.3; *In VI Metaph.*, lect.6, n.1236.) And this capacity of intellect to reflect is rooted in and a sign for us of its immateriality. (Cf. *De Ver.*, q.1, a.9; *In III Sent.*, d.23, q.1, a.2, ad 3.) The intellect is precisely *magis cognoscitiva* because *magis reflectiva*. (Cf. *Ia IIae*, q.31, a.5.)

2. Cf. *In III Sent.*, d.14, a.3, sol.3; *In II Sent.*, d.23, q.2, a.2, ad 2.

scientia.”¹ The habits of first principles, says St. Thomas commenting on the Aristotelian text, are not innate to us

... quasi determinati et completi, neque etiam fiunt de novo ab aliquibus notioribus habitibus praeexistentibus, sicut generatur in nobis habitus scientiae ex praecognitione principiorum ; sed habitus principiorum fiunt in nobis a sensu praeexistente.²

For the Aristotelian being rational does in fact imply the origin of knowledge in sense:³ human knowers must gather the truth from singular, sensible things.⁴

The singular, sensible things extrinsic to man indeed act upon his soul.⁵ They are causes of human science and somehow its measure.⁶ But if the human mind waits upon the agency of extrinsic, sensible things, it attains them only through the mediation of sense, a power capable of knowing the singular.⁷ Accordingly, while the first and ultimate cause and measure of human science is the exterior thing, the exterior thing exercises its role as cause and measure only through the mediation of sense, which, insofar as it is informed by a cognitive similitude of the exterior thing, is itself cause and measure with respect to that science.⁸ Further, intellect, just as it is mediately moved by the thing through the external senses, is moved by external sense only with the mediation of the internal senses. Common sense, imagination, memory, cogitative — these are the powers whence the intellect takes its object.⁹ For Aristotle the images or phantasms of internal sense (and all the internal senses can and often do concur) are compared to the intellect just as color to the eye.¹⁰ They are, in his words, “as if they were the contents of perception.”¹¹ St. Thomas, following Aristotle, refers to the phantasms *sicut objecta propria* of intellect.¹² Just as the visible moves the sense of sight, so the phantasm moves the intellect.¹³

1. *In I Post Anal.*, lect.42, n.381.

2. *Ibid.*, lect.20, n.593. Cf. *In II Sent.*, d.24, q.2, a.3 ; *Ia IIae*, q. 51, a.1 ; *In I Post. Anal.*, lect.7, n.67 ; *ibid.*, lect.30, n.252.

3. Cf. *In IV Sent.*, d.1, q.1, a.1, ad primam quaestionem.

4. Cf. *Ia*, q. 76, a.5 ; *Ia*, q.91, a.3, ad 2.

5. Cf. *De Ver.*, q. 10, a.4.

6. Cf. *ibid.*, q.18, a.8, ad 3.

7. Cf. *Q. D. de Anima*, q. un., a.8.

8. Cf. *De Ver.*, q.18, a.8, ad 3.

9. Cf. *ibid.*, c. ; ad 5 ; *In II Sent.*, d.20, q.2, a.2, ad 4.

10. Cf. *On the Soul*, III, c.7, 431 a 14-15 ; ST. THOMAS, lect.12, n.770 ; *Ia*, q.75, a.2, ad 3 ; *De Ver.*, q.10, a.2, ad 7 ; *ibid.*, q.18, a.8, ad 4 ; *ibid.*, q.10, a.9 ; *Cont. Gent.*, II, c.60 ; *Q. D. de Anima*, q. un., a.15.

11. ARISTOTLE, *loc. cit.*

12. Cf. *De Ver.*, q.18, a.8, ad 4 ; *In III Sent.*, d.14, a.3, q.1a.2.

13. Cf. *In III de Anima*, lect.12, n.770. — The human intellect, of course, is so dependent for its act upon the phantasm (and through the phantasm upon sense and the

Furthermore, singular, sensible things, through the phantasm of internal sense, are active with respect to a power obviously different from sense itself ; for we experience that what we call mind knows common natures.¹ Aristotle and his followers call a power capable of such natures the "possible intellect."²

But if the phantasm is responsible for the movement of the possible intellect by reason of its presentation of the object, it remains nonetheless (and through it, external things and external sense) an *agens insufficiens*³ with respect to intellection. What the possible intellect attains *primo et per se* is the common nature of material, sensible things.⁴ The things themselves are singular and the sense knowledge of them is linked to the singular, the *hic et nunc*. In order to explain human intellection, then, something more than the sensible, sense, and the phantasm must be posited as agents. And so to account for the attainment of the universal, Aristotle was moved to posit a power called the "agent intellect" — a power active with respect to the passive power capable of common natures.⁵ It is agent intellect which, by its abstraction from the singular, individuating conditions of matter, renders the phantasm actually intelligible and accounts as active principle for the attainment of the common nature. That is to say, in its abstractive role the light⁶ of agent intellect purifies the phantasm of those conditions not of the *ratio speciei*⁷ and renders it homogeneous to possible intellect.⁸ The "action" of the possible intellect is to receive the intelligible common natures, that of the agent intellect to abstract the intelligible ; both of these actions concur *ad unum intelligere*.⁹

sensible) that not only does it require the phantasm with respect to the first generation of intellectual knowledge, but also with respect to the actual use of science already acquired. (Cf. *De Ver.*, q. 10, a.2, ad 7 ; *ibid.*, a. 8 ; *Ia*, q.84, a.7 ; *In II Sent.*, d.20, q.2, a. 2, ad 3.) It is in the phantasm that intellect inspects what it considers : ". . . intellectus phantasmatis utitur quasi exemplis in quibus inspicit quod considerat, cujus tamen scientiam prius habebat in habitu" (*In III Sent.*, d.14, a.3, q.3).

1. Cf. *De Ver.*, q.10, a.4.

2. Cf. ARISTOTLE, *On the Soul*, III, c.4, especially 429 b 29-430 a 2 ; ST. THOMAS, lect.7 ; lect.9 ; *Q.D. de Anima*, q. un., a.2 ; *Ia*, q.79, a.2 ; *In III Sent.*, d.14, a.1, q.2.

3. Cf. *Quodl.* VIII, q.2, a.1.

4. And these sensible things remain the measure of all we know — whether by way of perfect representation or by way of negation. Cf. *In Boethii de Trin.*, q.6, a.2, ad 5. — Cf. also *Ia*, q.84, a.7, ad 3 ; *ibid.*, a.8.

5. Cf. *On the Soul*, III, c.5, 430 a 10-17 ; ST. THOMAS, lect.10 ; *In II Post. Anal.*, lect.20, n.593 ; *Q.D. de Anima*, q. un., a.3 ; *ibid.*, a.5 ; *Ia*, q.79, aa.3 & 4 ; *Q.D. de Spir. Creat.*, q. un., aa.9-10 ; *Cont. Gent.*, II, c.77.

6. The use of "light" with respect to agent intellect is rooted in Aristotle's own text. Cf. *On the Soul*, II, c.5, 430 a 10-17 ; ST. THOMAS, lect.10 ; *De Ver.*, q.10, a. 6, ad 8 ; *ibid.*, q.9, a.1 ; *Quodl.* VIII, q.2, a.1.

7. Cf. *De Ver.*, q.8, a.9.

8. Cf. *ibid.*, q.10, a.6, ad 1.

9. Cf. *Q.D. de Anima*, q. un., a.4, ad 8.

External singular, sensible, material things are adequate movers of the external sense, themselves passive powers.¹ Further, the agency of the external things and the agency of the external senses which these external things move are sufficient with respect to the movement of the imagination, the term of whose act is the phantasm (“...phantasia [est] quidam motus causatus a sensu secundum actum...”)²; for the phantasm, linked as it is to an organ, is tied to the *hic et nunc* inasmuch as it is the similitude of a singular thing. But, again, singular things, external sense knowledge, and the phantasm, when compared to intellect, must be counted as insufficient movers. In intellection, in fact, the phantasms, of internal sense are the instruments of agent intellect.³ The principality of action⁴ is assigned to the latter, which abstracts the intelligible from the phantasm. But though the phantasm of sense cannot be “totalis et perfecta causa intellectualis cognitionis,”⁵ this knowledge (and through it the sensible thing) remains truly efficient with respect to human intellectual knowledge, a knowledge dependent upon and posterior to things. If the phantasm does not bring actual intelligibility to intellect (but depends upon the agent intellect for that), it nonetheless does bring the similitude of a determinate thing and so determines the content of knowledge. It is important to remark that with respect to the similitude of a determinate thing the phantasm is in act when compared to possible intellect :

... in receptione qua intellectus possibilis species rerum accipit a phantasmatis, se habent phantasmata ut agens instrumentale et secundarium ; intellectus vero agens ut agens principale et primum. Et ideo actionis effectus relinquitur in intellectu possibili secundum conditionem utriusque, et non secundum conditionem alterius tantum ; et ideo intellectus possibilis recipit formas ut intelligibiles actu, ex virtute intellectus agentis, sed ut similitudines determinatarum rerum ex cognitione phantasmatum.⁶

b) “*Collatio*” in Human Sensitive Powers. The *collatio* proper to human cognitive sense powers — and this is the *collatio* formal to an explanation of *experimentum* — belongs to man’s internal senses because they are joined, in the same subject, to universal reason — a conjunction that makes them “*virtuosior*”⁷ and accounts for their

1. Cf. *ibid.*, a.4, ad 5. — There is no need to posit a distinction between active and passive external sense. (Cf. *Q.D. de Spir. Creat.*, q. un., a.9.)

2. *In III de Anima*, lect.6, n.659.

3. Cf. *Quodl.* VIII, q.2, a.1.

4. Cf. *Cont. Gent.*, II, c.77.

5. *Ia*, q.84, a.6.

6. *De Ver.*, q.10, a.6, ad 7. — Cf. *ibid.*, ad 8 ; *ibid.*, q.18, a.8, ad 3 ; *ibid.*, q.8, a.15 ; *Q.D. de Anima*, q. un., a.5 ; *Cont. Gent.*, II, c.77.

7. *Ia*, q.85, a.1, ad 4. Cf. CAJETAN, *In Iam*, q.85, a.1, n.IX.

excellence.¹ For these sense powers of cognition, like the sense appetites in man, are naturally apt to follow the commands of reason.

This capacity of some of the internal senses to obey universal reason (and so to share in its *collatio*) is linked to their indifference in the exercise of their acts to the actual presence of the external, singular, sensible thing. In this they stand in sharp contrast to the external senses:

. . . sensus exteriores indigent ad suos actus exterioribus sensibilibus, quibus immutentur, quorum praesentia non est in potestate rationis. Sed vires interiores, tam appetitivae quam apprehensivae, non indigent exterioribus rebus. Et ideo subduntur imperio rationis . . .²

Like the sense appetites (which, Aristotle says, are subject to reason in a political way), these internal sense knowing powers must be counted, then, among those "vires aliquo modo rationales";³ for inasmuch as they are less determined (and so less natural), they are capable of sharing in the order of reason, a power which "se habet ad multa."⁴ Reason can *form* the very phantasms independently of the physical presence of an object.

The common sense must be excluded from the number of those senses which share in an ordering of reason. Though an internal sense, it too depends upon the actual presence of the external object.⁵ Only those powers which perceive according to a kind of secondary movement and whose acts are in some sense passions⁶ of the common sense enjoy the kind of liberty from the actual presence of the external sensible which allows for rationality.

The imagination (as a distinct power ordered to the conservation of the data of external sensation) manifests its independence of the data of external sensation through its capacity to form, under the direction of reason, combinations never seen or in any way sensed — to use St. Thomas's example, the mountain of gold.⁷ Man's memory, too, bears the mark of his reason; for it is capable of what St. Thomas calls a quasi-syllogistic inquiry of the past, an ordered search for individual or singular past intentions.⁸

1. Cf. *Ia IIae*, q.74, a.3, ad 1; *Ia*, q.81, a.3.

2. *Ia*, q.81, a.3, ad 3. Cf. *Ia IIae*, q.17, a.7, ad 3.

3. *Q. D. de Virt. in Communi*, q. un., a.1.

4. *Ibid.*, a.6.

5. Cf. *In de Mem. et Rem.*, lect.2, n.319.

6. Cf. *ibid.*; *Ia*, q.78, a.4, ad 3.

7. Cf. *De Ver.*, q.10, a.6, ad 5; *ibid.*, q.8, a.5; *ibid.*, a.9; *Ia*, q.84, a.6, ad 2; *ibid.*, q.111, a.3, ad 1; *In II Sent.*, d.23, q.2, a.2, ad 3. — ST. THOMAS (*Quodl.* VIII, q.2, a.1) speaks of imagination as a patient which cooperates with the agency of sensible things, external sense, and common sense. Its agency, of course, can be rooted in reason.

8. Cf. *Ia*, q.78, a.4; *In de Mem. et Rem.*, especially lect.4. — ST. THOMAS (*Cont. Gent.*, III, c.81) seems to make the cogitative power the immediate mover of the memory in the act of reminiscence.

Though both artistic imagination and reminiscence signal a sharing by internal sense in the collation of reason, it is the collation of a fourth internal sense power, the cogitative or particular reason,¹ that is most formal to *experimentum*.² The cogitative is the human counterpart of the brute estimative power.³ This latter power is capable of what have been called *intentiones insensatae*, that is, "intentiones aliquae quas sensus non apprehendit, sicut nocivum, et utile et alia huiusmodi."⁴ These intentions are variously described as "quae non cadunt sub sensu,"⁵ "quae sensum non mutant,"⁶ "quae non sunt scriptae in sensu."⁷ In sum, they go beyond the reach of external sense. It is this power which accounts for the fact that the sheep "videns lupum venientem fugit, non propter indecentiam coloris vel figurae, sed quasi inimicum naturae; et similiter avis colligit paleam, non quia delectet sensum, sed quia est utilis ad nidificandum."⁸ And, of course, these unsensed intentions remain singular. The estimative does not take intentions of this kind, as St. Albert puts it, "secundum rationes communes et universales, sed potius in hac imagine vel illa nihil continens de communi."⁹ While they are intentions "quae nunquam in sensum fuerunt," nonetheless, "a sensibilibus conditionibus non sunt separatae."¹⁰

By means of this power both man and beast perceive a *ratio convenientis* with respect to some good of nature,¹¹ but differently. The judgment of the beast is instinctive; man's judgment is collative.¹²

1. Particular reason, another name for the cogitative power (cf. *Ia*, q.81, a.3), is sometimes taken as a name for the ensemble of internal senses. Cf. *Ia IIae*, q.51, a.3. — It is sometimes also referred to as the passive or corruptible intellect. Cf. *Cont. Gent.*, II, c.60.

2. Not only is the cogitative power associated so immediately with science because of its collation leading to experience, but also because of its more immaterial or abstract character as a sense power. The likeness of the singular thing impressed on sense "per quosdam gradus depurata, usque ad intellectum pertingit" (*De Ver.*, q.2, a.5). — On the grades of abstraction found among the sense powers, see St. Albert, *Lib. II de Anima*, Tr.3, c.4 (ed. Borgnet, vol.v), pp.237-238.

3. Cf. *Ia*, q.78, a.4.

4. *Q. D. de Anima*, q. un., a.13. Cf. *De Ver.*, q.25, a.2; *Ia*, q.78, a.4.

5. *In III Sent.*, d.26, q.1, a.2.

6. *Ia*, q.81, a.2, ad 2.

7. ST. ALBERT, *Lib. III de Anima*, Tr.1, c.2, (ed. Borgnet, vol.v), p.317.

8. *Ia*, q.78, a.4.

9. *Loc. cit.*

10. ST. ALBERT, *ibid.*, Lib. I, Tr.4, c.7, p.303. Cf. *In III Sent.*, d.26, q.1, a.2; *Q. D. de Anima*, q. un., a.13; *In II de Anima*, lect. 13, nn.394-396.

11. Cf. *De Ver.*, q.25, a.2.

12. Cf. *In II Sent.*, d.24, q.2, a.1, ad 3; *ibid.*, a.2; *ibid.*, d.25, q.1, a.1, ad 7; *De Ver.*, q.18, a.7, ad 7; *ibid.*, q.24, a.1; *De Malo*, q.16, a.5; *In III de Anima*, lect.4, n. 635.

The ultimate rationale of these differences is found in a diversity of proper active principles and ends to which the active principles are ordered. Man, directed to a higher end and endowed with a nobler active principle, the intellectual soul,¹ is not adequately served by a natural or instinctive judgment.² And so in man this apprehensive power "... nata est moveri et dirigi secundum rationem universalem..."³ And like sense appetite, imagination, and memory, it merits the name "rational." "... Dicitur rationalis, in quantum aliquid participat rationem, obediendo rationi, et sequendo motum ejus..."⁴

This power in some fashion straddles the worlds of sense and intellect: "... est in confinio sensitivae et intellectivae partis, ubi pars sensitiva intellectivam attingit."⁵ It has something of each order: "Habet enim aliquid a parte sensitiva, scilicet quod considerat formas particulares et habet aliquid ab intellectiva, scilicet quod confert. Unde et in solis hominibus est."⁶ It is "reason" because it collates; for universal reason impresses its concept⁷ and its discourse⁸ upon this sense. The cogitative can be an instrumental principle of an ordered collection. It is "particular" precisely because it is a sense power with an organic basis and so limited and ordered to the perception of the singular. The collation or discourse, then, is of singular intentions; it is these that the cogitative composes and divides.⁹

The organization or collecting of singular intentions in and by particular reason, under the command of universal reason, is evident to internal experience. We are quite aware that we exercise some measure of control over our internal sense powers as well as over our sense appetites. Our awareness is keenest in the practical context. Here there is clearly a *motus ab anima ad res*, which begins in mind and proceeds into the sensitive part of the soul, "prout mens regit inferiores vires."¹⁰ Since "... administratio... et providentia et motus sunt singularium prout sunt hic et nunc,"¹¹ universal practical

1. St. Thomas traces the differences between man and brute precisely to agent intellect (*Cont. Gent.*, II, c.76), which ultimately accounts for the more active character of human knowing.

2. Cf. *Q. D. de Virt. in Comm.*, q. un., a.6; *In II Sent.*, d.25, q.1, a.2, ad 7.

3. *Ia*, q.81, a.3.

4. *In III de Anima*, lect.10, n.745.

5. *In III Sent.*, d.23, q.2, a.2, q.1a.1, ad 3.

6. *Ibid.*

7. Cf. *ibid.*, d.15, q.2, a.2, q.1a.3, ad 3.

8. Cf. *De Ver.*, q.14, a.1, ad 9.

9. Cf. *Cont. Gent.*, II, cc.60, 73.

10. *De Ver.*, q.10, a.5. Cf. *IIa IIae*, q.47, a.3, ad 1.

11. *Ia IIae*, q.57, a.2. Cf. *In VII Eth.*, lect.3, n.1338.

knowledge — and human intellectual knowledge is “*primo et principaliter . . . de rationibus universalibus*”¹ — is simply inadequate to the direction of human activities. That is why the Aristotelian-Thomistic tradition insists that practical reason is in some sense two-fold: “*. . . quaedam est universalis, et quaedam particularis.*”² Practical reason has its beginnings, of course, in universal considerations; if this were not so, the actions that follow upon it would not be truly human for they would not proceed from a properly human principle.³ But universal reason is made capable of descent to the particular, singular, contingent domain of human action only through the mediation of that sense power called the particular reason: “*. . . dispositio sapientis de singularibus non fit per mentem nisi mediante vi cogitativa, cuius est intentiones singulares cognoscere . . .*”⁴ Universal reason simply cannot move with respect to operation without particular reason.⁵ The particular reason, then, is taken as a kind of medium “*inter rationem universalem moventem et motum qui in particularibus consequitur*”⁶ and so a “*causa proxima, et quodammodo motui applicata.*”⁷ Universal reason, on the other hand, is taken as a “*movens remotum.*”⁸ And it is precisely because of this proximity of particular reason to the singular motions to be directed that St. Thomas asserts that particular knowledge has a kind of *principalitas* in operation.⁹

In the achievement of the singular knowledge adequate to the direction of human activities, the cogitative power contributes the singular perceptions and universal reason accounts for their order. The issue in the cogitative power is an ordered collection of singular intentions — an *unum ex multis* similar to that found in universal reason itself.¹⁰ (Of course, the cogitative power itself does not perceive order.)

1. *In Boethii de Trin.*, q.5, a.2, ad 4.

2. *In III de Anima*, lect.16, n.845.

3. With respect to these universal considerations, practical reason is, of course, the same in subject as speculative reason. Cf. *In VI Eth.*, lect.2, n.1132.

4. *De Ver.*, q.10, a.5, ad 2. Cf. *ibid.*, q.22, a.4, ad 3.

5. Cf. *De Malo*, q.3, a.6.

6. *De Ver.*, q.10, a.2, ad 4 (secundum).

7. *In III de Anima*, lect.16, n.846.

8. *De Ver.*, q.2, a.6, ad 2.

9. Cf. *Ia IIae*, q.77, a.2, ad 1.

10. The application of the doctrine of the need for a sense power in order to descend to the particular considerations required for the adequate direction of human activities is found in the Aristotelian-Thomistic treatment of *eubulia*, *synesis*, and *gnome*, parts of the virtue of prudence which are concerned with the discovery (*eubulia*) and judgment (*synesis* and *gnome*) of what is appropriate to the end of an act. (Cf. *IIa IIae*, q.51, a. 1, ad 3.) What these virtues aim to discover and to judge are the means *in singulari*

But if we can readily concede the existence of a participated *collatio* in internal sense in the practical context, which is clearly a sphere in which there is *motus ab anima ad res*, can we grant the existence of such a *collatio* in internal sense in the order of the generation of intellectual knowledge from senses which present the object to intellect? In other words, even in the context described by the phrase *motus a rebus ad animam*,¹ is there a necessary direction of internal sense by universal reason? A closer analysis of Aristotle's texts will show that he holds that such a *collatio* is supposed to *experimentum*, which, in its turn, is supposed to science.

III. A CLOSER EXAMINATION OF THE ACCOUNTS OF
 "EXPERIMENTUM" IN THE
 "METAPHYSICS" AND IN THE "POSTERIORA"

While the Aristotelian-Thomistic tradition presents us with no formal and independent treatise on the nature of *experimentum*, it nonetheless provides an abundance of source material. As we have already indicated, the basic texts are to be found at the beginning of Aristotle's *Metaphysics* and at the end of his *Posterior Analytics*. St. Thomas Aquinas has left us expanded treatments of both passages. St. Albert the Great, St. Thomas's teacher, also comments on the passages mentioned. Dominic of Flanders, a fifteenth century Dominican and the teacher of Cardinal Cajetan, has left us an important series of *Quaestiones* on the *Metaphysics*;² there he has analyzed *experimentum* with care and, in our judgment, with accuracy. Cardinal Cajetan, too, has devoted several pages of commentary to the last chapter of the *Posteriora*.³ In the course of this essay we shall make use of all of these sources. But before we attempt to collect a definition of *experimentum*, we shall focus our attention on those passages at the beginning of the *Metaphysics* and at the end of the *Posterior Analytics* which immediately bear upon that element of invention called *experimentum*.

to some end *in singulari*, and this inevitably entails some ordered collection of singular perceptions in particular reason. It is for this reason that particular reason (or the corruptible intellect) plays such an extensive role in the Aristotelian-Thomistic account of these virtues. (Cf., e.g., *In VI Eth.*, lect.9, nn.1253-1255; *ibid.*, lect.6, n.1174; *ibid.*, lect.7, n.1215; *IIa IIae*, q.47, a.3, ad 3.)

1. *De Ver.*, q.10, a.5.

2. *Quaestiones super XII Libros Metaphysicae*. — We have used a microfilm (from St. Mary's College library in California) of an edition of Dominic's *Quaestiones* which is to be found in the Vatican Library. The title page of this edition is in bad repair. It is, therefore, impossible to discern the date, place, and house of publication.

3. *Commentaria in Posteriora Analytica Aristotelis* (Québec: Les Presses Universitaires Laval, 1952).

A. *The Account in the "Metaphysics"*

Having distinguished the various grades to be found among the animals (with sensation but without memory, with sensation and memory, and with sensation, memory, and hearing,)¹ Aristotle moves to a consideration of what is properly human in knowledge. It is in this context, as we have already pointed out, that Aristotle introduces *experimentum*. Accordingly, we shall use as our first guideline St. Thomas's commentary on the following passage from the *Metaphysics*:

The animals other than man live by appearance and memories, and have but little of connected experience; but the human race lives also by art and reasonings. Now from memory experience is produced in men; for the several memories of the same thing, produce finally the capacity for a single experience [*ἐμπειρίας δύναμις*]. And experience seems pretty much like science and art, but really science and art come to men *through* experience; for 'experience made art', as Polus says, 'but inexperience luck'. Now art arises when from many notions gained by experience one universal judgment about a class of objects is produced. For to have a judgment that when Callias was ill of this disease this did him good, and similarly in the case of Socrates and in many individual cases, is a matter of experience; but to judge that it has done good to all persons of a certain constitution, marked off in one class, when they were ill of this disease, e.g., to phlegmatic or bilious people when burning with fever — this is a matter of art.²

St. Thomas's Commentary, n. 15. Having already pointed out that the brutes are ruled by imagination and, in the case of the higher among them, by memory (which, in turn, can be the source of custom and/or the seat of a certain "discipline" which serve as *principia adiuvantia* with respect to brute operation),³ St. Thomas proceeds to comment on the second sentence of the text:

Supra memoriam . . . in hominibus, ut infra dicetur, proximum est experimentum, quod quaedam animalia non participant nisi parum. Experimentum enim est ex collatione plurium singularium in memoria receptorum. Huiusmodi autem collatio est homini propria, et pertinet ad vim cogitativam, quae ratio particularis dicitur: quae est collativa intentionum individualium, sicut ratio universalis intentionum universalium. Et, quia ex multis sensibus et memoria animalia ad aliquid consuescunt prosequendum vel vitandum, inde est quod aliquid experimenti, licet parum, participare videntur. Homines autem supra experimentum, quod pertinet ad rationem particularem, habent rationem universalem, per quam vivunt, sicut per id quod est principale in eis.

1. Cf. *Metaph.*, I, c.1, 980 a 27-980 b 24.

2. Trans. W. D. Ross (ed. Oxford), I, chap.1, 980 b 25-981 a 12.

3. Cf. DOMINIC OF FLANDERS, *Qq. super XII Libros Metaph.*, I, q.4, a.1.

Here St. Thomas carefully points to the reason for saying "...quaedam animalia non participant nisi parum"; it is because *experimentum* is "ex collatione." But we will return to the question of *experimentum* and beasts at a later point. For the moment let us simply attend to the notification of *experimentum* that the Common Doctor presents here: it is *ex collatione*. It implies reference to a gathering together, indeed, out of a "scattered state."¹ But a gathering of what? "...Plurium singularium in memoria receptorum." And to this St. Thomas is quick to add what we have already pointed to as one of the most important single elements in the signification of *experimentum*: the *collatio* here "est homini propria." He thus makes clear his position that *experimentum* involves a discourse, which is proper to man. Further, the discourse is one that involves a sense power. (It is worthy of note that *experimentum* can be counted as a kind of distinct knowledge precisely because of the discourse.) For he adds that this is the *collatio* or discourse of the cogitative power or particular reason. The greater perfection of the human counterpart of the brute estimative is precisely rooted, of course, in its association with rational soul. And the evidence of this perfection is precisely its *collatio* with respect to individual intentions:² there is a successive multiplicity of the singular apprehensions. "...Pars illa in hominibus, in quibus est perfectior propter conjunctionem ad animam rationalem, dicitur ratio particularis, quia confert de intentionibus particularibus..."³ Now St. Thomas can only mean here in his commentary on the *Metaphysics* that the principle of this *collatio* by sense is something proper to man: remotely, rational soul and more proximately, the potency of human reason itself. Even here, then in the first generation of the universal principle — in the context of *motus a re ad animam*⁴ — particular reason "...aliqua- liter participat rationem, obediendo rationi, et sequendo motum ejus..."⁵ (Recall that the cogitative power is, in some fashion, rational.) The act of the cogitative, in its relationship to *experimentum*, is ordered, then, not simply by things outside, upon which it is indeed dependent if science of things is to be generated, but also by an intrinsic (to the knower), active, and properly human principle, which is the reason.

1. ST. AUGUSTINE, *Confessions*, Bk. X, c.11.

2. ST. ALBERT (*Metaphysica*, I, Tr.1, c.6 [ed. Geyer, vol.xvi], p.10) gives his explanation of the word "intention" as it is used in this context: "Memoria... est coacer- vatio convenientium et inconvenientium ad vitam, ad quas intenditur per motum; et ideo intentiones a philosophis Peripateticis talia vocantur."

3. *In III Sent.*, d.26, a.1, a.2.

4. Cf. *De Ver.*, q.10, a.5. — In our brief discussion of the cogitative as a rational power we pointed to the role of the cogitative in both prudence and art. In these latter cases the context was that of the *motus ab anima ad res*.

5. *In III de Anima*, lect. 10, n.745.

St. Thomas' commentary (n. 15) is deserving of attention on another score. *Experimentum* indeed suggests activity, process, discourse, the action of gathering together or assembling together into a kind of whole. The text we are considering obviously indicates this. (The verb forms of both *experimentum* and *ἐμπειρία* show it too.) This notion of process as something associated with *experimentum* is also reflected in the following remark of St. Thomas in his commentary on the *Posterior Analytics* :

. . . experimentum nihil aliud esse videtur quam accipere aliquid ex multis in memoria retentis.

Sed tamen experimentum indiget aliqua ratiocinatione circa particularia, per quam confertur unum ad aliud, quod est proprium rationis.¹

But though St. Thomas associates *experimentum* with a process, he does not define it as *collatio*. Rather, *experimentum* is from a *collatio* : it emerges as the product or issue of a *collatio* — an *unum ex multis*, a collated or ordered *unum*.²

St. Thomas's Commentary, n. 16. St. Thomas continues his commentary with an emphasis on the association of particular reason and *experimentum* :

Sicut autem se habet experimentum ad rationem particularem, et consuetudo ad memoriam in animalibus, ita se habet ars ad rationem universalem. Ideo sicut perfectum vitae regimen est animalibus per memoriam adiuncta assuefactione ex disciplina, vel quomodolibet aliter, ita perfectum hominis regimen est per rationem arte perfectam. Quidam tamen ratione sine arte reguntur ; sed hoc est regimen imperfectum.

The proportion here is worthy of attention : just as custom is to the memory of the higher brutes and *experimentum* to particular reason, so is art to universal reason. Custom (whether from discipline or environmental sources), *experimentum*, and art all bring some additional perfections to their possessors with respect to *vivere* (which is taken here not for *esse viventis* but *pro actione vitae*).³ Now all three of these (memory, particular reason, universal reason) have some sort of responsibility with respect to custom, *experimentum*, and art respectively. Custom in the brute certainly supposes many memories. *Experimentum*, it seems, is in some sense the noetic product of the discourse of particular reason. And a universal principle of art indeed involves the composition of universal or common natures.

1. *In II Post. Anal.*, lect.20, n.592.

2. Cf. *De Ver.*, q.2, a.7, ad 3, where St. Thomas points out that *unio* is more appropriate to human knowing than to divine (where it is *unitas*) precisely because of the composite character of the human mind.

3. Cf. *In I Metaph.*, lect.1, n.14 ; DOMINIC OF FLANDERS, *op. cit.*, I, q.4, a.3, c. ; ad 3.

But if art is in some sense the result of universal reason (supposing *experimentum*, of course), it is also in universal reason (at least principally) as in its proper subject. And St. Thomas clearly places custom in memory as a kind of habit.¹ But is *experimentum* in the particular reason of passive (corruptible) intellect as in its proper subject? This text would certainly seem to indicate that St. Thomas holds this to be so.² Indeed, we shall place it there with a dependence upon reason. (Otherwise it could not be something proper to man.) At least, something of it must be placed there — and something of it that is essential to its manifestation. St. Albert the Great, however, remarks that *experimentum* is “universalis cognitio ex similitudine sensibili accepta per potentiam iudicativam.”³ If, of course, *experimentum* is universal knowledge, can it be the knowledge gained by an internal sense? We shall return, however, to the whole question of the knowing power in which *experimentum* is found when we attempt to collect a definition of *experimentum*. Perhaps at that point in our considerations we shall be in a better position to explain what St. Albert means by calling *experimentum* universal knowledge.

St. Thomas's Commentary, n. 17. St. Thomas's commentary proceeds with an analysis of the third sentence (“And experience seems pretty much like science and art . . .”) in the passage cited earlier from Aristotle's *Metaphysics*:

. . . ex memoria in hominibus experimentum causatur. Modus autem causandi est iste : quia ex multis memoriis unius rei accipit homo experimentum de aliquo, quo experimento potens est ad facile et recte operandum. Et ideo quia potentiam recte et faciliter operandi praebet experimentum, videtur fere esse simile arti et scientiae. Est enim similitudo eo quod utrobique ex multis una acceptio alicuius rei sumitur. Dissimilitudo autem, quia per artem accipiuntur universalialia, per experimentum singularialia, ut postea dicetur.

In this passage, when St. Thomas points out that it is by *experimentum* that a man is “potens . . . ad facile et recte operandum,” he may be referring to the *ἐμπειρίας δύναμις* (*potentia experientiae*) of Aristotle's preceding line. His interpretation of it may be that “potency” refers to what accrues to a man in action as a result of experience.⁴ We would like to suggest, however (and perhaps St.

1. Cf. *Ia IIae*, q.50, a.3, ad 3.

2. ST. THOMAS (*De Malo*, q.16, a.1, ad 2), speaking of *experimentum*, states: “. . . proprie pertinet ad sensum.” Cf. *ibid.*, ad 12; *In VII Phys.*, lect.6, n.923; *Expositio in Job*, c.12, lect.2.

3. *In II Post. Anal.*, Tr.5, c.1.

4. For St. Albert's interpretation (which is, perhaps, not different from the one we have given here) see *Metaph.*, I, Tr.1, c.7. Cf. also DOMINIC OF FLANDERS, *op. cit.*, I, q.4, a.4.

Thomas has this in mind too), that the *potentia experientiae*¹ may also be interpreted in the following fashion : many memories, before the organization or the collation of particular reason, are potentially *experimentum* ; that is, they provide, in their unorganized state, the ground or stuff of *experimentum*.

But worthy of even greater attention in this passage is the immediate purpose of St. Thomas : to point up the similitude and dissimilitude of *experimentum* and art. *Experimentum* seems like art² in that both furnish a certain power to operate with ease. Each involves, says St. Thomas, an *una acceptio* of something. In this connection, St. Albert remarks that "experientia nihil penitus differre ab arte in hoc quod utraque istarum acceptionum sive cognitionum est relata ad actum, qui dicitur operatio circa singularia existens."³

But though each involves an *una acceptio* and has a bearing upon operation *in singulari*, there is an important difference : through art are taken universals and through *experimentum* are taken the singulars. *Experimentum*, then, ineluctably connotes knowledge of the singular, and, indeed, of more than one singular. "Ex memoria autem multoties facta circa eandem rem, in diversis tamen singularibus, fit experimentum . . ."⁴ It would seem, then, that essential to an understanding of *experimentum* is *collectio*, a unity that presupposes the collecting or collating of remembered singulars by particular reason.⁵

St. Thomas's Commentary, nn. 18-19. St. Thomas completes his commentary on these few lines of Aristotle by pointing out first of all that, though *experimentum* and art do indeed have their similarities, nonetheless it is through *experimentum* that science and art come about ; and he concludes by repeating and amplifying the example given by Aristotle :

Ponit *generationem artis* : et dicit, quod ex experientia in hominibus fit scientia et ars : et probat per auctoritatem Poli, qui dicit, quod experientia facit artem, sed inexperientia casum. Quando enim aliquis inexpertus recte operatur, a casu est. Modus autem, quo ars fit ex experimento, est idem cum modo praedicto, quo experimentum fit ex memoria. Nam sicut ex mutis memoriis fit una experimentalis scientia,

1. This is the Latin translation given in the Leonine edition.

2. "Art" in this immediate context is taken, it seems to us, to refer to universal intellectual knowledge that bears upon the *factibilia* or *agibilia*, though in the whole context of this introduction to the *Metaphysics* the word "art" is taken by Aristotle to refer to intellectual knowledge that bears upon speculative as well as practical matters. Cf. *In I Metaph.*, lect.1, n.34.

3. ST. ALBERT, *Metaph.*, I, Tr.1, c.9 (ed. Geyer, vol.xvi), p.12.

4. *In II Post. Anal.*, lect.20, n.592.

5. Cf. DOMINIC OF FLANDERS, *op. cit.*, I, q.4, obj.4 ; ad 4 ; *ibid.*, q.4, aa.2, 5.

ita ex multis experimentis apprehensis fit universalis acceptio de omnibus similibus. Unde plus habet hoc ars quam experimentum : quia experimentum tantum circa singularia versatur, ars autem circa universalia.

Quod consequenter *per exempla exponit*, cum dicit, "Acceptionem quidem, etc." : quia cum homo accipit in sua cognitione quod haec medicina contulit Socrati et Platoni tali infirmitate laborantibus, et multis aliis singularibus, quidquid sit illud, hoc ad experientiam pertinet : sed, cum aliquis accipit, quod hoc omnibus conferat in tali specie aegritudinis determinata, et secundum talem complexionem, sicut quod contulit febricitantibus et phlegmaticis et cholericis, id iam ad artem pertinet.

With respect to these comments it is to be carefully noted that the mode of the generation of art and science is similar to that of *experimentum* from memory : both represent an *una acceptio ex multis*. In the case of art or science, the *unum* which is the principle of further considerations is a universal proposition such as the one with which both St. Thomas and Aristotle conclude. As we have already indicated, a universal proposition is itself an *unum ex multis* : the apprehension of the identity of the common natures presupposes a prior multiplicity of separate apprehensions of the common natures ; and, while the identity is that which is *primo et principaliter* apprehended when the proposition is grasped, *ex consequenti* there is apprehension of the *multa*. Such propositions, of course, can be presented by the teacher. Here, however, we are speaking about the first generation of the principles, about the discovery of the principles.¹ And with respect to the order of invention the position of Aristotle and St. Thomas is clear : not only does the principle (a proposition) involve a *collatio* of the common natures, but presupposes a *collatio* of a sense power ; and — an additional point of considerable importance — not only is *experimentum* needed, but the *acceptio universalis de omnibus similibus* requires *multa experimenta apprehensa*.²

1. *De Ver.*, q.11, a.1 : "... est duplex modus acquirendi scientiam : unus, quando naturalis ratio per seipsam devenit in cognitionem ignotorum ; et hic modus dicitur inventio ; alius, quando rationi naturali aliquis exterius adminiculatur, et hic modus dicitur disciplina."

2. The importance of this last point — that the acceptance of a principle (something complex) in which what is common is attributed to something common supposes *multa experimenta* — cannot be overemphasized. Our interpretation of Aristotle's account sees *experimentum proprie loquendo* as necessary to and responsible for not only the generation of knowledge of the principles of art and science, but also for the attainment of universal notions preliminary to the attainment of a universal proposition. We shall return to a consideration of this matter, especially in dealing with a position enunciated by Cardinal Cajetan. We submit, however, that a careful reading of Aristotle's remark that "art arises when from many notions gained by experience one universal judgment about a class of objects is produced" (981 a 6) justifies our interpretation that experience is necessary to a simple universal notion and that many *experimenta* are necessary for a proposition which can, in its turn, serve as a principle of art or science. The Latin translation (available in the Marietti edition of St. Thomas's commentary) makes the matter even clearer : "Fit autem ars cum ex multis experimentalibus conceptionibus una fit

In the texts we are considering (numbers 18 and 19), our attention is again directed to the singulars, to a collection of singulars. We note that such an herb cured Socrates on this occasion, and on this, and on this, etc. We have a collection of singular events that turn about Socrates. There is something the same here — not only Socrates, but a kind of herb which is curative of Socrates in distinct singular circumstances which can be called up from memory. “*Ex memoria autem multoties facta circa eandem rem, in diversis tamen singularibus, fit experimentum . . .*”¹ (The “same thing” in the case we have just considered is “such an herb.”) Further, we can note that “such an herb” has been frequently curative of such a disease not only of Socrates, but of Plato, too, and in similar circumstances. That *experimentum* can be joined to the *experimentum* which we have of Protagoras and Meno, who also have several times been cured by such an herb of such a disease. The mind notes not only that the herb is something common and that it has been curative of a disease which is common but that it is curative of several singulars who have something in common, namely, that they are all men. *Ex multis experimentis apprehensis* our considerations move from attention to the singulars which have something in common to the common natures themselves: we have moved to the level of the universal considerations of art, considerations that bear upon the universal natures themselves, in abstraction from the singulars. Our attention does not bear upon the fact that such an herb is curative of Socrates, Plato, etc., but upon the fact that it is curative of man with a certain type of disease.

In the following numbers (numbers 20, 21, and 22) St. Thomas attends to Aristotle’s comparison of art and *experimentum* with respect to operation, pointing out the greater efficacy of *experimentum* precisely because “. . . actiones sunt circa singularia.” We refer the reader to St. Thomas, St. Albert, and Dominic of Flanders for a more detailed account of this matter.²

B. The Account in the “*Posterior Analytics*”

1. Aristotle’s First Account of the Generation of First Principles

In the last chapter of Book Two of the *Posterior Analytics* the immediate problem confronting Aristotle is that of the generation of the first common and immediate principles of science. Since such

universalis, velut de similibus, acceptio.” The universal conceptions, notice, are not denominated *experimentum*, but *experimentalis*: they are from *experimentum*. — This question is also taken up by Emmanuel TRÉPANIÉ, “La connaissance des premiers principes,” *Laval théologique et philosophique*, IV (1948, n.2), pp.289-310.

1. In *II Post. Anal.*, lect.20, n.592.

2. Cf. ST. ALBERT, *Metaph.*, I, Tr.1, c.9 (ed. Geyer, vol.XVI), pp.12-14; DOMINIC OF FLANDERS, *op. cit.*, I, q.5, aa.1, 2.

principles cannot be demonstrated, how shall they be accounted for? For Aristotle the answer is that they are the results of an induction which supposes sense knowledge. The account given here in the *Posterior Analytics* is, of course, substantially the same as that found in the *Metaphysics*. We will take up a closer examination of the text of Aristotle's *Posterior Analytics* at the point where he first begins to give account of *experimentum* itself. (The passage immediately preceding presents three grades to be found in animals: with sense but without memory, with memory, which involves a capacity for *remansio sensibilis*, with memory and reason. The possibility of *experimentum* is obviously founded on the possession of memory.)

So out of sense-perception comes to be what we call memory, and out of frequently repeated memories of the same thing develops experience; for a number of memories constitute a single experience. From experience again — i. e. from the universal now stabilized in its entirety within the soul, the one beside the many which is a single identity within them all — originate the skill of the craftsman and the knowledge of the man of science, skill in the sphere of coming to be and science in the sphere of being.

We conclude that these states of knowledge are neither innate in a determinate form, nor developed from other higher states of knowledge, but from sense-perception. It is like a rout in battle stopped by first one man making a stand and then another until the original formation has been restored. The soul is so constituted as to be capable of this process.¹

This portion of Aristotle's text represents, significantly, a first account of the generation of first principles. He follows it immediately with another on the ground that his first is presented with "insufficient clearness."² But we shall first give St. Thomas's interpretation of the first account.

2. St. Thomas's Commentary on the First Account (nn. 592-593.)

And first of all the commentary of St. Thomas on the first account given by Aristotle:

n.592 — (1) Deinde cum dicit: *Ex sensu quidem igitur, etc.*, ostendit secundum praedicta quomodo in nobis fiat cognitio primorum principio-

1. *Posterior Analytics*, trans. G. R. G. Mure (ed. Oxford), II, c.19, 100 a 4-13. — The line (100 a 6) "From experience — i. e. from the universal now stabilized in the soul . . ." seems to identify experience with the universal, the *unum praeter multa*. The Loeb translation presents substantially the same interpretation: "experience, that is the universal when established as a whole in the soul . . ." This, however, seems a difficult interpretation to sustain in view of the fact that Aristotle has just identified *experimentum* and many memories. The Latin translation (available in the Marietti edition of Thomas's commentary) is as follows: "Ex experimento autem, aut ex omni quiescente universali in anima, uno praeter multa . . ." St. Thomas, as we shall see, interprets Aristotle as taking *experimentum* as a cause of the universal and as distinct from it. For a consideration of the textual difficulties associated with this line from Aristotle (100 a 6) see E. TRÉPANIÉ, *loc. cit.*, pp.292-296.

2. *Ibid.*, 100 a 14-15.

rum : et concludit ex praemissis quod ex sensu fit memoria in illis animalibus, in quibus remanet impressio sensibilis, sicut supra [n. 590] dictum est. Ex memoria autem multoties facta circa eandem rem, in diversis tamen singularibus, fit experimentum ; quia experimentum nihil aliud esse videtur quam accipere aliquid ex multis in memoria retentis.

(2) Sed tamen experimentum indiget aliqua ratiocinatione circa particularia, per quam confertur unum ad aliud, quod est proprium rationis. Puta cum aliquis recordatur quod talis herba multoties sanavit multos a febre, dicitur esse experimentum quod talis sit sanativa febris. Ratio autem non sistit in experimento particularium, sed ex multis particularibus in quibus expertus est, accipit unum commune, quod firmatur in anima, et considerat illud absque consideratione alicuius singularium ; et hoc commune accipit ut principium artis et scientiae. Puta quamdiu medicus consideravit hanc herbam sanasse Socratem febrientem, et Platonem, et multos alios singulares homines, est experimentum ; cum autem sua consideratio ad hoc ascendit quod talis species herbae sanat febrientem simpliciter, hoc accipitur ut quaedam regula artis medicinae.

(3) Hoc est ergo quod dicit, quod sicut ex memoria fit experimentum, ita etiam ex experimento, aut etiam ulterius *ex universali quiescente in anima* (quod scilicet accipitur ac si in omnibus ita sit, sicut est experimentum in quibusdam — Quod quidem universale dicitur esse quiescens in anima ; in quantum scilicet consideratur praeter singularia, in quibus est motus. Quod etiam dicit esse *unum praeter multa*, non quidem secundum esse, sed secundum considerationem intellectus, qui considerat naturam aliquam, puta hominis, non respiciendo ad Socratem et Platonem. Quod etsi secundum considerationem intellectus sit unum praeter multa, tamen secundum esse est in omnibus singularibus unum et idem, non quidem numero, quasi sit eadem humanitas numero omnium hominum, sed secundum rationem speciei. Sicut enim hoc album est simile illi albo in albedine, non quasi una numero albedine existente in utroque, ita etiam Socrates est similis Platoni in humanitate, non quasi una humanitate numero in utroque existente.) — ex hoc igitur experimento, et ex tali universali per experimentum accepto, est in anima id quod est principium artis et scientiae.

(4) Et distinguit inter artem et scientiam, sicut etiam in *VI Ethic.*, ubi dicitur quod ars est recta ratio factibilium. Et ideo hic dicit quod si ex experimento accipiatur aliquod universale circa *generationem*, idest circa quaecunque factibilia, puta circa sanationem vel agriculturam, hoc pertinet ad artem. Scientia vero, ut ibidem dicitur, est circa necessaria ; et ideo si universale consideratur circa ea quae semper eodem modo sunt, pertinet ad scientiam, puta circa numeros vel figuras. Et iste modus qui dictus est, competit in principiis omnium scientiarum et artium. Unde concludit quod neque praexistunt in nobis habitus principiorum, quasi *determinati* et completi ; neque etiam fiunt de novo ab aliquibus notioribus habitibus praexistentibus, sicut generatur in nobis habitus scientiae ex praecognitione principiorum ; sed habitus principiorum fiunt in nobis a sensu praesistente.

(5) Et ponit exemplum in pugnis quae fiunt per reversionem exercitus devicti et fugati. Cum enim unus eorum perfecit statum, idest immobiliter ceperit stare et non fugere, alter stat adiungens se ei, et postea alter, quousque tot congregentur quod faciant principium pugnae. Sic etiam ex

sensu et memoria unius particularis, et iterum alterius et alterius, quandoque pervenitur ad id quod est principium artis et scientiae, ut dictum est.

n.593 — Posset autem aliquis credere quod solus sensus, vel memoria singularium sufficiat ad causandum intelligibilem cognitionem principiorum, sicut posuerunt quidam antiqui, non discernentes inter sensum et intellectum; et ideo ad hoc excludendum Philosophus subdit quod simul cum sensu oportet praesupponere talem naturam animae, quae *possit pati hoc*, id est quae sit susceptiva cognitionis universalis, quod quidem fit per intellectum possibilem; et iterum quae possit agere hoc secundum intellectum agentem, qui facit intelligibilia in actu per abstractionem universalium a singularibus.¹

In number 592-1 the phrase already cited, “Ex memoria . . . multoties facta circa eandem rem, in diversis tamen singularibus, fit experimentum . . .,” recalls that *experimentum* involves a collection of singulars united by reason of a certain likeness in nature — *circa eandem rem*. (The translation of Aristotle in the Marietti edition of St. Thomas’s commentary has “Multae enim memoriae numero experimentum est unum.” Of importance here is that many memories are identified with *experimentum*.)

Number 592-2 recalls the role of memory. The cognitive collection of singulars is called up out of memory. Unless there is a possibility of the *mansio sensibilium*,² there is no *experimentum*, which is *ex collatione plurium singularium in memoria receptorum*. This second paragraph also recalls the collative character of *experimentum*, the need to bring one thing to another, to compose, to compare, to collate. The attainment of the *eadem res* by reason indeed depends upon the collecting or bringing together of the singulars. Finally, in this paragraph we note what we have already noted in the *Metaphysics*: when the common natures are attended to without consideration of the collection of singulars, we have the principle of an art or science.

In number 592-3 St. Thomas attends to the mode in which art comes from *experimentum*: it is the same as the way in which *experimentum* comes from memory. *Experimentum* is again taken with reference to the collection of singulars: “. . . est experimentum in quibusdam . . .” Worthy of note, too, is that in this paragraph (592-3) *experimentum* itself emerges as an element (in the whole process) which is distinct from the universal. Further, if we read this paragraph correctly, the *universale quiescens in anima* (i.e., the *unum praeter multa secundum considerationem intellectus*) seems here to represent a step between *experimentum* and *id quod est principium artis et scientiae*. What we are suggesting is that, while *experimentum* is necessary for the universal proposition, prior to that it is necessary for the attain-

1. We have taken the liberty of numbering the paragraphs in order to allow for easier reference in the body of our text.

2. Cf. *In II Post. Anal.*, lect. 20, n.590.

ment of any common nature as common. Indeed, in the case of the first attainment of a universal *ut sic* — as an *unum praeter multa* and precisely as communicable to many — a collecting is prerequisite. Knowing a universal as such does not prerequisite that one know *per viam sensus* every single individual that can share that nature ; but more than one singular is needed — in the first case at least. But this latter point we shall set aside for the moment, to return to it in our discussion of a position taken by Cardinal Cajetan.

In n. 592-4 St. Thomas attends to the distinction between the principles of art and science. In both cases, however, the process in attaining them is the same. In the same paragraph St. Thomas also notes what we have already pointed out : sense pre-exists to the determination and completion of the habit of first principles, which habit exists in us only *originaliter*¹ by reason of the light of agent intellect. For sense brings to an intellect dependent upon and posterior to things the similitudes of determinate things. Indeed, *experimentum* is associated with the presentation of the object to intellect by sense, for it involves a noetic collection of the singulars perceived by sense and conserved in memory. While first principles can be said to be naturally known, “. . . ipsa cognitio in nobis non determinetur nisi per acceptionem a sensibus.”²

Number 592-5 presents the *exemplum* which Aristotle constructs in order to manifest the experimental, collative process involved in the generation of a principle. The *exemplum* proposed here and that proposed in the first chapter of the *Metaphysics* are, however, quite different. In the latter text Aristotle gives an instance of the process by showing the steps involved in getting to a specific universal principle about the curative power of a certain herb. Here in the *Posterior Analytics* he has recourse to a process different in kind from but similar to that involved in the generation of a principle : he attends to the first meaning of *conferre*, which meaning is to congregate or gather a physical multitude.

In number 593 St. Thomas comments on Aristotle's remark that the “soul is so constituted as to be capable of this process.” Here he recalls Aristotle's teaching on possible and active intellect. Sense, though capable of receiving cognitively (and so immaterially) the object, nonetheless, because of its organic basis, receives it with the conditions of matter. Another receptive power is needed to account for the fact that we know the universal. And sense, though the agent (with a dependence upon external things) that determines the content of intellectual knowledge, is nonetheless *agens insufficiens*. The phantasm, the term of the act of internal sense, is the instrument

1. Cf. *De Ver.*, q.10, a.6.

2. *Ibid.*, q.8, a.15.

of the agent intellect, the power which ultimately accounts for actual intelligibility.

3. Aristotle's Second Account of the Generation of First Principles

Aristotle significantly begins his second account of the generation of principles with an admission of the insufficiency of the first. And yet disagreement of translators is witness to the difficulty of the Aristotelian text itself. We shall present the Oxford translation here — uncomfortable about what we feel are inadequacies, but with the hope the commentary of St. Thomas will serve to make the Stagirite's meaning clear :

Let us now restate the account given already, though with insufficient clearness. When one of a number of logically indiscriminable particulars has made a stand the earliest universal is present in the soul : for though the act of sense-perception is of the particular, its content is universal — is man, for example, not the man Callias. A fresh stand is made among these rudimentary universals, and the process does not cease until the indivisible concepts, the true universals, are established : e. g. such and such a species of animal is a step towards the genus animal, which by the same process is a step towards a further generalization.

Thus it is clear that we must get to know the primary premisses by induction ; for the method by which even sense-perception implants the universal is inductive.¹

4. St. Thomas's Commentary on the Second Account

a) *Nn. 594-595.* St. Thomas's commentary on these lines reads as follows :

594 — *Deinde cum dicit : Quod autem dictum est, etc.,* manifestat quod dictum est in praecedenti solutione, quantum ad hoc quod ex experimento singularium accipitur universale ; et dicit quod illud quod supra dictum est, et non plane, quomodo scilicet ex experimento singularium fiat universale in anima, iterum oportet dicere, ut planius manifestetur. Si enim accipian-

1. *Posterior Analytics*, trans. G. R. G. Mure (ed. Oxford), II, chap.19, 100 a 14-100 b 5. — The Latin version of the Aristotelian text used in the Marietti edition of St. Thomas's commentary is as follows : " Quod autem dictum est olim, non autem plane dictum est, iterum dicamus. Stante enim uno indifferentium, primum quidem universale in anima est. Et namque sentire quidem singulare est, sensus autem universalis est, ut hominis, non Calliae hominis. Iterum in his statur, quousque utique impartibilia stent et universalialia ; ut huiusmodi animal quousque animal, et in hoc similiter. Manifestum igitur est quoniam nobis prima inductione cognoscere necessarium est. Et namque sic sensus universale facit." — We also present the version (English) of the Loeb edition translator, Hugh Tredennick. While one may suggest that the Aristotelian text is forced a bit, it has the merit of emphasizing the role of the singular. The translation is as follows : " Let us re-state what we said just now with insufficient precision. As soon as one individual percept has ' come to a halt ' in the soul, this is the first beginning of the presence there of a universal (because although it is the particular that we perceive, the act of perception involves the universal, e. g., ' man ' not ' a man, Callias '). Then other

tur multa singularia, quae sunt indifferentia quantum ad aliquid unum in eis existens, illud unum secundum quod non differunt, in anima acceptum, est primum universale, quidquid sit illud, sive scilicet pertineat ad essentiam singularium, sive non. Quia enim invenimus Socratem et Platonem et multos alios esse indifferentes quantum ad albedinem, accipimus hoc unum, scilicet album, quasi universale quod est accidens. Et similiter quia invenimus Socratem et Platonem et multos alios esse indifferentes quantum ad rationalitatem, hoc unum in quo non differunt, scilicet rationale, accipimus quasi universale quod est differentia.

595 — (1) Qualiter autem hoc unum accipi possit, manifestat consequenter. Manifestum est enim quod singulare sentitur *proprie et per se* sed tamen sensus est quodammodo etiam ipsius universalis. Cognoscit enim Calliam non solum in quantum est Callias, sed etiam in quantum est hic homo, et similiter Socratem in quantum est hic homo. Et exinde est quod tali acceptione sensus praeeistente, anima intellectiva potest considerare hominem in utroque. Si autem ita esset quod sensus apprehenderet solum id quod est particularitatis, et nullo modo cum hoc apprehenderet universalem naturam in particulari, non esset possibile quod ex apprehensione sensus causaretur in nobis cognitio universalis.

(2) Et hoc idem manifestat in processu qui est a speciebus ad genus. Unde subdit quod iterum in his, scilicet in homine et equo, anima stat per considerationem quousque perveniatur ad aliquid impartibile in eis, quod est universale. Ut puta consideramus tale animal et tale, puta hominem et equum, quousque perveniamus ad commune animal, quod est genus; et in hoc similiter facimus quousque perveniamus ad aliquod genus superius. Quia igitur universalium cognitionem accipimus ex singularibus, concludit manifestum esse quod necesse est prima universalia principia cognoscere per inductionem. Sic enim, scilicet per viam inductionis, sensus facit universale intus in anima, in quantum considerantur omnia singularia.

b) *Remarks on n. 594.* To this point what we have been attempting to focus the reader's attention on is the association of collection with *experimentum*. We intend to say, with Dominic of Flanders, that *experimentum* is itself a collection. Of course, it is a collection of a very special kind; for it proceeds from the collation of many singulars, a collation made by the cogitative power or particular reason.

Now this collection represents a step in the process of generating first principles that is distinct from the simple perceptions of sense on the one hand and the *universale quiescens in anima* on the other. Its distinction once more comes to the fore when St. Thomas says that Aristotle's purpose in this second account is to make plain how "ex

'halts' occur among these (proximate) universals, until the indivisible genera or (ultimate) universals are established. E.g., a particular species of animal leads to the genus 'animal,' and so on. Clearly then it must be by induction that we acquire knowledge of the primary premisses, because this is also the way in which general concepts are conveyed to us by sense-perception." In a note Mr. Tredennick adds that "if Aristotle's illustration means anything, it is that the process begins with the perception of individuals, although the species is perceived in the individual."

experimento singularium fiat universale in anima." The first attainment of the universal *ut sic* is dependent upon many singulars, upon a collection of singulars. The universal or common nature known as common and yet as apart from the singulars has a dependence on a collection.¹ St. Thomas asserts this dependence of the *primum universale* on a collection when he says that "si . . . accipiantur multa singularia, quae sunt indifferentia quantum ad aliquid unum in eis existens, illud unum secundum quod non differunt, in anima acceptum, est primum universale, etc."

In this process it is the singulars which are compared. At the term of the process the intellect knows the comparison, the one with respect to which many singulars are indifferent, an *unum ex collatione*; it knows (indeed through a similitude which is the intelligible species) the real similitude (which can be and first of all is a real relation²) among, say, Socrates, Plato, etc. But knowing this comparison, this similitude, this relation, this order involved in the attaining of an *unum praeter multa* (an *unum* that is recognized as communicable to many inasmuch as what is *unum in numero existens* in one singular is *unum secundum rationem speciei* with respect to what is an *unum in numero existens* in another singular) is dependent upon a prior multiplicity of separate apprehensions of the things compared.

For every comparative process involves knowing the compared singly before knowing their comparison. Thus before knowing conclusion as conclusion, that is, as proceeding from its principles, it is necessary, as we saw, to know principle and what proceeds from principle by separate and distinct acts. The same obtains with respect to the proposition (or enunciation) from which the syllogistic conclusion follows: we must know subject and predicate by distinct

1. This dependence upon or association with a collection is reflected in the impositions of certain logical names. Porphyry, in his account of "genus," attends to it as a name, among other things, for either a collection or a principle of a collection: "For a collection of some who are in a certain condition in relation to one something and to one another is called a genus or family . . . In another way again, the principle or beginning of any one's generation is called the genus or stock — whether the person who generated him or the place in which he was born" (*Introduction to the Predicaments of Aristotle*, trans. Charles G. Wallis [Annapolis, 1938], p.4). The first meaning, St. Albert remarks, is dependent upon the second as giving it its unity. But in either case, he adds, there is question of collection: "Differunt autem istae duae generis significationes: quia prima est unius partiti in multa, secunda autem est multorum respicientium ad unum, quod est principium generationis eorum secundum modum parentis vel loci in quo generatur aliquis ad illius loci complexionem vel figuram" (*In de Praedicabilibus*, Tr.3, c.1). — One discovers something similar in some respects in the case of the English "class." This word is taken to mean a collection of things with something in common. If a name is taken as signifying a class in this sense, it is not, of course, predicable of the singulars in the class nor of any common natures in the class: that is, if we were to take the name "man" as the collection of men, we would not predicate it of Socrates; for to do so would be to assert that Socrates is not a man but a heap of men.

2. Cf. *De Ver.*, q.2, a.2, ad 3.

acts (and of course not as subject and predicate) before we know their comparison or identity in the proposition itself. The same obtains in the case of the composition (in definition) involved in a distinct knowledge of the *quid*. Knowing an order in each case involves an *unum ex collatione* ; and once the one order is known, *ex consequenti* we are said to know many.

A similar process obtains in the generation of the *primum universale*. The difference is that common natures are not being collated or compared but the singulars in which the common natures are found (though not as common, for Socrates's whiteness is not the whiteness of Plato, rather, these differ *in numero*). We ask the reader to recall a text to which we have already referred :

...similiter cum intelligit propositionem intelligit simul subiectum et praedicatum ; et cum intelligit similitudinem vel differentiam aliquorum, simul intelligit ea quorum est similitudo vel differentia.¹

St. Thomas's words here are in the context of showing that while *primo et principaliter* in grasping proposition, similitude or difference, we understand what is one, *ex consequenti* we understand many *in quantum plura accipiuntur ut unum*. To repeat, knowing a proposition involves knowing by a prior multiplicity of acts the parts of the proposition separately before knowing their relationship. There is no reason to deny that the same obtains in the case of similitude or difference. (And it is significant that St. Thomas mentions similitude first, for we certainly grasp likeness before difference.) These two — similitude and difference — represent a taking of many as one in some way and presuppose separate apprehensions *in singulari* of the compared ; for our first cognitive contact with things is through sense, which is of the singular.

Before we move on to a consideration of number 595 where St. Thomas manifests how this *primum universale* can come from sense, which is of the singular, it is important to attend to one further characteristic of *experimentum* revealed in number 594. Here again we see *experimentum* as something preliminary not only to the universal principle or proposition (which indeed depends upon it), but also to the *primum universale*. That is to say, the *terms* of the universal principle of art or science depend upon a collection of singulars in order to be attained as universal. The examples chosen by both Aristotle and St. Thomas seem clearly to suggest this. And the fact that Aristotle and St. Thomas (in number 595-2) assimilate this attainment of the first universal to that of the "true" universal or genus from the lower species confirms it. This, as we shall see, is opposed to the position of Cardinal Cajetan, who asserts that *experimentum proprie dictum* is not required for the universal term, but only

1. *Quodl.* VII, q.1, a.2.

for the principle or proposition itself.¹ This, however, is a matter to which we will return once we have attempted a definition of *experimentum*.

c) *Remarks on n. 595.* Here the special concern of Aristotle and St. Thomas is to account for the attainment of the universal, this *unum praeter multa*, from sense (*per viam inductionis*): the problem is that sense is *proprie* and *per se* of the singular;² intellect, on the other hand, is *proprie* and *per se* of the universal and of the singular only by way of reflection. If, says St. Thomas, the sense were only to apprehend what is of particularity and were not in any fashion to apprehend the universal nature in the particular, it would not be possible for universal knowledge to be caused in us from the apprehension of sense. The answer to the difficulty is that sense is *quodammodo* of the universal itself.

We ask the reader to recall the brief account of the doctrine of abstraction already given. It is sense that presents "the content of perception." The phantasm is the quasi-object of intellect; it brings to intellect the similitudes of determinate things. Of itself, of course, the phantasm is the term of the act of an organic power and so a representation of a singular — with the conditions of matter. It has actual determination of the similitude of things, but intelligibility and universality only potentially. Equipped with an active power, agent intellect, the rational soul makes these intelligible in act by abstracting from the conditions of individual matter. There is also an immaterial power (passive intellect) capable of these determinate similitudes (of sensible things) abstracted now from these conditions of matter.³ It is in the light of this doctrine that the following remarks of St. Thomas must be understood:

... de universali dupliciter contingit loqui: uno modo, secundum quod subest intentioni universalitatis; alio autem modo, de natura cui talis intentio attribuitur: alia est enim consideratio hominis universalis, et alia hominis in eo quod homo. Si igitur universale accipiatur primo modo, sic nulla potentia sensitivae partis, neque apprehensiva neque appetitiva, ferri potest in universale: quia universale fit per abstractionem a materia individuali, in qua radicatur omnis virtus sensitiva.

Potest tamen aliqua potentia sensitiva, et apprehensiva et appetitiva, ferri in aliquid universaliter. Sicut dicimus quod obiectum visus est color secundum genus, non quia visus cognoscat colorem universalem; sed quia quod color sit cognoscibilis a visu, non convenit colori in quantum est hic color, sed in quantum est color simpliciter.⁴

1. Cf. CAJETAN, *In Post. Anal.*, II, c.13, p.203.

2. Cf. *In I Post. Anal.*, lect.42, n.378.

3. Cf. *Cont. Gent.*, II, c. 77; *Ia*, q.79, a.4, c. and especially ad 4. — It is important to recognize that abstraction means the denuding of the singular conditions, etc. It is supposed to attaining the universal *qua* universal, which is formally attained only through a comparative act.

4. *Ia IIae*, q.29, a.6.

And in answer to an objection St. Thomas adds an important precision : “. . . sensus non apprehendit universale, prout est universale : apprehendit tamen aliquid cui per abstractionem accidit universalitas.”¹ Though it attains a nature only *in singulari*, sense nonetheless is responsible for the “content of perception” to which universality accrues.

In reading the text in which St. Thomas points out that sense is properly and *per se* of the singular, one must be cautious in the application of the doctrine which concerns the *per se* common and proper sensibles and the *per accidens* sensibles.² In the present context (number 595) one can assert that with respect to any sense (external or internal), whether the sensible be *per accidens* or *per se* with respect to external sense or with respect to internal sense, the sense (inasmuch as it is an organic power and so distinct from intellect) properly and *per se* attains the singular. Universality, as St. Thomas notes, happens (*accidit*) — with the aid of another and higher power in man’s case — to that singular which sense *per se* perceives as singular.³

St. Albert is of assistance here :

Ut autem omnem removeamus dubitationem, quod iam olim in *Metaphysicis* dictum est, iterum dicamus hic : non enim satis certo dictum est per ante habita, nisi dubitatio quae oriri posset removeatur. Dicimus igitur quod stante sive manente in anima uno indifferentium sensibilibus receptorum, quae in universali uno indifferentia sunt : tunc statim ad primum quidem (quod stat in anima) est universale. Et namque hujus ratio est, quia sensus est et sensum accipere est universale, quod mixtum et confusum est in singularibus : quamvis enim sentire secundum actum sit singulare, tamen sensus (hoc est, acceptio per sensum) est ipsius universalis : sicut acceptio per sensum non est tantum Calliae hominis, sed est acceptio hominis. Talis autem est sensus per accidens qui ex reflexa ratione ad sensum mixtum in sensibili accipit universale adjutorio superioris potentiae : et hoc acceptum manens iterum ratione stat in his universalibus ad universaliora semper resolvendo quae in sensibili mixta sunt, sicut resolvendo speciem ad genus, et genus resolvendo in generalius, quousque sic universalis accepta stent ad impartibilia per resolutionem . . .⁴

1. *Ibid.*, ad 1.

2. For that doctrine see *In II de Anima*, lect. 13 ; *Ia*, q.78, a.3, c. ; ad 2 ; *Ia*, q.17, a.3 ; St. Albert, *Liber II de Anima*, Tr.3, c.5 (ed. Borgnet, vol. v), pp.238-240 ; John of St. Thomas, *Curs. Phil.*, T.III (ed. Reiser), pp.111 ff.

3. It seems to us that — in some sense at least — the cogitative power is the sense of substance. Though the cogitative cannot be said to attain substance as substance — that would mean that it could know a certain order — nonetheless it attains “this man” under the common nature “man” precisely because of the union of cogitative and intellect in the same subject. (Cf. *In II de Anima*, lect.13, nn.396-398 ; *De Ver.*, q.2, a.6, ad 3.)

4. *In II Post. Anal.*, Tr.5, c.1.

What St. Albert makes clear is that the universal is in the data of sense *mixtum et confusum*, that is, potentially. The abstractive power of a higher and reflective potency is needed to attain the datum of sense without the material, singular conditions that accompany its representation by sense. Sense, of itself, is of the universal only *per accidens*.

In considering number 595 it is also important to attend to the fact that the cogitative is united to intellect in the same subject, man.¹ Man knows through both powers. (If the universal *prout universale* were not known by some power, then it could not be said to be known *per accidens* with respect to sense.)² Indeed, he can be said to know through both simultaneously. The agent intellect is "simpliciter activa"; it has no need of some mediating habit in order to operate.³ In some sense, one can say that its light is always on.⁴ "The soul is so constituted . . ." But, of course, this active power is naturally ordered to illuminate the phantasm of sense⁵ — which phantasm, in the measure it actually involves similitudes of determinate things, provides the "content of perception."⁶ And, of course, with respect to these similitudes of determinate things sense is prior to intellect.

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(To be continued.)

1. See note 3 above, on page 114.

2. In order to be accidentally sensible, it must be somehow apprehended by the one sensing. Cf. *In II de Anima*, lect.13, n.395.

3. Cf. *In III Sent.*, d.14, a.1, q.2, ad 2; *In III de Anima*, lect.10, n.732; *Ia*, q.54, a.1, ad 1.

4. Cf. *In II Sent.*, d.3, q.3, a.4, ad 4.

5. Cf. *De Ver.*, q.18, a.2.

6. Cf., again, *Cont. Gent.*, II, c.77.