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CONTAINMENT IN *THE PORT-ROYAL LOGIC*

by

Bernard R. Roy

A dissertation submitted to the Graduate Faculty in Philosophy in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

1995

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Abstract

CONTAINMENT IN *THE PORT-ROYAL LOGIC*

by

Bernard Roy

Adviser: Professor Marx Wartofsky

*The Logic of Port-Royal*, first published in 1662 by the Jansenists Antoine Arnauld and Pierre Nicole, is a work that underlines the inadequacies of the traditional logic. Traditional logic, which included the texts of Aristotle's *Organon* and the works of the scholastics, was experiencing a mild renaissance in the seventeenth century following its outright and brutal discrediting by the humanists of the previous two centuries. Arnauld and Nicole introduce a fairly original system of logic that attempts to remedy the shortcomings of the revived tradition; they dismiss the Aristotelian "Categories", "Predicables", and "Topics", ignore the scholastic "Doctrine of Terms and Consequence", and suggest a single "General Principle" by means of which

the validity of all arguments can be decided. The Principle is based on a notion of containment, divided into *étendue* (extension of subjects) and *compréhension* (essential properties belonging to the subjects), which applies to all terms. Because the notion of containment is linked to the objective reality of Cartesian ideas, the authors can claim that their system of logic properly describes reality. The General Principle also suggests that terminist logic is logically and epistemologically prior to sentential logic because, Arnauld and Nicole claim, it governs the *Dictum de Omni et Nullo* and the *Nota Notæ*. The self-evidence of the two *dicta* confirmed the validity of all syllogisms of the first figure; furthermore, all syllogisms of other figures could be reduced to one of the first figure. With the General Principle, however, there is no need for such reduction to the first figure. This additional result makes the theorem of sentential logic, " $((p \wedge q) \supset r) \approx ((p \wedge \neg r) \supset \neg q)$ ", which was needed for the reductions of *Baroco* and *Bocardo*, unnecessary. The fact that no theorem of sentential logic is needed to underline term logic guarantees the autonomy of the latter.

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me going when little else seemed to work.

My sincere thanks also go to Floyd Moreland, Rita Fleisher, and their faculty at the Summer Latin Institute: Stephanie, Drew and Allan. They made good on the daring promise that we, the students, could read Catullus, Horace, Cicero, Augustine, *et al.* in the text after ten intense weeks. Their pedagogy and dedication is exemplary; the mark they left is indelible.

I also wish to thank my family who unconditionally supported my decision to go back to school at the ripe age of 42 years: my mother Renée Roy; my aunt and uncle Mary and Marcel Floris; my brother and my sister-in-law, Olivier and Nanou Roy. They were all encouraging and loving.

Finally, I doubt that this project could have been completed without the emotional and professional support of Laura Hinton. She lived through the project with me; ironically, it was not much longer after she had completed her own dissertation at Stanford. Whenever I was in doubt about the feasibility of my endeavor, Laura assured me that I was nearly there already; she read material, suggested changes, urged me to seek out my advisors, and told me, a year ago, that my dissertation was finished. It took me a year to believe her.

This dissertation is dedicated to the children I love, and who became adults while it grew: Charlotte, Dylan, Laurent, Paul and Thomas.

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## INTRODUCTION

This dissertation is about a work of the past. It takes seriously what is believed to be the central claim of a seventeenth-century manual of logic, and it tests the claim, as much as it is possible, with the very apparatus that was developed to formulate it. It concludes that this manual of logic, *La logique ou l'art de penser*<sup>1</sup> (LAP), written by the Port-Royal Jansenists Antoine Arnauld (1612-1694) and Pierre Nicole (1625-1695), and first published in 1662, represents a crucial turning point in the history of logic. LAP's central claim is simple: it purports to replace all rules legislating the syllogistics by a general

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<sup>1</sup>*La Logique ou l'Art de Penser; contenant outre les regles communes, plusieurs observations nouvelles, propres à former le jugement*, was first published anonymously in July 1662. Four revised editions followed under the authorship of Antoine Arnauld (1612-1694), and Pierre Nicole (1625-1695): 1664, 1668, 1671, and 1683. The edition to which I refer in this work is the *édition critique* by Pierre Clair and François Girbal, Paris: Vrin, 1981. I also make references to the manuscript version of 1660, so-called Du Vallant, written for the son of the Duc de Luynes (translator of Descartes' *Meditationes* into French) as a text to teach him "all and only the useful parts of logic" ("*tout ce qu'il y avait d'utile dans la Logique*" Avis).

principle based on containment.<sup>2</sup> Thus, it is my aim to argue that the significance of *LAP* lies in showing that Aristotelian syllogistic and, more specifically, Aristotelian formalism,<sup>3</sup> which had survived the purge of the Humanists and which was traditionally taught in the schools, was inadequate and impractical.<sup>4</sup> By pointing to the shortcomings of the Aristotelian system, and by substituting for it an informal method that became vulnerable to the attacks of rigorists, the two authors accomplished two feats: they unknowingly "cleared ground," worked as "underlabourers" for an expanded formalism, as Locke would later claim to have accomplished for science; and they argued for a logical syntax of language. The substitute, a commonsensical informal logic of containment, partially succeeded in achieving what it set out to do. It owed too great a debt to the Cartesian doctrines of clarity

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<sup>2</sup>One is irresistibly tempted to liken the Christian theologians Arnauld and Nicole's effort to reduce all the scholastics' rules to a general principle to Jesus Christ's reduction of all the Hebrew laws to the "golden rule."

<sup>3</sup>Formalism is here understood to privilege form over content. Hence any system that makes use of variables or schematic letters, and that gives mechanical rules and method is considered formalist.

<sup>4</sup>That the Aristotelian system is weak is evident by the results it yields. If we take the five valid moods of the first figure as axioms (because of their "perfection"), we only have fifteen valid syllogisms. Furthermore, the system assumes that all propositions are adequately represented by one of the four categorical ones. Relations, and propositional attitudes are, however, less than accurately represented by the subject-predicate form of propositions.

and distinctness, but the effort to develop it was not in vain, for, in addition to its partial success, it also offered interesting solutions to issues that had plagued the field of philosophy of language. The expanded formalism, as is well known, was initiated by Leibniz in 1666, two years after the second edition of *LAP* came out.

More specifically, this project carefully and critically examines this new logic of containment, by investigating how its authors tried to test the validity of arguments that included propositions of a form other than the standard subject-predicate one, propositions which, for example, would consist of propositional attitudes such as, "Father Picoté believed that the Duc de Liancourt's daughter attended the Little Schools of Port-Royal." A by-product of this examination reveals how Arnauld and Nicole accounted for subjects of propositions that were other than class terms, for example, proper names and definite descriptions, and subjects of propositions preceded by demonstratives rather than the standard quantifier. The results of the investigation are mixed. The Port-Royal system did not completely succeed in improving the Aristotelian system because it lacked the rigor of a formal system, and it failed to go beyond the three-term syllogistic form of arguments. But it did make a lasting contribution in the area of philosophy of language by offering coherent insights to these areas that continue to blight the field.

It is not uncommon for historians of logic to downplay the rôle of the seventeenth century in the advance toward mathematical logic, and to characterize this period as an unprosperous interregnum.<sup>5</sup> This view seems precipitatedly triumphalist because it supposes that present-day systems of logics are the *termini ad quem* of the logical venture. This is far from justified; the only partial success of today's formal theories in areas of intensional logics, may signal the need for a new kind of formalism. And it may take something like *LAP* to do the signaling. *The Port-Royal Logic* is therefore not to be dismissed; it represents as crucial a turning point as the two celebrated ones that immediately preceded it, and the one that followed it. The first such celebrated turn was undertaken in the late thirteenth century by William of Sherwood (1200/1210–1266/1271) and Peter of Spain (1210/1220–1277) and gave rise to the terminist school of logic. The terminists supplemented the Aristotelian logical canon with extended

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<sup>5</sup>For examples: C.I. Lewis in *A Survey of Symbolic Logic* (New York: Dover Publications, 1960), begins his survey with Leibniz, thus ignoring all preceding works; I.M. Bochenski in *A History of Logic*, trans. I. Thomas (Notre Dame: Indiana, 1961), p. 14: "But the content of this logic is so poor, it is loaded with so many utter misunderstandings, and its creative power is so extremely weak, that one can hardly risk calling something so decadent a distinct variety of logic and so setting it on a level with ancient, scholastic, mathematical and Indian logic."; Martha and William Kneale in *The Development of Logic* (Oxford: Clarendon, 1986), pp. 298–320. But among classical logics, *LAP* often is singled out as the most interesting.

discussions on the properties of terms. This addition was called the *parva logicalia* ("small things pertaining to logic"). Laurentius Valla (1408–1457) initiated the second turn Petrus Ramus (1515–1572) glorified it through his martyrdom (he was one of the victims of the massacre of St. Bartholomew) in the sixteenth century. These two logicians and their Humanist disciples favored Cicero over Aristotle and jettisoned the *parva logicalia*, stressed rhetoric over rigor, and introduced a chapter on method in logical treatises.<sup>6</sup> Since one turn introduced the *parva logicalia*, and the next one undercut its relevance and advocated its elimination from logic manuals, it can be said that these two turns essentially canceled each other and redirected logic back toward Aristotle's *Organon*. This meant a return to an emphasis on the *Categories*, the conversion of propositions, the syllogistic, Aristotelian method (*Posterior Analytics*), topics, and fallacies. After *LAP* had not entirely succeeded in its attempt to substitute formalism with an informal logic of containment, Leibniz was able to begin the next crucial turn.<sup>7</sup>

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<sup>6</sup>Heinrich Schölz in *Concise History of Logic*, trans. K.F. Leidecker (New York: Philosophical Library, 1961), p. 14 is incorrect crediting Arnauld and Nicole for introducing a chapter on method in a logic treatise.

<sup>7</sup>Leibniz had read *LAP*. He mentions the quality of the work in "Meditations on Knowledge, Truth and Ideas" (1684); he favors a containment at the level of intension rather than extension in "Elementa Calculi" (1686); and in a letter to Wagner, "The Value of Logic" (1696), he disputes *LAP*'s claim

*LAP and Descartes*

When I earlier claimed that Arnauld and Nicole unknowingly cleared grounds for an expanded formalism, I took this position because the failure of the Aristotelian formalism was mistakenly seen by these authors as the failure of formalism altogether. In fact, the two authors often argue against formalism. The Aristotelian syllogistic system was incontestably seen as the beginning and the end of logic. It was (and remained for a long time) so entrenched in the culture that only a few philosophers could conceive of an alternative. How, then, could the Port-Royalists help the cause of formalism? How could a work infused with two of the worst enemies of modern formal logic, namely psychologism and epistemology, be credited with pioneering, at least in part, modern logic? The cause of formalism was helped because of the exhaustiveness of an implicit disjunction that could be reconstructed in the following manner: if Aristotelian formalism is incomplete, then either formalism is to be done away with or an expanded formalism is needed. Arnauld and Nicole challenged the hegemony of the Aristotelian system by choosing the first

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that errors most often take place in judgments rather than inferences.

alternative, an informal commonsensical logic of containment anchored in a Cartesian doctrine of ideas. They saw in Descartes' doctrine of ideas a solid enough foundation for all terms in need of logical analysis. Their proposal, however, because it lacked the rigor the scientific community had grown accustomed to in the Aristotelian model and in the fields of mathematics and geometry, and because it relied too heavily on the phenomenological qualities of ideas forced a return to the second alternative. It was Leibniz who entertained the return, but he could not reach very far because, like his predecessors, he was settled in the mire of subject-predicate propositions, and three-term syllogistic arguments.<sup>8</sup>

#### *LAP and the Doctrine of Supposition*

I also earlier mentioned that Arnauld and Nicole not only cleared the way for a new formalism, but also informally argued for a logical syntax of language and, in the process, reformulated many difficulties in the field of philosophy of language.<sup>9</sup> In fact, they had remarkably

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<sup>8</sup>Louis Couturat, in *La Logique de Leibniz* (Paris: Aubin, 1904), p. 32 argues that Leibniz privileged an intensional logic, but this view has been recently challenged by Nicholas Rescher, in "Leibniz Interpretation of his Logical Calculi," *Journal of Symbolic Logic*, (1954), pp. 1-13.

<sup>9</sup>Their implicit argument for a logical syntax of language was noted by Noam Chomsky in *Cartesian Linguistics* (New

progressive insights. This progress was achieved by streamlining the key semantic notions of William of Sherwood and Peter of Spain's *parva logicalia*. Many of the semantic notions that defined medieval logic resurface in *LAP*. Is this another philosophical instance of throwing your predecessors out the front door, only to sneak them back in through the service entrance? Not exactly; for the medievalists, terms in isolation had a natural property (signification), and accidental properties (supposition, etc.) only when they became part of a proposition. The standard three-tier resolution of logic into term, proposition, and argument led to individual analyses of each tier, and to the analyses of the combination of each tier with another. For the Port-Royalists, the resolution takes place at the level of operations of the mind; signification and supposition (rid of its many sub-species) are two properties terms simultaneously possess, and are two aspects of containment. The authors' importance, therefore, does not solely reside in the fact that they dared to take one of the two next necessary steps that exposed the incompleteness of the Aristotelian system, but in their new ways of looking at supposition and signification, and the like notions that inflated Scholastic logical treatises. These notions have

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York: Harper & Row, 1966). But Chomsky bases most of his remarks on another work that Arnauld co-authored with Claude Lancelot (1615-1695) *Grammaire Générale et Raisonnée (GGR)*, first published in 1660.

recently reappeared couched in the much more modern language of intention-based meaning and reference, definite descriptions, demonstratives, and proper names.

### *LAP's Angle*

But how was the Aristotelian logic deemed inadequate by Arnauld and Nicole, and why was a new formalism not considered by the two authors? Aristotelian logic in general was seen by the two Port-Royalists as a shortcut to examine propositions and arguments. Diligently following Cartesian precepts, Arnauld and Nicole preferred attentiveness and unprecipitous reflection over expedience and rapidity. But more specifically, Aristotelian logic was deemed inadequate in its analysis of single terms by means of the Categories, because the latter were viewed as arbitrary and inviting to mental laziness. Moreover, both the *parva logicalia* and the Categories brought along a metaphysical trousseau that prompted endless extralogical disputes over the nature of various "intellects," e.g., Aristotelian active intellect or Sherwoodian material intellect, and over the nature of universals; are they in things or outside of things? Aristotelian logic was also inadequate in its handling of propositions because the reduction of all propositions to one of the four categorical

ones was never practiced outside of the schools and, moreover, the reduction ignored propositional attitudes. Finally, it was inadequate in its handling of arguments, first because not all arguments could be "perfectly" reduced to categorical syllogisms of the first figure, and second because the use of topics was counterproductive and confusing.<sup>10</sup> Generally speaking, the Port-Royalist authors spoke against any mechanical approach, such as the use of rules and exhaustive lists, to a problem. Echoing Descartes (AT VI, 17,) they liken this rote learning to the mechanical tables of Llull's (1232-1316) *Ars Brevis*, and echoing Michel Montaigne (1533-1592), they favor a well-made mind over a full one<sup>11</sup>: "Nothing is more likely to smother good seeds than an abundance of weeds : nothing other than a fertility of common thoughts, can make a mind sterile of just and

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<sup>10</sup>Ramus in his *Dialectique* (1555) divided logic into "invention" and "judgment," and made "invention" (the finding of topics) prior to judgment. Arnauld and Nicole devote an entire chapter (*LAP*, III, XVII) to the criticism of Ramus' approach, arguing, as they did in the case of the Aristotelian categories, that such listings crowded the mind.

<sup>11</sup>"...je voudrais aussi qu'on fut soigneux de luy choisir un conducteur qui eust plutost la teste bien faicte que bien pleine," Montaigne, "De l'institution des enfans," in *Oeuvres Complètes de Montaigne - Essais*, Livre Premier, deuxième volume, Société Les Belles Lettres, Paris 1960, p. 14. "I would also want that one be careful to choose for him (the pupil) a tutor who has a well-crafter rather than well-filled head." The annotator of the edition, Jean Plattard traces the origin of the expression to several writers, in particular, Noël du Fail and Henri Estienne, (p. 266).

solid thoughts."<sup>12</sup>

However, it must be said that while Arnauld and Nicole granted no value to the Categories and to the conversion of propositions, they allowed the syllogism to remain the canonical form of a deductive argument. They tried in vain to accommodate non-syllogistic argument form to a three-term analysis. Thus, the *parva logicalia* and the Aristotelian syllogistic were the two Procrustean beds of the medieval logicians. The former was unmade by the Humanists; the latter was shown unfit by Arnauld and Nicole. But it could not completely be done away, because formalism, an expanded one, was needed.

The reasons why *LAP* sidestepped an expanded formalism are inspired by Arnauld's Cartesianism and Augustinism. The weakness of the Aristotelian syllogistic added support to the Cartesian view that content was to be favored over form, and provided grist for the authors' antiformalist mill. Moreover, a new formalism would necessitate a kind of universal language, and such universal language had been condemned as highly improbable by Descartes, because it presupposed "big changes in the order of things" (AT I, 76). Furthermore, formalism would have implied another language, an apparatus about which following Augustine, the authors

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<sup>12</sup>"Rien n'étouffe plus les bonnes semences que l'abondance des mauvaises herbes : rien ne rend un esprit plus sterile en pensées justes & solides, que cette mauvaise fertilité de pensées communes." (*LAP*, 235)

admitted their diffidence. Finally, it would seem that formalism does not espouse Descartes' analytical method, and worse yet, it would disturb the perfect linearity of the "long chains of reasoning" (AT VI, 19 and X, 369) also privileged by Descartes, because it would most likely include proofs by *reductio ad absurdum*. *Baroco* and *Bocardo* can yield *Barbara* only by means of this indirect proof. And Arnauld's *Nouveaux Eléments de Géométrie* (1667) is an effort to rewrite Euclid's *Elements* in a "clear and distinct" text free of such "unlinear" proofs.

#### LAP's Historical Background

Given the dominant pro-Aristotelian climate of the Paris universities, one may wonder why both Arnauld and Nicole thought so differently from the authorities, and how they succeeded in publishing and promulgating their work.<sup>13</sup>

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<sup>13</sup>The severity of the Paris University, the French Court, and the French clergy towards anti-Aristotelian sentiments cannot be overemphasized. Charles Jourdain, in *Histoire de l'Université de Paris au XVII<sup>e</sup> et au XVIII<sup>e</sup> siècles*, Hachette 1862, p. 106, cites the case of a student who wrote a thesis unfavorable to Aristotle: "*Le Parlement, sur l'avis de la Faculté de Théologie, ordonna que ces thèses seraient lacérées; que l'auteur [Bitaud] et ses deux complices [A. Villon et E. de Claves] sortiraient de Paris dans les vingt-quatre heures, et qu'ils ne pourraient enseigner ni même séjourner dans les villes et bourgs du ressort de la cour. L'arrêt, ce qui était le plus grave, faisait défense "à toutes personnes, à peine de la vie, de tenir ni enseigner aucunes maximes contre les anciens auteurs et approuvez, ny faire aucunes disputes que celles qui seraient approuvées par les docteurs de la Faculté de Théologie"*." Jourdain

Primarily, and most importantly, Arnauld had a political agenda; he was at the center of many debates including the one trying to establish whether the text of Cornelius Jansenius' *Augustinus* (1640) contained certain heretical propositions, and the one concerned about the interpretation of the eucharistic statement "This is my body." He turned to logic for help. He also had been the only member of the Sorbonne to send a set of objections to Descartes' *Méditations*, and was a committed defender of Cartesian doctrines. The Sorbonne, on the other hand, did not permit the teaching of Cartesian philosophy. (In the eyes of many seventeenth century philosophers, this combination of Cartesianism and logic made *LAP* the Cartesian logical treatise that Descartes never wrote). Moreover, as a doctoral student, Arnauld was more attracted to the Platonic-Augustinian content of his spiritual mentor, l'Abbé de Saint-Cyran (Jean Duvergier de Hauranne, 1581-1643), the principle defender and promulgator of the views of Cornelius Jansenius (1585-1638) than to the Aristotelian-Thomist approach of his archconservative dissertation mentor, l'abbé Lescot (Thomas Aquinas was a contemporary and follower of Peter of Spain). There is little doubt that these two early encounters set Arnauld adrift from the institutional tradition. The second set of reasons for the

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also refers the reader to Launoy's *de Varia Aristotelis Academia Parisensi fortuna*, 1653.

lack of dissent from authorities is perhaps more speculative. Because Arnauld had already been expelled from the Sorbonne as a result of his position in the *Formulaire* controversy,<sup>14</sup> and because Nicole had explicitly renounced institutional ambition,<sup>15</sup> neither felt socially compelled to follow the dominant current. Both of them had to spend most of their adult life in exile, dodging prosecution by both the Royal Court and the Church.

The ideas contained in *LAP* gained the interest of a wide audience; the work became successful almost instantly. A number of reasons can be offered for its success. Arnauld spent most of his professional life battling theological issues, and Nicole spent his defending an austere ethical program. Cartesian physics was often debated in Port-Royal circles, and it was a controversial topic that divided the

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<sup>14</sup>The Sorbonne and Rome condemned Jansenius' *Augustinus* because it allegedly contained five "heretical" propositions. Arnauld and Nicole argued that Rome had the right ("*droit*") to condemn any propositions they saw fit, but the *de facto* question ("*question de fait*") whether the propositions were actually in the *Augustinus* could be decided by any competent reader. The controversy lasted well over ten years. During that time, Rome required that all members of the clergy, monastery, and nunnery sign a form ("*formulaire*") attesting that they submitted to the ruling of Rome. Arnauld and most personnel affiliated with Port-Royal refused to sign the *Formulaire*. The conflict was dramatically captured by Sainte-Beuve (*Port-Royal*) in the nineteenth century, and by Montherlant (*Port-Royal*) in the twentieth century.

<sup>15</sup>Nicole achieved the rank of *bachelier* in 1649, and then withdrew after the Sorbonne censured the five propositions allegedly contained in the *Augustinus* of Jansenius. He was never ordained a priest.

otherwise homogenous group. Logic was intended to be an instrument to do the "correct" science, and to redress the "incorrect" one. The three sciences of Ethics, Theology and Physics were specifically targeted. The "correct" examples of physics were borrowed from Descartes and Pascal, while Epicurus and Gassendi provided the "incorrect" ones. The Jansenist doctrines were a source of "correct" theology and ethics, while Protestantism and the lax Jesuit morals supplied copious "incorrect" examples. Since many of these issues were not only of interest to many intellectuals of the time, but also to many non-intellectuals after they were narrated with irony and wit by Pascal in his very popular *Provincial Letters*, this new way of looking at logic rapidly spread to professional and non-professional circles, and permitted the notion of the inadequacy of the Aristotelian system to slowly take root.<sup>16</sup> Of course, I do not mean to say that criticism and demystification of the Aristotelian system of logic originated at Port-Royal--the Humanists had already done some of that--but I mean to say that Arnauld and Nicole, in proposing a new way of looking at logic

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<sup>16</sup>In a 1666 letter answering Nicole's ten "*Lettres sur l'Hérésie Imaginaire*," and eight "*Lettres Visionnaires*" (1664-1666), Nicole's failed attempt to equal the brilliance of the eighteen "*Lettres Provinciales*", Racine (the most famous pupil of the Little Schools of Port-Royal) writes: "*l'enjouement de M. Pascal a plus servi à votre parti que tout le sérieux de M. Arnauld.*" ("Pascal's playful style has done more for your sake than all of Arnauld's serious writings.")

promulgated the inadequacies of the syllogistic and of the *parva logicalia*. It is interesting to again note that the authors did not reject all of Aristotle's logic. They salvaged the Aristotelian notion of logic as an *organon* by constantly underlining its practical and useful aspect. They accepted its characterization as the study of terms, propositions and arguments, and, as I remarked earlier, they conserved the primacy of the syllogistic form of deductive arguments. They rejected the authority of the *Categories*, *Predicables* and *Topics*.

Another reason for the rapid spread of their ideas was the subtlety of the authors' approach. After the first edition had offended a conservative element of the French institutions, the authors added a preliminary "Discourse" to the second edition reassuring their audience that rather than demoting Aristotle, they were promoting him and had "no intention to attack" the foundation of his philosophy. A mark of this respect is the scattering within the text of *LAP* of a few bastions of Aristotelianism like the *Categories*, the *Predicables*, conversions of propositions, moods and figures, and topics. But these concepts are always prefaced by a warning that they are either needlessly mind-straining, ludic or simply not very useful. At times, they appear to be disconnected from the rest of the text; at other times, they seem to be included only to placate a conservative group, or possibly to record history; in

general, however, they are offered insidiously as awkward and hurried alternatives to *LAP*'s elegant and thoughtful method.

Kant's often-quoted passage, describing logic as "closed and completed"<sup>17</sup> since Aristotle, and written some one hundred years later, bears witness to this persistent attitude of praising and characterizing Aristotelian logic as the *termini a quo et ad quem* of logic. And some two hundred and fifty years later, many philosophers would renew their allegiance to Aristotelian logic by condemning the new mathematical logic.<sup>18</sup> The slowness of the process cannot therefore be over-emphasized.

The last reason for the success of the manual was that Arnauld and Nicole were quite original in their approach. *LAP* is unique in its form. Practically all logic treatises of the seventeenth century--and they were published at the dizzying rate of about twenty a year--were written in Latin

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<sup>17</sup>*Critique of Pure Reason*, Bviii.

<sup>18</sup>Couturat's admonitory tone of the address he gave in 1903 at the *Collège de France*, attests to the general reluctance at giving up the Aristotelian system. See «*La logique et la philosophie contemporaine*,» in *Revue de métaphysique et de morale* (1904). See also A. D. Ritchie's "A Defence Of Aristotle's Logic" in *Mind* (1946), and P. Banks' "On the Philosophical Interpretation of Logic: an Aristotelian Dialogue" in *Dominican Studies* (1950). Russell's comment in his *History of Western Philosophy* (p. 225) sums up the rampant conservatism: "Throughout modern times, practically every advance in science, in logic, or in philosophy has had to be made in the teeth of opposition from Aristotle's disciples."

and were part of a complete *Cursus, Systema, Syntagma, or Summa*. All tomes amounted to no more than an extended commentary on the original works, and a commentary on the commentaries of the original works, of Aristotle and Peter of Spain via Thomas Aquinas. (The only exception was Jungius' *Logica Hamburgensis*, which was published in 1638 and which, although written in Latin, was, together with *LAP*, the work of the period most often mentioned and praised by Leibniz). In contrast to these massive and intimidating tomes written in an impenetrable language, *LAP* is a small book written in readable French. It favors common sense and "natural light" over rules and mnemonic devices. Logic is not the daunting speculative science that the schools make of it; it is something useful we all do pretty much the way Molière's Monsieur Jourdain did prose.

### ***LAP's* General Principle**

But in what precise way were the authors of *LAP* original and revolutionary, and in what way did they dethrone Aristotle? I need to emphasize again that Arnauld and Nicole intended to provide a real and useful tool. They repeat over and over again that in the world outside of the schools, no one talks or argues in standard categorical form. Furthermore, no one involved in a dialogue ever goes through the trouble of reducing a recalcitrant proposition

to a standard categorical form. So, how does one accurately know the meanings of propositions and their truth-values, and how does one judge the validity of arguments? Ideally, the "natural light" of reason would suffice, but ideal conditions in the imperfect duality of the Cartesian world of mind and body cannot obtain. The Jansenist logicians offer a general principle based on the concept of containment in order to make up for this imperfection. The principle amounts to saying that in all deductive arguments the conclusion is contained in one of the premises, and another premise shows that it is so. But what is containment? The authors regularly speak of the containment of one term in another under some aspect, but how is the containment of one proposition in another one derived from this analysis? Furthermore, the authors argue that the rules of the first figure are derived from this principle. But it is well known that the rules of the first figure are governed by the *Dictum de omni et nullo*. The question that naturally arises is whether the new principle is a version of the old one or not.

These questions are addressed by ushering in two aspects of the notion of containment. A term is contained either extensionally or intensionally in another. The term 'cat' is contained extensionally in the term 'animal' while the latter is contained intensionally in the former. But if it is taken extensionally, what will it consist of in the

case of undetermined propositions like particular ones? The medieval scholastic translation of the expression 'some cats' as 'this cat or that cat or etc.' and the modern translation of 'at least one cat' (or the infinite disjunction) are not recognized by Arnauld and Nicole. They gave particular propositions a sense of a part (part of a whole). This is not to suggest a mereological interpretation; it simply seeks to replace the undetermined nature of a particular proposition by the precise notion of intension. In other words, the containment of one particular proposition in another is not established at the level of extension, but at the level of intension. The proposition 'Some animals are felines' is contained in the proposition 'Some Persian are cats' because the attribute of felinity belongs to the term 'cat'. On the other hand, if containment is taken intensionally, what will happen in the case of negative propositions? In the proposition 'No cats are dogs,' the intension of dogs cannot be entirely excluded from that of cats, for the latter remains an animal.

How, then, did Arnauld and Nicole explain this dual aspect of terms? They introduced two facets to general terms (or ideas), that of *compréhension*, and that of *étendue*, and suggested that each aspect take over the other one, when that other fails. The former consists in the attributes that make up a general idea and without which the idea would no longer be what it is. The latter consists in

the subjects (inferiors, i.e., sub-species and individuals) that fall under the general term or idea. Thus, suppose I wanted to find out, as the authors did, whether some friends of God were poor, and all I knew was that some saints were poor. It would not really help to know that some friends of God are contained in the extension of some saints, because the friends of God I have in mind in 'Some friends of God are poor' may not be the same individuals I have in mind in 'Some saints are poor.' The nature of a particular proposition is to be undetermined. The aspect of extension cannot, therefore, be very helpful in the case of a particular proposition. In this case I need to have recourse to the intensional aspect of containment; the proposition 'All saints are friends of God,' when it is taken intensionally claims that the *compréhension* of the term 'saints' includes that of 'friends of God.'<sup>19</sup> The subject of the conclusion, 'friends of God,' is contained in the *compréhension* of the subject of the major premise 'Some saints are poor,' and the minor premise 'All saints are friends of God' shows it. The inference is now justified from the point of view of *compréhension*. In this case, Arnauld and Nicole shifted from the *Dictum de omni et nullo* that relies on the extensional analysis of containment, to

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<sup>19</sup>Here, the authors revert to Aristotle's way of reading a universal affirmative proposition: 'B is in all A's', which had been changed in the very beginning of the first millemium A.D., possibly by Lucius Apuleius (125-180).

the *Nota notæ est etiam nota rei ipsius* that relies on the intensional notion of containment. The term 'poor' is an attribute of 'saint' and 'friend of God' is an attribute of 'saint'; so, 'friend of God' is an attribute of the term 'poor' (the converse of the conclusion). This reading of *Disamis* types of arguments undoubtedly privileges the intuitive nature of intensional analysis over the extensional one exemplified in the rule of Existential Elimination (or Instantiation) in modern predicate calculus, or exemplified by the free floating 'x' in nineteenth century diagrammatic analyses. But it privileges it because, if containment is to be intuitive in a Cartesian sense, it needs be denumerable, and no extensional denumeration can be achieved in a particular proposition. To my knowledge they are the first logicians to have tried to combine both aspects in the determination of argument validity.

Contrary to the terminists' doctrine of *suppositio* and *significatio*, these two properties of terms (or ideas) neither are independent of the other, nor do they differ in priority. They are related in the following manner: in a true affirmative proposition the subject is contained in the *étendue* of the predicate, and the predicate is contained in the *compréhension* of the subject; furthermore, if the *compréhension* of a term (or idea) is modified, that is, if it is either increased or decreased, the corresponding

*étendue*, if it varies at all, will vary inversely. This view, of course, has the drawback that it only recognizes subject-predicate propositions, where both subject and predicate are related to each other by the notion of containment. It takes propositions of the form "Finistère is bigger than Gaia" as having as a predicate "bigger-than-Gaia", making it very awkward to justify inferences of the above to "Gaia is smaller than Finistère".

The apparatus that makes up the general principle is introduced and argued for in the previous chapters of *LAP*. It includes, in particular the definitions of the two notions of *compréhension* and *étendue*, and their attendant aspects of determination and *resserrement* (restriction). When *LAP* is viewed from the perspective of a work that introduces and justifies an apparatus, and shows how it can be put to use, it presents itself as a unified work, a promising complete and original theory of the logic of natural language, rather than an expanded commentary on Aristotle. This feature alone makes *LAP* unique among its contemporaries.

### **Port-Royal**

The modern abbey of Port-Royal owes much of its fame to the Arnauld family, Jansenism, Blaise Pascal (1629-1662) and

protracted controversies with the courts of Louis XIII (in the person of Richelieu) and Louis XIV.<sup>20</sup> Founded in the thirteenth century by the Cistercian order and located in the Chevreuse valley south of Versailles, it experienced in 1602 a revival under the leadership of the abbess Marie-Angélique Arnauld (1591-1661), eldest sister of Antoine Arnauld. The first controversy to befall Port-Royal comes from a short publication by Marie-Angélique's sister, Agnès Arnauld who was a nun at the abbey. The pamphlet, *Le Chapelet secret du Saint-Sacrement* (1633), because of its occasional obscurity, and its austerity was censored by pope Urban VIII. The work, however, caught the attention of the abbé de Saint-Cyran (Jean Duvergier de Hauranne). Saint-Cyran was a friend of Cornelius Jansenius, and together they campaigned for a strict Augustinian catholic doctrine, which the work of Agnès Arnauld supported. Their conservatism went against cardinal Richelieu, who ordered the imprisonment of Saint-Cyran. By 1643, Saint-Cyran, Richelieu and Jansenius had died, but the controversy already had worsened after Antoine Arnauld's publication of *La Fréquente Communion* (1638) and Jansenius' posthumous

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<sup>20</sup>Histories of Port-Royal abound. The most notorious is that of Charles de Sainte Beuve, *Port-Royal*, 3 vols. (Paris: La Pléiade, 1953-1955). Racine wrote an abridged history, *Abrégé de l'Histoire de Port-Royal* in *Oeuvres Complètes*, vol. II (Paris: La Pléiade, 1960). For a complete bibliography, I recommend Ruth Clark's *Strangers and Sojourners at Port-Royal* (New York: Octagon, 1972)

publication of the *Augustinus* (1640). Arnauld's book flew in the face of Jesuit practices, and Jansenius' dangerously grazed Semi-Pelagian ideas.<sup>21</sup> Arnauld was finishing his doctorate in theology at the Sorbonne. From the mid-1620's on, Port-Royal and its adherents endured severe persecutions at the hands of both the Church and the Court.

In anticipation of persecution, and with the help of the Duchess of Longueville, Marie-Angélique Arnauld began a reform and moved the abbey to Paris. Around 1638, a number of religious men (*les solitaires*) established themselves in the deserted abbey of the Chevreuse valley. They were escaping the corruption of the material world and devoted themselves to prayers, gardening and scholarly work. Among the early *solitaires* are Claude Lancelot, who with two others began to teach a few boys, and later girls (including Pascal's sister); by 1646, the school had earned such a high reputation that it opened a branch in Paris, which rapidly became the competitor of a Jesuit school. Lancelot, a

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<sup>21</sup>The Semi-Pelagians believed that the original sin continued to lead to human corruption. Without God's grace this corruption could not be overcome; however, man's free will was enough to permit the initial "push" (*initium fidei* or *credulitatis affectus*) toward Christianity. This view stood opposed to the Augustinians who argued that the initial "push" could not take place without God's grace. Semi-Pelagianism is a watered-down version of Pelagianism, which argued for the essential goodness of human nature and for the freedom of the will. Human beings possess all that is necessary to choose between good and evil; there is no original sin, and hence, no need of baptism. Both movements originated in the fifth century.

skilled speaker of many foreign languages, attended the seminary of Saint Nicholas du Chardonnet in 1627. By 1629, he is said to have mastered Latin, Greek, Spanish and Italian. He studies philosophy and becomes a member of Port-Royal after he meets Saint-Cyran. Besides co-authoring the *GGR* with Arnauld, he begins publishing in 1644 a number of *Méthodes* to learn languages. He favors the use of the French language as a meta-language to teach Latin. Lancelot taught mathematics and Greek.

Pierre Nicole joined the faculty of Paris at the time it moved. He had studied philosophy at the Collège d'Harcourt, he also had studied theology and Hebrew but, unlike Arnauld, never took the vows of priesthood. He joins Port-Royal because his aunt is a nun there. He meets Arnauld in 1654. He teaches philosophy and rhetoric (*belles-lettres*); the future historian Le Nain de Tillemont becomes his student. Besides co-authoring *LAP* with Arnauld, he is believed to be the author of *La grande perpétuité* where he argues at length against the Protestants' interpretation of the eucharist. He is also the author of an influential *Essais de Morale* (1675) and the Latin translator of *LAP* and Pascal's *Provincial Letters* under the pseudonym of Weindrock.

In 1648, the nuns returned to the Chevreuse Valley and forced the *solitaires* to move to the neighboring area called *Les Granges*. It is at *Les Granges* that Jean Racine becomes

their most famous student. Following more persecutions, the Little Schools had to move in 1649 and again in 1653 until they were closed in 1660.

After Saint-Cyran's death, Arnauld became the confessor (*directeur de conscience*) of the abbey, but his commitment was impaired severely following two major disputes. The first involved his protest of the 1649 condemnation of five propositions allegedly contained in the *Augustinus*. Arnauld responded by the famed distinction he made between *droit* and *fait*; only the pope had the right (*droit*) to condemn propositions as heretical, but it was a fact (*fait*) discoverable by anyone whether the propositions were present in the text. The dispute escalated to a point where all members of the clergy of France were required to sign a formulary showing support of the condemnation. Port-Royal, under the guidance of Antoine Arnauld refused; the dispute lasted until 1669, at which time a truce was called. For much of the duration of the dispute, Arnauld and Nicole were in hiding or in exile.

The second is connected to the first. In 1655, a Parisian priest refuses to give the Duke of Liancourt absolution until he took his daughter out of the Little Schools. Arnauld answers the affront with two scathing letters. Because of this and other subsversive activities, he is stripped of his Sorbonne doctorship in 1656. Pascal responds to the outrage with the *Provincial Letters*.

In 1679, Port-Royal lost its strongest supporter; the Duchess of Longueville, cousin of Louis XIV died. Many dispersions of the abbey followed until finally, in 1709 Louis XIV ordered Port-Royal closed and the few remaining nuns to be placed in other convents.

### Plan of Dissertation

This work is divided into six chapters. Chapter One begins by comparing Aristotelian, Scholastic and Cartesian methodologies. I then trace the problematic raised in *LAP* to Aristotle and the Scholastics, but challenge the position taken by the philosopher Norman Kretzmann who argues that the Port-Royal distinction between *compréhension* and *étendue* is a version of the scholastics' simple and personal supposition. I give a terse introduction to the scholastic doctrine underscoring its complications and ad hocity, and highlighting their interpretation of the particle of particularity 'some'.

Chapter Two introduces the Cartesian doctrine of ideas and discuss the application of ideas to the study of logic. There was a longstanding debate among logicians of the seventeenth century as to what constituted the object, subject, and end of logic. The *LAP* authors skirt the debate and impose ideas as the basic unit or element of knowledge, and organize their treatise according to four combinatorial

operations of the mind, namely, conceiving, judging, reasoning, and ordering. With regards to Cartesian ideas, I emphasize the dual aspect of formal and objective reality and argue that the notion of containment is anchored in the "reality" of ideas, thereby conferring a metaphysical foundation to the principle. I show the minor and major differences between Descartes and Arnauld's account of ideas, and, after explaining that universal ideas are arrived at by abstraction, I suggest that the *compréhension* and *étendue*, which are aspects of universal ideas, are two features that enrich the original Cartesian doctrine. Finally, and based on remarks regarding the formal and objective realities of ideas, I offer an approach to the controversy surrounding "materially false" ideas.

Attending to the wide variety of vocabulary chosen by the Port-Royal authors to signify containment, in Chapter Three I focus on that notion and I attempt to identify a pattern of terms used to signify containment at the level of *compréhension* and at the level of *étendue*. The analysis takes me to Arnauld's *Nouveaux Elements de Géométrie*, and reveals that the vocabulary (and notion) is borrowed from that discipline. But while geometry stipulates specific functions for each term, logic does not repeat that explicitness. This conspicuous looseness exposed the inability of Arnauld's system of logic to duplicate the tightness of geometry, and perpetuated the conservative view

that geometry was to be a model for all other disciplines. In this chapter, I also examine the specific components of *compréhension* and *étendue*, namely and respectively, attributes and subjects. Attributes are the essential properties of the objective reality of universal ideas; subjects are the sub-species and individuals that fall under the *étendue* of the objective reality of ideas. Finally, I offer a motivation for the authors' suggestion that terms and ideas be used interchangeably.

Chapter Four traces the origin of the Port-Royal distinction between *compréhension* and *étendue* to the doctrine of the predicables, and it examines their relation to each other by means of the so-called "law of Port-Royal." First, and with regards to *compréhension*, and contrary to the authors' claim, it will turn out that not all universal ideas, viz., the ideas of being, truth, and idea, have *compréhension*; will this mean that some terms (ideas), like all *summa genera* are "incomprehensible"? No, in this case the two authors follow the model initiated by Pascal in his monograph on definitions: some undefined, albeit clear terms, are needed to avoid an infinite regress. As a matter of fact, they are terms that are so clear that an attempt to define them would obscure them. Secondly, the *étendue* of a term will consist of both subspecies, and individuals. Subspecies, because the authors consider "subjects" or "inferiors" as the extension of a term, and individuals

since some species are *infimæ*, but not individual things. In this case, the extension of the term 'circle,' if it is to have an extension at all, will have to be the ideas of individual circles.

With regards to the law of Port-Royal, which states that if the *compréhension* of a term is either increased or decreased, its corresponding extension, if it varies at all, will vary inversely,<sup>22</sup> the issue of restriction ("*resserrement*"), as it is understood by the Port-Royalists, is connected to the authors' understanding of quantifying particles. A determined expression, in contradistinction to an undetermined one, has its extension fully restricted, and has a referent. Undetermined expressions are to be understood from the point of view of their *compréhension*. They include the following: 'The man in whose arms Arnauld died,' 'some triangles,' 'this body,' and exclude proper names. The section on the law of Port-Royal focuses on the quantifying particle 'some,' the treatment of which in the Port-Royal works is given special attention. It is

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<sup>22</sup>The law could be stated bi-conditionally, for it is possible for the intension of a term to be increased or decreased with no resulting change in its extension--the extension of 'ruminant' is equal to that of 'cloven-hoofed ruminant' and *vice-versa*--and it is equally possible for the extension of term to be increased or decreased with no resulting change in the intension. A new species could be discovered, or an existing one could become extinct or could have been misclassified. But, if a change in the extension of a term results in a variance in its intension, that variance will be inverse.

sometimes viewed as a "determinant" (*GGR*, 59), and other times as a *bona fide* idea ( "*une idée de partie*," *LAP*, 59) that increases the idea of the term it is adjoined to, and that correspondingly decreases--undeterminedly or determinedly--its extension. When the term 'some' is used in isolation, as in 'some cats,' it is taken intensionally; when the same term is embedded in a proposition, as in 'some cats are friendly,' it could be understood extensionally, but when the same proposition is part of a syllogistic argument, the particle 'some' is understood intensionally if it is supposed to be contained in another particular proposition, and it can be understood extensionally if it is supposed to be contained in a universal proposition. Further clarification about the rôle of 'some' is made by comparing it to the other modifiers 'all,' 'only' and 'except'. I show that Arnauld and Nicole not only define the extensional reading of 'all' in particular cases of what they call "metaphysical universalities," but also indicate instances of intensional readings and of equivalence as in the proposition 'All virtue is nobility'. An intensional interpretation of a universal proposition yields that the *compréhension* of the predicate is contained in its entirety in that of the subject; if the *compréhension* of the subject is also contained in that of the predicate, there is an equivalence, as in 'All bachelors are unmarried males'. The particle 'only' presents a special challenge because the

authors define it in terms of its function of conferring a sense (a meaning) of exclusivity to some of the terms of the proposition in which it occurs. This function, for the most part, translates exclusive sentences into equivalences.

Chapter Five stipulates that "reticent ideas" are ideas that are not materially false, but whose objective reality is not readily available; they include ideas of proper names, ideas of definite descriptions, ideas of demonstrative pronouns and adjectives, and ideas of logical connectives.

With regards to the representational character of ideas, Arnauld and Nicole divide ideas into general and singular. General ideas represent many things, and singular ideas represent one individual thing. Singular ideas are expressed by singular names; proper names are singular names because they designate individual things. They are referential, but they also need to have a sense. In order to allow for inferences that are obviously valid, the proposition in which the proper name occurs must be given the status of a universal proposition, but the proposition is universal in virtue of the fact that the subject (the proper name) is considered in its entire, albeit singular, extension; it is not universal because it contains a universal term as a subject. The view is consistent with *LAP*'s concept of determination outlined above: since a proper name is fully determined, it denotes all of its

*étendue*, which happens to be a single individual ("For individual terms expressed distinctly are understood in their entire *étendue*, being determined all they can be."<sup>23</sup> But, according to Arnauld and Nicole, all propositions are either "determinative," i.e., they restrict ("*resserre*") the *étendue* of the subject, or "explicative," i.e., they vent out the *compréhension* of the subject or attribute a property to the individual that completely befits him. Thus, singular propositions are universal and explicative, because whatever predicate is said of the subject, is said of its complete extension.

Proper names have no *compréhension* in the sense of *compréhension* introduced for universal terms, but proper names need to have a sense in order to be present in some arguments, and in order for such arguments to be evaluated. Senses of proper names are argued to be clusters of definite descriptions. This would mean that in the proposition 'Quesnel was Arnauld's loyal friend,' the attribute "Arnauld's loyal friend" is part of the sense of Arnauld (one of many parts), but not an essential attribute. Senses of proper names are not *compréhension* because Arnauld and Nicole explicitly recognize that Quesnel could have existed without his loyal friendship to Arnauld; in truth, the only

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<sup>23</sup>"Car les termes individuels distinctement exprimés se prennent dans toute leur *étendue*, étant déterminés tout ce qu'ils le peuvent être." (LAP, 65)

attributes that are possessed by individuals and without which they could not exist are those attributes that are possessed by all individuals. So, if *compréhension* were the sense of proper names, all individuals would have the same sense. I argue that the senses of proper names countenanced by the authors are specific kinds of definitions called "descriptions." (*LAP*, 165) Descriptions, which, until *Port-Royal*, were never taken very seriously by logicians, gained some status as a result of their new role. The seriousness is due in great part to the affiliation of descriptions to Leibniz' concept of the individual substance. Arnauld and Nicole are thinking along the same line as Leibniz without many of the metaphysical trappings: everything that is said of an individual substance necessarily belongs to that substance, but an attribute or even a cluster of attributes, cannot be used to fix the reference. Thus, proper names have senses, but these senses cannot, like *compréhension*, determine reference.

The introduction of descriptions as senses of proper names is justified by the need of evaluating some arguments containing proper names as terms. However, Arnauld and Nicole are well aware that descriptions are commonly used to fix reference; but, given that descriptions are essentially attributive--they are used as senses of proper names--if they are used referentially, there must be cause of error. The authors argue that if an individual subject inevitably

seems to accompany a description, it is because the human psychological make up is such that it is compelled to add distinctness to ideas that do not have the werewithal to do it. Our psychology (our will in particular) compels us to compensate for the vagueness of confused ideas. This distinction between the attributive and referential uses of definite descriptions became familiar to the modern philosopher of language after Keith Donnellan published his seminal article some thirty years ago.<sup>24</sup>

For the Port-Royalists, then, definite descriptions, in contradistinction to proper names, of which they are the senses, are never strictly referential. If an individual thing is assigned to a definite description, the authors call the assignment a "universal equivocality" (*équivoque universelle, équivoque par erreur*); the error comes from the assignment, rather than from the individual thing that has been picked out. A definite description is to be interpreted attributively even when it occurs as the subject of a proposition. The sense of a definite description is culled from the *compréhension* of the general terms that make up the description with the addition of the attribute of uniqueness. The expression, 'The man in whose arms Arnauld died,' uttered in isolation or as part of a sentence is

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<sup>24</sup>"Reference and Definite Descriptions", in Stephen P. Schwartz, ed., *Naming, Necessity, and Natural Kinds*, (Ithaca: Cornell U. Press, 1977).

meaningful, but without a referent; it evokes (excites) the idea of the dead individual Arnauld in the arms of a live one, and when it is embedded in a proposition and occurs as the subject, as in 'The man in whose arms Arnauld died was arrested in Brussels in 1703,' it means nothing more than there is a unique person in whose arms Arnauld died. If it may be thought to refer to Quesnel, it is because the mind is wont to seek distinctness in ideas, whether or not the idea has the wherewithal to do so. This rather unorthodox interpretation by modern standards, is one of the few rare cases where a subject is understood from the standpoint of *compréhension*; in general, subjects are interpreted according to their *étendue*, and predicates are interpreted according to their *compréhension*. As far as definite descriptions are concerned, whether they occur as subjects or predicates, they always are understood attributively: the description in 'Quesnel is the man in whose arms Arnauld died,' has exactly the same meaning as the description occurring in 'The man in whose arms Arnauld died was arrested in Brussels in 1703.'

In an attempt to clear the theological controversy surrounding the interpretation of the eucharistic statement "*Hoc est enim corpus meus*" ("This is my body"), Arnauld and Nicole made some original contributions to an understanding

of the meaning of demonstratives.<sup>25</sup> Demonstratives can either be determinant, deictic, or autonomous ideas. Furthermore, they exhibit something like what Kaplan has called "content" and "character" in his article "Demonstratives".<sup>26</sup> They are determinant when I say 'This pope,' in which case the demonstrative restricts the *étendue* of the general term 'pope' to mean a particular individual. Since there can only be one pope at a time, the demonstrative is not used as a pointer, as it would be in the case of a deictic demonstrative, as for example, when I say: "This man." The latter are characterized by an

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<sup>25</sup>Port-Royal is particularly sensitive to the issue of the eucharist. Marie-Angélique and Agnès Arnauld were chosen by the first wife of the Duke of Longueville to open a religious institution devoted to the worship of that sacrifice in 1633. They were later permitted by Rome to be called the "daughters of the *Saint-Sacrement*." Their habit was changed to symbolically represent the rite--white robe and red wooden cross. Saint-Cyran was attracted to Port-Royal to defend the writing of Agnès, *Chapelet secret*, a rigid and austere reading of the eucharist that was critical of the tolerant Jesuit practices. And finally, Arnauld's first major controversy was over his *Fréquente Communion* published in 1638, which "authoritatively" restated Agnès' views. The *LAP* chapters related to the issue were added in the fifth edition of 1683 following the publication of *La Grande Perpétuité de la Foi de l'Eglise Catholique touchant l'Eucharistie, défendue contre les livres du Sieur Claude Ministre de Charenton*, 5 v., 1669-1672. Arnauld also tried to accommodate the Cartesian doctrine of extension to the catholic interpretation of the eucharist, but had to back out because of the division it caused within Port-Royal (see *Letter 415* to du Vaucel).

<sup>26</sup>"Demonstratives: An Essay on the Semantics, Logic, Metaphysics, and Epistemology of Demonstratives and Other Indexicals", in *Themes from Kaplan*, Joseph Almog, John Perry, Howard Wettstein, Eds., (New York: Oxford U. Press, 1989).

accompanying gesture. The demonstrative is an autonomous idea when it stands for the most general of ideas, like the idea of a thing, or of a state of affairs. The eucharistic statement belongs to that last category. The '*hoc*' of '*Hoc est enim corpus meus*' only means the thing present, *hoc negotium*. The mind is erringly wont to add the confused idea of some other thing, e.g., the bread, etc. Since the demonstrative means the most general thing, it is also undeterminate, but less undeterminate than the expression 'some thing,' since 'this thing' means some thing that is here present. The distinction is more or less akin to the uniqueness feature of some existential statements. Its Russellian meaning would be something like: "There is a thing, and that thing is present, such that it is my body." An arrow head ( $\exists x \blacktriangleright$ ) instead of the conventional iota or exclamation mark ( $\exists x !$ ) could be used as an abbreviation.

Chapter Two had noted the debt that Arnauld and Nicole owed to Descartes for his doctrine of ideas, but if, following Descartes, and as Arnauld argues in his 1683 treatise on ideas, *Des vraies et des fausses idées (VFI)*, all words (meaningful sounds) give rise to ideas, and ideas have both formal and objective realities, i.e., are always of something as well as being modifications of the mind, one is well justified in asking what kind of ideas logical connectives give rise to, that is to say what is the objective content of the ideas of "and," "or," "if...then,"

and "not". What do these ideas represent to the mind? In short, what kinds of ideas do logical connectives occasion? *LAP* conspicuously omits mention of logical connectives in its chapter on parts of speech, but in a celebrated grammar book earlier written by Arnauld and Lancelot, *Grammaire Générale et Raisonnée (GGR)*<sup>27</sup>, the authors argue that logical connectives are ideas that function like verbs. Both are said to signify the form of our thoughts, and "not properly" ("*non pas proprement*") the objects of our thoughts. This may mean that they require a *bona fide* idea in order to function like an idea. But this view goes against common sense. These words are meaningful, and it just cannot be maintained that in isolation they are mere meaningless acoustic blasts (*flatus voci*). I attempt to show that logical connectives and verbs primarily signify an affirmation in the form of a propositional function. If I utter 'I deny,' I have the idea that I affirm that  $x$  is not the case; likewise, if I utter 'or,' I have the idea that I affirm  $x$  or  $\Phi$ , where  $\Phi$  is any disjunct. The cost of this maneuver is minor, for all that is conceded is that verbs and logical connectives uttered in isolation cannot give rise to clear ideas; clarity has been sacrificed on the

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<sup>27</sup>*Grammaire Générale et Raisonnée, contenant les fondements de l'Art de Parler, expliqués d'une manière claire et naturelle; les raisons de ce qui est commun à toutes les langues, et des principales différences qui s'y rencontrent, etc.*, par Antoine Arnauld and Claude Lancelot (1615-1695)-Republications Paulet, Paris, 1969.

altar of meaningfulness, but if one thing stands out in *The Port-Royal Logic* it is that, outside universal ideas, there are very few clear and distinct ideas.

Negation offers a special challenge. When the particle 'not' explicitly attaches to a verb as in 'he is not a friend of God,' or implicitly, as in 'not now,' the affirmation signified by the verb is denied, and when the negation prefixes a general term (or takes the form of the complement of a class), as in 'they are non-friends of God,' the authors wish it to be equivalent to the negation 'they are not friends of God.' (*LAP*, 209-210) Although this seems correct in the context of a proposition, it also seems to assume that all terms presuppose a proposition. However, the term 'non-friend of God' is neither true nor false, because it makes no statement; it is a general term that has *compréhension* and *étendue*, and the question that should be asked is how it differs from the term 'friend of God.' The prefix 'non' cannot be a full-blown idea like other kinds of prefixes--e.g., 'tri' in 'triangularity'--because as such it would increase the *compréhension* of the word 'friend of God,' and decrease its *étendue* because the expression is not explicative, i.e., it does not articulate the *compréhension* of the term 'friend of God' and hence keep its *étendue* unchanged. The curious feature of the prefix 'non' is that one needs the *compréhension* of 'friend of God' in order to understand 'non-friend of God' the way one needs the

*compréhension* of 'angularity' in order to understand that of 'triangularity,' but while there seems to be fewer things exhibiting triangularity than things exhibiting angularity, it is not the case that fewer individuals are denoted by the term 'non-friends of God,' than by the term 'friends of God.' In other words, given the relation of *compréhension* to *étendue*, and the meaningfulness of the prefix 'non,' the prefix 'non' will not abide by the so-called law of Port-Royal.

In the last chapter (Chapter Six), I examine the general principle that governs all syllogisms, and that is heralded by the authors as a substitute to all the traditional rules. The principle states that one premise shows that the conclusion is contained in the other premise. This principle heavily relies on the apparatus introduced in the first three sections, the apparatus of *compréhension* and *étendue*. It has a logical justification, namely that the notion of containment stands as the basis of all reasonings, and it has a practical justification: the overwhelmingly greater frequency of arguments containing complex terms over arguments containing simple terms. But is this principle a version of the *Dictum de omni*, the *Nota Notæ*, or of the combination of the two? Does it permit the elimination of the Aristotelian rules? Arnauld and Nicole argue that all rules are derived from this principle. Furthermore, the principle eliminates the necessity of converting the last

three figures to the first one; as a result, the *dicta* are no longer required. The notion of containment, which is appealed to in the principle, includes containments at the level of *compréhension* and at the level of *étendue*.

We have already seen that a particular proposition can be interpreted either from the point of view of *compréhension* or from the point of view of *étendue*. If the particular proposition is compared to a universal one, it is interpreted extensionally, and if it is compared to another particular proposition, it is interpreted intensionally. In an argument of the *Disamis* form (see the table "Valid Forms of Syllogism" in Chapter Six), the subject of the conclusion is contained in the *compréhension* of the subject of the major premise (they are both particular propositions), and the minor premise, a universal proposition interpreted intensionally, confirms it.

The principle has the obvious advantages of economy and simplicity. But, if it delivers what it promises, it also achieves several feats for the Cartesian project. Arnauld and Nicole claim that this principle does not require the reduction of the last three figures to the first. This is quite a bonus because, in the second and third figures respectively, *Baroco* and *Bocardo* can only be reduced indirectly. An indirect proof requires a *reductio ad absurdum*, that is to say, an indirect proof requires that the impossible be conceived. Cartesian ideas, however,

cannot provide such conceptions. But, if the conversion to the first figure is made unnecessary, what happens to the Aristotelian confidence in syllogistic reasonings because of their subjectification to the *Dictum*. The extensional version of the *Dictum* states that whatever is said of a subject is said of all things that fall under this subject; the intensional version of the *Dictum* states that the attribute of an attribute is an attribute of the very thing the first attribute was an attribute of. These *Dicta* were considered so evident that they were used to argue for the "natural" aspect of syllogistic reasonings. LAP's principle, however, eliminates the need of the *dictorum*; I argue that the *dicta* rely on the notion of containment that anchors the principle, and that the notion of containment has more concrete evidence than the *dicta*. *Barbara*, which, according to Aristotle, was the most obvious and evident of all syllogistic forms, has its evidence demonstrated by means of spatial containment: if A belongs to all B, and B to all C, then A belongs to all C. The connection is "seen," for ABBC yields AC.

The principle also permits the evaluation of argument forms that are very complex, without necessitating a reduction to categorical propositions. Some of the complex propositions introduced by Arnauld and Nicole include propositional attitudes and propositions containing many-place relations. The results are not always conclusive, but

the reasoning behind the application of the principle to such propositions reveal aspects of a logical syntax of language. This aspect is further emphasized by the elimination of the concept of validity. A valid but unsound argument has no value for a Cartesian. Validity is concerned strictly with form, but for Arnauld and Nicole, form is abstracted from content.

The privileging of content over form also make a logic of terms prior to a logic of propositions. The general principle cannot govern sentential arguments; sentential arguments contain categorical propositions that are joined or disjoined to other categorical propositions by logical connectives. The truth-value of such propositions is no longer determined by the notion of containment, but by the truth-values of their components; likewise, the soundness of arguments containing propositions linked by logical connectives cannot be determined by containment, but must be determined by the truth definitions of the connectives. *Port-Royal* is aware of the distinction between term and sentence logic because it recognizes that the principle has no jurisdiction over sentential arguments. However, although the truth-value of a conjunction (for example) is determined by the truth-value of its conjuncts, Arnauld and Nicole would argue that the truth-values of the conjuncts is established on the basis of containment. Thus, containment is needed to assign truth values, and to evaluate the

soundness of all arguments.

Furthermore, an argument, which ukasiewicz offers to show that a logic of proposition is prior to a logic of terms, relies on the fact that conversions to the first figure of *Baroco* and *Bocardo* require a theorem of the logic of propositions. But, since *LAP*'s system makes the reduction superfluous, the theorem is no longer necessary. So much the better, then, for *Port-Royal*, who, by introducing a system making form an abstraction of the content of language, present an argument for a logical syntax of language. It is this feature that made modern linguists acknowledge the value of *LAP*, and made them hopeful that a more sophisticated grammar of language could yield a logic of language.<sup>28</sup>

### Conclusion

There are two views regarding the past: one may subscribe to the continuum view or to the picture of disconnected paradigms of history of logic. Between the two views, one feature seems fairly clear: some issues stubbornly resurface at different times and under different paradigms. A work on logic has historical weight if it

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<sup>28</sup>See for example Noam Chomsky's *Cartesian Linguistics*, Harper and Row, 1966.

offers innovative insight about these issues or if it points to the weakness of a coeval paradigm. *LAP* showed that the Aristotelian syllogistic was not enough, and that the notions of the *parva logicalia* needed to be disencumbered of their metaphysical trousseau and reintroduced into the logical debate. Instead of the paradigm of an artificial system, instead of the Aristotelian matrix, Arnauld and Nicole appealed to Cartesian common-sense, with which we are presumably all so equally endowed, and to the very evident notion of containment that anchors a Cartesian doctrine of ideas. The effort yielded insights into a logic of language. Instead of having an artificial system in need of interpretations, they had issues resulting from a deep analysis of language, an analysis, the success of which is owed to the original apparatus of *compréhension* and *étendue* introduced by the authors. This "sincere" approach, the result of combining a Cartesian doctrine of ideas with an analysis of language, brought surprising results that have been largely overshadowed by the dominant historical view that the seventeenth century is an interregnum in the history of logic.

## CHAPTER ONE

### THE IMPLICIT SCHOLASTIC LEGACY

#### 1. Introduction

A frequent post-Fregean criticism of *LAP* is that it overflows the limits of logic by admitting material that belongs to epistemology and psychology.<sup>1</sup> There is little doubt that the one factor most responsible for this admonition is the attempt by the Port-Royal authors to accommodate their system of logic to Cartesian ideas. Cartesian ideas are the essence of the mind, and that through which we know. But Cartesian ideas are also part and parcel of the "modernity" of the philosophy of the seventeenth century philosophy, for they embody the decisive rupture (initiated in spirit by the Humanists) from the

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<sup>1</sup>The most notable historians of logic who impute to *LAP* the trespassing of epistemology and psychology are: I.M. Bochenski, *History of Formal Logic*, (Notre Dame: Indiana Press, 1961), p. 258, "...permeated with a whole lot of non-logical philosophical ideas, psychologist in the worst sense..."; William and Martha Kneale, *The Development of Logic*, (Oxford: Clarendon, 1986), p. 316, "...it is the source of a bad fashion of confusing logic with epistemology..."

scholastic methodology, and they signal, while in the possession of Arnauld and Nicole, the beginning of a long weaning period from Aristotelian logic. In Descartes, *species, concepti, rationes, or formæ*, replace objects (*res*) as the starting point of all inquiries;<sup>2</sup> in the Cartesian logic of Arnauld and Nicole, the Aristotelian rules are stripped of their power, and are replaced by the rediscovered concepts of meaning and reference streamlined and unified under a notion of containment parasitic on the degrees of reality of ideas.<sup>3</sup> It is not clear how much Arnauld or Nicole knew about their scholastic predecessors-- they make frequent critical mentions of the "logic of the schools" (*la logique des écoles*,) but never cite any particular author. But it is clear that the semantic concepts, so much debated by the scholastics, are

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<sup>2</sup>It is an oversimplification to characterize the seventeenth century as making epistemology prior to metaphysics because ideas, the foundation of modern philosophy, cannot really be considered metaphysically, that is as the mode of a substance mind, without at the same time being considered epistemologically, that is to say as potential instruments of knowledge. The metaphysical idea contains the epistemological idea in the sense that if the former (or latter) is removed, the latter (or former) disappears; the containment reflects the relation of the formal reality of an idea to its objective reality. Analogically (perhaps) a mountain contains valleys.

<sup>3</sup>It is purely coincidental, or perhaps it is an indication of mankind's obsession with mereology, that Arnauld and Nicole spent most of their careers arguing that Jansenius' *Augustinus* did not contain the five heretical propositions that Cornet, the syndic of the Faculty of Theology of the Sorbonne, had alleged it did in July 1649.

reorganized under the notion of containment. This new organization, rather than the systems of *LAP*'s predecessors, with their widely acknowledged "ad hocity," attests to the fact that these concepts are indispensable in logical analyses.

This chapter briefly explains the old methodology, and suggests that the doctrine of supposition, that is to say the apparatus ancillary to the doctrine of consequences, and developed by the scholastics to resolve questions of meaning and reference, because of its enormous complexities, failed to provide a useful tool of analysis.

## 2. Scholastic methodology

The scholastic period spans from William of Sherwood (1200/10-1266/72) to Paul of Venice (1369-1429).<sup>4</sup> The "way of ideas" began with Descartes and ended with Thomas Reid (1710-1796) who, like Paul of Venice some four centuries earlier, gave an exhaustive summary of the individual doctrines of his predecessors. The works of Paul of Venice,

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<sup>4</sup>This period is sometimes referred to as *Logica Moderna*, contrasted with the *Logica Antiqua*. The latter was divided into two periods: the *logica vetus* which consisted mostly of commentaries on Aristotle's *Categories*, and *De Interpretatione*, and which included as its most notable representatives, Porphyry, Boethius, Augustine, and Anselm; and the *logica nova* of Abelard, Lombard, and the School of Chartres. The *logica nova* had acquired the remainder of Aristotle's works of the *Organon* from Islamic scholars.

and of Thomas Reid clearly confirm that the degree of complexity attained by the scholastics far exceeded the complexity attained by the way of ideas.

The doctrines of the properties of terms and of consequence, characteristic of the scholastic period, take their roots in the period's epistemology. For the scholastics, and speaking very generally, a word was imposed on an extra-linguistic entity, a linguistic entity, or a concept (intention or intelligible *species*.) The concept was transmitted to the mind from a physical object.<sup>5</sup> There were a great many variances among the authors as to what part of the object became the concept, and as to what part of the mind (or soul) the concept occupied. Be that as it may, once the object metamorphosed itself into a concept, the concept became a sign that bore some likeness to the physical object it was a sign of, so that concept and object shared *some* commonality. One tradition, represented by Avicenna (980-1037), Thomas Aquinas (1225-1274), and their followers, recognized two tiers in the concept: the first intention, that which is primarily known, is the natural sign of the extra-mental entity; the second intention, that

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<sup>5</sup>On the following discussion, I depend on the following: Joseph Owens' "Faith, Ideas, Illumination, and Experience," and Christian Knudsen's "Intentions and Impositions," in *The Cambridge History of Later Medieval Philosophy*, Norman Kretzmann, Anthony Kenny, Jan Pinborg, Eds., (New York: Cambridge U. Press, 1989); "History of Semantics" in *The Encyclopedia of Philosophy*, Paul Edwards Ed., v. 7, (New York: MacMillan, 1972), in particular pp. 369-375.

which is secondarily known, is the intellect in various modes of cognition. The modes of cognition are paired with the three operations of the mind: the second intention of universality (*genus, species, etc.*) was arrived at by abstractive apprehension (by successive steps of apprehension and abstraction); the second intention of predication was reached by the mental operation of judging; and the second intention of consequence was the product of the discursive operation. Since the domain of logic was thought to consist of universals, predication, and consequence, logic was the science of second intentions, and *a fortiori, a scientia rationalis.*

Another tradition that was explored and inchoate in the twelfth century, was elaborated and perfected in the thirteenth and fourteenth centuries; it consisted of shifting the focus from first and second intentions to terms.<sup>6</sup> It evolved from the need to keep the doctrines of impositions and intentions separate; the fact that first and second intentions were "imposed" names often resulted in a conflation of the two doctrines. William of Ockham (1285-

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<sup>6</sup>Peter Abelard (1079-1142), who is thought to have studied under the radical nominalist Roscelin of Compiègne (b. 1045), is generally credited with initiating the shift. While Roscelin argued that universals were mere acoustic blasts (*flatus vocis*), Abelard countered that mere noises, that is physical things, could not be the proper subject of logic; he suggested instead that words (*sermones*), that is syntactically and semantically meaningful noises, become the proper subject of logic.

1349), and others after him, downplayed the rôle of intentions, and concentrated on terms as signs of objects. An intention was a natural sign of either something other than a sign, or of a sign, and was part of a mental proposition. But a term is a sign of an intention that is a sign of a physical object, so, Lambert of Auxerre argued, since the cause of the cause of an event can be said to be the cause of that event, the sign of the sign of a thing can be said to be the sign of that thing.<sup>7</sup> Terms, then, are signs of the physical objects, and the concerns of logic, which is then fittingly called a *scientia sermocinalis*.

As terms are imposed, they acquire signification. Signification is the natural property of a categorematic term (a term that has a meaning in isolation,) and it is from this property that all other properties are derived. Syncategorematic terms like logical connectives, prepositions, and articles, on the other hand, only acquire meaning or signification by being joined to a categorematic term. Most late medieval discussions hovered around the overworked derived property of supposition (*suppositio*), the property a term acquires in virtue of its position or rôle in a proposition.

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<sup>7</sup>Lambert of Auxerre's "Properties of Terms," in *The Cambridge Translations of Medieval Philosophical Texts*, v. 1, *Logic and the Philosophy of Language*, Norman Kretzmann, Eleonore Stump, Eds., (New York: Cambridge U. Press, 1988), p. 105.

### 3. Supposition and Reference

Although a few scattered logicians continued to include discussions of the doctrine of supposition in their works, interest in the doctrine dramatically waned in the sixteenth and seventeenth centuries.<sup>8</sup> This is not to say that post-scholastic logicians were unaware of it, or that its language had completely disappeared. In what may be construed as a sort of slip, Charles Walon de Beaupuis<sup>9</sup>, the future director of the "*Petites Ecoles de Port-Royal*," defending his Sorbonnic *licence* in 1648, was asked by Arnauld, who was then his professor, whether a universal was a sign that represented "personally."<sup>10</sup> The deep impression that the doctrine of supposition in general had left, the alleged resemblance of simple and personal supposition to Arnauld and Nicole's doctrine of *compréhension* and

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<sup>8</sup>E.J. Ashworth, in "The Doctrine of Supposition in the Sixteenth and Seventeenth Centuries," *Archiv für Geschichte der Philosophie*, v. 51, nr. 3 (1969), gives a thorough account of the doctrine at that time.

<sup>9</sup>Walon de Beaupuis (1621-1709) was one of the most liked *solitaire* of Port-Royal. He studied rhetoric in a Jesuit school and later studied theology under Arnauld at the Collège du Mans. He joined the Jansenist group after reading Arnauld's *La Fréquente Communion*. He was ordained a priest in 1666. He met Descartes on behalf of Arnauld in 1644 and was present at the death of Pascal.

<sup>10</sup>"*Quid igitur universale? Vel signum, quod sine sui variatione, personaliter, & immediatè multa singularia repræsentat.*" *Les Oeuvres de Messire Antoine Arnauld (OC)*, v. 38, 1 (Lausanne: Sigismond d'Arnay) underlining mine)

*étendue*<sup>11</sup>, and above all the distinctness of the methodologies between Aristotelian distribution, Scholastic "determination or mere confusion" and Port-Royal "universality" introduced to describe reference, justify a mention of its cumbersome working.

The many doctrines of supposition that permeated the logical sums of the two centuries between William of Sherwood and Paul of Venice are that many attempts to give an exhaustive division of all the possible referents a significative term that is part (subject or predicate) of a proposition can have. Naturally, the ontological identity of the sum's author played a rôle in the configuration of the division; realists like William of Sherwood and Walter Burleigh (1275-1343) divided proper supposition (non-figurative) into material and formal, and formal into personal and simple; nominalists like William of Ockham and John Buridan (1295-1356) left out the sub-classification of formal supposition, and favored a tripartite division between material, personal and simple. Proper supposition was either, material or formal or material, simple or personal.<sup>12</sup> The principal dichotomy amounts to saying that

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<sup>11</sup>Kretzman, in the entry "History of Semantics" in the *Encyclopedia of Philosophy* compares Port-Royal's *compréhension* to the scholastic "simple" supposition, and *étendue* to "personal supposition."

<sup>12</sup>In the *Fourth Reply*, Descartes explains to Arnauld that ideas have two unseparable aspects: they are to be viewed both materially (*materialiter*), that is to say as a

terms in proposition can be used or mentioned, they can stand for something other than themselves, or for themselves. The apparently similar notions of the accepting of A for B, A standing for B, A taking the place of B, are introduced to explain the intransitive and transitive uses of the verb '*supponere*,' and are at the heart of all the doctrines: "Supposition is the acceptance of a substantival term for something." (Peter of Spain, *Summalæ Logicales*, Tract VI, 3); "'Man' can, nevertheless, supposit for Socrates, and for Plato, and for *man* [what 'man' signifies]." (Lambert of Auxerre, *op. cit.*, p. 106); "Supposition is said to be a sort of taking the place of another." (William of Ockham, *Summa Logicæ*, Part I, 63). The suppositing relation was also explained by a rule of substitution: all true propositions could be transformed to an equivalently true proposition by a "descent to particulars": "But supposition as it is here used is the taking of a term in a proposition for some thing or things, in such a way that if that thing or those things are indicated by the pronoun *this* or *these*, or the equivalent, then that term is truly affirmed of this pronoun, by the mediation of the copula of the proposition." (Buridan,

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modification of the mind, and formally (*formaliter*), i.e., as having representative content. The duality of matter and form stubbornly carves the epistemological foci of philosophical periods until Kant: physical objects for Aristotle; terms for the Scholastics; and ideas for Descartes and his followers.

*Sophisms on Meaning and Truth* (100), Meredith, NY, 1966). Thus, the terms *cats* and *feline animals* in the true proposition 'Cats are feline animals' supposit in the sense that the proposition can be transformed into the following types of true propositions: (1) 'Gaia and Finistère are feline animals,' where *Gaia* and *Finistère* are the names of my cats; (2) 'These are feline animals,' pointing to *Gaia* and *Finistère*; (3) 'Cats are this feline animal, or that feline animal,' pointing to any cat (or cats).

There is little doubt that the doctrines of supposition capture semantic features that are essential to the process of validating inferences; it does so, however, at the cost of contortional difficulties. But more precisely, it cannot really be said that the same kind of relation (the same relational phenomenon) takes place when a term supposits materially, and when it supposits formally. And moreover, the descent to particulars, in the case of personal supposition in quantified propositions, privileges the separate analyses of the suppositions of subjects and predicates, rather than their combined analysis. The separate *supposita* of 'S' and of 'P' in the proposition 'All S is P' are clearly detailed by all the authors, but the copulating of the two *supposita* is never outlined, so that some immediate inferences (conversion, obversion, etc.) are difficult to validate. Finally, there is no exact way to determine the precise nature of the *suppositum*, so that

questions of metaphysics often overshadow questions of logic.

a. Material supposition

What does the relation of supposition precisely mean? When a term supposits formally (personally), it takes the place of its signification (*supponit suum significatum*), in the sense that, were the signification present one could point to it and affirm the predicate of it. In the case of formal supposition, the relation of *standing for* does not overwhelm as much as the gordian knot into which the precise nature of the *suppositum* translates itself. But it does appear that in the case of material supposition, the relation of suppositing does not work the same way as in the case of formal supposition.

For William of Sherwood, a term supposits materially when it stands for its sound (*supponit pro ipsa voce absolute*), or both for its sound and its signification (*pro ipsa dictione composita ex voce et significatione*).<sup>13</sup> For example, the term *man* in the propositions: (1) '*Man*' is monosyllabic, and (2) '*man*' is spelled M-A-N, stands for the sound '[mæn]'; and in the proposition: (3) '*man*' is a noun,

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<sup>13</sup>It must be noted that in the case of material supposition, the verb *supponere* is used intransitively, and that in the case of formal (personal) supposition, it is used transitively.

it stands both for the sound and its signification. *Prima facie*, the distinction seems to be justified because propositions (1) and (2) do not require a meaningful subject in order to be true or false, whereas (3) does; the proposition (4) '*ghoti*' *is monosyllabic* is true, but '*ghoti*' *is a verb* (or any part of speech) is false.<sup>14</sup> However, the distinction may be challenged if the relation of *standing for* is taken seriously. Furthermore, if the distinction is grounded on meaningfulness, it may also be questioned because supposition presupposes signification; a meaningless utterance cannot possibly supposit. Finally, in the case of the *pro ipsa voce absolute* supposition, it remains to be seen whether the signification of the word *man* can be completely ignored in (1) or (2), and precisely how it is necessary in (3).

The distinction does not fare as well, if the relation of *standing for* is given the focus. Does it make sense, in the case of (1) and (2), to say that the English sound '[mæn]' stands for, takes the place of, supposits for, itself? This does not seem to be the nature of the relation of *standing for*; an actor stands for the character he portrays (even if he portrays himself, he portrays a

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<sup>14</sup>My first grammar school English teacher demonstrated the intricacies of English pronunciation by arguing that the word *ghoti* could be pronounced '[fiʃ]' if the 'GH' was pronounced as in *rough*, the 'O' as in *women*, and the 'TI' as in *nation*.

character), but if he stands for himself, he no longer acts. In general if A stands for B, it is because B cannot be present, a deputy stands for the sheriff, if the sheriff is absent. Sherwood tries to meet the challenge by making the distinction less rigorous, and correctly arguing that a term always totes along its significatio. So that in cases like (1) and (2) the subject of itself does not stand for its sound, but acquires this additional function by virtue of its being joined to this particular kind of predicates.<sup>15</sup> In other words, *man* in (1) and (2) does not properly speaking supposit for its sound, it does so after it has been joined to the predicate. If the predicate is a quality of sounds, then the subject, besides conserving its conventional significatio, also stands for the sound it makes when uttered in the English language. But unfortunately Sherwood's strategy leads to a confusion between significatio and suppositio. Sherwood lets the reader believe that terms continue to "present their significatio" (*suam significatum præsésentant*) when they are joined to predicates.<sup>16</sup> Significatio enables a term to

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<sup>15</sup>"...quia dictiones semper suam significatum præsésentant quantum de se est, et si præsésentant suam vocem, hoc est non secundum se sed adiunctione cum prædicato." Cited in Kneale and Kneale, *op. cit.*, 254.

<sup>16</sup>In the distinction *pro ipsa voce absolute/pro ipsa dictione composita ex voce et significatio*, Sherwood uses the noun '*significatio*,' whereas in this quote, he uses the past participle form '*significatum*,' suggesting that the *significatum* is the *suppositum*.

stand for a *suppositum* while it is embedded in a proposition, but a term cannot properly stand for (supposit) its signification. An ambassador does not stand for his portfolio, after a portfolio enables him to stand for his government in a foreign country. In addition, if a term can supposit for its signification, that term would have supposition prior to its being embedded in a proposition, a view that is contrary to standard doctrines of supposition. Finally, the strategy imposes a double supposition, namely signification and sound.<sup>17</sup> It now appears that many terms could have multiple supposition, because Sherwood does not give precise ways to decide which predicates do not concern the intrinsic qualities of words. This consequence unduly burdens the task of the logician.

It seems that it would have been easier for Sherwood to eliminate the relation of suppositing in the case of the sound '[mæn].' What I think Sherwood needs to say is that supposition does not properly belong to the word *man* but to the elided word *sound*; (1) and (2) should really have as a subject *The English sound '[mæn]'*, where *sound* has personal supposition because the sentence can be turned into *This English sound '[mæn]' is monosyllabic.*

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<sup>17</sup>Acronyms appear to be a case of legitimate double supposition. USA stands for the United States, and for the words *united*, *states*, and *america*. But although the language of modern society delights and overindulges in their uses, the language of the Middle Ages seems to ignore them.

It is probable that Sherwood did not wish to recognize the elision because supposition presupposes signification, and has, therefore, no *raison d'être* in the midst of meaningless sounds. The problem with this view is that propositions like (4), and *a fortiori* propositions like *The English word 'ghoti' is pronounced by the sound '[fi]'* are eliminated from our language, in spite of their informativeness. This would also mean that the doctrine of supposition, by presupposing that all the elements of a proposition have signification, does not permit our language to discriminate between significative and non-significative utterances. More damaging to Sherwood, however, is the fact that the new strategy of having a term constantly tote along its signification nullifies the distinction between *pro ipsa voce absolute* and *pro ipsa dictione composita ex voce et significatione*, since it cannot be said that the subject in (1) and (2) only supposits for itself. Perhaps Sherwood was too quick in making the distinction, and he may have vacillated as to whether meaningful terms could ever be entirely divorced from their signification.

The Kneales (*op. cit.*, 254) argue that propositions like (1), (2), and (3) are tantamount to a drill sergeant ostensibly showing a recruit how to salute. Since the drill sergeant does not wish to be respectful to the recruit, the salute cannot conserve its conventional

signification. I agree that the sergeant does not wish the salute to have its conventional meaning, but the salute is being taught to the recruit because of what it means, and it is as unlikely that its signification can be entirely ignored from the ostensive definition, as the meaning (value) of a one hundred dollar bill can be ignored while it is being burnt in New York in order to demonstrate the flammability of paper. The same can be said, albeit with less drama, about the meaning of *man* in utterances (1) or (2). Similarly, anyone hearing (4) is likely to ask for the meaning of *ghoti*. In all these examples, the ostensive definitions or demonstrations inevitably accomplish more than what is implied by a definition or demonstration. It is therefore doubtful that, even when the signification of a meaningful term is not in question, this signification can be entirely ignored.

In the case of proposition (3) '*Man*' is a noun, it is evident that, for a medievalist, the signification of *man* must be known in order for anyone to attribute nounhood to it--the explanation of the grammarians of the Middle Ages, namely that substances were indicated in language by nouns, went (as far as I know) unchallenged. In (3), as in (1) and (2), it is not *man* doing the suppositing, but an elided word, in this case the word *word*. The word *man* (or sound '[mæn]') can be pointed to, and the proposition *This is a noun* affirmed.

The foregoing discussion not only shows that Sherwood's distinction *pro ipsa voce absolute/pro ipsa dictione composita ex voce et significatione* is at best precarious, but also that the distinction between material and formal supposition is superfluous. All that is needed in order to understand the supposition of (1,) (2,) and (3) is to recognize that their subjects are abbreviated expressions, and that their unabbreviated versions have conventional personal supposition. The often *ad hoc* solutions to the complications arising from the material/formal distinction of the doctrines of supposition seem to be an effort to combine an Augustinian doctrine of sign with a doctrine of reference. In a doctrine of sign, the emphasis is placed on the fact that a sign stands for something more than itself; in a doctrine of reference, the emphasis is placed on the fact that a term is supposed to stand for something other than itself.<sup>18</sup> Of course, terms are signs, but they are

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<sup>18</sup>Augustine's well-known definition confirms that a sign never ceases to be what it is besides uncovering something else: "*Signum est quod, præter species, quas ingerit sensibus, aliquid aliud facit in cognitionem venire.*" (*De Doctrina Christiana*, II,I). Of course, it may be argued that a term never completely abandons its intrinsic qualities (e.g., phonetics and scansion), and this is why similar states of affairs are described "better" in one language than in another. But these texts are primarily evaluated on the basis of their expressiveness rather than on the basis of their informativeness. The logicians and philosophers of language under consideration here were concerned about scientific treatises (Aristotle,) and religious texts (Medievalists and Arnauld.) A scientific treatise ideally strives for clarity of information that is achieved by referentiality; on the other hand, the inherent

arbitrary signs (unless they are onomatopœias), and as such their intrinsic properties are separate from their referential function. I cannot talk about the word *man* without keeping man in mind, but I can certainly talk about man without being irresistably drawn towards the monosyllabism or towards the syntactic function of the sound '[mæn].'

b. Formal supposition

The relation of *suppositing* is not as problematic in the case of formal supposition; a term is said to stand for what it signifies, or a term is used in lieu of its *suppositum*. In a world where only two cats of the same subspecies exist, the term *cat* supposits, or stands for, or is used in lieu of, Gaia and Finistère. Since most worlds count more than two cats, the term *cat* is introduced for convenience of speech; acronyms similarly relieve the clutter of speech, when many words are needed to describe an organization. The difficulty of formal supposition resides in the exact nature of the *suppositum*, not only from an ontological, but also from a logical point of view. All divisions recognize that a term does not always have individual(s) under it, in which case it may stand for a

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obscurity of religious texts demands that "experts" strive to clarify them to the "uninformed" reader.

concept of the mind (*intentio animæ*), which is a sign of something else, or it stands for the presentation of some form to the intellect (*præsentatio alicuius formæ ad intellectum*). The realist Sherwood, who holds the latter view, divides formal supposition into simple (*simplex*), and personal (*personalis*); the nominalist Ockham, who follows the first view, makes no mention of formal supposition, and only considers simple and personal suppositions. *Grosso modo*, personal supposition obtains when a term stands for individual things (persons,) and simple supposition obtains when a term does not have any individual things (persons) which it can be said to stand for. On closer scrutiny, however, the various doctrines conceal many obscurities.

### c. Simple Supposition

The interpretations of the following propositions, borrowed from Sherwood and from Ockham, attest to the confusion. The bold italicized terms have simple supposition:

- (5) ***Man*** is a species.
- (6) ***Man*** is the most dignified of creatures.
- (7) That ***man*** is an animal is a true proposition.
- (8) ***Pepper*** is sold here and in Rome.<sup>19</sup>

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<sup>19</sup>*Homo est species; Homo est dignissima creaturarum; Hominem esse animal est propositio vera; Piper venditur hic et Romæ.*

The term *man* in (5) and (6) cannot have personal supposition because the former does not imply that Socrates (any typical individual) is a species, and the latter does not imply that Socrates is the most dignified of creatures. For Ockham, *man* is a term that supposits for an intention of the soul in (5)<sup>20</sup>, and (6) has personal supposition, and is false; for Sherwood, (5) is a "manerial" supposition (*suppositio manerialis*) because it supposits for the very manner of the species as it dwells in the intellect (*pro ipsa manerie speciei*), and (6) supposits for the species as it dwells in individual men.<sup>21</sup>

(7) is not mentioned by Sherwood, and turns out problematic for Ockham because it is not clear what precise term Ockham intends to do the suppositing. Michael Loux, in his translation of the *Summa Logicæ*,<sup>22</sup> makes it look as if the clause *that man is an animal* is doing the suppositing, while Carlos Dufour makes it clear that only the term *man* is

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<sup>20</sup>For Ockham, as for most medievalist logicians, there were three levels of language: the mental, which was the same for all speakers; the verbal, and the written. The written was a sign of the verbal, the verbal was a sign of the mental, and the mental was a sign of something else.

<sup>21</sup>William of Sherwood, *Introduction to Logic*, tr. by N. Kretzmann, (Minneapolis: U. of Minnesota Press, 1966), pp. 111-12.

<sup>22</sup>*Ockham's Theory of Terms, Part I of the Summa Logicæ*, (Notre Dame: U. of ND Press, 1974), p. 198.

under suppositing consideration.<sup>23</sup> According to Dufour, then, (7) is interpreted as an indirect statement; this interpretation is consistent with the Latin and English constructions of the sentences. In this reading, the term *man* loses its customary reference, but gains reference to a concept of the mind. The switch resembles, in form only, a Fregean maneuver; the resemblance does not affect the content because Fregean *Sinne* are not *intentiones animæ*. And moreover, there is a difference between the canonical indirect statement *S believes (says) that P*, and the statement *It is true that P*. The first statement can be true even if P is false precisely because the subject of the that-clause does not have its customary reference. On the other hand, if the second statement is true, P must be true. In order for P to be true, it would make little sense to say that its subject does not have its customary reference.

Ockham's Latin text<sup>24</sup> cannot decisively resolve the issue because the manuscripts on which it is based did not adopt a rigorous convention regarding the use or mention of terms. For what it is worth, it favors Loux' reading. Ockham distinguishes between the written proposition "*Hominem currere*" *est verum*," and the mental proposition

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<sup>23</sup>"Die Lehre der *Proprietates Terminorum*," *Philosophia Verlag*, 1989.

<sup>24</sup>*Summa Logicæ, Pars Prima*, P. Boehner, Ed. (St. Bonaventure: 1951), pp. 186-187.

'*Hominem esse animal est propositio vera,*' [sic for quotation marks]. In the first example, Ockham argues that the subject *Hominem currere* supposits for the sentence *Homo currit*, but does not signify it ("*illiud subjectum 'hominem currere' non supponit pro se, sed supponit pro ista propositione: 'homo currit,' quam tamen non significat.*") In the second example, he unfortunately does not spell out what precisely does the suppositing, but he says that it supposits for a concept of the mind without signifying what that concept means: "*quandoque autem supponit pro alia intentione animæ, quam tamen non significat, sicut in tali propositione mentali: 'Hominem esse animal est propositione vera'.*" (187) The editor's quotation marks seem to suggest that the entire proposition stands for a concept of the mind. But the Latin does not support this version, because the sentence would read something like: '*Veram propositionem esse hominem animal esse.*' It makes sense to say, then, that the that-clause of (7) is what does the suppositing, and it supposits for the mental concept itself that has been stripped of its customary signification. In fact, Ockham argues that in the case of personal supposition, subjects and predicates comprised of more than one word (*extrema propositionis*) cannot be taken apart: the entire expression *white man* in the proposition *a white man is an animal* does

the suppositing.<sup>25</sup>

The last example is from Sherwood. It seems strange that in this proposition, the term *pepper* would be denied its customary personal supposition. The proposition suggests (to me as well as to Ockham) that some pepper is sold here, and some other in Rome. However, if the proposition is translated into first order symbolism, the result

$$(\exists x)(\exists y)[(Sx1 \wedge Syr) \wedge x \neq y]$$

can hardly be instantiated, and be given an intelligible interpretation, unless every grain of pepper is individualized. At least one pepper is sold in London according to 'Sal,' but what is *a*? It is no surprise, then, that Sherwood rejects a personal supposition interpretation of (7). He argues that the supposition of subjects occurring in particular sentences is unfixed (*vaga*), meaning that no determined individuals can be assigned under it. As a result, instead of having personal supposition, the term stands for the species (the signified form of the thing as opposed to the things bearing the form) that is common to all the individuals. This explains why (7) cannot be

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<sup>25</sup>"*Per illam particulam 'extremum propositionis' excluditur pars extremi, quantumcumque sit nomen et categorema; sicut hic: 'Homo albus est animal,' nec 'homo' supponit, nec 'albus' supponit, sed totum extremum supponit.*" (*Summæ Logicæ*, I, 69, 16-19)

faithfully translated into first order logic.<sup>26</sup>

Sherwood properly recognized that in some cases a term cannot supposit for individuals, even though the proposition in which it is embedded seems to suggest that it does.

There are many other such propositions--'Rabbits make good civets', for example--which continue to offer challenges to the quantification theorist.

Unfortunately, Sherwood goes too far when he applies the same simple supposition analysis to propositions like 'woman, who has damned, has also saved' (*mulier quæ damnavit salvavit*,) and 'this plant grows here and in my garden.' Under simple supposition, the first proposition is to be understood as signifying that it is in the form (nature) of womanhood to damn and save, but that hardly seems to be the intended reference. Such simple supposition gives *mulier* a metonymic or autonomastic meaning, and this figurative use of language was excluded from proper supposition by all logicians of the period.<sup>27</sup> For the Christian Sherwood, it must have been evident that *damnavit* and *salvavit* did not have the same subject, and that Eve and Mary were the respective personal *supposita* of each. Contrary to (7,) this proposition can be accurately translated into first

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<sup>26</sup>This strategy, as will be shown, is mimicked by Arnauld and Nicole.

<sup>27</sup>Walter Burleigh (1275-1343), and John Buridan (1295-1358) make explicit mention of improper supposition.

order symbolism as

$$(\exists x)(\exists y)\{(\forall z)(Dxz \wedge Syz) \wedge x \neq y\}$$

and  $x$  and  $y$  can be instantiated. In the second proposition, the demonstrative has a faux-deictic function; it purports to point to a particular token of a plant when in fact it points to a type. But types, having no spatial claims, cannot be shown. So, if *plant* has simple supposition, the demonstrative loses its deictic function; if *plant* has personal supposition, the demonstrative's function is saved, but the proposition is false. Sherwood opts for the first alternative.<sup>28</sup>

#### d. Personal supposition

This is by far the most interesting case because it draws valuable distinctions in the Aristotelian doctrine of distribution, and it is that part which most resembles our modern first order quantification theory.<sup>29</sup> A proper name,

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<sup>28</sup>Arnauld and Nicole, in an effort to reconcile the transsubstantiationist interpretation of the Eucharistic statement *Hoc est enim corpus meum* with their semantics, gave the demonstrative *hoc* the autonomous meaning of thing present (*chose présente*), but Arnauld's *hoc* is a pronoun--it stands for a noun-- whereas Sherwood's *this* is an adjective--it modifies *plant*.

<sup>29</sup>This is Boehner's argument in *Medieval Logic*.

like a constant, stands for one individual; a general name stands for as many individuals as the quantifier suggests. For Sherwood and Ockham, personal supposition is either discrete (*discreta*) or common (*communis*.) All proper names and properly deictic demonstrative adjectives have discrete personal supposition. And both Sherwood and Ockham divide common personal supposition into confused (*confusa*) and determined (*determinata*)

A. *Confusa*

*confusa tantum: (merely confused)*

*Omnis homo est animal*

*Confusa distributiva: (distributive)*

*mobilis*

*Omnis homo est animal*

*immobilis*

*Tantum omnis homo currit (Sherwood)*

*Omnis homo præter Sortes currit (Ockham)*

B. *Determinata*

*Homo currit (Sherwood)*

*Homo est animal (Ockham)*

Using the Aristotelian jargon, it turns out that only the predicate of a universal affirmative has "merely confused" supposition; the subjects of universal affirmative and negative, and the predicates of universal and particular negatives have "mobile distributive" supposition; the subject of an affirmative exceptive has "immobile distributive" supposition, and the subject and predicate of

particular affirmative have "determined" supposition. But in Aristotelian logic, "merely confused" and "determined" terms are both placed in the same class of "undistributed" terms. What, then, did supposition theory wish to stress that Aristotelian logic overlooked?

Let the notation  $\tau_{s_1}$  be used to identify the supposition of a term, and let conversion *per accidens*, be recognized as the rule that permits the inference from *All  $S_{s_1}$  is  $P_{s_1}$*  to *Some  $P_{s_2}$  is  $S_{s_2}$* . In the process of this inference, the supposition of P changes from "merely confused" to "determinate," and that of S changes from "distributive mobile" to "determinate."  $S_{s_1}$  is the only term about which precise information regarding its quantity (distribution or personal supposition) is available; the universal predicative proposition tells that all things that are S are also P, and that there are things that are P that are not S, but the exact quantity of P's that are not S's is not known. What happens to  $P_s$  in the conversion? If it is argued that conversion *per accidens* preserves the quantity of P, then  $P_{s_1} = P_{s_2}$ ; if this equality obtains then  $S_{s_1} = S_{s_2}$ , since the quantity of  $P_{s_1}$  is determined by that of  $S_{s_1}$ , and that of  $S_{s_2}$  is determined by that of  $P_{s_2}$ . Furthermore, since the inference from *Some P is S* to *Some S is P* is legitimate, the following undesirable result seems, in some instance, inevitable

$$\text{All } S_{s_1} \text{ is } P_{s_1} \approx \text{Some } S_{s_2} \text{ is } P_{s_2}.$$

This equivalence could happen only if the universal affirmative lost its predicative force, and gained the status of equivalence. It is well known that the medievals validated the inference from a universal proposition to a particular one, but not the converse. *Prima facie*, therefore, if it makes no sense to argue that  $P_{s1} = P_{s2}$ , and that no inference from a lesser quantity to a larger one can be deductively validated, then it must be the case that  $P_{s2} < P_{s1}$ , and the scholastics are intuitively correct in wishing to call for a "*Distinguēmus!*" between the two undistributed suppositions.

The distinction made sense to Ockham because some inferences from "merely confused" suppositions are possible that are not from "determinate" suppositions, and *vice versa*. But one feature that the distinction accomplished, and that remained, as far as I know, unacknowledged by Ockham and other medievals, is that it invalidated conversion *per accidens*. Conversion *per accidens* is not a valid inference in modern quantification theory for two reasons that justify denying existential import to universal propositions: (1) it sometimes makes sense to generalize about non-existents, for example, one way to insure that the class of cheaters in a competition remains empty is to warn that it is true that all cheaters are disqualified; and (2), if universal propositions had existential import, generalizations about non-existents would have to be false, and that would make

their contradictory, which asserts that at least one non-existent exists, true. For Ockham, the conversion turns out not to be a valid inference in virtue of the meaning of the logical connective that explicates the supposition of the terms. The medievals gave the same "truth-table" definition of logical connectives as post-Wittgenstein logicians, so that, given a finite universe of discourse, instantiated first order quantified propositions can be compared with propositions that have their suppositions explicated. In first order theory, the instantiation of the universal formula

$$(\forall x)(Mx \supset Ax)$$

takes the following form

$$(Ma_1 \supset Aa_1) \wedge (Ma_2 \supset Aa_2), \dots, \wedge (Ma_n \supset Aa_n).$$

The form underlines the unseparability of the subject (antecedent) from the predicate (consequent.) Although the medievals' supposition apparatus is only used to handle one term (subject or predicate) at a time, there is no reason to deny that the two *supposita* can then be linked together. The supposition of the subject of the proposition

(9) All men are animals

yields

a<sub>1</sub> (or this man) is an animal,  
 and a<sub>2</sub> (or that man) is an animal,  
 and a<sub>n</sub> (that other man) is an animal,<sup>30</sup>

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<sup>30</sup>Thus, the subject in 'Everyman is an animal' supposits confusedly and distributively, for the following inference

or, using first order symbolism

$$(10) Aa_1 \wedge Aa_2, \dots, \wedge Aa_n.$$

The "merely confused" supposition of the predicate of (9), in turn yields

$$(11) \text{All men are } a_1 \text{ (this animal),} \\ \text{or } a_2 \text{ (that animal),} \\ \text{or } a_j \text{ (that other animal).}^{31}$$

And the joining (the joint is predicative) of (9) and (11) yields the following

$$a_1 \text{ (or this man), and } a_2 \text{ (or that man), and etc.} \\ \text{are} \\ a_1 \text{ (or this animal), or } a_2 \text{ (or that animal), or etc.}$$

or

Socrates (who is a man), and Plato (who is a man), etc.   
 are   
 Socrates (who is an animal), or Plato (who is an animal),...

or

$$(12) Ma_1 \wedge Ma_2, \dots, \wedge Ma_n \text{ are } Aa_1 \vee Aa_2, \dots, \vee Aa_j.$$

where the same name names a man and an animal. In a world where there are only four animals, two of which are men, and

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is good: everyman is an animal; therefore this man is an animal, that man... (and so on for all the relevant particulars). [*'Omnis homo est animal, igitur iste homo est animal, et ille' et sic de singulis;*]" *Summa Logicæ*, Pars Prima, 70, pp. 70-71.

<sup>31</sup>"For example, in the proposition 'Everyman is an animal', the word 'animal' has merely confused supposition; [for] the following is a good inference: everyman is an animal; therefore, everyman is this animal or that animal or that...(and so on for all the relevant particulars) [*quia bene sequitur: 'Omnis homo est animal, igitur omnis homo est hoc animal vel illud' et sic de singulis*]" *Summa Logicæ*, Pars Prima, 70, pp. 51-52, 58-59.

the other two cats, the following proposition is true

The men (Socrates and Plato) are the animals (Socrates  
or Plato or Gaia or Finistère).

The function of the copula in (9) is clearly predicative; animality is said of mankind. The function of the copula in (12) is not so clear. It could be interpreted as the copula of identity, since Socrates (the man) is identical to Socrates (the animal) or Gaia (the animal). So that the descent to particulars performs some alteration on the meaning of the copula.

The converse *per accidens* of (9) is

Some animals are men,

which yields the following *supposita*

$$(13) (Aa_1 \text{ is } Ma_1) \vee (Aa_1 \text{ is } Ma_2) \vee (Aa_1 \text{ is } Ma_n) \vee \\ (Aa_2 \text{ is } Ma_1) \dots^{32}$$

If the copula of (12) is interpreted as ' $\supset$ ', and that of (13) is interpreted as ' $\wedge$ ', then (13) does not follow from (12), and conversion *per accidens* is not valid.

Furthermore, if the predicate of (9) had been given

"determinate" (instead of "merely confused") supposition, it would have been given the following supposition

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<sup>32</sup>"Therefore, in the proposition 'A man is an animal', both extremes have determinate supposition; for the following is a good inference: a man is an animal; therefore this man is an animal or that man...(and so on with all the relevant particulars). [Likewise], the following is a good inference: a man is an animal; therefore, a man is this animal or a man...(and so on with all the relevant particulars)." *Summa Logicæ, Pars Prima*, 70, pp. 33-36, 37-39.

(14) All men are  $b_1$  (this animal),  
 or All men are  $b_2$  (that animal),  
 or All men are  $b_n$  (that other animal).

(11) and (14) are respectively translated into first order symbolism as

(11')  $(\forall x)[Mx \supset (x=b_1 \vee x=b_2, \dots, \vee x=b_n)]$   
 (14')  $(\forall x)(Mx \supset x=b_1) \vee (\forall x)(Mx \supset x=b_2), \dots, \vee (\forall x)(Mx \supset x=b_n),$

but only (11') can be derived from (14')--it is a version of the well-known theorem of logic

$$\vdash \{[(\forall x)\Phi x \vee (\forall x)Yx] \supset (\forall x)(\Phi x \vee Yx)\}^{33}$$

but (14') cannot be derived from (11'), and consequently it appears that the medievals were justified in distinguishing between the suppositions of two undistributed terms.

Exceptive propositions, those whose subjects have "immobile distributive" supposition present problems to both the medievals, and to the modern quantification theorists. The canonical exceptive proposition

Everyone, except employees are eligible,  
 is generally given the following logical analysis

(15) All and only non-employees are eligible.<sup>34</sup>

But modern quantification theory cannot precisely capture obversion; the propositions 'No employees are eligible,' and 'All employees are non-eligible' are both translated

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<sup>33</sup> $(\forall x)[(Mx \supset (x=a_1 \vee x=a_2, \dots, \vee x=a_n))] \approx$   
 $(\forall x)[(Mx \supset x=a_1) \vee (Mx \supset x=a_2), \dots, \vee (Mx \supset a_n)].$

<sup>34</sup>Since it means that all non-employees are eligible, and that no employees are eligible. The second proposition, by successive steps of conversion and obversion, means that all eligible persons are non-employees.

$$(\forall x)(Fx \supset \neg Gx),$$

unless the predicates 'eligible' and 'non-eligible' are given meanings independent of each other, in which case both propositions lose their logical connection of equivalence. For Ockham and the medievals,<sup>35</sup> the canonical exceptive proposition was

(16) Everyone, except Socrates, runs.<sup>36</sup>

In this case the exception is a singular term instead of a common term, and as a result, a translation similar in form to (15) is not possible. Ockham claims that, although the descent to particulars is possible, i.e., 'Plato runs, Aristotle runs, etc..', "the exceptive expression with its object" (*dictio exceptiva cum parte extra capta*, *Summa Logicæ*, 1, 70, 86-87) which is present in the exceptive proposition, is lost in the valid descent to particulars. It seems possible to remedy the loss by requiring the descent to particulars to include the exception. For example, the following proposition would follow from (16): 'Plato runs and Socrates does not run, and Aristotle runs and Socrates does not run, etc.' Each conjunct of the long

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<sup>35</sup>p. T. Geach's suggestion that the medievals' exceptive propositions could have been their way to articulate a definite description--"for "Every A except  $a_1$  is P" is, as they interpreted it, tantamount to " $a_1$  is the one and only A that is not P"." *Reference and Generality*, (Ithaca: Cornell U. Press, 1962), p. 103--does not work when the exception is not a singular term.

<sup>36</sup>"*Omnis homo præter Sortem currit.*"

conjunction needs to include the exception. Successive applications of conjunction elimination eventually yields that Plato runs, but 'Plato runs' is a further inference from the exceptive proposition. The situation is similar in the case of a universal affirmative; the proposition 'All men run' says more than 'Plato runs', but the latter is not an immediate inference from the former.

The one positive contribution to logic that exceptive propositions seem to have made lies in the demonstration that singular propositions are neither like particular, nor like universals. Sherwood argued that the exceptive proposition (16), if true, showed that first, both universal propositions 'All men are running', and 'No men are running' are false (vindicating the relation of contrariness), and second both particular propositions 'Some men are running', and 'Some men are not running' are true (vindicating the relation of subcontrariness). But since the singular propositions 'Socrates is running', and 'Socrates is not running' are clearly contradictory (they are neither contrary nor subcontrary), they cannot be treated, as they often are in syllogisms, as universal or particular propositions.<sup>37</sup>

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<sup>37</sup>The contribution is noted by Norman Kretzmann in his translation of Sherwood's *Introduction to Logic*, (Minnesota: U. of Minnesota Press, 1966), p. 31.

### CONCLUSION

It appears that the only case of clear supposition is that of discrete supposition, or that of a proper name. In reviewing the various doctrines of supposition, one gets the feeling that ideally all terms should supposit the way proper names do. But they don't, because terms are not always used to refer to individuals. Frege clearly showed that terms are used or mentioned, and that the expressions 'morning star' and 'evening star' cannot refer to Venus in the proposition 'the morning star=evening star,' but must refer to some "mode of presentation." The medievals had similar insights but could not articulate them in the clear manner Frege articulated them; they found that terms could be mentioned (could supposit materially), but failed to see that in this case no relation of suppositing was actually taking place. They found that terms could stand for things other than individuals (supposit simply), and either dumped everything that could not have individuals as *supposita* under it, or became entangled in endless metaphysical disputes. And finally, they found that terms could stand for more than one individual (supposit personally), and provided an apparatus to explicate this kind of supposition that did not truly capture the binding of subject and predicate by a quantifier. In the end, the doctrines of

supposition had become so ad hoc and entangled that only the Humanists, with their cavalier attitude, were able to relieve the frustrations engendered by interminable distinctions, and offer some order to logicians. In the seventeenth century, LAP's fresh dichotomy between *compréhension* and *étendue* considerably cleaned up all the precious distinctions, and prepared the way for Fregean quantification.

## CHAPTER TWO

### THE EXPLICIT CARTESIAN LEGACY

#### 1. The matter and form of Cartesian ideas

The notion of containment that is crucial to *LAP*'s general principle governing all syllogistic reasonings is anchored in the notion of containment underpinning Descartes' theory of ideas. Cartesian ideas have both formal (as modifications of the mind), and objective (as representative entities) realities. Although Descartes is not explicit on this point, it is consistent with his overall view that these two levels of realities are not two distinct and separate entities; they are two aspects of one and the same thing, and the two aspects are related to each other in the following manner: the idea, considered formally (as a mode of the substance mind,) contains objective reality. The *Third Meditation* is unambiguous on this point

but such is the nature of an idea that it requires from itself no other formal reality than that which it borrows from my thought of which it is a mode. But, in order that an idea contain one particular objective reality rather than another,

it undoubtedly must have it from some cause...<sup>1</sup>

In a similar manner, a painting is both material and artistic; a medium (canvas, wood, paper, etc.) can be said to contain an artistic reality, and although one can be conceived without the other, neither can be separated from the other. It is this notion of containment that inspired and buttressed the notion of containment that governs LAP's general principle. But, while for Descartes, the objective reality of an idea was not analysed into further components, for Arnauld and Nicole, the objective reality of a universal idea was seen as containing *compréhension* and *étendue*. Thus, the singular idea of "cat" consists of a formally real entity (a modification of the substance mind) that contains the objective reality of the idea, which objective reality, by a process of abstraction, yields another degree of reality, that of the universal (*compréhension*) and singular (*étendue*) ideas of "animal," "domesticity," "Persian," "Gaia," etc. This other degree of reality is contained in

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<sup>1</sup>"*sed talem esse naturam ipsius ideæ, ut nullam aliam ex se realitatem formalem exigat, præter illam quam mutuatur a cogitatione meâ, cujus est modus. Quòd autem hæc idea realitatem objectivam hanc vel illam contineat potius quàm aliam,...*" (AT VII, 41); "*toute idée étant un ouvrage de l'esprit, sa nature est telle qu'elle ne demande de soi aucune autre réalité formelle, que celle qu'elle reçoit et emprunte de la pensée ou de l'esprit dont elle est seulement un mode, c'est-à-dire une manière ou façon de penser. Or, afin qu'une idée contienne une telle réalité objective plutôt qu'une autre, elle doit sans doute avoir cela de quelque cause...*" (AT IX, 32-33);

the objective reality of the original idea. Assuming the transitivity of the relation of "containing," the formal reality of the idea of "cat" contains the objective realities of "animality," "Gaia," etc. An actual being, a mode of substance inferior in degree of reality to the substance of which it is a mode, also contains the objects of knowledge by means of which one conceives, judges, and reasons. These being of objects of knowledge are not to be confused with the being of physical objects; the level of being of my idea of "Gaia" is quite distinct from the level of being of Gaia. For Descartes, as well as for Arnauld and Nicole, being, as opposed to reality, admits of degree.

Thus, the objective reality of an idea, because of its dependence on its own formal reality, and its rôle as container of what there is to be known (*compréhension* and *étendue*) about the idea, is a bridge that spans between metaphysics and epistemology. The Port-Royal logicians can justify the claim of usefulness of their logic, for even though objective reality, according to Descartes, is a lesser being than formal reality, its notion of containment bears enough resemblance to the Cartesian notion applied to formal reality to suggest that whatever is contained within objective reality has some degree of reality. This maneuver insures Arnauld and Nicole that their principle is grounded in something manifestly real, something that the Aristotelian rules (or the scholastic doctrine of

consequences) had never unequivocally achieved. In the logic of Port-Royal, Cartesian metaphysics bring supports logical containment, and logical containment sanctions all reasonings. Any conclusion that is so sanctioned becomes less of a formal school exercise, and more like a tracing art of real relations among objects (as they are known, rather than as they are) and their characteristics. Thus, reasoning may be seen to be justified in a real metaphysical sense. Logic is always applied.

As a result of this picture, the authors of *LAP* repeatedly emphasize the practical aspect of their manual; they earn the title of *logiciens engagés*, that is, logicians who are seriously engaged in the promulgation of genuine and metaphysically real theological and moral doctrines.<sup>2</sup> But this "reality" has validity only if Cartesian ideas can be made sense of, and are as reliable vehicles of truths as Descartes argues they were. This chapter critically examines Cartesian ideas and the additions and precisions

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<sup>2</sup>The seventeenth century classical period has been characterized by N. Kretzmann in the entry "History of Semantics," in the *Encyclopedia of Philosophy*, as the source of "manuals" of logic. It is true that there was a more than usual proliferation of manuals that were designed to help lawyers. But there were also a large number of traditional Aristotelian and Scholastic texts. See Risse's *Bibliographia Logica; Verzeichnis der Drückshriften zur Logik mit Angabe ihrer Fundorte*, (Hildesheim: Olms, 1965) and Wilhelm Windelband's *A History of Philosophy*, trans. James Tufts, vol. II, (New York: Harper, 1958), pp. 354-357. *LAP* is unique in the sense that it did not address a legalistic audience, and it did not mimic the standard school texts.

they underwent in the hands of Arnauld and Nicole. It will conclude that although Port-Royal's additions clarify internal difficulties within Cartesian ideas, they do not elucidate the obscure relationship ideas have to the external world.

## 2. Cartesian ideas

Descartes' "way of ideas" eliminated many of the Aristotelian and scholastic disputes concerning knowledge, but it also brought about difficulties that he was unable to explain out. One such difficulty was owed to his inability to explain how the mind knew physical objects (matter).

Descartes reversed the direction of the scholastic model. Instead of proceeding from objects to concepts, he proceeded from concepts to objects. The change of direction is dramatically and resoundingly heralded by the first word of the *Meditationis Primæ*: "*Animadverti*," which literally means, "I turned to my (the) soul (mind)." This crucial rhetorical subtlety of the opening of the *Méditations* is lost in both the French and English translations; de Luynes, Haldane & Ross, and Cottingham rearranged the order of the first sentence in such a way that '*animadverti*' is no longer the first word, and is translated according to the word use that does not reflect its etymology.

An examination of his opinions follows the change of

direction. Methodological doubt permits Descartes to clear his mind of former opinions, many of which had deceived him. Following this tiresome thought experiment, he is able to know with certainty the idea of his own self. He, then, comes to know that the self is the mind and its thoughts, and because he knows the mind without knowing matter, the two must be absolutely distinct.

The inspection of this idea further reveals that, unlike its scholastic ancestor, the idea has nothing in common with its physical counterpart, and it is not a sign of physical objects. Also, and in what may very well be construed as an affront to the common sense he boasted to champion, Descartes defends the view that there is no direct causal link between ideas and the physical objects of which they are ideas. An idea is that by means of which one knows the mind-independent object; it is the *esse obiectivum*, the cognitive *alter ego* of the physical object.<sup>3</sup> To know object

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<sup>3</sup>Joseph Owens, *op. cit.*, p. 459, argues that the "objective" and "formal" concepts are borrowed from Francisco Suarez (1548-1617), and Gabriel Vasquez (1551-1604). Baillet, Descartes' biographer, writes that Descartes always had a copy of Suarez' *Disputationes Metaphysicæ* with him, and De Larrière, one of Arnould two biographers, writes that while at the Sorbonne, Arnould studied under Lescot who introduced him to the theological writings of Vasquez. Owens also argues (459) that "ideas" evolved from Neoplatonic forms, through intelligible species, and Suarez' "objective concept." "The notion of 'idea' gradually metamorphosed from the Neoplatonic forms through intelligible *species* into the 'formal' and 'objective' concepts familiar to students of Descartes." Julia Annas and Jonathan Barnes, in *The Modes of Scepticism—Ancient Texts and Modern Interpretations*, (Cambridge: Cambridge U. Press, 1985), pp.

X is to know its *esse objectivum* and not its *esse physicalum*. This view has a Platonic and Augustinian ring, and can be understood given the anti-skeptical philosophical climate of the time, and the generally accepted view that mind-independent objects are cagy. But why place such responsibility on the mind? Why believe that the mind is so generous that it can compensate for nature's avarice? Does it make sense to argue that a substance so entirely other than another, as Descartes argues mind is to matter, can convey information about that other? It seems that a crystal ball has more in common with nature than Descartes' mind, and yet no crystal ball gazers have ever been taken seriously in the field of epistemology.

Descartes faced a dilemma: because nature's stinginess had made the faculty of perception look so poor, he could either surrender to skepticism, or he could embrace the possibility of knowledge. The latter alternative is possible to him because he feels justified to empower the mind--that, by means of which he thought and understood himself--with "epistemophilia" (love of knowing). But his only justification for placing so much trust in the mind seems to be the order of knowing. That which he first knows

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4-9, argue that the new way of ideas, with its attendant epistemological priority, attests to the renewed skeptical challenge brought about in 1562 by Henri Etienne's first modern edition in French and Latin of Sextus Empiricus' *Outlines of Pyrrhonism*.

with certainty must possess knowledge of everything else. The former alternative, to give in to skepticism would have meant the abandonment of mathematics, about which he "knew" too much, and it would have undercut knowledge and belief in the truths of religion. For Descartes, the blurred zone of interaction between mind and body must have seemed less difficult to overcome than the abyss of scepticism.

A further examination of his ideas (thoughts) revealed to Descartes that, although ideas were all form (mind) and no matter (body), "But, since ideas in themselves are a certain form, and are not composed of any matter,...",<sup>4</sup> they could be taken "objectively" (*objective*) when they were considered in their representative rôle, or "materially" (*materialiter*) when they were considered as an operation of the mind

there is equivocity here in the word 'idea': for it can be taken materially for an operation of my understanding, and in this meaning it cannot be said that it [the idea] is more perfect than I; or it can be taken objectively for the thing that is represented by this operation, which thing, although one does not assume that it exists outside my understanding, may nevertheless be more perfect than I on account of its essence.<sup>5</sup>

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<sup>4</sup>"*Nam, cum ipsæ idæ sint formæ quædam, nec ex materiâ ullâ componantur,*" (AT VII, 232); "*Car, puisque les idées mêmes ne sont rien que des formes, et qu'elles ne sont point composées de matière,*" (AT IX, 180).

<sup>5</sup>"*Sed respondeo hîc subesse æquivocationem in voce idæ : sumi enim potest vel materialiter, pro operatione intellectûs, quo sensu me perfectior dici nequit, vel*

"By the *objective reality of an idea*, I understand the entity of the thing represented by the idea, insofar as it is in the idea;"<sup>6</sup>

Moreover, exposing his scholastic heritage, and in what could be construed as a move to confuse his reader, Descartes also referred to ideas taken materially or as modes of the mind, as formally real: "but such is the nature of an idea that it requires from itself no other formal reality than that which it borrows from my thought of which it is a mode...." (AT VII, 41)<sup>7</sup>; and to ideas taken

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*objective, pro re per istam operationem repræsentatâ, quæ res, etsi non supponatur extra intellectum existere, potest tamen me esse perfectior ratione suæ essentiæ.*" (*Præfatio ad Lectorem*, AT IX, 8); "Mais, je réponds que dans ce mot d' 'idée' il y a ici de l'équivoque : car, ou il peut être pris matériellement pour une opération de mon entendement, et en ce sens on ne peut pas dire qu'elle soit plus parfaite que moi; ou il peut être pris objectivement pour la chose qui est représentée par cette opération, laquelle, quoiqu'on ne suppose point qu'elle existe hors de mon entendement, peut néanmoins être plus parfaite que moi à raison de son essence." ("Préface de l'Auteur au Lecteur," the translation is by Clerselier, and is not in the AT collection. All modern French and English editions contain the Preface.)

<sup>6</sup>"*Per realitatem objectivam ideæ intelligo entitatem rei repræsentatæ per ideam, quatenus est in ideâ;*" (AT VII, 161); "Par la réalité objective d'une idée, j'entends l'entité ou l'être de la chose représentée par l'idée, en tant que cette entité est dans l'idée;" (AT IX, 124). The emphasis is by Descartes.

<sup>7</sup>"...sed talem esse naturam ipsius ideæ, ut nullam aliam ex se realitatem formalem exigat, præter illam quam mutuatur a cogitatione meâ, cujus est modus." (AT VII, 41); "...toute idée étant un ouvrage de l'esprit, sa nature est telle qu'elle ne demande de soi aucune autre réalité formelle, que celle qu'elle reçoit et emprunte de la pensée ou de l'esprit.." (AT IX, 32)

objectively as taken "formally (*formaliter*): "whenever they [ideas] are considered insofar as they represent something, they are not taken *materially*, but *formally*."<sup>8</sup>

One cannot perceive the formal reality of an idea, anymore than one can perceive his or her mind. So, when one speaks of the perception of an idea, the perception applies to the objective reality of the idea. These perceptions may vary in clarity, and informativeness; an ideal perception is "clear and distinct." If a clear and distinct perception of an idea obtains, its objective reality (that part of it that is knowable by humans) is fully and brightly exhibited; if such quality of perception does not obtain, then it is confused and/or obscure, incomplete (inadequate) or "materially" false. An idea is materially false when it represents "a non-thing just as a thing."<sup>9</sup>, or when it brings about "matter or occasion for error."<sup>10</sup> Thus, "materially" false ideas differ in their falsity from ideas

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<sup>8</sup>Descartes' italics. "*quoties considerantur [ideæ] quatenus aliquid repræsentant, non 'materialiter,' sed 'formaliter' sumuntur.*" (AT VII, 232); "*toutes et quantes fois qu'elles sont considérées en tant qu'elles représentent quelque chose, elles ne sont pas prises 'matériellement,' mais 'formellement.'*" (AT IX, 180)

<sup>9</sup>"...*cùm non rem tanquam rem repræsentant.*" (AT VII, 43); "*elles représentent ce qui n'est rien comme si c'était quelque chose.*" (AT IX, 34).

<sup>10</sup>"*ut judicio materiam præbeant erroris.*" (AT VII, 231); "*quatenus falsis ipsorum judiciis materiam præbent.*" (AT VII, 233); "*elles donnent au jugement matière ou occasion d'erreur.*" (AT IX, 179); "*laquelle je dis me donner matière ou occasion d'erreur.*" (AT IX, 180).

that are false *tout court*, in other words from ideas that are "formally" false. But "formal falsity" is more properly speaking a property of idea-judgments.

The problematic interaction between the mental and the physical--sensations are expected to somehow give rise to ideas the way the scent of madeleines brought memories to Proust--the precise nature of the two realities of ideas, the criterion of clarity and distinctness, and the nature of material falsity engendered a debate no less intense and lengthy than had the nature of Aristotelian "matter" and "form" in the previous era. The Port-Royalists made important contributions to the internal debate, in particular in the areas of the distinction between formal and objective reality, and in the area of material falsity. But Arnauld and Nicole are conspicuously silent on the debate that plagued Descartes; their contribution assumes the plausibility of the Cartesian doctrine regarding the interaction between mind and body.

### 3. Port-Royal's adoption of Cartesian ideas

Port-Royal offers three main sources of information about ideas: the *Fourth Objections*, first published in 1641; *LAP* (1662-1683), and Arnauld's long controversy with Malebranche over the nature of ideas, which appears in *Des Vraies et des Fausses Idées (VFI)*, first published in 1683,

and in *Défense de M. Arnauld contre la Réponse au livre des vraies & fausses Idées (DRVFI)*,<sup>11</sup> published in 1684.

In *DRVFI*, Arnauld claims that he had no personal opinion about ideas until he wrote *VFI*, "I had never before meditated on this matter of ideas: I only had very general views about them. [I] had no opinion whatsoever about ideas before the book I wrote about them; and what I say about them gradually came to me as I applied myself to them, and as I followed the method I advanced at the beginning of the treatise."<sup>12</sup> The "general views" are admittedly borrowed from Descartes, but Arnauld's confessed innocence about ideas is exaggerated; he had to have given some serious thought to ideas in order to raise the objections he did in the *Fourth Objections*. Similarly the *compréhension/étendue* distinction must have required more than a superficial consideration of ideas. It is unlikely that Nicole alone

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<sup>11</sup>*Des Vraies et des Fausses Idées contre ce qu'enseigne l'Auteur de "La Recherche de la Vérité."* (Paris: Corpus des Œuvres de philosophie en langue française, Fayard, 1986). First published in 1683; *Défense de M. Arnauld contre la Réponse au livre des vraies & fausses Idées (OC) 1684* in *Œuvres Complètes de Messire Antoine Arnauld*, vol. 38, nr. 6 (Lausanne: Sigismond d'Arnay & Compagnie, 1775).

<sup>12</sup>"Je n'avois jamais médité auparavant sur cette matière des Idées : je n'en avois que des vues fort générales. [...] je n'avois aucune opinion sur les idées, avant le livre que j'en ai fait; & ce que j'en dis m'est venu dans l'esprit à mesure que j'y travaillois, en suivant la méthode que j'ai marquée au commencement de ce Traité." (*DRVFI*, 442) Arnauld comments on a letter he had sent to the Marquis de Roucy on April 11, 1682. De Roucy acted as intermediary between Arnauld and Malebranche.

should be credited for the distinction because the distinction is explained in the original Vallant ms., which Arnauld reportedly dictated to Nicole. And Arnauld could not have approved so crucial a distinction without having given it his attention.

Among the various accounts related in these sources, accounts, which, I must repeat, only relate to the internal doctrine of ideas, one can distinguish some minor, and one can distinguish some major variances between Descartes and Port-Royal.

### 2.1 The minor variances

Variances that are minor are variances nevertheless. They are mentioned because, at times, Arnauld and Nicole pretty much unabashedly plagiarize Descartes or make small changes to Descartes' text (without citation) to fit their context. These practices, to copy and/or to alter someone else's text without citation, which today would be viewed with scorn, seem to have been tolerated in the seventeenth century. So, the minor variances deserve mention for two reasons: they articulate Descartes' doctrine as their own, and they report the historical fact of the practice of copying without citing.

*The Logic of Port-Royal* opens with the following passage

As we can have no knowledge of that which is outside us except by the interposition of ideas that are within us,<sup>13</sup>

which strongly resembles Descartes' explanation in a letter to Gibieuf dated January 19, 1642

I can have no knowledge of that which is outside me, except by the interposition of ideas that I have had of it within me.<sup>14</sup>

Descartes uses the first person singular, while Arnauld and Nicole use the first person plural; Descartes speaks of ideas "he has had," whereas the Port-Royal authors speak of ideas "that are in us." Descartes is concerned to show that when the mind performs an abstraction on an idea (*abstractio intellectus*)--as for example when it focuses on the figure of an extended substance--it does not at the same time mutilate or destroy the original idea (*non redditur a me inadæquata*). Accordingly, the idea must be prior to my abstraction (and knowledge) of it, which explains Descartes'

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<sup>13</sup>"Comme nous ne pouvons avoir aucune connaissance de ce qui est hors de nous que par l'entremise des idées qui sont en nous,..." (LAP, 39)

<sup>14</sup>"...je ne puis avoir aucune connaissance de ce qui est hors de moi, que par l'entremise des idées que j'en ai eue en moi..." (AT III, 474); Descartes' most general definition of ideas is in the *Third Response*: "*ostendo me nomen ideæ sumere pro omni eo quod immediate a mente percipitur.*" (AT VII, 181)

use of the past tense, "*que j'en ai eues.*" Descartes' use of the first person signifies that he is assured of this by his personal experience. The authors of *LAP*, by using the first person plural, acknowledge that both of their personal experiences confirm Descartes'.

Later in *LAP*'s first chapter, this definition of "ideas" appear

So when we speak of ideas, we are not calling by this name the images that are painted in the fantasy, but rather everything that is in our mind, when we can say with truth that we conceive of a thing, in whatever manner we conceive of it.<sup>15</sup>

which also strongly resembles

For I do not simply call by the name 'idea' the images that are depicted in the fantasy; on the contrary, I do not at all call them by that name, as long as they are in the corporeal fantasy; but I generally call by the name 'idea' all that is in our mind, when we conceive of a thing, in whatever manner we conceive of it.<sup>16</sup>

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<sup>15</sup>"*Lors donc que nous parlons des idées, nous n'appelons point de ce nom les images qui sont peintes en la fantaisie, mais tout ce qui est dans notre esprit, lorsque nous pouvons dire avec vérité que nous concevons une chose, de quelque manière que nous la concevions.*" (*LAP*, 41)

<sup>16</sup>"*Car je n'appelle pas simplement du nom d'idée les images qui sont dépeintes en la fantaisie; au contraire, je ne les appelle point de ce nom, en tant qu'elles sont dans la fantaisie corporelle; mais j'appelle généralement du nom d'idée tout ce qui est dans notre esprit, lorsque nous concevons une chose, de quelque manière que nous la*

The variance between LAP's "we can say with truth that we conceive of a thing," and Descartes' "we conceive of a thing" is needed to justify an inference that Arnauld and Nicole draw from Descartes' borrowed passage to another of Descartes' borrowed passage. LAP's definition, which I just quoted, entails that we can say nothing without ideas

Whence it follows that we can express nothing in our speech, when we understand what we say, unless from this very fact it is certain that we have within us the idea of the thing that we signify by our speech...<sup>17</sup>

which are Descartes' words at another place of the same letter

In such a way that I can express nothing in speech, when I understand what I say, unless from this very fact it is certain that I have within me the idea of the thing that is signified by my

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*concevions."* (AT III, 392-93) "*Atque ita non solas imagines in phantasiâ depictas ideas voco, imo ipsas hîc nullo modo voco ideas, quatenus sunt in phantasiâ corporeâ.*" (AT VII, 160-61)

<sup>17</sup>"*D'où il s'ensuit que nous ne pouvons rien exprimer par nos paroles lorsque nous entendons ce que nous disons, que de cela même il ne soit certain que nous avons en nous l'idée de la chose que nous signifions par nos paroles,...*" (LAP, 41). The first edition of 1662 has "*chose qui est signifiée par...*" instead of "*chose que nous signifions par...*"

speech.<sup>18</sup>

Thus, the addition, by Arnauld and Nicole, of "we can say with truth" to Descartes' "we conceive of a thing" is needed in order to bring support to the claim that we can "express nothing in speech...". If I truly say that I conceive X, everything present in my mind at this time is an idea. Hence, I cannot express nything without first possèssing an ide of it.

The addition also may have some significance in view of the close ties that language and ideas have for Port-Royal; sounds and ideas are "so narrowly tied to each other that one can hardly conceive one without the other" (*LAP*, 102).<sup>19</sup> Speech is meaningful because of ideas, and if I conceive an idea, according to Arnauld and Nicole, I must be able to say it, suggesting, on the one hand, that no ideas are ineffable, and on the other that a pure "logic of ideas"

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<sup>18</sup>*En telle sorte que je ne puis rien exprimer par des paroles lorsque j'entends ce que je dis, que de cela même il ne soit certain que j'ai en moi l'idée de la chose qui est signifiée par mes paroles." (AT IX, 124); "adeo ut nihil possim verbis exprimere, intelligendo id quod dico, quin ex hoc ipso certum sit, in me esse ideam ejus quod verbis illis significatur." (AT VII, 160) "puisque nous ne sçaurions rien exprimer par nos paroles, lors que nous entendons ce que nous disons, que de cela mesme il ne soit certain que nous avons en nous l'idée de la chose qui est signifiée par nos paroles." (AT III, 393).*

<sup>19</sup>Clair and Girbal note that this passage, added to the 1683 edition, probably is inspired by Cordemoy's *Discours Physique de la Parole* (Paris: 1668).

would be futile. Ideas are useless to a logical treatise unless they are capable of being articulated in speech. Language is a sign of our ideas, and it is needed to communicate each other's ideas. Logic is more about the communication of our ideas than about our ideas proper. There would not be a need for logic, if we did not have to communicate.

## 2.2 The major variances

### 2.2.1. Objective and Formal Realities

*LAP's* taxonomy of ideas, as to what they represent, vary from that of Descartes. Descartes divided ideas into ideas of substance, mode and accident and argued that ideas of substance had more objective reality than those of modes. Arnauld and Nicole change the classification to that of ideas of substance, mode and modified things (*choses modifiées*). This section argues that this change is introduced as an attempt to provide a solution to the problem caused by ideas that are so confused they could be "materially false".

In *VFI*, Arnauld quotes (instead of plagiarizes) Descartes on the distinction between material and formal realities when he defends his view that ideas are both acts of the mind (perceptions), and objectively real.

Furthermore, according to Arnauld, ideas do not need to be, as Malebranche suggests, entities separable from the mind ("*êtres représentatifs*", *VFI*, Chapt. 6). Arnauld, however, is more specific about the distinction than Descartes is

I have said that I took for the same thing the *perception* and the *idea*. One must nevertheless note that this thing, though unique, has two relations: one to the soul, which it modifies: the other to the thing noticed, as far as it is objectively in the soul; and the word 'perception' denotes more directly the first relation, and that of 'idea' the second. [t]hese are not two distinct entities, but one same modification of our soul, which essentially encloses these two relations; since I cannot have a perception, which is not at the same time the perception of my mind, as perceiving, and the perception of something, as being perceived, and also that nothing can be objectively in my mind (which is what I call *idea*) without my mind perceiving it. (Italics are *LAP's*)<sup>20</sup>

In this passage, Arnauld makes it clear that formal and objective realities are two aspects of a unique thing that is a mode of the substance mind. In other words, there are

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<sup>20</sup> "J'ai dit que je prenois pour la même chose la *perception* & l'*idée*. Il faut néanmoins remarquer, que cette chose, quoiqu'unique, a deux rapports: l'un à l'ame, qu'elle modifie: l'autre à la chose apperçue, en tant qu'elle est objectivement dans l'ame; & que le mot de 'perception' marque plus directement le premier rapport, & celui d''*idée*' le dernier. [c]e ne sont point deux entités différentes, mais une même modification de notre ame, qui enferme essentiellement ces deux rapports; puisque je ne puis avoir de perception, qui ne soit tout ensemble la perception de mon esprit, comme apperçant, & la perception de quelque chose, comme apperçue, & que rien aussi ne peut être objectivement dans mon esprit (qui est ce que j'appelle *idée*) que mon esprit ne l'apperçoive." (*VFI*, 198-199)

three elements involved in the distinction: the idea, its formal reality, and its objective reality. The formal reality of the idea has to be distinguishable (if only by reason) from its metaphysical status (a mode of substance.) Thus, all ideas, as modes, are equal, but it does not follow that all formal realities are likewise equal; in fact they are unequal.

This is a clear improvement over the explanation Descartes gives of the two aspects of ideas. On the one hand, he seems to suggest that the formally real and the objective real are two aspects of another thing (a third entity), as when he writes that the formally real idea "contains an objective reality." In a like manner, a bushel of rutabagas and a bushel of topinambours have some aspects in common, and differ with regard to other aspects. They are both the same size (they are one mode,) but have different values (weight) because one bushel contains something denser than the other. The "bushel of rutabagas" is analogous to the "idea of rutabagas" (the mode of substance) in the sense that the bushel (the formal reality of the idea) contains rutabagas (the objective reality of the idea.) But the rutabagas or topinambours cannot be removed from their bushels without doing away with the bushel of rutabagas or or the bushel of topinambours. A bushel *tout court* is like a mode of mind, or is to the bushel of rutabagas what the modification of the mind is to

the idea.

On the other hand, Descartes seems to be saying that an idea is one thing or another, but not both at the same time as in Wittgenstein's duck/rabbit example. He writes that there is "equivocity in the word *idea*," meaning that, like in the case of the word *bank*, the sound of the words can give rise to one or the other idea, but not to both at the same time. Arnauld's reading of Descartes has the advantage of making some sense of material falsity.

### 2.2.2. Material Falsity-Degrees of reality

Descartes claims that ideas as modes of the substance mind (taken materially as formally real) are all equal

if these ideas are only taken as far as they are some modes of thinking, I do not recognize among them any inequality...<sup>21</sup>

This equality must be limited to the metaphysical realm, however, formally real ideas are metaphysically equal insofar as they are all modes of substance. The substance mind has two faculties, understanding and will; the mode of

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<sup>21</sup> "*Nempe, quatenus ideæ istæ cogitandi quidam modi tantùm sunt, non agnosco ullam inter ipsas inæqualitatem...*" (AT VII, 40); "*si ces idées sont prises en tant seulement que ce sont de certaines façons de penser, je ne reconnais entre elles aucune différence ou inégalité...*" (AT IX, 31)

the substance mind is thought, and the thoughts that specifically belong to the understanding ("operation of the intellect") are those that best deserve the name of 'ideas.' Despite the fact that all ideas *quâ* modes of substance are equal, i.e., no ideas are substances or accidents, there is possible inequality looming beyond the confines of metaphysics; Descartes argues that an idea of substance has greater objective reality than an idea of mode,

For undoubtedly, these ideas that exhibit substances to me are something bigger, and, so to speak, contain in themselves more objective reality, than those that only represent modes or accidents.<sup>22</sup>

This passage clearly indicates that not all objective realities are equal. But if the objective reality of an idea is contained in its formal reality, it must be the case that similarly not all formal realities are equal. If A contains B, and B is greater than C that is contained by D, then A and D do not have to be equal. The idea of "stone" is less objectively real than that of "God," and the idea of

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<sup>22</sup>"*Nam proculdubio illæ quæ substantias mihi exhibent, majus aliquid sunt, atque, ut ita loquar, plus realitatis objectivæ in se continent, quàm illæ quæ tantùm modos, sive accidentia, repræsentant.*" (AT VII, 40); "*Car, en effet, celles qui me représentent des substances, sont sans doute quelque chose de plus, et contiennent en soi (pour ainsi parler) plus de réalité objective, c'est-à-dire participent par représentation à plus de degrés d'être ou de perfection, que celles qui me représentent seulement des modes ou des accidents.*" (AT IX, 31-32)

"heat" less objectively real than that of "stone" because God is the highest substance, a stone is a body and heat a sensation of body. Let 'I<sub>fr</sub>' be any idea taken in its formal reality in mind, and 'I<sub>or</sub>' be any idea taken in its representative rôle. If "Stone<sub>or</sub>" has more objectively reality than "Heat<sub>or</sub>," and "Stone<sub>or</sub>" is contained in "Stone<sub>fr</sub>," and "Heat<sub>or</sub>" is contained in "Heat<sub>fr</sub>," and no I<sub>fr</sub> can have more than exactly one I<sub>or</sub>, and no I<sub>or</sub> can have more than one I<sub>fr</sub>, then "Stone<sub>fr</sub>" has more formal reality than "Heat<sub>fr</sub>." The same is true of "God<sub>fr</sub>," and "Stone<sub>fr</sub>" even though both are substances. In fact, Descartes seems comfortable with the idea of a hierarchy of substances. He clearly states that the substance of God "eminently" contains other substances, and that the substance mind likewise contains ("eminently") that of body.<sup>23</sup> Thus, there is a level at which ideas, taken as modes of mind in the exercise of the understanding, are not equal; and these ideas that are formally weak explain why some ideas have such confused objective reality that they could be ideas of nothing.

The *cogito* ended Descartes' seemingly desperate

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<sup>23</sup>"Quantum autem ad ideas rerum corporalium, nihil in illis occurrit, quod sit tantum ut non videatur a me ipso potuisse proficisci;" (AT VII, 43); "Et pour ce qui regarde les idées des choses corporelles, je n'y reconnais rien de si grand ni de si excellent, qui ne me semble pouvoir venir de moi-même;" (AT IX, 34). "A me ipso," and "de moi-même" are to be understood as referring to the mind I.

struggle between skepticism and a knowledge provided by solid epistemological foundations--it is worth remembering the dramatic, albeit amusing, description of his pathetic feeling of entrapment in a whirlpool (*in profundum gurgitem*) following his perilous thought experiments with "real" doubts (*AT VII, 34/IX, 18*)--but the *cogito* also plunged Descartes into a hardly resourceful solipsism.

Consequently, his major concern in the *Third Meditation* is to make sure that he is not alone in the world; he seeks a way that would enable him to affirm: "I am not alone in the world."<sup>24</sup> The way is by means of the objective reality of ideas; if he can find an idea, the objective reality of which is not formally or "eminently" contained in the *cogito*, then something other than himself must be its cause. In order to avoid the interminable task of examining particular ideas, Descartes classifies his ideas into simple, composite, and others.<sup>25</sup> The simple ideas were those of God, the self, and body; the composite ideas were those of angels (God, and mind or body?), men (self and body), and animals (body). The "others" consisted of ideas of sensations, for instance light, colors, sounds, heat, cold, etc. Since the composite ideas were formed of simple

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<sup>24</sup>"*non me solum esse in mundo*" (*AT VII, 42*); "*je ne suis pas seul dans le monde*" (*AT IX, 33*).

<sup>25</sup>Invoking the same fear of interminability, Descartes classified classes of knowledge in the *First Meditation*.

ideas, they required no individual attention; whatever was said of their simple components would apply to them. The simple idea of the self is one kind of simple idea about which "there can be here no difficulty" (*de quâ hîc nulla difficultas esse potest* (AT VII, 42-43)). Since the idea of "body" has less perfection than that of "mind" (the self), the self is capable of fabricating it; the idea of "God," on the other hand, has more perfection than that of "mind," hence the mind is incapable of its manufacture, and Descartes is delivered from his solitude.

The "other" ideas, the ideas of sensation, however, are, for Descartes, a source of difficulty. They are so unclear that they may contain what Descartes calls "material falsity" (*falsitas materialis, fausseté matérielle*); they may "represent what is a non-thing as if it were a thing." (*non rem tanquam rem repræsentant; elles représentent ce qui n'est rien comme si c'était quelque chose*. AT VII, 43/IX, 34). For example, the idea of cold is so obscure that one cannot tell whether it represents something real (e.g., a substance or a mode) or a privation; that is to say, one cannot tell whether it is a positive idea of cold or a negative idea of non-heat. One part of what I think Descartes is trying to articulate is that ideas of sensation are of no help in confirming the two distinct ideas occasioned by the sounds of the words 'cold' and 'non-heat.' In other words the ideas occasioned by the sounds of the

words 'cold,' and 'non-heat,' although co-extensive, are different, since they have different meanings; whereas the sensations of cold and of non-heat feel as one and the same. Thus, the sensation cannot be of any help in the determination of the reality of the object of the idea. But, since all ideas, as operations of the understanding, must represent, "And since no ideas can be unless they are as of things,"<sup>26</sup> their representations in the case of ideas of sensation are so faint that the veracity of the representation cannot be ascertained; the faintness is attributed by Descartes to the defective workmanship of the idea, the idea *quâ* formal reality. What is important to bear in mind is that Descartes cannot conclusively claim that ideas of sensations are materially false, he can only claim that their objective reality is so unclear that they could be materially false. If they are materially false, then they represent something that has no other formal cause than the formal reality of the idea itself. If I hit my head, I "see" stars; these stars are not representations of celestial bodies, but the product, the fabrication of my brain. Descartes' choice of language may be unfortunate; he may be trying to say too much in too few words. The formal reality of an idea can cause false representations, but

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<sup>26</sup>"*Et quia nullæ ideæ nisi tanquam rerum esse possunt...*" (AT VII, 44); "*il n'y en peut avoir aucune qui ne nous semble représenter quelque chose...*" (AT IX, 34-35).

given the obscure and faint nature of the representation (objective reality), it cannot be ascertained whether this was in fact caused by the formal reality of the idea or by a formal reality of another thing.

Descartes uses the analogous language of images; for anything to be an image, there must be something it is an image of. Whether that something is a representation of some existent thing or not is not relevant to the nature of an image. Materially false ideas are like either hallucinations or mirages (if their representation has no source), the degree of reality of which is not knowable; materially true ideas are ideas of things, the degree of reality of which is potentially knowable (they are ideas of substance or mode). In both cases, given the imperfection of the self, they can be caused by the self. But in both cases, the impossibility or difficulty involved in determining the reality or degree of reality of the idea (substance, mode, accident or sentiment) must be blamed on the formal reality of the idea; ideas of substance and modes, perhaps because of their robust pedigree, wear their degree of reality on their sleeve, whereas ideas of sensation do not. The former have a clear and distinct objective reality that must be contained in a correspondingly well-constituted formal reality; the latter make no such claim to clarity and distinctness, which they must inherit from a poorly-constituted formal reality, hence

their possible material falsity, a falsity that originates from the material side of ideas.

This reading of materially false ideas relieves Margaret Wilson from being forced, against her, (and Descartes') better judgment, to conclude that the objective reality of an idea must be distinguished from its representational character.<sup>27</sup> Quoting Descartes who wrote that if ideas are materially false "they proceed from nothing," ("*elles procèdent du néant,*" "*illas a nihilo procedere.*" (AT IX, 35/VII, 44)), but nevertheless conserve their representative character, "no ideas can be unless they are as of things," she concludes that the representational content of the idea cannot have objective reality, since "there can be no more objective reality in an idea that there is formal reality in its cause" (111). But what Wilson overlooks is that the objective reality of a materially false idea is caused by the formal reality of the idea itself, which certainly possesses more formal reality as a derivative of a mode of the substance than the objective reality of that same idea. Furthermore, Wilson does not have to endorse the undesirable distinction because Descartes cannot, for certain, determine whether ideas of sensation are materially true or false; his discussion is strictly hypothetical: "If they are (materially) false....If

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<sup>27</sup>Margaret Dauley Wilson, *Descartes*, (New York: Routledge & Kegan Paul, 1978), pp. 100-111.

they are (materially) true" (AT VII, 44). But even if they are materially false, they conserve objective reality because they are caused by something that has as much (or more) formal reality, namely the mode of substance mind.

Descartes' inability to determine whether ideas of sensations are materially false or true is also overlooked by Aloyse Raymond Ndiaye; he assumes that they are materially false because

The sensible idea constitutes, then, a unique case where the formal reality of the idea functions without there being the formal reality of the thing. The idea functions and appears to me as having a certain objective reality. But this reality is infinitely small, since the true property of the body in itself, to which the idea refers is for me a nothingness of knowledge. It is so small that it cannot be distinguished from nothingness, and that one is faced with the risk to mistake nothingness for something about it.<sup>28</sup>

but clearly, the faintness of the objective reality cannot conclusively attest to the material falsity of the idea.

Arnauld, who at first confused material with formal falsity in the *Fourth Objection*, forced Descartes to clarify

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<sup>28</sup>A. R. Ndiaye, *La Philosophie d'Antoine Arnauld*, (Paris: Vrin, 1991): "L'idée sensible constitue donc un cas unique où la réalité formelle de l'idée fonctionne sans même qu'il y ait la réalité formelle de la chose. L'idée fonctionne et m'apparaît comme ayant une certaine réalité objective. Mais cette réalité est infiniment petite, puisque la vraie propriété du corps en soi, à laquelle elle renvoie est pour moi un néant de connaissance. Elle est si petite qu'on ne peut la distinguer du néant et qu'on risque à son propos de prendre le néant pour de l'être." (54)

the fact that material falsity applied to the formal reality of idea. He also later tried to eliminate the difficulties caused by ideas of sensation by suggesting that they are placed in us by God.

In the second section of the *Fourth Objection*, entitled "About God," Arnauld thought that if an idea of cold could be an idea of non-heat, then the idea would have no objective reality (being), and would consequently lose its *raison d'être*

For, what is the idea of cold? It is cold itself, insofar as it is objectively in the understanding; but if cold is a privation, it cannot be objectively in the understanding by an idea, the objective being of which is a positive entity. Therefore, if cold is only a privation, there will never be a positive idea of this, and consequently none that be materially false.<sup>29</sup>

Here, Arnauld is on the same wavelength as Caterus was in the *First Objection*. First, he confuses objective "being"

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<sup>29</sup>"*Quid enim est idea frigoris? Frigus ipsum, quatenus est objective in intellectu. At si frigus sit privatio, non potest esse objective in intellectu per ideam, cujus esse objectivum sit ens positivum. Ergo, si frigus sit tantum privatio, nunquam illius poterit esse idea positiva, & proinde nulla quæ materialiter falsa sit.*" (AT VII, 206); "Car qu'est-ce que l'idée du froid? C'est le froid mesme, en tant qu'il est objectivement dans l'entendement; mais si le froid est une privation, il ne scauroit estre objectivement dans l'entendement par une idée de qui l'estre objectif soit une estre positif; doncques, si le froid est seulement une privation, iamais l'idée n'en pourra estre positive, & consequemment il n'y en pourra avoir aucune qui soit materiellement fausse." (AT IX, 161)

with objective "reality;" a being is or is not, whereas reality admits of degree. Secondly, he believes that for any idea X to be objectively in the mind, it must be thought; the property of being thought is an "external denomination" (*dénomination externe*<sup>30</sup>) that in no way affects the object thought. And although it is possible to think a non-existent object--a chimera can be thought--it is not possible to have a positive idea of a privation (negative thing), because the Cartesian idea is mistaken for the Thomist species (being), i.e., cold itself as it affects the individual. Hence, if I have a Thomist idea of cold, cold is not a privation.

Descartes answers that his ideas are taken either *formaliter* (representationally,) and *materialiter* (as modifications of the mind,) and that material falsity (as distinguished from formal falsity, which properly speaking is only predicated of judgments) applies to ideas *quâ* operations of the mind

if in truth they [ideas] are considered not just as they represent this or that, but only just as they are operations of the understanding, it can indeed be said that they are taken materially, but then in no way do they concern the truth or

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<sup>30</sup>LAP (49) brings up the properties of "exterior denomination" as belonging to individuals without affecting them. For example, either I am seen or I am not seen; if I am seen, I can be said to possess the property of being seen, but this property, as opposed to the "internal" property of being tanned, does not change anything about me.

falsity of objects. [i]ndeed whether cold is a positive thing or a privation, I do not have for that reason another idea (two different ideas) of it, but it remains in me that very same [idea] I always had.<sup>31</sup>

The "truth or falsity of objects" that Descartes is mentioning in this passage must be formal truth or falsity; that is, my idea of the sun is "true," if it represents an existing sun. This, of course, represents a deviation from the position that Descartes takes at the beginning of the *Third Meditation*, and of which he reminds his reader right before he introduces material falsity, namely that truth or falsity is only predicated of judgments, and not of ideas *simpliciter*: "only in judgements can falsity properly speaking or formal falsity be found."<sup>32</sup> But he cannot be

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<sup>31</sup>"*si verò spectarentur, non prout hoc vel illud repræsentant, sed tantummodo prout sunt operationes intellectûs, dici quidem posset materialiter illas sumi, sed tunc nullo modo veritatem vel falsitatem objectorum respicerent. [n]empe sive frigus sit res positiva, sive privatio, non aliam idcirco de ipso habeo ideam, sed manet in me eadem illa quam semper habui.*" (AT VII, 232); "*que si on les consideroit, non pas en tant qu'elles representent une chose ou une autre, mais seulement comme estant des operations de l'entendement, on pouroit bien à la verité dire qu'elles seroient prises materiellement, mais alors elles ne se raporteroient point du tout à la verité ny à la fausseté des objets. [s]oit que le froid soit une chose positive, soit qu'il soit un privation, ie n'ay pas pour cela une autre idée de luy, mais elle demeure en moy la mesme que i'ay tousiours euës.*" (AT IX, 180)

<sup>32</sup>"*Quamvis enim falsitatem proprie dictam, sive formalem, nonnisi in judiciis posset reperiri..*" (AT VII, 43); "*il n'y a que dans les jugements que se puisse rencontrer la vraie et formelle fausseté..*" (AT IX, 34) The oxymoron "true falsity" is added to the French translation.

referring to material truth or falsity, because he is, right after the quote (AT VII, 232 and ATIX, 180), contrasting this kind of truth and falsity to material falsity. And what is he saying? He is saying that the material idea of sensation contains such faint objective reality that he cannot tell whether it represents something or nothing. That is to say, both the idea of "cold", and that of "non-heat" have an identical degree of reality. A potentially materially false idea does not have the substantial wherewithal, which it passes on to the objective reality, to permit its holder to be concerned about the veracity of its representation.

There are two reasons for supposing that Arnauld understood and accepted Descartes' explication. First, a letter that Mersenne wrote December 13, 1642, in which he writes that Arnauld had let him know that he had no rebuttal to Descartes' responses to his objections.<sup>33</sup> Secondly, in a letter to Mr. Le Roy, dated June 26, 1661, Arnauld likens the signing (approval) of a document that one disapproves of with "material falsities"

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<sup>33</sup>*"Tertio, cum nobilem quartarum objectionum Autorem, qui totius Academiæ Parisiensis subtilissimus habetur Philosophus et Theologiæ Doctor, rogarem, num rursus vellet contra responsiones insurgere, mihi que respondisset se nihil prorsus habere, sibi que penitus esse satisfactum, ipseque docuisset et publice sustinuisset eandem Philosophiam."* (AT III, 603)

For, in order for these material falsities of the Formulary, so to speak, be a lie as far as I am concerned, it must be the case that while uttering them, or signing them, I lead those to whom I speak, or in front of whom I sign, to believe that I approve them, although I do not.<sup>34</sup>

Here, the Formulary (or any letter) is like an idea; it has matter or formal reality, the paper on which, and the ink with which it is written, and it has a content or objective reality. A letter (or a speaker), *quâ* formal entity, is susceptible of "material falsity" because one cannot determine from the content alone of the letter or of the speech, whether it is sincere or not. If the signer of a letter (or a speaker) knowingly signs (or utters) something he or she does not believe, then the letter (or the speech) is a lie (*mensonge*,) i.e., materially false. Given Arnauld's strict adhesion to the Augustinian dogma of mankind's *nature déçue*, it is not surprising that he has no difficulties equating mankind with potential material falsity.

Port-Royal offers two solutions to the problem caused by ideas of sensation. The first does not resolve the issue of the degree of reality of sensations. The authors of *LAP*

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<sup>34</sup>"Car enfin que ces faussetés matérielles du Formulaire, pour parler ainsi, soient un mensonge à mon égard, il faut qu'en les prononçant, ou en les signant, je donne lieu de croire à ceux à qui je parle, ou devant qui je signe, que je les approuve, quoique je ne les approuve pas..." (OC, I, 263)

rearranged Descartes' ontological taxonomy of ideas. A new classification included "ideas of things modified," (*idées de choses modifiées*), like the idea of a "hard body." These were ideas of substance joined to an accident or quality that our senses registered, in such a way that the substance was directly, albeit confusedly, perceived, and the quality was indirectly, but distinctly perceived. In other words, a quality that is perceived by the senses is always parasitic on a substance, and this gives it *raison d'être* but it gives no clues as to its degree of reality; a hard body could still be a non-soft body.

The second solution is far too timid. Arnauld claims in *VFI* that ideas of sensations are given to us by God. But he qualifies his claim by confessingly admitting that the proposal can only be mentioned in passing because of its extracautious aspect

One can almost not doubt that it be God who gives us perceptions of light, sounds, and other sensible qualities, as well as pain, hunger, thirst, although this be the case as a result of what goes on in our organs of sense, or in the constitution of our body.<sup>35</sup>

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<sup>35</sup>"*One ne peut presque pas douter que ce ne soit Dieu qui nous donne les perceptions de la lumiere, des sons et des autres qualitez sensibles, aussi bien que de la douleur, de la faim, de la soif, quoyque ce soit l'occasion de ce qui se passe dans les organes de nos sens, ou dans la constitution de nostre corps.*" (*VFI*, Chap. 27, pp. 261-262)

As is evident from the language, Arnauld exercises great caution in warning his reader that he is unable to assert it with any certainty. The most embarrassing part about materially false ideas is that they exhibit so little or so faint reality that one cannot determine whether they are materially true or false. By having God place ideas of sensation in us, we may hope to be in a position to justify their material falsity at last, but it is not clear why God would do that and not give us the epistemological werewithal to identify the kind of reality of such ideas.

### 2.2.3 Compréhension, Etendue

The Cartesian authors often remind their reader that the mind is limited in its ability to grasp concepts other than simple ones. Although this imperfection places boundaries to our knowledge--we cannot have "complete" knowledge of some ideas such as that of God or of infinity--we can mitigate it by the process of abstraction, and by the use of language. Our mind can perform three kinds of abstraction on its ideas: (1) the mind can break the objective reality of a complex idea into its component parts, as for example the idea of a human body can be broken down into the ideas of arms, veins, brains, etc., and the idea of a large number (not prime) can be factored. Each

idea of a part is in turn given a distinct name; (2) the mind can separate a mode from its substance, even though a mode cannot subsist without a substance. For example, the idea of length can be separated from the idea of an extended body, and named; (3) the mind can separate a *genus* from its *species*, as when it proceeds from the idea of itself to the idea of thinking things, or from the idea of Socrates to the idea of thinking things. In this last case, the mind only performs a "rational distinction" (*distinction de raison*), but the operation is important because it explains universal ideas. Common nouns like 'thinking thing' are signs of universal ideas, and the corresponding universal idea represents (*représente*) all thinking things. This last abstraction gives rise to a distinction essential to LAP's general principle governing deductive reasonings, namely the distinction between *compréhension* and *étendue*. The general principle is anchored in the notion of containment, and the notion of containment applies to either *compréhension* or *étendue*, depending on the sense of the propositions included in the argument. Terms, together with particles of quantity, such as 'some,' 'all,' and 'only' convey a sense to a proposition; copulative verbs indicate affirmation, and attitudinal verbs affect the manner of affirmation.

General (universal or common) ideas represent several individuals, and they are expressed (*marquées*) in language by nouns. Examples of such nouns are 'man', 'city',

'horse'. When I hear the sound produced by the utterance of the phoneme "city", it gives occasion to my mind, perhaps in the Proustian sense that I earlier suggested could account for the occurrence of Cartesian ideas, to form the idea that sound signifies.<sup>36</sup> In turn, this idea may represent in my mind, among other things, and in the objectively real manner ideas are wont to represent, the cities of New York, Vence, Santa Eulalia or Woodstock. On the other hand, the sound produced by the phoneme "Vence" will only result in the representation in my mind of the individual city of Vence. The idea of Vence is an "individual" or "singular" idea, and such ideas are expressed in language by proper nouns.<sup>37</sup>

With regard to universal ideas, the authors of *LAP* argue that "It is very important to well distinguish two things:"

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<sup>36</sup>'Words' and 'sounds' are used interchangeably in keeping, I believe, with the Augustinian tradition. "*Omne verbum sonat*", *De Dialectica*, pp.86-88, a *verbum* is what reverberates. *LAP* shows ambivalence towards etymology. They sometimes say that we can use any sound we please to express an idea so long as we forewarn our interlocutors, and other times they say that we should not use any sounds the etymology of which would conflict with the sense we wish to give it. Be that as it may, the tradition was that a word was always the spoken word, and if reference to a written word was required then the expression 'written word', or the like, was used.

<sup>37</sup>Of course, vocal sounds are either mere accoustic blasts (*flatus vocis*) or words. If they are words, they are signs of ideas, and as signs they give rise to two kinds of ideas, viz., the idea of themselves as a sign, e.g., a monosyllabic sound, a noun, etc., and the idea of that which they are the sign of.

I call *compréhension* of the idea, the attributes which it contains within itself, and which cannot be taken away from it without destroying it, as the *compréhension* of the idea of a triangle contains extension, figure, three lines, three angles, and the equality of its three angles to two right ones.<sup>38</sup>

I call *étendue* of the idea, the subjects which this idea fits, what is also called the inferiors of a general term, which with regards to them is called a superior, as the idea of the triangle generally ranges over all various species of triangles.<sup>39</sup>

It must be remembered that ideas are considered from the point of view of their formal reality, that is as modifications of the mind with content, and from the point of view of their objective reality, that is as representative of something other than a modification of the mind. The distinction between *compréhension* and *étendue* must belong exclusively to the objective reality of a universal idea, for the property of being a substance or a

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<sup>38</sup>"*J'appelle compréhension de l'idée, les attributs qu'elle enferme en soi, & qu'on ne peut lui ôter sans la détruire, comme la compréhension de l'idée du triangle enferme extension, figure, trois lignes, trois angles, & l'égalité de ces trois angles à deux droits.*" (LAP, 59. Italics (emphasis) LAP)

<sup>39</sup>"*J'appelle étendue de l'idée, les sujets à qui cette idée convient, ce qu'on appelle aussi les inférieurs d'un terme general, qui à leur égard est appelé supérieur, comme l'idée du triangle en general s'étend à toutes les diverses especes de triangles* (LAP, 59. Italics (emphasis) LAP).

mode is not really part of the *compréhension* of an idea. So, the objective reality of a universal idea would appear to consist both of attributes, the subtraction of which would result in the destruction of that idea, and of subjects, and of classes of subjects that can be added or subtracted without simultaneously affecting that idea. The *compréhension* of the idea of a triangle is a plane three-sided closed figure whose sum of its interior angles is equal to two right ones, and its *étendue* includes isocèles, scalene, right, etc., and any individual triangle. The *compréhension* of the idea of a cat is a feline domestic animal, and its *étendue* includes Persian, alley cats, etc., and Gaia, Finistère, Timo, etc. *Compréhension* and *étendue* are properties possessed by the idea itself, "the attributes that it encloses in itself," (*les attributs qu'elle [l'idée] enferme en soi,*) and "subjects which befit this idea," (*les sujets à qui cette idée convient,*) (LAP, 59) about which the perceiving agent has no say: "For it is not up to the will of men that ideas comprise what they [men] would wish they comprised,"<sup>40</sup> and these properties can be perceived given an attentive (non-precipitous), and clear and distinct perception. However, a thinking agent cannot will to take away any part of the *compréhension* of an idea, lest the idea

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<sup>40</sup>"Car il ne dépend point de la volonté des hommes, que les idées comprennent ce qu'ils voudroient qu'elles comprissent;" (LAP, 87)

is destroyed, but can take away part of its *étendue* without affecting the idea.

one can take away none of its [the idea's] attributes without destroying it, as we have already said, whereas one can restrict it as to its *étendue*, only applying it to some of the subjects it fits, without at the same time destroying it.<sup>41</sup>

But if no element of the *compréhension* of an idea can be taken away without destroying the idea, certainly some elements can be added. The result is a new universal idea; if I add the idea of "rationality" to the universal "animal," I form the new idea of "man." Thus, some *compréhensions* are greater than others, and when they are, they contain more than others. Likewise, some *étendues* contain more than others. In fact, the two are connected by an inverse relation of containment; the *compréhension* of "man" contains "animal," and the *étendue* of "animal" contains "man." And, in general, it can be said that the greater the *compréhension* (*étendue*) of an idea, the smaller its *étendue* (*compréhension*).

The question, then, is whether there is any relationship between how much objective reality a particular

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<sup>41</sup>"on ne peut lui ôter aucun de ses attributs sans la détruire, comme nous avons déjà dit, au-lieu qu'on peut la resserrer quant à son étendue, ne l'appliquant qu'à quelqu'un des sujets auxquels elle convient, sans que pour cela on la détruise." (LAP, 59)

idea contains, and how much *compréhension* or *étendue* its corresponding universal contains. On the surface, it appears that there is no such relationship because *compréhension* and *étendue* vary inversely; the greater the objective reality is, the greater one of the two components of the universal is. A relationship begins to surface, however, if, instead of considering objective reality from the point of view of metaphysics, it is considered from the point of view of epistemology.

From the metaphysical angle, universals are neither substance, nor modes; in fact, they possess no reality. Arnauld and Nicole are clearly nominalist: "all things that exist are singular."<sup>42</sup> Does it then make sense to talk about their "objective reality?" Objective reality, as Descartes stressed, is a degree of reality conferred in virtue of something being a substance, mode, or accident, and universals are neither of these. But universals are derived, by abstraction, from singular ideas that possess objective reality. Universal ideas are contrasted to singular ideas by their ability to represent "many things" (*plusieurs choses*, (LAP, 58)). Thus, upon my reflection on the singular idea of the *cogito*, I cannot fail to "pay attention" (*faire attention*, (LAP, 56)) to the fact that I am the one doing the thinking, and focus, for some length of

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<sup>42</sup>"*Quoique toutes les choses qui existent soient singulieres...*" (LAP, 57)

time, on the idea of a thinking thing. Thereafter, an attentive inspection of the universal idea of the thinking thing must somehow reveal to the *ego* I had temporarily forsaken not only "many things" (its *étendue*), but also its essential characteristics (its *compréhension*). One is left to suppose that the more substantial the formal reality of the cause of the idea is, the clearer and more distinct its objective reality, and the more complete the *compréhension* and *étendue* of its corresponding universal. It is at this point that metaphysics and epistemology overlap.<sup>43</sup>

*LAP* is silent on this issue, but Arnauld, in a later work, indicates that some ideas are better known (*mieux connues*) than others, possibly implying that the more an idea is known, the more objective reality it possesses. For instance, the Cartesian *cogito* shows that thought is better known than existence because the latter is contained in the former. In general, X is better known than Y, if and only if Y is seen (as seen in a known object--[*tanquam in objecto cognito*]) in X.<sup>44</sup> The degree of knowability of an idea is

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<sup>43</sup>Unfortunately, this daring phenomenological jaunt to the crossroad of metaphysics and epistemology leads nowhere when taken with the optimally substantial idea of God; we have no precise idea of the *compréhension* of God, but the formidability of its substance, and then its *étendue* are inferred from the **incomprehensible** formidability of its *compréhension*.

<sup>44</sup>In the *Regles du bon sens pour bien juger des Ecrits polémiques dans les matieres de science*, (OC, v. 40, nr. 14), Arnauld distinguishes two meanings to the sentence "to see one thing in another" (*voir une chose dans une autre*):

also precisely its objective reality--objective reality is the reality an idea embodies in order to be known--so that, the more an idea is known, the more objectively real it is. Thus, if I say: "Gaia is a cat; therefore she is an animal," I would have to conclude that the idea of a cat is better known (more objectively real) than that of an animal. But is it better known (more objectively real) solely in virtue of the fact that the *compréhension* of the idea "cat" contains, is greater than, that of the idea "animal"? If the answer is yes, then the degree of *compréhension*, but not that of *étendue*, is proportional to the amount of objective reality, that is to say, the greater the objective reality of an idea is, the greater its *compréhension* is. If the answer is no, then the degree of objective reality plays no rôle in the determination of both *étendue* and *compréhension*. The latter alternative is unlikely; how could the knowledge of an idea be justified without something like *compréhension* and *étendue*? It seems that the first alternative must be accepted; this means that the *étendue* can be said to be derived from *compréhension*, or even that the latter determines the former.

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(1) *causaliter*, i.e., one can see Y in X, if X is the efficient cause of Y, thus one sees (or knows) in the sun; (2) *tanquam in objecto cognito*, i.e., one sees what is less known in what is better known. This work was published in late 1693 in response to François Lami's response to Arnauld's August 1693 *Dissertatio bipartita*, which was written in response to Huyghens' *De Veritate æterna, sapientia & justitia æterna*.

Furthermore, the distinction does not apply to non-universal ideas, "At this point, within universal ideas, there are two things that are very important to well distinguish, *compréhension* and *étendue*."<sup>45</sup> It would then appear that singular ideas (ideas of individuals) do not directly benefit from the distinction. But since the distinction is introduced as an apparatus to decide the validity of arguments, how will arguments where proper names and definite descriptions occur be evaluated? Worse yet, one should ask whether the distinction applies to ideas of sensations (Descartes' potentially materially false ideas)? Is heat a universal idea? If it is, then I must have "known" something about it in order to have been able to abstract it from particular experiences of heat. But if I "knew" something about it, it must have possessed some degree of reality, and could not have been materially false, namely it could not have represented something that was nothing. If it is not a universal idea, how do I explain the validity of certain inferences by means of a logic of containment? These questions need to be temporarily shelved (they will be addressed in the last Chapter) until the many meanings of 'containment' are secured *vis-à-vis* "terms" (as understood by the authors,) attributes of *compréhension*,

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<sup>45</sup>"Or dans ces idées universelles il y a deux choses qu'il est très-important de bien distinguer, la *compréhension*, & l'*étendue*." (LAP, 59)

subjects (inferiors) of *étendue*, and universals (as alternates to antepredicaments).

### Conclusion

This chapter considered the explicit debt the Port-Royal logicians recognized toward Descartes' doctrine of ideas. The Cartesian doctrine of ideas was used to pragmaticize and buttress *LAP*'s notion of containment that is flaunted as a streamlined substitute to the scholastic rules. Cartesian ideas are seen as a more substantial foundation to conceiving, judging and reasoning than the scholastic linguistic term. A linguistic term signifies in virtue of something else--in virtue of its "signification"--an idea signifies *tout court*.<sup>46</sup> Arnauld and Nicole often write as if they were afraid of falling into the temptation of trusting language, so they remind their reader that language is an arbitrary sign, and that it is easy, because of the force of habit, to forget that language is a sign of ideas. Thus, language can only feign to embody containment,

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<sup>46</sup>The terms 'to represent,' 'representative,' and 'representation' are what Arnauld calls "analogous terms" (*mots analogues*). A food, an air are said to be healthy because they are the causes of health to a living body; a word, a painting are said to be representative because they are the causes of a mental representation. Thus, a living body is healthy tout court, and a mental idea represents tout court, that is, without reference to something else. *DRFI*, in *OC* 38, 584-585.

and it does it because it is a sign of ideas (and ideas are not signs), and not a sign of mind-independent objects (cats do not contain animality).<sup>47</sup> They argue that the mind is accustomed to so narrowly join ideas with the sound of a word that one can hardly be considered without the other.<sup>48</sup> But there is no real connection between sensations and ideas; the idea of the sound constantly loiters like a parasite around the idea of the thing, mistakenly suggesting that some of the properties of the objectively real idea are passed on to the sound (or ink mark) that signifies it. The properties of terms are neither genetically inherited, nor logically derived from the signification of that term as the scholastics had suggested. Linguistic terms "act" as if they had the properties, not by explicit proxy as the vicar or the actor, but by an usurpation that remains unchallenged because of the force of habit.

The general principle governing all syllogistic reasonings permits a rapid and accurate determination of

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<sup>47</sup>The Millian view that terms cannot be signs of ideas because "the sun is the cause of the day" does not mean that "my idea of the sun causes or excites in me the idea of the day" (*System of Logic*, I,II,§1) forces a strictly extensional analysis of containment.

<sup>48</sup>"Or certainement il est de quelque utilité pour la fin de la Logique, qui est de **bien penser**, d'entendre les divers usages des sons qui sont destinés à signifier les idées, & que l'esprit a de coutume d'y lier si étroitement que l'une ne se conçoit gueres sans l'autre; ensorte que l'idée de la chose excite l'idée du son, & l'idée du son celle de la chose." (LAP, 103 (emphasis by the authors)).

their validity. Along with trying to adapt the Cartesian doctrine to their project, Arnauld in particular, and Nicole at times made important contributions to the determination of validity. They clearly separated the objective and formal realities of ideas, and presented them as two aspects of a unique thing, they contributed to the clarification of the perplexing materially false ideas, and they added the *compréhension* and *étendue* distinction as derivatives of the objective reality of ideas.

### CHAPTER THREE

#### COMPREHENSION AND ETENDUE

Historians of logic who have few positive things to say about *LAP* nonetheless find the distinction between *compréhension* and *étendue* worth mentioning. Why has the distinction become the distinguishing characteristic of Port-Royal? Looking at it superficially, the interest can be accounted for by the temporal position that *LAP*'s distinction occupies in history; it stands between two well-known doctrines that bear some resemblance to it: namely the scholastic doctrine of supposition, which Chapter One discusses, and the Fregean doctrine of sense and denotation (*Sinn und Bedeutung*).<sup>1</sup> Although Norman Kretzmann, in his entry "History of Semantics" in the *Encyclopedia of Philosophy*, likened the Port-Royal distinction to the scholastic distinction between simple and personal supposition, the likening was found to be, at best, very general: the three doctrines share the aim of accounting

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<sup>1</sup>G. Frege's (1892) "On Sense and Reference", in *Translations from the Philosophical Writings*, trans. P. Geach and M. Black (Oxford: Blackwell, 1952).

for the fact that linguistic terms occurring in propositions and arguments signify as well as denote objects, and this signification plays the significant logical rôle of determining which objects are denoted. However, the aim greatly varies in each of the three doctrines.<sup>2</sup>

Whereas Frege first introduced the distinction because of his concern about the informativeness of statements of identity,<sup>3</sup> the scholastics and Port-Royal, on the other hand, were concerned about ways to determine the truth of particular propositions and the validity of arguments. Contrary to modern theories of logic that can clearly segregate semantics and syntax in arguments (content and form), seventeenth century manuals of logic made the truths of propositions and the soundness of arguments so indissoluble that the concept of validity was eliminated (see Chapter Six). Arnauld and Nicole, like their contemporaries and predecessors, adopt a content-oriented (rather than form-oriented) logic. The content solely depends on the clarity of signification; a proposition is true provided that some containment relation clearly obtains

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<sup>2</sup>For the scholastics, the proposition determines the signification (*suppositio*) of linguistic terms; for Port-Royal, linguistic terms only signify ideas, and ideas do the rest of the work as is required by the proposition; for the late Frege, linguistic terms are specific manners of presenting objects.

<sup>3</sup>Another important concern for Frege was the reference of subjects occurring in oblique context and propositional attitudes.

between subject and predicate; an argument is valid provided that some containment relation obtains between premises and conclusion. The components of LAP's notion of signification, therefore, need to be considered carefully. This chapter critically examines the relation of containment that is pervasive within ideas in general, and within *compréhension* and *étendue* of universal ideas. This chapter also examines the terminology adopted by Port-Royal to describe the various elements of *compréhension* and *étendue*. An explanation is suggested for the authors' stipulation that the term 'term' be used to denote both linguistic terms and ideas. Furthermore, the concepts of "attributes," which make up *compréhension*, and "subjects," which make up *étendue* are carefully explained in anticipation of their rôle in the so-called "law of Port-Royal." The law states that if the *compréhension* of an idea is increased or decreased, its *étendue*, if it varies at all, varies inversely. The "law" is presented in Chapter Four.

### 1. Terms of containment

The notion of containment, so crucial to LAP's general principle governing all syllogisms, is informally introduced in the chapter explicating *compréhension* and *étendue*.

Attributes are contained in the *compréhension* of an idea,

and subjects or inferiors are contained in its *étendue*. However, because the *compréhension* of idea-A contains idea-B whose *étendue* contains idea-A, the two idea-A's must be distinct tokens. I have an idea of "cat"; its *compréhension* contains the idea of "animality." I now have an idea of "animality": its *étendue* contains the idea of "cat," which is a distinct idea-token from the original idea-token of "cat," which gave rise to the idea of "animality." Thus, idea-types, rather than idea-tokens are the subjects of containment in general.

No relation seems easier to grasp than the relation of containment. We, as a species, seem to delight in putting things in boxes and boxes in greater boxes; the Russians made an endearing art of containment with stacking dolls. Why, then, do the Port-Royal authors use so many distinct terms to describe it?

There is no doubt that the term 'containment' and many other terms of logic like 'term' (Greek: *horoi*) and 'figure' (Greek: *schema*) are borrowed from the language of Euclidean geometry. It is well documented that, from Plato to the nineteenth century, Euclidean geometry was not only viewed as an accurate science of the actual world, but also represented an ideal of precision, certainty and coherence that theories in all fields were often urged to duplicate.<sup>4</sup>

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<sup>4</sup>Descartes may be one exception to this generalization. In a letter to Mersenne (April 15 1630), he writes that

Ironically, the inability of classical logic to decisively break out of the Aristotelian mold could be traced to its practitioners' obsession with Euclidean geometry, and to their disregard for its algebraization;<sup>5</sup> the break was even more unlikely for Arnauld and Nicole, given the fact that their obsession was combined with an explicit refusal to use abstract symbols in logic.

Cases where Arnauld and Nicole hope to model logic on geometry abound. The hope is rarely justified. Logic could be modeled on geometry only if all reasonings were uncontroversially reducible to *Barbara* (syllogisms of the form: "All M is P and All S is M; therefore All S is P" where 'M' is the middle term, 'S' is the minor term and 'P' is the major term). *Barbara's* minor term was located at the bottom left angle, the major term at the bottom right angle, and the middle term at the top angle. In this unique (and perfect) case, the *étendue* of the minor is contained in the *étendue* of the middle term, and the *étendue* of the

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metaphysical truths can be demonstrated "in a more evident way than demonstrations of Geometry."

<sup>5</sup>The frequent advantages of algebra over geometry are obvious. In geometry, if two straight lines are abutted to form a new straight line and then squared the result is expressed in a particular numerical value of the area of one square, or by the general formula:  $(ab + bc)^2 = ac^2$ . In algebra, the result is expressed by an equation showing that not only four squares are contained within the square, but also showing their magnitude relative to each other:  $(x + y)^2 = x^2 + 2xy + y^2$ . If ideas were translated into a calculus the information yielded by algebra is in many cases more useful than the one contained in geometry.

middle term is contained in the *étendue* of the major; inversely, the *compréhension* of the major is contained in the *compréhension* of the middle, and the *compréhension* of the middle in that of the minor.

Middle term

Minor Term

Major Term

But *Barbara* is the only figure that has a perfect spatial disposition; even Aristotle thought of it spatially when he equated it with the perfect chiasm, BAAC; therefore BC (animality is in all felines, and felinity is in all cats; therefore animality is in all cats).

Because all other moods and figures can be reduced to *Barbara*, syllogistic reasoning is as close to geometry as is possible. Sometimes, however, for Arnauld and Nicole, it is a little too close. They do not accept the reductions that require indirect proofs. *Baroco* and *Bocardo*<sup>6</sup> are two examples of figures that are only reducible to the first figure by *reductio ad absurdum*, a form of reasoning rejected by the authors of *LAP* on account of its

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<sup>6</sup>*Baroco*: All P is M, Some S is not M; therefore, some S is not P; *Bocardo*: Some M is not P, All M is S; therefore, Some S is not P.

counterintuitive character: no one ever could hope for a clear perception of the impossible. Thus, although the Vallant Ms graphically represents *Barbara* as an equilateral triangle, it must come as no surprise that the practice is not repeated in subsequent editions.

Arnauld's *Nouveaux Eléments de Géométrie* (1667; 1683; 1693) is an attempt to clarify in a Cartesian manner, i.e., a manner free of *reductio*, Euclid's *Elements*. Pascal, who at first had been placed in charge of the project for the Little Schools of Port-Royal, backed out after he lost interest in the sciences and completed the introduction; its introduction is extant under the title of "*De l'Esprit Géométrique et de l'Art de Persuader*." It stresses the need of precise definitions, definitions that nevertheless require some undefined terms in order to avoid infinite regress. Arnauld begins the *Nouveaux Elements* with a set of definitions that takes containment as an undefined primitive. It is telling that reason (*ratio, raison*), that is to say the proportional comparison of two homogenous magnitudes, is defined in terms of containment: "the manner in which a magnitude is contained in another, or contains another."<sup>7</sup> It is also telling that containment is terminologically distinguished according to the objects of

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<sup>7</sup>"la maniere dont une grandeur est contenue dans une autre, ou en contient une autre." Quoted by Jean-Louis Gardies in *Pascal entre Eudoxe et Cantor*, Paris: Vrin, 1984, p. 93.

the relation. Two parallel lines are said to enclose (*enfermer*) another line: "If an enclosed line is perpendicular to one and the other of the enclosing lines, etc."; an angle is said to be a surface comprised (*compris*) "between two straight lines that join each other"; and an area is contained (*contenue*) in a figure: "Figures considered according to their areas: that is to say, according to the magnitude of the areas they contain."<sup>8</sup>

The terminology reflects a pattern between container and containee: parallel lines that enclose other lines have two open ends and enclosed lines (the containee) can be added or removed without affecting the two parallel lines (the container); two non-parallel lines join at one end and comprise an angle (the containee), which has one open end and which cannot be increased or decreased without altering the two non-parallel lines (the container); and three or more connecting lines, which have no open end contain an area, but the three or more lines (the container) may be altered without changing the area (the containee)--a 6x6 square has the same area as a 9x4 rectangle. Thus, in geometry, as would be hoped in logic, a reason (a reasoning) is explained

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<sup>8</sup>"Si une ligne enfermée est perpendiculaire à l'une et l'autre des enfermantes,..." (OC, 42, 229); "L'angle rectiligne est une surface comprise entre deux lignes droites qui se joignent en un point du côté où elles se rapprochent le plus." Ibid., p.292; "Des Figures planes, considérées selon leur aire: c'est-à-dire selon la grandeur des surfaces qu'elles contiennent." Ibid., p. 305.

by containment and a precise containment is expressed by the verbs 'enclose,' 'comprise' and 'contain.' And just as some contained areas of geometry are commensurable and others are not, some ideas in reasoning are adequate, and others are not.

Sadly, none of geometry's terminology that ends up in logic reflects a pattern that could be linked to distinct forms of containment. Why, then, import the terminology? It may be in an attempt to make logic look as certain as geometry. It is clear that in the absence of rigorous distinctions, logical containment invites figurative speech and becomes savory fodder for metaphorists. It is unfortunate that Arnauld and Nicole enthusiastically join their ranks; in the end, the terminology of geometry only gives the illusion of rigor. Within the *compréhension* and *étendue* of ideas, terms of the scholastics are shuffled with terms of geometry; it is hard to figure out which of the two disciplines is more longed for. Thus, it is by means of terms of geometry that the authors describe the relation of containing as "enclosing": "the *compréhension* of the idea of a triangle encloses *étendue*" (*la compréhension de l'idée du triangle enferme extension...*); and as "ranging over" or "extending over": "the idea of a triangle generally ranges over all various species of triangles" (*l'idée du triangle en general s'étend à toutes les diverses especes de triangle*); and they describe it as "comprising": "the

attributes that this idea comprises" (*les attributs qu'elle [cette idée] comprend*). And it is by means of the scholastic terminology that they describe the relation of befitting: "subjects that befit this idea" (*les sujets à qui cette idée convient*).<sup>9</sup>

Not only do the *compréhension* and *étendue* of ideas contain other ideas, but also ideas, considered as objectively real, contain distinct other objectively real ideas. In this context, Arnauld and Nicole use the verb 'enclose' (*enfermer*), which had been restricted to lines enclosed between parallel lines in the *Nouveaux Eléments*. For example, a sign is said to enclose (*enfermer*) two ideas, as when a name or a sound is said to enclose certain ideas.<sup>10</sup> First, in order to avoid the metaphysical difficulty of inter-substantial travel, a sign (a written mark or sound) needs to metamorphose itself into an idea of a sign, and only then can this idea be said to contain more ideas. Otherwise, the containment of ideas by written marks or sounds would be as incomprehensible as the "containment"

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<sup>9</sup>All four quotations belong to the three short paragraphs explaining *compréhension* and *étendue*. (LAP, 59)

<sup>10</sup>"...*les mots adjectifs, ..., enferment encore l'idée du mépris.*" (LAP, 95); "*le signe enferme deux idées.*" (LAP, 53); "*il n'y a rien de tout cela enfermé dans ce son "Dieu".*" (LAP, 42); "*outre l'idée principale en laquelle ils conviennent, ils (les mots) enferment aussi l'image d'une mauvaise disposition.*" (LAP, 99) The term 'enclose' seems privileged by the authors to express the non-explicit connotation of terms.

of the mind by the body. If an idea of sign contains two distinct ideas, there is a sense in which the containment is essential; the removal of the contained, although it does not eliminate ideas of scratch marks and accoustic blasts from the mental world, does alter in a dramatic way the nature of the containers. The containers are stripped of their meaningfulness. So, there is a strange sense in which the contained dictates the nature of the container, perhaps the way the oak shapes that in which other oaks are contained.

Of all the terms used, the verb 'befit' (*convenir*) appears to be the only one strictly reserved for *compréhension*. As for example: "the genus befits each species," or "mortality and rationality only befit man," or "what is proper also befits all inferiors," or "accidents befit genera."<sup>11</sup> The concept of befitting belongs to the language of the predicables (genus, species, etc.) which dominated the logic texts of the scholastics (terms and topics,) but could not, according to Arnauld and Nicole, account for the dual aspects of containment as adequately as *compréhension* and *étendue*.<sup>12</sup> Instead of having man a

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<sup>11</sup>"le genre convient à chaque espece,..." (LAP, 61); "mortalité et rationalité ne conviennent qu'à l'homme,..." (LAP, 62); "le propre convient ainsi à tous les inférieurs..." (LAP, 63); "les accidens conviennent aux genres,..." (LAP, 64).

<sup>12</sup>I believe that the fresh presentation of the subject by Arnauld and Nicole paved the way for the intensional and

species of the genus animal because the genus animal befits man, we have the *étendue* of the idea of man as a part of the *étendue* of the idea of animal because the *compréhension* of the idea animal is a part of the *compréhension* of the idea of man. These examples betray the authors' continued dependence on the language of predicables of the scholastics. The next chapter explains how the predicables forebears of the distinction between *compréhension* and *étendue*.

All terms, then, except 'befit,' can be used synonymously to describe containment within *compréhension* or *étendue*. The authors are actually explicit on this point. This suggests that their motivations for the multiplicity of terms was for concerns of rhetoric rather than concerns of rigor

What befits an idea taken universally befits everything that this idea is said of, or everything that is the subject of this idea, or that is comprised in the extension of this idea, for these expressions are synonymous.

to be the subject of an idea, and to be contained in its extension is no other than to enclose this idea.<sup>13</sup>

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extensional interpretations of Leibniz' logical calculi. See Resher's "Leibniz' Interpretation of his Logical Calculi," in *The Journal of Symbolic Logic*, v. 19, Nr. 1, March 1954.

<sup>13</sup>"Ce qui convient à une idée prise universellement, convient aussi à tout ce dont cette idée est affirmée, ou qui est sujet de cette idée, ou qui est compris dans

This passage clearly indicates that the relation of "containing" is intended to apply to both *compréhension* and to *étendue*; in other words, the term indiscriminately shuttles the two significations back and forth. This is important because the validity of arguments containing particular propositions cannot be established from the point of view of *étendue*. The passage begins with a version of the *Nota notæ est etiam nota rei ipsius* (the attribute of an attribute is the attribute of the thing itself) and ends up with a version of the *Dictum de omni* (Whatever is predicated of a term used distributively may be predicated of everything included in the term).<sup>14</sup> The idea "animal" befits the universal idea "cat" (the *compréhension* of the idea "cat" contains that of "animal"); cat is said of Siamese Lilac points (the *étendue* of the idea "cat" contains the idea "Siamese Lilac points" or "Siamese Lilac points" are subjects of "cats", they are comprised in the extension of cats); so the *compréhension* of "Siamese Lilac points" contains the idea of "animal." This maneuvering between *compréhension* and *étendue* is possible because of the connection of the containment applicable to each. If the

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*l'extension [sic] de cette idée, car ces expressions sont synonymes." (LAP, 193) "...être sujet d'une idée, & être contenu dans son extension [sic], n'est autre chose qu'enfermer cette idée." (LAP, 173).*

<sup>14</sup>I omit the negative counterparts of the *dictorum* to simplify the argument.

*compréhension* of A contains that of B, (cats  $C_{comp}$  animals) then the *étendue* of B contains that of A or the *étendue* of A is contained in that of B (animals  $C_{éten}$  cats). Or if animality is included in the *compréhension* of cats, then cats are included in the *étendue* of animals. The graphic representation of *Barbara* as an equilateral triangle attests to the connection between the two elements of universal ideas. Ideally, then, there is no need to distinguish between the two kinds of containment.

From these various considerations, and if containment is restricted to the realm of universal ideas, two classifications of containment can be culled. Because what is contained in the *compréhension* cannot be removed without annihilation of the idea, but what is contained in the *étendue* may be altered without similar peril, there is a need to distinguish between essential and non-essential containment:

Essential Containment: the *compréhension*  $\Phi$  of idea<sub>i</sub> contains (encloses) attribute-idea<sub>k</sub> in such a way that if idea<sub>k</sub> is removed,  $\Phi$  is also removed. The idea "cat" contains the idea "animality" in such a way that former disappears upon removal of the latter.

Non-essential Containment: the *étendue* Y of idea<sub>i</sub> contains (ranges over) subject-ideas<sub>1, ..., n</sub> in such a way that idea<sub>j</sub> can itself contain other ideas or can be removed, and idea<sub>n+1</sub> can be added without affecting idea<sub>i</sub>.

Furthermore, within this distinction, an additional distinction is needed because some essential or non-essential containments are, what the authors call "actual" or "possible." For example a genus may contain certain *differentiæ* by not excluding them

the idea of animal does not enclose thought in its *compréhension*, but neither excludes it, and even encloses it in its *étendue*, because it befits a thinking animal; whereas the idea of beast excludes it in its *compréhension*, and accordingly cannot befit the idea of a thinking animal.<sup>15</sup>

Here, we have the curious case of an idea the *étendue* of which contains subjects the *compréhension* of which differs from that of the idea it is a subject of. These phenomena are accounted for by the authors by appealing to possible and actual "befitting"

For, if it is said, for example that judges who are never influenced by begging pleas and favors are worthy of praise, it is not said at the same time that such a perfect judge exists. Nevertheless, I believe that in these kinds of propositions, there is always a tacit and virtual affirmation, not of the actual befitting of the attribute to the subject which the relative pronoun 'who' connects, but of the possible

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<sup>15</sup>"*l'idée d'animal n'enferme pas la pensée dans sa compréhension, mais ne l'exclut pas aussi, & l'enferme même dans son étendue, parce qu'elle convient à un animal qui pense ; au-lieu que l'idée de la bête l'exclut dans sa compréhension, & ainsi ne peut convenir à l'animal qui pense.*" (LAP, 63)

befitting.<sup>16</sup>

Possible containment within the realm of the mental may be used to explain the fact that some things outside the realm of ideas contain other things without actually containing them. It is said that rutabagas are contained in a bushel, and that an oak is contained in an acorn.<sup>17</sup> Although both bushel and acorn are said to contain, they contain in a very different manner; the former contains actually, and the latter contains potentially. It should be noted that possibility and actuality are not exact opposites; the mind contains body neither actually nor possibly. It would seem that some containers "crack" or "self-destroy" if they are filled by a totally different substance.

So far, the discussion has focused on the containment of single (universal or particular) ideas. But the general

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<sup>16</sup>"Car si on dit, par exemple, "Que les Juges qui ne font jamais rien par prieres & par faveur, sont dignes de louanges," on ne dit pas pour cela qu'il y ait aucun Juge sur la terre qui soit dans cette perfection. Neanmoins je croi qu'il y a toujors dans ces propositions une affirmation tacite & virtuelle, non de la convenance actuelle de l'attribut au sujet auquel le 'qui' se rapporte; mais de la convenance possible." (LAP, 127, underlining mine.) This passage also makes it clear that some universal propositions, namely those that are modified "determinatively" rather than "explicatively," have no existential import.

<sup>17</sup>This distinction is noted by G. Frege in *The Foundations of Arithmetic*, Northwestern U. Press, 1980, p.101: "they (Kant's predicates of a priori synthetic judgments) are contained in the definitions, but as plants are contained in their seeds, not as beams are contained in a house."

principle governing all syllogisms is also spelled out in terms of containment: "That one of the two propositions must contain the conclusion, and that the other shows that it does contain it."<sup>18</sup> In what sense does one proposition contain another? How precisely are we supposed to understand the notion of containment here? From the point of view of *compréhension*, *étendue*, or both? Consider the following argument: All cats are animals; therefore all Siamese Lilac points are animals. Here, the conclusion is contained in the premise from the point of view of *étendue* because the subject of the conclusion is a subject of the subject of the premise. Consider now the following argument: Siamese Lilac points are cats; therefore Siamese Lilac points are animals. Here the conclusion is also contained in the premise because the *compréhension* of cats contains "animality." So,  $P \text{ } C_{\text{comp}} \text{ } Q$  if and only if the *compréhension* of the predicate of P contains the predicate of Q, and  $P \text{ } C_{\text{éten}} \text{ } Q$  if and only if the *étendue* of the subject of P contains the subject of Q. It is also possible for the two types of containment to appear simultaneously, for example: All cats are feline; therefore all Siamese Lilac points are animals.<sup>19</sup> The problem with this analysis is

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<sup>18</sup>"Que l'une des deux propositions doit contenir la conclusion, & l'autre faire voir qu'elle la contient." (LAP, 214, underlining mine)

<sup>19</sup>Chapter Six points out to some cases where the *étendue* of the subject of the conclusion is contained in the *étendue* of

that a proposition is identified with either its quantified subject or its predicate, and ignores everything else. However, since a proposition is itself defined by the relation of containment--either the subject is contained in the *étendue* of the predicate, or the predicate is contained in the *compréhension* of the subject--it makes sense for Port-Royal to argue that if the subject of a proposition contains the subject of another, both subjects are contained in the predicate of the first. The transitivity of containment can take epidemic proportion; if  $S_1$  both contains  $S_2$  and is contained in  $P$  then  $S_2$  is contained in  $P$ , and  $S_1P$  contains  $S_2P$ .

Containment is not only a pervasive relation, it is also one that is easily graspable. No wonder it is appealed to to explain so much! The loose terminology used by Arnauld and Nicole to describe the relation assumes that the reader will make the distinctions pointed at in this section. Containment is of types, *viz.*, idea-types, *compréhension*-types, *étendue*-types, and proposition-types. It is essential or non-essential, actual, possible or impossible.

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the predicate of a premise, but this case only happens when the premise in question is either particular affirmative or universal negative, i.e., in cases where conversion is evident and where it would seem more "natural" to switch the subject with the predicate.

## 2. Terms and Ideas

The brief remarks about ideas and words that were made towards the end of the previous chapter intimate that the boundaries between the mental and linguistic/corporeal realms do not always get the respect that their respective metaphysical ranks pretend to confer onto them; for instance, the idea "felineity" could accidentally be predicated of Gaia. The LAP authors seem to invite such accidents when they want the term 'term' to signify both universal ideas, and ideas of common nouns. But Port-Royal's stipulation is introduced for a positive purpose; it anticipates the confusion that would arise between terms and ideas in the formulation of the rules of the syllogism, and it indirectly leads to the new concept of "false equivocity" that has been likened to Donnellan's distinction between the attributive and referential uses of definite descriptions.<sup>20</sup>

Jean-Claude Pariente observes in footnotes that "Port-Royal moves from ideas to terms without much concern for rigor."<sup>21</sup> But in fairness to Arnauld and Nicole, these

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<sup>20</sup>See Chapter Five, sections 1 and 2.

<sup>21</sup>"Port-Royal passe sans scrupules des idées aux termes, des signifiés aux signifiants," in "Le système des propositions catégoriques à Port-Royal," in *Mérites et limites des méthodes logiques en philosophie*, Vrin, 1986, p.229 (Transcript of a 1984 colloquium); "Port-Royal passe sans scrupules des idées aux termes, et ne manifeste aucun souci de rigueur dans la méta-langue," in *L'analyse du langage à Port-Royal*, Paris 1985, p. 229.

shifts are not made without an initial warning from them: "Universal ideas, as well as common nouns can be called general terms."<sup>22</sup> The remark, which takes the form of a stipulative definition (*définition de mots*), makes the spoken word 'term' equivocal; it signifies both ideas of common nouns, and ideas of general ideas.<sup>23</sup> It was noted in the previous chapter that the mind is so accustomed to bind ideas to words that it requires hard mental work to conceive one without the other. But this cannot be the explanation for the need of the definition, as Pariente seems to imply. Arnauld and Nicole certainly could not have wished to blur the division between words and ideas; they warn their readers about such possible confusions. Words and ideas are so matter-of-factly used together that it may explain the fact that one is often mistaken for the other, but again, it needs to be emphasized that this is a mistake, and not the

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<sup>22</sup>"Et tant les idées universelles que les noms communs, se peuvent appeler termes généraux." (LAP, 58)

<sup>23</sup>LAP's example of a stipulative definition has the same form as the above remark: "I call soul that which in us is the principle of thought" ("*J'appelle ame ce qui est en nous le principe de la pensée*", LAP, 86). Following Aristotle, Arnauld and Nicole distinguish between what we would call today lexical and theoretical definitions (*definitio nominis* and *definitio rei*). They are original, however, in distinguishing between lexical (*selon l'usage*) and stipulative (*arbitraires*) definitions. Robert Blanché, in *La logique et son histoire, d'Aristote à Russell*, (Paris: Colin, 1970), p. 185, notes that after Port-Royal, and contrary to the scholastics, the expression '*definitio nominis*' became ambiguous. It could mean either a lexical or stipulative definition, the latter differing from the former in the fact that it could be neither true nor false.

way things are; words and ideas are neither of the same metaphysical ilk, nor do they share certain properties. Words belong to the material realm, ideas to the mental; the former is a social fabrication, the latter is part of the very fabric of a divine creation. As vicars or deputies of ideas, words may sometimes usurp the properties of ideas, but ideas could not usurp the properties of words because they belong to a "higher" metaphysical realm. As a matter of fact, the *LAP* authors devote an entire chapter to explain how the undue trust we place on language leads us into error: "We have already said that our need to use exterior signs in order to be understood, results in the fact that we bind ideas to words so much, that we often pay more attention to words than ideas."<sup>24</sup>

I believe that the definition is introduced to facilitate the exposition of the syllogistic rules in a later chapter. The word 'term' signifies universal ideas and ideas of common nouns, the way the term 'substance'

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<sup>24</sup>"*Nous avons déjà dit que la nécessité que nous avons d'user de signes extérieurs pour nous faire entendre, fait que nous attachons tellement nos idées aux mots, que souvent nous considérons plus les mots que les choses.*" (*LAP*, 83) This is the first paragraph of chapter XI of Book I, titled "*D'une autre cause qui met de la confusion dans nos pensées & dans nos discours, qui est que nous les attachons à des mots.*" This chapter, which appeared in the Vallant MS, was considerably modified in the first edition of 1662. The section on "analogues" was moved to the chapter on *compréhension* and *étendue*, and incorporated in the paragraphs explicating the antepredicaments; and a fairly long section that addresses the distinction between sense, and intellectual perception was added.

signifies the ideas of God, mind, and body, and the definition is needed in anticipation of the chapters on the syllogisms where reasoning is explained as two ideas being compared by means of a third one, and these ideas are referred to as "*petit, moyen, or grand terme*."<sup>25</sup> The scholastic terminology is used because the spatial positions of ideas vis-à-vis each other remain the same as the spatial positions of linguistic terms in scholastic logic. By so doing, they avoid the need to introduce a novel terminology that would map on the level of ideas the terminology that belongs to the syllogism.

#### 2a. False equivocity

Interestingly enough, the definitional remark is immediately followed by a short explanatory section on the equivocity and univocity of words (*noms*).<sup>26</sup> According to the authors, this apparent digression is needed in order to explain that the general words signifying the universal

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<sup>25</sup>LAP, III, I-XVI, *passim*.

<sup>26</sup>*Categories*, 1. The terminology differs, Aristotle speaks of homonyms, synonyms, and paronyms. The medieval logicians generally devoted a chapter of their treatise to this subject which they named the "antepredicaments," (*antepredicamenta*,) and the corresponding terminology became *univocata*, *æquivocata*, and *denominativa*. Each class acquired various subdivisions.

ideas under investigation, can only be univocal.<sup>27</sup> This explanation is rather suspicious; first because it seems obvious that the equivocality of a noun must be cleared before it can signify an idea, the *compréhension* and *étendue* of which is sought. Before I can hope to have a representation of the idea of a canon (cannon), I must decide (will) whether the sound '[kanon]' will signify the idea of a law or that of a gun. It seems unlikely that both ideas can be represented at the same time. Secondly, the definition is suspicious because the manuscript version of *LAP* skips the entire digression, and directly passes from the definitional remark about terms and ideas to the distinction between *compréhension* and *étendue*.<sup>28</sup> Why was this bit of "Aristoteliana" squeezed in here?

Arnauld and Nicole, possibly in order to mollify Aristotelian diehards, strew some core Aristotelian doctrines throughout *LAP*.<sup>29</sup> Thus, the doctrines of the

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<sup>27</sup>"*Mais quand nous parlons ici des mots generaux, nous entendons les univoques qui sont joints à des idées universelles & generales.*" (*LAP*, 58)

<sup>28</sup>A brief paragraph about analogues, a special class of equivocal terms, is included in the chapter titled "*D'une autre cause qui met de la confusion dans nos pensées & dans nos discours, qui est que nous les attachons à des mots.*" (*LAP*, I, XI, and MS.) This paragraph is moved back to the section on antepredicaments in the published version (*LAP*, 58).

<sup>29</sup>It is significant that the "*manuscrit Du Vallant*," which was only intended for the private use of the Duc de Chevreuse (de Luynes' son and friend of Port-Royal) does not include a chapter on the categories, the ante predicaments,

predicables (*genus, species, etc.*,) the antepredicaments (homonymy, synonymy, and paronymy,) the predicaments (the ten categories,) and the topics surface at unexpected places, with no apparent respect for the traditional order in which the core doctrines were originally presented. While a traditional seventeenth century logical treatise would begin by a discussion of the object, subject, and end of logic, and then continue on to chapters on predicables, antepredicaments, predicaments (categories), and postpredicaments (*oppositio, prioritas, simultas, motus, habere*), *LAP* places the chapter on Aristotelian categories immediately after the chapter where ideas are presented in relation to their objects: "Everything that we conceive is represented to our mind either as a thing, or as a manner of thing, or as a modified thing."<sup>30</sup> This order of presentation seems to suggest a streamlined version of the Aristotelian categories: ideas are of substances, of modes, or of modified substances. This division, however, became challenged when a fourth category, that of ideas of signs, was added to the fifth 1683 edition (*LAP*, IV). The

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and the topics. It does, however include the long chapter on the predicables.

<sup>30</sup>"*Tout ce que nous concevons est représenté à notre esprit ou comme chose, ou comme maniere de choses, ou comme chose modifiée.*" (*LAP*, 46) A fourth kind of object of ideas, ideas of signs, is the topic of a chapter that is added to the fifth edition of 1683. This chapter follows the chapter that discusses the Aristotelian categories.

antepredicaments, as we saw, are not the objects of a chapter, but are interposed between a discussion on the division of ideas into universal and particular, and the celebrated distinction of universal ideas (Chapter VI). The chapter on predicables follows Chapter VI. The chapter on topics follows the last chapter on syllogisms. In all cases, except with respect to the section on the antepredicaments, the chapters are prefaced by a warning that such discussions are not very useful, and mind-cluttering.<sup>31</sup> The antepredicaments deserve special attention because they are integrated in the very crucial chapter that explains *compréhension* and *étendue*, rather than being presented as a piece of speculative and otiose school exercise. More importantly, however, they serve to introduce the notion of "false equivocity" (*équivoques par erreur*) that is essential to LAP's formulation of definite descriptions. Common nouns are univocally general, when and only when "they are bound (*liés*) to general ideas, in such a way that the same word is applicable (*convient*) to several ideas, both according to the sound and according to the same

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<sup>31</sup>The doctrines of the conversion of propositions, and of the syllogisms are also part of the Aristotelian core doctrines deemed "*dangereuse(s)* [51]...*peu utiles pour la pratique* [168]...*une chose à peu près indifferente* [233]." I do not specifically mention them because they are introduced in the order that is generally accepted.

idea, which is annexed to it."<sup>32</sup> As examples of univocal terms, *LAP* cites 'man,' 'city,' and 'horse.' The English sound ['hô(e)rs] signifies all and only the Appaloosas, the Lipizzaners, the Clydesdales, Rosinante, Bucephalus, Mr. Ed, and all the other breeds and individual horses.<sup>33</sup>

Words are general equivocally, when and only when "a same sound has been bound by men to different ideas, in such a way that the same sound is applicable to several ideas, not according to the same idea, but according to ideas different to the ones to which it (the sound) happens to be usually annexed."<sup>34</sup> Thus, and according to the Port-Royalists, the spoken word 'canon' ('cannon') signifies the ideas of the many kinds, and of the many individual cannons;

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<sup>32</sup>"*Mais il faut remarquer que les mots sont generaux en deux manieres : l'une que l'on appelle univoque, qui est lorsqu'ils sont liés avec les idées generales ; de sorte que le même mot convient à plusieurs & selon le son & selon une même idée, qui y est jointe: tels sont les mots dont on vient de parler, d'homme, de ville, de cheval.*" (*LAP*, 58)

<sup>33</sup>Bertil Rolf, in "The Port-Royal Theory of Definition," in *Studia Leibnitiana*, Band XV/1 (1983), tries to show that sounds cannot be rigorously linked to ideas because of the variances in pronunciations, and opts for establishing a link between morphemes and ideas (p. 97). Following Augustine, and as noted earlier, the authors make sounds prior to the written word. It would appear that the same argument leveled against pronunciations could also be leveled against typescripts. Naturally, part of the competence in a language must include a wide enough range of capacities for pronunciation and making of typescript.

<sup>34</sup>"*L'autre qu'on appelle équivoque, qui est lorsqu'un même son a été lié par les hommes à des idées différentes, de sorte que le même son convient à plusieurs, non selon une même idée, mais selon les idées différentes auxquelles il se trouve joint dans l'usage:*" (*LAP*, 58)

it also signifies the many decrees of Church Councils, and a kind of adjustment. Furthermore, the different ideas to which the sound is annexed are either unrelated to each other, as in the case of the spoken word 'canon', or they are related by a relation of cause, effect, sign or resemblance. In this case, they are called "analogues."<sup>35</sup> The English sound emitted by the utterance of the word (*mot adjectif ou connotatif*) 'healthy' "principally" signifies an attribute of the substance animal.<sup>36</sup> That is, and with the help of LAP's account of ideas, principally, it first and directly (albeit confusedly) signifies the idea of the substance animal together with the indirect (albeit more distinct) idea of the attribute of health, and secondarily, it signifies the causes, effects, resemblances, and signs of a healthy animal, for example healthy air, healthy food,

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<sup>35</sup>"Car les différentes idées jointes à un même son, ou n'ont aucun rapport naturel entre elles, comme dans le mot de 'canon', ou en ont quelqu'un, comme lorsqu'un mot étant principalement joint à une idée à une idée, on ne le joint à une autre idée que parce qu'elle a un rapport de cause, ou d'effet, ou de signe, ou de ressemblance à la première; & alors ces sortes de mots équivoques s'appellent 'analogues';" (LAP, 58)

<sup>36</sup>Ideas are either of things, of modes of things, of things modified, or of signs. The first, second, and last are signified by substantives (*substantifs ou absolus.*) The third are signified by adjectives (*adjectifs ou connotatifs,*) which, when uttered, signify firstly and directly, albeit confusedly, the thing of which they are predicated; they signify indirectly, albeit more distinctly (than the signification of the thing) the mode. Thus, the word 'healthy' signifies first and directly animal substance, and indirectly the mode of health. (LAP, I, II)

etc. Naturally, principal, and secondary ideas cannot be represented simultaneously, so I suppose that if the principal cannot yield the desired clarity and distinction,<sup>37</sup> the second one is tried. It would then appear that when I conceive of the idea of healthy food, I am first acquainted with the idea of a healthy animal, and then of nourishment that is the cause of a healthy animal. It would seem here that Arnauld and Nicole are influenced by the Latin language which, when it uses an adjective in isolation, implies the noun that the adjective in question most commonly modifies. Part of this practice has survived in French where the adjective *parisienne* used in isolation implies a female.

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<sup>37</sup>The concept of clarity and distinction is borrowed from Descartes, but it is loosely used. For Descartes, distinction implies clarity, but not conversely, "it [an idea] can be clear without being distinct, but not the contrary." *Principles*, I, 46 (AT, II, 44) For the Port-Royalist authors, "an idea is clear to us, when it vividly strikes us, although it be not distinct. The idea of pain, for example, strikes us very vividly, and accordingly can be called clear, but nevertheless it is greatly confused because it represents us pain as in the wounded hand, even though it is only in our mind." But then they add that "Nevertheless, one can say that all ideas are distinct insofar as they are clear, and that their obscurity only comes from their confusion." (LAP, 70) In other words, all clear ideas are distinct, and all confused ideas are obscure. But not much is added by the second claim, because the two propositions are equivalent by contraposition. But since, according to Descartes, all distinct ideas are clear, the LAP authors are saying that an idea is clear if and only if it is distinct. This analysis invalidates the view that connects clarity with *compréhension*, and distinction with *étendue*, which is proposed by James and Dickoff in their "Introduction" to their translation of LAP. (*The Art of Thinking*. Indianapolis: Bobbs-Merrill, 1964.

This background is necessary in order to introduce the notion of false equivocity (*équivoque par erreur*) brought up in connection with some simple terms like 'virtue,' and complex terms (definite descriptions) discussed in Chapter VIII: "Complex Terms—Their Universality and Particularity." They are terms like 'The greatest geometer,' and 'the true religion.' These expressions are implicitly complex because they signify both certain attributes, and a unique substance.<sup>38</sup> As a result, the mind is wont to add a particular individual (Pascal,) or a particular religion (catholicism) to the idea. Some other times, however, the sound of the expression could falsely signify the idea of the individual Gassendi or the idea of protestantism to these complex ideas. In other words, a sound gives occasion to the mind to perceive the same *compréhension* of an idea, but different *étendues*. Both Arnauld and Claude<sup>39</sup> conceive the same *compréhension* of the expression '*la véritable*

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<sup>38</sup>Of course, we recognize here a precursor of Donnellan's distinction between the attributive and referential uses of definite descriptions.

<sup>39</sup>Jean Claude (1619–1687) was the well respected protestant minister who controverted with Nicole (and Bossuet) on the nature of the eucharist. *La (Grande) Perpétuité de la Foi de l'Eglise catholique touchant l'Eucharistie défendue contre les livres du sieur Claude ministre de Charenton*, 3 v., Paris, 1669–1772, written by Nicole, attributed to Arnauld, was written in response to Claude's response to a Preface on the subject of the eucharist written by Nicole in 1664. Chapters IV and XV of Book I, and chapters XII and XIV of Book II, were added to the LAP's 1683 fifth edition as a result of the debate on the nature of demonstratives, and on the connotation of terms.

*religion,*' but Arnauld's *étendue* is catholicism, while Claude's is protestantism. Arnauld and Nicole have no other recourse but to impugn the clarity and distinction of Claude's idea. These terms are *équivoques par erreur*, that is to say, they are not really equivocal, and in such a case the holder of the idea could not have a clear and distinct perception of that idea. The difference between the equivocal term 'canon,' and the falsely equivocal term 'virtue' is that the English sound of the former gives occasion to one of three clear and distinct ideas, i.e., to three clear and distinct *compréhensions* and *étendues*, whereas the English sound of the latter only occasions clear and distinct *compréhension*.<sup>40</sup> Since it is possible to possess a clear and distinct *compréhension*, and a confused and obscure *étendue* of the same idea, *compréhension* cannot be said to determine (in the Fregean sense) *étendue*, but this issue will be discussed in details in the context of reference and definite descriptions.

### 3. Attributes

The *étendue* of the universal idea "cat" consists of more universal ideas such as "domestic short-hair," "Siamese

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<sup>40</sup>If the Cartesian "materially false' ideas turn out to be universal ideas, then their sensation (qualia, touch, etc.) will occasion confusion and obscurity in both *compréhension* and *étendue*.

Lilac point," and "alley-cat," but it also consists of singular ideas such as "this cat," "Gaia," "Finistère," and "Timo." These singular ideas are not only the ideas from which the universal idea "cat" was originally abstracted, they also must be the thresholds back to the external world. Thus, the *étendue* of ideas appears to provide the link to and from the extra-mental. But what about the *compréhension* of a universal idea? It consists of "attributes" that are essential in the sense that if any one is removed, then the idea is destroyed (self-destroys?). But *compréhension* is a property the idea itself possesses, so the attributes that make it up must be predicated of the universal idea. These attributes, therefore, can only belong to the mental realm. Thus, the ideas of "domesticity," and "felineity" are predicated of the universal idea "cat," since only idea-like things can be predicated of ideas. Furthermore, ideas of attributes are themselves universal ideas predicated of other universal ideas ("animality" is predicated of "cat"). But, whereas the universal "cat" is reached, as was shown in Chapter Two, by abstraction from particular ideas, the universal "animality," by contrast, is gleaned from the *compréhension* of the universal "cat." The question arises: What kind of information does the idea of animality and other ideas of attributes bring to us, and what is their ontological status? This section attempts to answer the second part of the question; the first part is addressed in

the last chapter.

LAP claims that only singular things exist, "*Quoique toutes les choses qui existent soient singulieres*" (LAP, 57), and LAP's ontology is spelled out in Chapter Two where ideas are classified according to their objects. I already noted that ideas are divided into ideas of things (*choses*), as a man or a body; ideas of manners of things (*maniere de choses*) as a prudent man or round body; and ideas of modified things (*choses modifiées*), as prudence or roundness. Modified things always presuppose the thing they modify, as all other categories. In the 1683 edition, the class of ideas of signs (*signes*) is added, but their ontological status is not specified. Again, I already have suggested in section 2 of this chapter that the Port-Royal classification was offered as a substitute for Aristotle's categories. The following passage makes the authors' position explicit

One can relate to this consideration of ideas according to their objects the ten Categories of Aristotle; since they are nothing other than various classes to which this Philosopher wished to reduce all objects of our thoughts, comprising all substances under the first, and all accidents under the nine others.<sup>41</sup>

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<sup>41</sup>"On peut rapporter à cette consideration des idees, selon leurs objets, les dix Categories d'Aristote; puisque ce ne sont que diverses classes auxquelles ce Philosophe a voulu reduire tous les objets de nos pensées, en comprenant toutes les substances sous la premiere, & tous les accidens sous les neuf autres." (LAP, 49-50)

The terms 'attributes,' 'modes,' 'qualities,' and 'manners of things' are used synonymously

I call manner of thing, or mode, or attribute, or quality, that which being conceived in the thing, and because of it [the attribute] being unable to subsist without it [the thing], determines it [the thing] to be in a certain way, and makes it being called that name.<sup>42</sup>

Thus, roundness is an attribute of a round body, and the expression 'round body' contains in its *compréhension* the attribute of roundness without which it could not be called a 'round body.' The characteristic of attributes as defined above is that they cannot be conceived without a substance (a singular thing) in which they inhere. As a result, the term 'roundness' signifies firstly and directly the attribute of roundness, and also, albeit confusedly, the relation it bears to the substance. If the relation is taken away from the *compréhension* of the mode, the mode is destroyed, "but that which shows that [the notion of, 1662] the relation to the substance is enclosed at least confusedly in that of the mode, is the fact that we could not take away this relation from the mode, without

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<sup>42</sup>"*J'appelle maniere de chose, ou mode, ou attribut, ou qualité, ce qui étant conçu dans la chose, & comme ne pouvant subsister sans elle, la détermine à être d'une certaine façon, & la fait nommer telle.*" (LAP, 47-  
underlining and brackets are mine.)

destroying the idea we had of it."<sup>43</sup>

Attributes are divided into "genuine modes" and "substance abstracts" (*abstrait des substances*). The nature of a genuine (*veritable*) mode is such that it cannot be clearly conceived without the relation it bears to a substance; on the other hand, the substance of which it is a mode can be conceived clearly without it.<sup>44</sup> A genuine mode (*veritable mode, mode réel*) is distinguished from an "essential attribute" (*attribut essentiel, or abstrait des substances.*) The latter is the thing itself. Thus, the idea of a corporeal human rational man is not an idea of a modified thing, but of a thing. The *compréhension* of an idea, then may include genuine modes when the idea is an idea of a modified thing, and essential attributes, when the idea is an idea of thing. Thus, the ontological status of the *compréhension* of an idea is exactly the same as that of the singular idea from which the universal was abstracted.

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<sup>43</sup>"*mais ce qui montre que [la notion du rapport, 1662] le rapport à la substance est enfermé au moins confusément dans celle du mode, c'est qu'on ne sauroit nier ce rapport du mode, qu'on ne détruise l'idée qu'on en avait.*" (LAP, 48)

<sup>44</sup>Here, the authors seem to suggest that a criterion of knowledge consists in trying to take away a genuine mode from an idea of substance. If the operation destroys the idea, then it is a genuine mode; if, despite the operation, I can still clearly conceive the substance and its attributes, then it is not a genuine mode: "*je puis nier de la substance étendue tout ce que je conçois de la substance qui pense, sans cesser pour cela de concevoir très distinctement la substance étendue, & tous les autres attributs qui y sont joints.*" (LAP, 48)

The journey down the Porphyryan tree begins with the *compréhension* of an idea consisting only of essential attributes (with some exceptions as will appear in the section on predicables,) and proceeds with the acquisition of genuine modes that are added to the essential attributes. Genuine modes, then, are scholastic *differentiæ* outfitted in Cartesian fashion; the idea of a rational man is one single idea of a thing (substance); the idea of a rational animal is that of a modified thing, and it consists of three separate ideas in one: one of substance (animal), one of mode (rationality), and one of a relation that attests to the dependence of a mode on a substance. If the substance is fully determined, as in the case of an individual (Homer or the rational animal who wrote the *Odyssey*), then it never can be a modified thing because modifications have the characteristic of reducing the *étendue* of the term they modify, and the extension of an individual cannot be further reduced. But more will be said in this on this issue in the section on proper names.

Finally, the authors note that modes can be called internal (*dénominations internes*,) as in the expressions 'round body,' 'square tower,' or external (*dénominations externes*,) as in the expressions 'loved ones,' 'perceived body,' and 'desired thing.' Some modes are substantial (*modes substanciels*) in the cases where substance is applied to substance, for example the expression 'a dressed man.'

Others are negative (*modes négatifs*) when they represent a substance deprived of a genuine or substantial mode, for example, 'undressed man,' 'dark moon.'<sup>45</sup>

But now a problem arises. Arnauld and Nicole explained that we reached universal ideas by a process of abstraction, and that the process of abstraction consisted in, so to speak, peeling off the particularity of an idea

But if I turn my mind away from the consideration of all particular circumstances that pertains to the idea (of an equilateral triangle,) and only apply it to think that it is a figure enclosed by three equal lines, the idea that I will form of it, on the one hand will represent to me the equality of its sides (its attributes) more clearly, and on the other hand, will be able to represent all equilateral triangles to me.<sup>46</sup>

But why should I focus on this aspect of the figure? Why can I not focus on the equality of the interior angles, or the pointedness of the exterior angles? It seems to me that in order to rid an idea of its particularity, in order to know when to stop, I need to have a clear perception of its

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<sup>45</sup>In the *First Objection*, Caterus mistakes a Cartesian idea for an external object qualified by the *dénomination externe* of being thought.

<sup>46</sup>"*Mais si je détourne mon esprit de la consideration de toutes ces circonstances particulieres, & que je ne l'applique qu'à penser que c'est une figure bornée par trois lignes égales, l'idée que je m'en formerai me représentera d'une part plus nettement cette égalité de lignes, & de l'autre sera capable de me représenter tous les triangles équilatères.*" (LAP, 57) Parentheses and underlining are mine.

particularity. But if I have a clear perception of its particularity, will it not follow that I have a clear perception of its generality (universality)? In other words, I can reach universal ideas only if I can tell the particular from the general in a particular perception, or if I already know the universal. If I shell a pod to get the pea, it is because I know that the pea is the meaty part. In order to move from a sentence token to its type, it is not evident that I need to conceptually strip the token of its particular typescript. So, why bother with the intermediate step of universality in order to find out the *compréhension* of an idea? It seems that the point, if there is one, is to disencumber the idea of its inessential parts, in order to unambiguously represent its essentiality, viz., *compréhension* and *étendue*. Simply put, the point of the exercise is weeding and cleaning. The authors indicate that the perception of an idea stripped of its particularity is clearer; thus its attributes (its *compréhension*) are represented more clearly (*plus nettement*.) Without the operation of cleaning, the particular idea represents its *compréhension* and *étendue* in a confused manner, but not so confusedly that all interfering particularities can be swept aside. Clearly, in order to reach the generality, that which constitutes the particularity must be identifiable.

It was noted earlier that the Port-Royal dichotomy differed from the medieval doctrine of supposition by the

logical independence of one concept from the other; in Port-Royal, *étendue* is not presented as presupposing *compréhension*; both are properties of ideas that can be singly discovered through a clear perception. The merit of universalization consists in priming (preparing) the idea for a clear perception. Once the idea is primed, it presumably lends itself for attentive contemplation, the payoff of which is the "reading" of its *compréhension* and *étendue*.

#### 4. Subjects

Subjects (*sujets*) or inferiors (*inferieurs*) are the components of an idea's *étendue*. LAP's version of the *Dictum de omni* makes it explicit

What befits an idea taken universally, also befits everything that idea is said of, or everything that is the subject of that idea, or which is comprised in the extension of that idea.<sup>47</sup>

According to Pariente,<sup>48</sup> the word 'subject' is used by

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<sup>47</sup>"Ce qui convient à une idée prise universellement, convient aussi à tout ce dont cette idée est affirmée, ou qui est sujet de cette idée, ou qui est compris dans l'extension de cette idée." (LAP, 193) Underlining mine.

<sup>48</sup>op. cit. 1986, p. 230 and 1985, p.231 "one must beware to give the word 'subject' the individual sense which it often

Arnauld and Nicole in the sense medieval logicians used it, that is as a sub-class of a larger class, and not exclusively as individuals belonging to a set. So, both sub-classes and individuals figure within the *étendue* of an idea. Accordingly, the *étendue* of the term 'planet' may consist of the following set: {Mars, ..., Earth, {uninhabited planets}, {planets with moons}}; the *étendue* of the idea of number includes, besides the set of natural numbers, the subset of odd numbers, the subset of even numbers, etc. But although Pariente's reading may be true generally, it cannot be true of subjects as they are presented in the passage quoted above. Part of the *compréhension* of the idea "planets" is the idea "objects with elliptical orbits," which befits the ideas of Mars, Earth, etc., but does not befit the idea of a set of planets. What is curious about this account is that the *compréhension* cannot be predicated of a subset, but it could be predicated of a species; the *compréhension* of the idea "animal" can be predicated of the idea "cat," but only if the species is not considered as the holder of an *étendue*. Thus, in the context of the *Dictum de omni*, subjects must be restricted to individuals;

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has for us, and to assimilate the extension of the idea with the extension of the predicate, understood as the set of individuals of which the predicate is true. The notion of subject, in the vocabulary of post medieval logic, does not refer to the individual, to the entity denoted by an expression of type 0 according to contemporary logic, but to the *partes subjectivae* of the medievals and to the correlative distinction of two kinds of wholes."

they cannot be extended to species, unless species are reified. Such move, however, would not be consistent with LAP's ontology.

In other contexts, it is clear that just about anything goes into the *étendue* of an idea. Pariente refers his reader to Peter of Spain

A universal whole, as the term is used here, is what is superior and substantial. What is inferior under a universal is a subjective part. [W]hen the genus or universal whole is removed, its species or subjective part is also removed.<sup>49</sup>

LAP's example of the *étendue* of an idea provided in the original definition of Chapter Six--that of a triangle which consists of the various species of triangles--confirms Pariente's general reading. Why do Arnauld and Nicole again introduce a distinct terminology--subjects and inferiors--if they do not have a distinction in mind?

There is little doubt that they are thinking like the scholastics when they switch from the term 'subject' to the term 'inferior' to refer to the content of the *étendue* of an idea. The terms 'inferior,' and its correlative 'superior' were routinely used by several medieval logicians as another

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<sup>49</sup>This passage is from the book on Topics (*Tractatus V*) of Peter of Spain's *Summulae Logicales*. The quote is from *The Cambridge Translations of Medieval Philosophical Texts*, op. cit., p. 233.

term for species and genera.<sup>50</sup> This scholastic rapprochement is further confirmed in a chapter devoted to division<sup>51</sup> where Arnauld and Nicole echo the medieval doctrine by showing that the *étendue* of a universal term is akin to a division of a universal whole.<sup>52</sup> The universal whole, which is signified in Latin by the term '*omne*,' and sometimes called "accidental division," is contrasted to the integral whole, signified in Latin by '*totum*,' and which is sometimes called "essential division" or "partition." The former divides into subjective parts or inferiors, the latter divides into integral parts. The Jansenist authors clearly state that the *étendue* of an idea is the same as its

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<sup>50</sup>Nicholas of Paris (fl. 1250), Albert of Saxony (d. 1390) are mentioned by N. Kretzmann in "Syncategoremata, Exponibilia, Sophismata," in *The Cambridge History of Later Medieval Philosophy*, Cambridge U. Press, 1989.

<sup>51</sup>Chapter XV, Book II. "*De deux sortes de propositions qui sont de grand usage dans les sciences, la Division & la Définition. Et premierement de la division.*" This chapter is not in the MS Du Vallant.

<sup>52</sup>It has been argued by T.S. Baynes who translated *LAP* into English in the nineteenth century, that if the *étendue* of an idea was akin to the division of a universal whole, its *compréhension* could be likened to a definition of thing (*definitio rei*.) This section shows that *étendues* are more than divisions of universal wholes. Neither can *compréhensions* be considered definitions of things. Definitions of things claim to give the *compréhension* of an idea, but they can only claim, as a result of which they can be contested. If the definition is contested, some of the attributes of the ideas are taken away, but without the concomitant destruction generally associated with the removal of an attribute of the *compréhension*. So, although all *compréhensions* are definitions of things, the converse does not hold.

accidental division

The other 'whole' is called in Latin 'omne', and its parts, 'subjective parts', or 'inferiors'; because this whole is a universal term, and its parts are the subjects comprised in its *étendue*, the way the term 'animal' is such a term, the inferiors of which, like 'man' and 'beast', which are comprised in its *étendue* are subjective parts.<sup>53</sup>

The above passage is followed by a list of four kinds of divisions of a universal whole, and by three rules governing this kind of division. The first rule demands that "the members (*membres*) of the division comprise (*comprennent*) all the *étendue* of the term being divided." The division of numbers into the "members" odd and even exhausts the *étendue* of the idea of number. Nowhere in these passages, is it suggested by the authors that *étendue* is to be understood in the modern sense of extension, that is the set of individuals designated by the term. Although I can divide the idea of man into those who eat what they want when they want, and those who eat what they are told when they are told, I cannot properly speaking "divide" the idea of man into all

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<sup>53</sup>"L'autre tout est appelé en Latin 'omne', & ses parties 'parties' subjectives, ou 'inferieures'; parce que ce tout est un terme commun, & ses parties sont les sujets compris dans son *étendue*, comme le mot d''animal' est un tout de cette nature, dont les inferieurs comme 'homme' & 'bête', qui sont compris dans son *étendue*, sont des parties subjectives." (LAP, 161)

individual men. All divisions may be (not simultaneously) part of the *étendue* of a term, but not all *étendues* are divisions.

However, in another context, Arnauld and Nicole explicitly state (albeit indirectly) that a universal whole can also signify all the individuals designated by the term

As when I say: The Romans conquered the Carthaginians: The Venetians are at war against the Turk: The Judges of such and place have condemned a criminal, these propositions are not universal; otherwise we could conclude of each Roman that he would have conquered the Carthaginians, which would be false.<sup>54</sup>

Here, it is clearly implied that an idea taken universally can have as its *étendue* all the individuals comprised in the idea. This is not surprising, given the fact that subalternation was recognized as a valid inference; a true universal sentence yields the truth of its corresponding particular sentence and to a "descent to individuals." Furthermore, it is clear that the universal idea of a *species infima*, such as the idea "1"-black-circles" can only comprise individuals in its *étendue*. This is a point where epistemology and logic part company; the complete division

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<sup>54</sup>"Comme quand je dis: "Les Romains ont vaincu les Carthaginois: Les Venitiens ont fait la guerre au Turc [sic]: Les Juges d'un tel lieu ont condamné un criminel," ces propositions ne sont point universelles; autrement on pourroit conclure de chaque Romain qu'il auroit vaincu les Carthaginois, ce qui seroit faux." (LAP, 155)

of most universal ideas into their individual members is inconceivable. No one, except God, could possess a clear idea of man. In the epistemological realm of ideas, it is therefore necessary to have recourse to "subjective parts." In the context of an argument, however, if the *étendue* of a universal idea only consists of individuals, another premise will make clear what the domain of discourse is. The context of discourse will help in determining the interpretation of universality. The authors constantly remind the reader that factors such as context, and speaker's intent must be taken into consideration. For example, when trying to decide whether a proposition where a relative pronoun occurs is "explicative" (spells out the *compréhension*) or "determinative" (reduces the *étendue*) they suggest "that one pay more attention to meaning and speaker's intent than to the linguistic expression"<sup>55</sup>; in other words, that one pay more attention to content than to form.

The notion of containment, because of its intuitive flair and because of its connection to geometry, explains and buttresses the characteristics of *compréhension* and *étendue* that universal ideas possess. Ideas or non-linguistic terms contain attributes and subjects. This

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<sup>55</sup>"*il faut souvent avoir plus d'égard au sens & à l'intention de celui qui parle, qu'à la seule expression.*" (LAP, 123)

chapter critically examined the logical contribution to subjects and attributes that Arnauld and Nicole made to the metaphysical account that Aristotle and the scholastics had given them. The chapter also justified the introduction of the term 'term' to refer to ideas. The terms 'term,' and 'idea' are used interchangeably in order to facilitate the exposition of the syllogism and in order to introduce the concept of false equivocity. In general, this chapter suggests that Port-Royal clarified the logical function of subjects and attributes but failed in its attempt to confer to its system of logic the precision and rigor of geometry.

## CHAPTER FOUR

### PORT-ROYAL AND THE PREDICABLES

#### 1. Porphyrian Division and Composition

Chapter Two argued that the Cartesian doctrine of ideas superseded the scholastic doctrines of second intentions; this chapter shows that *compréhension* and *étendue* are to the objective reality of ideas what the predicables were to the scholastic doctrine of intentions. This abandonment of metaphysics represents a major breakthrough in history of logic.<sup>1</sup>

Up until the time of *LAP*, most logic books and textbooks devoted a disproportionate amount of space to the metaphysical aspect of the predicables; this emphasis detracted the logicians from the logical rôle Aristotle originally intended them to play; for Aristotle, predicables were helpful tools in the search for arguments. The tendency toward metaphysical digression in logic text books

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<sup>1</sup>But if metaphysics was abandoned, epistemology was ushered in; as if logic could not do it on its own.

is to be blamed in part on the Latin translation of Porphyry's (232/3-304) *Isagoge* by the Roman Boethius (480-524). Aristotle's *Categories* and *On Interpretation* and Boethius' texts and translations shaped medieval logic until the twelfth century, a time at which the world of Islam transmitted to western Europe the remainder of Aristotle's *Organon*, in particular, *Sophistical Refutations*.

Even in the seventeenth century, metaphysical discussions consisted for the most part of commentaries on commentaries and on Boethius' translations. For example the very influential *Commentarii Collegii Conimbrensis e Societate Jesu in Universam Dialecticam Aristotelis Stagiritae* (1611) devotes about 230 pages to Porphyry's *Isagoge*, against 270 to Aristotle's *Categories*, 230 to *De Interpretatione*, 170 to *Prior Analytics*, 230 to *Posterior Analytics*, 35 to *Topics*, and 15 to *Sophistical Refutations*. This commentary, together with seven others on Aristotle's works on physics, biology and ethics were the notes taken by students of the Jesuit University of Coimbra in Portugal in the late sixteenth century. Two of the most well known professors of that period were Pedro Fonseca (1528-1599,) and Sebastian Couto. W. S. Howell, in *Logic and Rhetoric in England 1500-1700*, (New York: 1961), p. 234, credits them with having dictated these notes. E. Gilson, in *Index Scholastico-Cartesianum* (1912), lists the commentaries as texts used by Descartes at La Flèche; and J. Sirven, in *Les*

*années d'apprentissage de Descartes (1596-1628)*, (Albi: 1928), names Franciscus Toletus (1532-1596,) and Antonius Rubius as the originators of the Coimbran commentaries, and writes that Fonseca's *Institutionem Dialecticarum*, 1609, had been used by Descartes.

This emphasis on predicables is further confirmed by two manuscripts of notes taken at logic courses taught at the university of Aix-en-Provence in 1611, and in 1612 by Philibert Fesaye (one of Gassendi's teachers). The notes were divided into three books preceded by the usual discussions on the nature, object and subject of logic (a polemical fray that Arnauld and Nicole opted not to join.) The three books were about terms, propositions and arguments. The book on terms, which consisted of discussions on the predicables (*Prædicabiles*,) the antepredicaments (*Antepredicamentis*,) the categories (*Prædicamentis*,) and the postpredicaments (*Postpredicamentis*,) represented over half of the notes. Scipion Dupleix, in his *La Logique ou art de discourir et raisonner* (1603), Joannes Thiers, in his *Logica Major* (1669), and the very influential logical works of J. Clauberg, J. Jungius, and A. Geulincx,<sup>2</sup> are many of

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<sup>2</sup>Thiers' unpublished manuscript is at the Bibliothèque de Nice and Fesaye's is at the Bibliothèque of Marseille. The rare book division of the New York Public Library has a copy of the 1611 Coimbran Commentaries. Other volumes are available in reprint editions: Joachim Jungius (1587-1657), *Logica Hamburgensis* (1638), reprinted in 1957; Scipion Dupleix (1569-1661), *La logique ou art de discourir et raisonner* (1607), (Paris: Fayard, 1984); Johannis Clauberg

the other logic texts consulted that confirm this distribution.

Aristotle divided all universal ideas into genera, species, differences, properties, or accidents.<sup>3</sup> The classification was known as the *voces prædicabiles*, or predicables, that is to say things that could be predicated of attributes. While "Socrates," "man," and "wise" respectively belong to the categories of primary substance, secondary substance, and quality, the categories can be the subjects of one or more of the five predicables; substance is predicated of man, and genus (or species) is predicated of man. Like the categories, the predicables are not properties inherent in the things they are predicated of, they are the very thing, and the generally accepted view around the time of Arnauld and Nicole was that predicables designated second intentions.<sup>4</sup> But while for the medievals, the predicables became the focus of an intense metaphysical debate, for Aristotle, they were helpful as topics (*lieux, loci*), and topics were a quasi-mechanical source of information about terms occurring in deductive arguments, "a line of inquiry whereby we shall be able to reason from

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(1622-1665), *Logica Vetus et Nova* (1654), 2 vols., (Hildesheim: G. Olms, 1968); Arnold Geulincx (1625-1669), *Logica Fundamentis suis a quibus hactenus collapsa fuerat restituta* (1662), reprinted in *Sämtlichen Schriften*.

<sup>3</sup>*Topics*, 101<sup>b</sup> 16-25.

<sup>4</sup>For example, Ockham, *Summa Logicae*, Part I, Section 20.

reputable opinions about any subject presented to us, and also shall ourselves, when putting forward an argument, avoid saying anything contrary to it."<sup>5</sup> After Aristotle, although the number of topical maxims varied from author to author, it was clear that the interest around topics was more metaphysical than logical.

Port-Royal concedes that general ideas can be called genera or species, "*les idées generales qui nous représentent leurs objects comme des choses, sont appelées genres ou especes*" (LAP, 60), but its attitude towards predicables and topics is as condescending as its attitude towards the Aristotelian Categories. The Categories are arbitrary and dangerous, the predicables and topics are superfluous

For it is of little use to know that there are genera, species, differentiae, propria, and accidents; what is important is to recognize the true genera of things, the true species of each genus, their true differentiae, their true propria, and the accidents that befit them.

It is therefore true that it is necessary to have a topic in order to have something to which the rules of reasoning can be applied; but it is false that it is necessary to find this topic by means of the method of topics.<sup>6</sup>

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<sup>5</sup>*Topics*, 100<sup>a</sup> 20-22.

<sup>6</sup>"*Car il sert de très-peu de savoir qu'il y a des Genres, des Especies, des Differences, des Propres, & des Accidens; mais l'importance est de reconnoître les vrais genres des choses, les vraies especes de chaque genre, leurs vraies differences, leurs vraies propriétés, & les accidens qui*

It is significant, however, that the chapter on predicables is the only part of Aristotle's *Organon* present in the Vallant Ms. Since the manuscript was not intended for publication, there could not have been any concerns of pacifying the Aristotelian conservatives; the concerns, then, must have been internal to some material contained in *LAP*.<sup>7</sup> This material is the distinction between *compréhension* and *étendue*; the doctrine of supposition that operated on linguistic terms is superseded by something like the doctrine of predicables--yet another replacement for that doctrine--that operated on Cartesian ideas. It is easy to recognize the similarity between a genus and its differentia, and an idea and its *compréhension*; between a genus and its species, and an idea and its *étendue*. The subordination of species to genera, and the division of

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*leur conviennent.*" (*LAP*, 64; note the abandonment of capitalized terms). "*Il est donc vrai qu'il faut avoir une matiere pour y appliquer les regles des argumens ; mais il est faux qu'il soit necessaire de trouver cette maniere par la methode des Lieux.*" (*LAP*, 233) The clause preceding the semi-colon echoes the sentiment of John of Salisbury (Twelfth century School of Chartres) that logic without content is "bloodless and sterile." (*Encyclopedia of Philosophy*, v 7, 210)

<sup>7</sup>A passage in the "Second Discourse," which was added to the second edition of 1664, makes manifest to the authors' concerns not to offend Aristotelian conservatives: "*Ce n'est donc pas pour rabaisser Aristote, mais au-contraire pour l'honorer autant que l'on peut en des choses où l'on est pas de son sentiment, que l'on a tiré ces exemples de ces livres: & il est visible d'ailleurs que les points où l'on l'a repris sont de très peu d'importance & ne touchent point le fond de sa philosophie, que l'on n'a eu nulle intention d'attaquer.*" (*LAP*, 33)

genera and the composition of species by the addition of differentia presuppose the same notion of containment that buttresses the Port-Royal distinction. One difference between the doctrine of predicables and Port-Royal distinction is the lightness of the metaphysical trousseau of the latter.

Although Port-Royal's distinction is intended to replace the doctrine of predicables, the latter, nevertheless, provided the inspiration for the former. This is evident in the organization of *LAP*'s chapters. It is not coincidental that the section on predicables follows the discussion on *compréhension* and *étendue*, and does not, as was the custom, precede the section on categories. It strongly suggests that the distinction is meant to supersede the five-fold classification. Similar reorganization was remarked earlier when *LAP*'s chapter on the categories tailed the chapter on the classification of ideas according to their objects; the chapter on topics, entirely borrowed from Clauberg's *Logica Antiqua et Nova*, similarly follows the chapters explaining the rules and the general principle of the syllogism.<sup>8</sup>

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<sup>8</sup>Johannis Clauberg (1622-1665) *Logica Vetus et Nova: modum inveniendæ ac tradendæ veritatis, in Genesi simul & Analysisi, facili methodo exhibens*, 1654. Arnauld and Nicole acknowledge their source, albeit not a debt: "En voici une [manner of dividing topics] qui paroît assez commode d'un philosophe Allemand fort judicieux & fort solide nommé Clauberge dont la Logique m'est tombée entre les mains, lorsqu'on avoit déjà commencé à imprimer celle ci." (*LAP*,

But how precisely is *LAP*'s distinction between *compréhension* and *étendue* better than the post-Boethian doctrine of the predicables? If one takes the distinction as the central doctrine of the logic of Port-Royal, its authors find it evident that it can do more work in a more compact fashion than the Aristotelian system of categories and predicables. Not only is it more economical than the *Organon*, the method of Port-Royal also makes the Aristotelian system easy to understand: "What we have said in the foregoing chapters give us the means to make clear in few words the five predicables that are usually explained in schools."<sup>9</sup> The *Isagoge* contains the famous Porphyryan tree that graphically represents the ascent from an earthy individual overladen with accidents, propria, and differentiae, to an airy supreme genus entirely free from attributes, but from which myriad species and individuals dangle. In Port-Royal, the singular idea that has the most *compréhension* has the least *étendue*; the universal idea that has the least *compréhension* has the most *étendue*.

Sylvain Auroux, in *La Logique des Idées*, (Paris: Vrin, 1993), argues that *LAP*'s distinction provides three novel perspectives on the predicables, two of which are less

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<sup>9</sup>"Ce que nous avons dit dans les chapitres précédents nous donne moyen de faire entendre en peu de paroles les cinq Universaux qu'on explique ordinairement dans l'école." (*LAP*, 59)

significant than the third. Less significant is the replacement of universals and their relations by Cartesian ideas, and a possible interpretation of the Porphyryan tree, a trivial formal structure, by the same ideas. He explains that if you take any node of a tree that has no open branch, and interpret it as an idea, e.g., an idea of cat, then anything that is on top of that node is the *compréhension* of the idea "cat" and everything below is its *étendue*. More significant than this bit of metaphysics and trivia is the fact that within a Porphyryan tree, a species, which is the result of adding a *differentiam* to a genus yields two operations, namely division of the *étendue* of the differentia, and constitution of the *compréhension* of the species. Because the two operations affect two distinct entities, it cannot be schematized satisfactorily. For Arnauld and Nicole, on the other hand, the adding of two compatible ideas yields a third one whose *compréhension* is greater than, and whose *étendue* is smaller than that of the other two ideas.

Auroux' remarks are helpful for an understanding of what logic is--with some modifications, some aspects of *LAP* can be translated into formal logic--but Auroux fails to recognize the historical importance of the distinction between *compréhension* and *étendue*. After Boethius, the function of the doctrine of the predicables changed from that of an instrument whose utility consisted in finding and

identifying good arguments, to the center of focus of lengthy metaphysical debates. By constructing a fresh doctrine that admits a debt to the predicables, and that is the foundation of a general principle for deciding good arguments from bad ones, Arnauld and Nicole reinstated an apparatus to its old function. The new version stripped the predicables from all metaphysical clothing (sadly, the strip made room for another clothing, that of Cartesian epistemology). Nevertheless, Arnauld and Nicole made contributions to logic; they did more than their predecessors did by not commenting on the *Isagoge* and its commentaries. They underscored the importance of the meaning of terms by presenting them free of their context of the predicables.

a. Genera and Species

For Porphyry, a genus differed from a species in that a genus was predicated of subjects that differed both specifically and numerically from each other, whereas a species was only predicated of subjects that only differed numerically. For example the genus "animal" could be predicated of different species, viz., "man," "cat," etc., whereas the species "man" could only be predicated of individuals of the same species, viz., "Socrates," "Plato," etc. For Arnauld and Nicole, the distinction is

disregarded: "when general ideas represent their objects as if they were things, . . . , they are called genera or species."<sup>10</sup>

It seems that there are two reasons for the *LAP* authors to completely disregard Porphyry's formulation: one is that statements predicating genera and/or species of subjects are uninformative, and relate a subject to a predicate that is not compatible with it, and the second is that the use of predicables as topics is a dangerous mechanical (unCartesian) method.

In the first place, then, a proposition predicated of a predicable is uninformative. The terms 'genera' and 'species'—except in the cases of *summum genus* and *species infima*—are relative terms: a feline is a species with regards to animals, but a genus with regards to cats and tigers: "And so the same idea can be a genus when it is related to the ideas over which it extends, and a species when it is related to another one more general."<sup>11</sup> So, if a feline is both a genus and a species, and if a tabby only is predicated of individual cats, how useful can the classification be? In other words, to say of a subject that

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<sup>10</sup>"Car lorsque les idées generales nous représentent leurs objets comme des choses, & qu'elles sont marquées par des termes appelés substantifs ou absolus, on les appelle genres ou especes." (*LAP*, 60)

<sup>11</sup>"Et ainsi la même idée peut être genre étant comparée aux idées auxquelles elle s'étend, & espece étant comparée à une autre qui est plus generale, . . ." (*LAP*, 60)

it is a genus or a species is not only not really informative, worse yet, it can be ontologically embarrassing on account of the predicables' association with second intentions.

For Arnauld and Nicole, there are only two informative propositions. A subject can be qualified by one or more of the attributes which comprise its *compréhension*, in which case the proposition is an explication (*explication*); or a subject can be qualified by attributes that are not included in its *compréhension*, in which case the proposition is a determination (*détermination*). I can say of a cat that she is a feline domestic animal, or that she is short-black-haired, pointy-eared, and sloe-eyed. The first statement explicates the *compréhension* of "cats," and extends over the entire extension of cats; the second statement restricts the extension of "cats," and increases its *compréhension*. The only two elements of informative discourse are *compréhension* and *étendue*; to say of the idea "cat" that it is a genus and/or a species is a cumbersome school triviality, and, to borrow a modern expression, a category mistake.

In the second place, the use of predicables as topics cannot yield thoughtful arguments. If the information released by the predicables is used for the purpose of determining the validity of arguments, as chapters on "Topics" traditionally do in classical logic, a rote learning of the predicables is dangerous; to seek arguments

by means of the "topic from genus" is an invitation to a potentially damaging mental laziness because of its mechanical procedure. Arnauld and Nicole liken the use of topics to the use of rules of eloquence: one does not become a good arguer, anymore than one becomes an eloquent speaker by following rules, but rather, the rules are abstracted from convincing arguments and eloquent speeches.<sup>12</sup>

But, the doctrine of predicables, with all its trivial and burdensome apparatus, is founded on a principle of containment, a feature that did not go unnoticed by *Port-Royal*; in a sense, it can be said that *LAP*'s borrowing of the principles of containment underlying the doctrine of the predicables, and its reappearance couched in the language of

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<sup>12</sup>Arnauld and Nicole mention that although Cicero and Quintillian were the originators and enforcers of the rules of Topics and eloquence, they warned their readers that the rules were not sufficient (*LAP*, 234). They quote a famous passage from Augustine's *De Doctrina Christiana*: "They [public speakers] fulfilled them [the precepts of eloquence] because they were eloquent; they did not apply them that they might be eloquent." (Indianapolis: Bobbs-Merrill, 1983), p. 120. ("*Implent quippe illia quia sunt eloquentes, non adhibent ut sint eloquentes.*") Descartes echoes Augustine's sentiment in the *Discourse on Method*: "*J'estimais fort l'éloquence, et j'étais amoureux de la poésie; mais je pensais que l'une et l'autre étaient des dons de l'esprit, plutôt que des fruits de l'école. Ceux qui ont le raisonnement le plus fort, et qui digèrent le mieux leur pensées, afin de les rendre claires et intelligibles, peuvent toujours le mieux persuader ce qu'ils proposent, encore qu'ils ne parlassent bas breton, et qu'ils n'eussent jamais appris de rhétorique. Et ceux qui ont les inventions les plus agréables, et qui les savent exprimer avec le plus d'ornement et de douceur, ne laisseraient pas d'être les meilleurs poètes, encore que l'art poétique leur fût inconnu.*" (AT VI, 7)

*compréhension* and *étendue*, brings back to the surface the gold buried under scholastic trivia. Ironically, the authors vindicate Leibniz' repeated claim that the works of the scholastics should not be allowed to go extinct.<sup>13</sup>

*Port-Royal's* formulation of the doctrine of the predicables also is helpful in further understanding the nature of *compréhension* and *étendue*. It was noted at the beginning of this section that the objects of general ideas could be called genera or species. But it was also noted that general ideas became known by abstraction from particulars; however, some general ideas that qualify as genera or species cannot be abstracted from particulars. For example, the idea of "shaped body" is an idea of modified thing (*chose modifiée*), and both body and shape can be called genera because each extend over species and individuals, but only body can be said to be a general idea abstracted from particulars; the modifier 'shaped,' in view of *LAP's* earlier discussion cannot be disjoined from the

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<sup>13</sup>Leibniz' paper "On the Unitarian Metaphysics of Christoph Stegman," (reprinted in the "Appendix" of Nicholas Jolley's *Leibniz and Locke* (Oxford: Clarendon, 1986), pp. 194-206), contains the reference to his second thoughts on the scholastics: "I will only remark that certainly the style of some Scholastics was such that their writing deserved to be called Augean stables. We should not, however, follow our author's example and reject everything, nor should we imitate Hercules, who is said to have diverted the river Alphaeus into those Augean stables, carrying everything away at one fell swoop. There is gold buried in that dirt, however.", p. 195. This is a version of Augustine's Egyptian gold argument in *De Doctrina Christiana*, Book II, XL, 60.

relation of dependence it has on the substance it modifies. Arnauld and Nicole argue that some ideas of modes can represent their objects as if they were things

I have said that general ideas, which represent to us their objects as things, are called genera or species. For, it is not necessary that the objects of those ideas factually be things and substances; it is enough that we consider them as things, so that when they are modes, we do not relate them to their substances, but to other ideas of modes less, or more general, as for example, figure, which is only a mode in relation to a body with a shape, is a genus in relation to curved, and straight lines, etc.<sup>14</sup>

This passage is revealing because it shows that the parts of the *compréhension* of an idea have *étendue*. The shape of a body-with-shape (*corps figuré*) is an attribute, and not a substance. It was noted earlier that the name of an attribute, like 'shape,' signified "firstly and directly" the idea of a mode, and then, secondly and confusedly the idea of relation to a substance; and that the name of a modified thing, like "body with shape" (*corps figuré*)

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<sup>14</sup>"J'ai dit que les idées generales qui nous representent leurs objets comme des choses, sont appelées genres ou especes. Car il n'est pas necessaire que les objets de ces idées soient effectivement des choses & des substances ; mais il suffit que nous les considerions comme des choses, en ce que lors même que ce sont des modes on ne les rapporte point à leurs substances, mais à d'autres idées de mode moins generales ou plus generales, comme la figure qui n'est qu'un mode au regard du corps figuré, est un genre au regard des figures curvilignes & rectilignes, &tc." (LAP, 61, underlining mine)

signified "firstly, directly, . . . , and confusedly" the thing, and secondly "indirectly, albeit more distinctly" the attribute. In this case, the attribute is presented to us as part of the *compréhension* of the substance of which it is an attribute. However, if we "direct" our perception to consider the attribute as if it were a thing, the attribute will present itself as a genus, that is to say, it will reveal its *étendue*. It should also be noted that in anatomizing the perception of an idea in this manner, the Port-Royal authors are repeating that there is no distinction between the idea "shape," and the idea "genus shape," thus reminding the reader of the superfluosity of the doctrine of predicables.

There is another aspect of the doctrine of predicables that is helpful for the understanding of the famed *Port-Royal* distinction. The authors reveal that some genera, like "substance," "being," and "time" are so general that they are not the species of any higher genus. They are, so to speak, all *étendue*, and no *compréhension*. Likewise, some species, like "man" or "circle" have no other species or inferiors below them. Those are, in the manner of their polar opposite, all *compréhension*, and no *étendue*. Let us follow the tradition, and call the former *summum genus*, and the latter *species infima*. The case of the *speciei infimæ* is not so problematic, because it was earlier suggested that their *étendue* consisted of individuals, and

the authors indirectly confirmed it: "But there is another notion of the word 'species' that only befits ideas that cannot be genera. It is when an idea has under itself only individuals and singulars, as a circle has under itself only singular circles which are all of the same species. It is what we call the last species, *species infima*."<sup>15</sup> The case of the *summi genus*, however, is more severe, for one may wonder how a general idea can have no *compréhension*, and still be an idea? Yet, we are told that they are "so clear, that often, while wishing to make them even clearer, instead of contenting oneself of those we form naturally, we obfuscate them."<sup>16</sup> This remark certainly indicates that the *compréhension* of those ideas cannot be spelled out. Is it simply a question of the ineffability in language? But, how will such ideas behave in arguments where consideration of their *compréhension* is essential to the establishment of the validity of the argument? Pascal, whose influence on *LAP* is ingenuously acknowledged by its authors (*LAP*, 21), had argued that the definitions of linguistic terms had to include some indefinable terms in order to avoid an infinite

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<sup>15</sup>"Mais il y a une autre notion du mot d'espece qui ne convient qu'aux idées qui ne peuvent être genres. C'est lorsqu'une idée n'a sous soi que des individus & des singuliers, comme le cercle n'a sous soi que des cercles singuliers qui sont tous d'une même espece. C'est ce qu'on appelle, espece dernière, "*species infima*"." (*LAP*, 60)

<sup>16</sup>"Toutes ces idées-là sont si claires, que souvent en les voulant éclaircir davantage, & ne pas se contenter de celles que nous formons naturellement, on les obscurcit." (*LAP*, 71)

regress.<sup>17</sup> Arnauld and Nicole repeat what Pascal had argued (*LAP*, IV, IV), but Pascal's comment, as well as their own, apply to linguistic terms (*definitio nominis*,) and not to ideas (*definitio rei*.) The world of ideas is supposed to be more perfect than the world of language; the *compréhension* and *étendue* of ideas was expected to do more than the language of predicables (second intentions). We seem to have a case that is damaging to the purity of both the Augustinian mental language and the Cartesian doctrine of ideas; a case where the imperfection of language is inherited from that of ideas.

b. Differences and Properties

When the general idea of an attribute (*maniere de chose, attribut, mode*) or of a modified thing (*chose modifiée*) is no longer considered as if it were a thing (*chose*,) that is when, in the language of the predicables, it was no longer thought of as a genus or a species, the attribute was called the difference (*differentia*) or the property (*proprium, propre*.)

They are called *differences*, when the object of

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<sup>17</sup>"De 'Esprit Géométrique et de l'Art de Persuader," in *Oeuvres Complètes*, Gallimard, 1954, pp. 575-604.

those ideas is an essential attribute that distinguishes one species from another ; such as extended, heavy, rational.

They are called *properties*, when their object is an attribute that in fact belongs to the essence of the thing ; but that is not the first that is considered in this essence, but only a dependence of the first, as divisible, immortal, docile.<sup>18</sup>

Thus, the difference extendedness divides the genus substance into two species one of which, namely body, has extension in its *compréhension*. Difference operates on two levels: on the level of the genus, which it divides, and on the level of species, which it makes up by constituting its *compréhension*. The difference that constitutes the species has the same *étendue* as the species, in other words

$$\text{Genus} + \text{Difference} = \text{étendue} \text{ Species}$$

In some cases, the *compréhension* of some ideas may require more than one attribute, if one attribute does not befit one and only one genus. Three-sidedness is an attribute of

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<sup>18</sup>"On les appelle 'differences,' quand l'objet de ces idées est un attribut essentiel qui distingue une espece d'une autre ; comme étendu, pesant,\* raisonnable.[...] On les appelle 'propres', quand leur objet est un attribut qui appartient en effet à l'essence de la chose ; mais qui n'est pas le premier que l'on considere dans cette essence, mais seulement une dépendance de ce premier, comme divisible, immortel, docile." (LAP, 61) \* the word 'pensant' occurred in the first edition of 1662, and was changed to 'pesant' in the following editions. The change is unexplainable because the examples of differences are compared to examples of properties that are assumed to be derived from the differences. Divisibility and docility are respectively derived from extension and rationality, but immortality, though derivable from thinking substance, is not derivable from heavy body.

closed and unclosed plane figures, so to say of the species triangle that it is the genus figure with the difference three-sidedness will not make their *étendues* equivalent, as schematized by the above equivalence because the left-hand side will include in its *étendue* the shapes **Z**, and **N** in addition to triangles. Finally, a difference is also negative; for example, the genus animal can be divided into the species man and beast by the difference rationality, in which case the *compréhension* of beast is irrational animal.

Properties are essential attributes of differences (*quelque attribut qui soit nécessairement lié avec ce premier attribut*). This secondary attribute befits all and only and always (*omni & soli & semper*) the species determined by the primary attribute, the difference. To have the square of the hypotenuse equal to the sum of the square of the other two sides is the property of a right triangle because this property is logically derived from the property of a triangle having a right angle. Logicians of the seventeenth century, and their medieval predecessors since Porphyry, recognized three additional kinds of properties as parts of predicables. But Arnauld and Nicole only seem to accept the most stringent one, that is to say the one that is not only part of the *compréhension* of the idea, but also whose *étendue* is equal to that of the idea.<sup>19</sup>

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<sup>19</sup>The other kinds are listed in an order different than the traditional one, and without elaboration. 3 and 4 cannot

I think that what Arnauld and Nicole have in mind here, is that properties differ from attributes only in the order of knowing. An attribute is known first (for a reason I cannot explain) and properties are logically derived from it. Moreover, what the Port-Royal authors need but fail to underline, is that differences and properties reflect an order that *compréhension* fails to highlight. The *compréhension* of a right triangle consists of the following: three-sided figure, rectilinearity, closed figure, right angularity and having the square of the hypotenuse equal to the sum of the squares of the other two sides. From a phenomenological point of view, I am not sure how the components of the *compréhension* appear to the perceiver; all that is known is that they cannot be separated from one another without destroying the idea of a right triangle. The Porphyrian analysis reflects the fact that the idea is

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qualify as part of the *compréhension* of an idea. They are:

2. A property that befits all but not only (*quod convenit omni, sed non soli*) the idea. Divisibility is the property of extension because all extension is divisible, but it is also a property of time, number, and force. This property remains part of the *compréhension* of the idea. It cannot quite be the differences we said could not alone determine a species, because it needs to be derived from a difference.

3. A property that befits the *compréhension*, but not the *étendue* of an idea (*quod convenit soli, sed non omni.*) The property of being a philosopher befits man, but not all men.

4. A property that befits all and only one idea, but not always (*quod convenit omni & soli, sed non semper.*) For example, the authors claim that the property of being white-haired befits all and only human, but not always.

made up of a most general one, namely figure, to which the differences "three-sidedness" is added, etc. There is a construction going on here that explains how one is contained in another. *Port-Royal* implicitly relies on this construction, but the doctrine of *compréhension* does not reflect it explicitly.

### c. Accidents

Accidents are the non-essential qualities of an object. For Porphyry they were the qualities which could be added or taken away, really or conceptually, from a subject. Being dressed is an accident for Æneas because this quality can be really taken away from him and, borrowing Porphyry's example, being black for an Ethiopian is also an accident, because blackness can be conceptually removed from her. For the *LAP* authors accidents make up the non-essential attributes of substances; they are what they call "determinative terms." That is to say, when they are added (or joined) to a general term, they restrict (*restreignent*) the *étendue* of the first term. (*LAP*, 66) For example "red" in the idea of a "red balloon." Another feature of accidents is that, like attributes and properties, they do not subsist on their own; they need a substance within which to inhere, and they also negatively affect the clarity of the perception of the substance in which they inhere. When

I perceive the idea of a red balloon, the idea of redness affects the clarity of my perception of the substance, despite the fact that I "firstly and directly" perceive the substance. In fact, the nature of an accident is such that the substance of which it is an accident can, not only be conceived without the accident, but also can be more clearly perceived without the accident.

## 2. The "law" of Port-Royal

I noted in Chapter One that Norman Kretzmann, in his entry "History of Semantics" in the *Encyclopedia of Philosophy*, had likened Port-Royal's *compréhension* and *étendue* to the medievalists' simple and personal supposition. By now it is clear that the comparison is not entirely accurate; Port-Royal's distinction applies to universal ideas in isolation and is not parasitic on another semantic property of ideas; the medievalists' distinction applies to singular and universal terms only in the context of a proposition and is parasitic on the properties of signification and imposition. This section explores another reason for thinking the comparison unjustified. The reason is that while the medievalists treat each supposition as if it were independent of all others, the Port-Royalists consider a way in which *compréhension* and *étendue* are

related. Various suppositions are independent of each other because the supposition of a term is in question only when that term occurs in a proposition, and that term can only have one supposition at a time; on the other hand, a universal idea is always identical to its *compréhension* and *étendue* in such a way that if one or the other (or both) is altered, the idea is most likely to be altered. This feature has led Arnauld and Nicole to formulate a certain relationship between the two aspects of universal ideas, namely that if the *compréhension* of an idea is increased, its *étendue* will decrease. This relationship has been dubbed by historians of logic as the "law of Port-Royal."<sup>20</sup>

Port-Royal states its "law" by explaining that the *étendue* of an idea can be decreased (*resserrée*) either by adding a "distinct and determined" idea to it or by joining it to an "indistinct and undetermined" idea

The first way is by another distinct & determined idea which one joins to it, as when to the general idea of a triangle, I join that of having a right angle : which tightens this idea to the sole

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<sup>20</sup>Dominicy in *La naissance de la grammaire moderne : langage, logique et philosophie à Port-Royal*, Bruxelles, 1984, p. 42, calls it "la loi de Port-Royal" and cites Blanché, *op. cit.*, Kneale and Kneale, *The Development of Logic*, 1962, and Risse, *Die Logik der Neuzeit (1500-1780)*, as historians of logic who concur with him as viewing Port-Royal as the initiator of a form of this "law".

species of triangle which is the right triangle.<sup>21</sup>

The other way, by only joining an indistinct and indetermined idea of part, as when I say, some triangle.<sup>22</sup>

The authors' formulation makes sense only if the joining of two ideas (determined or undetermined) is read as meaning the joining of the *compréhension* of two ideas. Thus, if the *compréhension* of an idea is increased, its *étendue* decreases (*est resserrée*). In other words, the greater or smaller the *compréhension*, the smaller or greater the *étendue*. A number of modern logicians and linguists have attempted to confirm the law by translating the Cartesian doctrine of ideas into a calculus of inclusion that is related to a class calculus by the relation of duality.<sup>23</sup> Dominicy, for example, shows

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<sup>21</sup>"*La première est, par une autre idée distincte & déterminée qu'on y joint, comme lorsqu'à l'idée générale du triangle, je joins celle d'avoir un angle droit : ce qui resserre cette idée à une seule espèce de triangle, qui est le triangle rectangle.*" (LAP, 59)

<sup>22</sup>"*L'autre, en y joignant seulement une idée indistincte & indéterminée de partie, comme quand je dis, quelque triangle :*" (LAP, 59)

<sup>23</sup>Marc Dominicy, *La naissance de la grammaire moderne; Langage, logique et philosophie à Port-Royal*, Mardaga, Bruxelles, 1984, pp.39-44; Sylvain Auroux, *La logiques des idées*, Vrin, Paris, 1993, pp. 131-135. The relation of duality between intension and extension in modern parlance was algebraically formulated by Boole, and perfected by De Morgan (1858) and Peirce's (1867) "Law of Logical Duality." See Federigo Enriques, *The Historic Development of Logic*,

that if an idea  $a$  is included in idea  $b$  ( $a > b$ ) then, by a special relation of duality, the class  $\beta$  is included in the class  $\alpha$  ( $\beta > \alpha$ ); since  $a$  and  $b$  are not identical, there must be an idea  $c$  such that  $b = a + c$  or, by duality,  $\beta = \alpha X \Gamma$  where  $X$  represents the product of two classes. The operation demonstrates (the author recognizes that the original doctrine of ideas needs to be modified) that idea  $a$  represents more things than idea  $b$ . But this conversion says more about our modern theories than about our old theories; furthermore, this way of presenting Port-Royal's formulation can be misleading. It is tempting to imagine that *compréhension* and *étendue* can be manipulated the way the levels of a liquid in communicating vases can be manipulated; that is to say, if one level goes up, the other goes down, and vice-versa. That this is not the case can be easily demonstrated. There are four possible ways of manipulating the two elements:

- (1)  $\uparrow$  *compré.*  $\rightarrow$   $\downarrow$  *étendue*
- (2)  $\uparrow$  *étendue*  $\rightarrow$   $\downarrow$  *compré.*
- (3)  $\downarrow$  *compré.*  $\rightarrow$   $\uparrow$  *étendue*
- (4)  $\downarrow$  *étendue*  $\rightarrow$   $\uparrow$  *compré.*

It is immediately clear that (2) and (4) do not obtain. The number of individual human beings is constantly changing without simultaneously resulting in a change in the number

of attributes of mankind; new species of animals and plants are discovered and others become extinct, but the size of their corresponding genera is not altered. It seems that if a change in *étendue* resulted in a change in *compréhension*, the change would have to be total. Although tomatoes are more likely to be found in vegetable recipes than in fruit recipes, they are counted as fruits; should a botanist become concerned about the taxonomic welfare of chefs and decide to correct the apparent anomaly, she would have to change all the attributes of fruits under the most general one of plant. But attributes cannot be changed (at least according to Port-Royal) because they are essential to the idea (they are part of the *definitio rei*).

Besides (2) and (4), (3) presents serious difficulties. Strictly speaking, one can only add to a *compréhension*, since any subtraction (a real subtraction as opposed to subtraction *de raison*) results in the destruction of the idea. Although Arnauld and Nicole are emphatic about this point: "by removing any one of its [the idea's] essential attributes we entirely destroy and annihilate it [the idea], and it is no longer the same idea,"<sup>24</sup> they omit the case of the complement of a term where it can be argued that the *compréhension's* decrease yields an increase in *étendue*. Let

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<sup>24</sup>"en lui ôtant quelqu'un de ses attributs essentiels on la détruit & on l'anéantit entièrement, & ce n'est plus la même idée." (LAP, 169)

*us first examine Port-Royal's claim that the removal of the part of the *compréhension* of an idea results in the destruction of that idea.*

What exactly is meant by an idea's destruction? The authors tell us that the idea is replaced by another one, but it does not seem that destruction (or annihilation) implies replacement; formicacides destroy ants in the hope that none will replace the fallen ones. A replacement scenario, on the other hand, is easy to come by; if I remove the attribute of right-angledness from the idea of a right triangle, the idea of a right triangle is replaced by that of a scalene triangle. It seems that, in general, the removal of an attribute will result in the passing of an idea to a higher genus on the Porphyrian tree. But, what if I remove the attribute of plane-figure from the idea of right-triangle? In this case, there is no higher genus for the idea to go to. I now have a completely destroyed idea. But, do I have a blank representation, that is to say the formally real idea without its objective content? No, because no modification of the mind can be without content, and no content can be without modification of the mind. Do I become idealess? No, because the mind always thinks; thinking is an essential attribute of the mind. As a matter of fact, thinking is to mind the way attributes are to the *compréhension* of an idea. So, immediately following the destructon of idea *a*, another idea must surface. The

authors are careful to tell their readers that the idea is replaced by another one; they unfortunately omit to give details about this other idea. One possible answer is given in Arnauld's *VFI*; the mind always has the idea of itself (*est sui conscia*), and this mental act is either voluntary and conscious (*expresse*) or involuntary and unconscious (*virtuelle*)

The first remark is that our *thought or perception* is essentially self reflective, or what sounds better in Latin *est sui conscia*. For I do not think without knowing that I think. I do not know a square without knowing that I know it. [T]he second remark is that in addition to this reflection that can be called *virtuelle*, which is found in all our perceptions, there is another one more *expresse*, by means of which we examine our perception by another perception, as everyone experiences without difficulty.<sup>25</sup>

It would appear, then, that when a specific idea is destroyed, and it is not replaced by another specific idea, I have nothing left but my own thought (my essence as *res cogitans*) as object of perception; the formal reality of my

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<sup>25</sup>"La 1. est que nostre *pensée ou perception* est essentiellement *reflechissante sur elle-même* : ou, ce qui se dit plus heureusement en Latin, *est sui conscia*. Car je ne pense point, que je ne sçache que je pense. Je ne connois point un quarré que je ne sçache que je le connois. [...] La 2. est qu'outre cette reflexion qu'on peut appeler *virtuelle*, qui se rencontre dans toutes nos perceptions, il y en a une autre plus *expresse*, par laquelle nous examinons nostre perception par une autre perception, comme chacun l'éprouve sans peine;" (*VFI*, 52; underlined words appear italicized in the Fench text)

mind guarantees that I always perceive it as a thinking substance. I take it that this last act of perception either can be "virtual" or "express" since I can choose to be aware or unaware of this thought.<sup>26</sup>

Finally, J.N. Keynes<sup>27</sup>, who is thinking of linguistic terms rather than ideas, argues that there are cases where the intension of a term is reduced with no resulting change in the extension. He asks his reader whether by dropping 'invalid' from the expression 'invalid syllogism with undistributed middle', we increase its extension. The answer is obviously no. Can the same be said about the ideas of "invalid syllogism with undistributed middle" and of "syllogism with undistributed middle"? Another way of framing the question would be to ask whether two ideas can share the same *étendue*, but have different *compréhension*. Here again, the answer must be no because the components of *compréhension* are essential to the idea. In modern logic, reates and cordates are the canonical coextensional terms with different intensions; in classical logic, if you have a heart you must have some blood-filtering device like kidneys, and if you have kidneys you must have some pump-

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<sup>26</sup>In his division between "virtual" and "express," Arnauld omits the possibility of an involuntary conscious perception. I can be forced to perceive pain, and I can perceive my self by default when the *compréhension* of an idea is plucked away.

<sup>27</sup>John Neville Keynes, *Studies and Exercises in Formal Logic*, (London: 1906), p. 37.

like device like a heart. Port-Royal's position can be explained by going back to the doctrine of predicables. Arnauld and Nicole distinguished between difference (*differentia*) and property (*proprium*) by arguing that although the two are essential to the species (or genus), the latter was epistemologically prior, and logically derivable (and in many cases interderivable) from the former. The attribute of invalidity could be said to be known from the attribute of having undistributed middle terms, and can also be said to be logically derivable from it. This is another example where the question of epistemological priority cannot be entirely separated from the logical framework (see Chapter One); what can be said in support of Arnauldian epistemological priority? not much, except that whatever is known first has greater objective reality, and *vice-versa*. So, that attribute that has the greatest objective reality is the difference (*differentia*).

The complement of a general term may be said to be a case of decreased *compréhension*. In modern parlance, the complement of a term is every object that is not denoted by the complement of its complement; the term 'non-cat' denotes all objects that are not cats, e.g., squirrels, dictionaries and planets. There is, however, something counterintuitive about this analysis: if I ask a restaurant's maitre d' to be seated with non-smokers, I don't expect to find squirrels, dictionaries and planets

seating in that section; I expect to find individuals (human beings) who do not smoke cigars, cigarettes or pipes. So that, whereas in modern parlance, the prefix 'non' in 'non-smoker' replaces the extension of the term 'smoker' with everything that is not a smoker, it makes more intuitive sense to say that the prefix 'non' operates on the *compréhension* of the term it modifies. A smoker (*species*) is an individual human being (*genus*) who smokes (*differentia*); a non-smoker is an individual human being who does not smoke. The prefix 'non' has decreased the *compréhension* of 'smoker' by eliminating only the *differentia* signified by the term 'smoker.' As a result of the decreased *compréhension*, it is expected that the *étendue* increases (presumably there are more non-smokers than smokers). In other words, not all grammatical prefixes, such as 'tri,' 'endo,' etc., increase the *compréhension* of terms they modify.

What would Arnauld and Nicole about this analysis? The only mention of complements I was able to find in *LAP* suggests that its authors adopted an extensional analysis of the complement

it is the same thing to say negatively that a man is not a friend of God, as to say affirmatively that he is a non-friend of God, *i.e.*, among those

who are not friends of God.<sup>28</sup>

Non-friends of God share the *étendue* (*sont du nombre*) of those individuals who are not friends of God. However, LAP's example is not entirely conclusive because it is a singular proposition; it has as a subject an unidentified individual (*un homme*) and not a general term. Although individual names have senses, as Chapter Five argues, their senses are not to be equated with *compréhension*. Consequently, the example can be given an intensional analysis: the sentence "the sense of friend-of-god does not belong to a man" means the same as "the sense of non-friend-of-God belongs to a man." In this case the "difference" 'friend-of-God' is removed from a man--the sense is decreased--but of course, it is far from clear whether the extension of 'non-friend of God' is greater than that of 'friend of God.' Be that as it may, first-order quantification theories somehow confirm that a complement of a term may affect the intension of the term it modifies. The operation of obversion<sup>29</sup> allows the inference of all

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<sup>28</sup>"*c'est que c'est la même chose de dire négativement qu'un homme n'est pas ami de Dieu, & de dire affirmativement qu'il est non ami de Dieu, c'est-à-dire, du nombre de ceux qui ne sont pas amis de Dieu.*" (LAP, 209-210)

<sup>29</sup>LAP makes no mention of the operations of obversion or contraposition. It has four very short chapters (II, 17-20) on the operation of conversion that are prefaced by the following warning: "*Les chapitres suivans sont un peu difficiles à comprendre, & ne sont nécessaires que pour la*

four categorical propositions (*A, E, I, O*) to their opposite quality, provided the predicate is changed to its complement. This operation cannot be captured in first-order theory--the obverse of 'All *S* is *P*' or ' $(\forall x)(Sx \supset Px)$ ' is 'No *S* is non-*P*,' but not ' $(\forall x)(Sx \supset \neg Px)$ '--because first-order theories are extensional. The only way to translate the obverse of an *A* proposition in first-order theory requires that the predicate be changed: ' $(\forall x)(Sx \supset \neg \Phi x)$ ,' where ' $\Phi$ ,' which is the complement of '*P*' has a different sense. The lexicon of first-order theory does not include the complement 'non' because 'non' primarily affects the sense (which determines the extension) of the term it modifies. Categorical logic, on the other hand, permits both intensional and extensional analyses: extensional 'All *S* is *P*' is equivalent to intensional '*P* is in all *S*,' so that 'No *S* is non-*P*' is equivalent to 'non-*P* is in no *S*,' where 'non-*P*' is the attribute above *P* in the Porphyrian tree that does not possess the *differentia* that '*P*' possesses.

Thus, there is a case where *compréhension* can be decreased, but because, in this special case of complement, the sense of the term is changed, it is not clear whether the extension varies inversely.

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*spéculation. C'est pourquoi ceux qui ne voudront pas se fatiguer l'esprit à des choses peu utiles pour la pratique, les peuvent passer."* (LAP, 168)

Of the four original possibilities, then, only (1) is left; it is the one suggested by Arnauld and Nicole, but even this one is not without difficulties. It states that if the *compréhension* of an idea is increased then its *étendue* decreases. But of course, there is more than a decrease of *étendue* taking place. If I add the attribute of being an American to the *compréhension* of the idea of women I accomplish two things: I decrease the *étendue* of the idea of women, and I make the attribute of being-an-American part of the *compréhension* of the idea of American women. But notice that in this case there was no difficulty in determining that being-an-American was not already part of the *compréhension* of the idea of women. Unfortunately, it appears that there is no strict criterion (except perhaps clarity and distinctness, which fares rather poorly in the realm of strictness) to determine whether an attribute is or is not already part of the *compréhension* of an idea. In the absence of a rigorous account of the phenomenological qualities of ideas, one is restricted to the following remarks.

a. Increased *compréhension*

J.F. Keynes' remarks regarding the removal of a part of the intension of a term without affecting its extension

equally applies to the addition of attributes to the intension of term. If the attribute is derivable from one of the attributes already present, the extension does not vary. He cites equiangularity added to the intension of an equilateral triangle; cloven-hoofedness to that of a ruminant; having jaws opening up and down to that of a vertebrate, and concludes from the enumeration that no corresponding changes take place in the extension. In the first example, the authors of *LAP* would again refer to their chapter on the predicables and argue that equiangularity is a property, in the restricted sense of *omni, soli & semper*, of equilaterality, hence necessarily bound to it. It cannot be an addition because it is already part of the *compréhension*. In fact, as geometry progresses we may discover more and more properties of equilateral triangles without, at the same time, decreasing the extension of the idea. Besides, if we possess a distinct and determined idea of equiangularity, as is required by the authors, the *compréhension* of this idea will include equilaterality when applied to the idea of triangle. By adding equiangularity, we have done nothing other than "explicating" the *compréhension* of the original idea.

The problem is a little more difficult with the second and third examples. Cloven-hoofedness is not "necessarily bound" to rumination; at least, no such bond has been discovered. Until now, it is a pure empirical fact induced

from observation; all ruminants so far observed have had hoofs which were split. If Arnauld and Nicole argue that if we have a clear idea of ruminants, then it will include that of cloven-hoofedness, then it will follow that the two properties are "somehow" logically or otherwise connected. That neither Arnauld nor Nicole could satisfactorily provide such link is evident from the turmoil created by Hume half a century or so later.

Now, could Arnauld and Nicole argue that if the increase in *compréhension* does not result in a decrease in *étendue*, then the addition is not strictly speaking an addition, but an explication of the *compréhension*? That is to say, that it is already part of the *compréhension*. How would this work? I have the idea of ruminants, it has a certain *compréhension* that does not include cloven-hoofedness, *viz.*, mammals who chew the cud; it has a certain *étendue*, *viz.*, pronghorns, okapis, chevrotains, Blanchette, etc. I then consider these general ideas attentively. Do I note that they must also represent the property of cloven-hoofedness? Not unless there is a logical connection between this property and the others. Ideas are not images, there is no mental empiricism going on here, so I cannot say that I have a mental perception of cloven-hoofedness. So, I decide to do a little thought experiment and add cloven-hoofedness to the *compréhension*; lo and behold! nothing happens to the *étendue* of the idea. I conclude that the

property must be part of the *compréhension*. The thought experiment is far from conclusive. Suppose that I add to the *compréhension* of the idea of earthling human beings who solved the Humean problem the attribute of having-walked-on-Mars; nothing will happen to the *étendue* of the original idea. However, the attribute of having-walked-on-Mars hardly can be said to be part of the *compréhension* of the idea of earthling human beings who have solved the Humean problem. Thus, where additional attributes are not logically derivable from existing ones, it seems that the only way out for Arnauld and Nicole is to reach out for phenomenological qualities in ideas (like clarity and distinctness) that reveal whether an attribute is or is not part of the *compréhension*; this is hardly satisfying.

b. Particles of quantity and the Law of Port-Royal

At the beginning of this section, I noted that two distinct paths could be followed in order to effect a decrease in *étendue*: the first path, which consisted of adding a "distinct and determined" idea to another one, led to the "Law of Port-Royal," namely that an increase in *compréhension* generally results in a decrease in *étendue*. The second path consists in adding an "indistinct and undetermined" idea of part signified by the quantifier 'some.' What is strange is that, in this instance, Arnauld

and Nicole seem to confer the quantifier 'some' the full status of an idea, whereby, by concatenating 'some' with a universal term, as in the expression 'some triangles,' we obtain a "complex idea" in the sense specified by LAP. This section shows that the expression cannot be a complex idea, and that the particle 'some' is an idea the status of which was made precise by the authors. It is suggested that it is an idea of "determinant" that generally restricts the *étendue* of ideas, but that also can operate on the *compréhension* of idea at the level of "distinction of reason." Its function is then compared to that of the particles 'all,' 'no,' 'only' and 'except.' This section concludes by showing that *Port-Royal's* understanding and description of all particles of quantity is the authors' most compelling testimony that the content (sense) of propositions determines their logical form.

#### b.1. Some

Port-Royal's explanation of particularization identifies the quantifier 'some' as a full-fledged idea, an "idea of part"

The other way, by only joining an indistinct and indetermined idea of part, as when I say, some triangle: and then it is said that the common term

becomes particular because it only ranges over a part of the subjects over which it originally ranged, nevertheless without having determined which part it has been reduced to.<sup>30</sup>

In order to be loyal to the Cartesian doctrine of ideas, the authors have no choice but to make all meaningful sounds signify an idea. Here, they obviously do not wish to acknowledge the distinction that Augustine made in *De Magistro*; neither do they wish to reintroduce the medieval distinction between categorematic and syncategorematic terms. Their reason for snubbing the distinctions must be that sounds only acquire meaning when they signify an idea. But, this identification of 'some' with an idea curiously suggests, as is the case when two ideas are joined, that the expression resulting from the concatenation of 'some' with any term is a "complex term (idea)," i.e., "a total idea of which it often happens that we can affirm or deny that which

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<sup>30</sup>"L'autre, en y joignant seulement une idée indistincte & déterminée de partie, comme quand je dis, quelque triangle : & on dit alors que le terme commun devient particulier, parce qu'il ne s'étend plus qu'à une partie des sujets auxquels il s'étendoit auparavant, sans que néanmoins on ait déterminé quelle est cette partie à laquelle on l'a resserré." (LAP, 59) Pariente, in *L'analyse du langage à Port-Royal*, Editions de Minuit, Paris 1985, pp.236-244, insightfully notes that Port-Royal's analysis marks the formal end of the medieval distinction between particularization and restriction (*coartatio*). The distinction already had been blurred, albeit not replaced, by the Cambridge logician John Seton (1498-1567). For the medieval doctrine of particularization, see Chapter One.

we could not affirm or deny of each terms in isolation."<sup>31</sup> However, this is far from what is happening here. A canonical complex term (idea) is 'prudent men' and a canonical undeterminately restricted expression is 'some triangles'. Both expressions have little in common: 'prudent men' and 'some triangles' can be truly predicated of things that neither 'men' nor 'triangles' can, but while I can say that there are less prudent men than men and that some men are prudent, I cannot say that there are less "some triangles" than triangles or that "some triangles are some." Furthermore, if 'prudent men' and 'some triangles' were expressions of the same ilk then their *étendue* could not vary according to their context of occurrence. If one accepts that prudent men are reflective then there are as many prudent men as there are prudent men who are reflective; contrarywise, if one accepts that some triangles are isocèles, it does not follow that there are equal numbers of triangles in "some triangles" taken in isolation than triangles that are isocèles. If the concatenation of 'some' with an idea does not yield a complex idea then what part of speech and what kind of idea is 'some'? It cannot be an adjective (*adjectif ou connotatif*; LAP, 47), and so it cannot be an idea of modified thing (*chose modifiée*). It

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<sup>31</sup>"...une idée totale, de laquelle il arrive souvent qu'on peut affirmer ou nier, ce qu'on ne pourroit pas affirmer ou nier de chacun de ces termes étant séparés:" (LAP, 65)

cannot be an idea of substance or an idea of mode; neither can it be a universal, particular or singular idea.

Arnauld and Nicole inform their reader that 'some' is a word (*mot*; *LAP*, 114), a "mark of particularity" (*marque de particularité*; *LAP*, 152), and that it signifies an "idea of part." All this is, of course, very general and vague; the reader still does not know what part of speech it is except that it functions like an indefinite article because 'some' sometimes can be replaced by an indefinite article (*LAP*, 152), and the reader is referred to the *GGR*.

The *GGR* throws some light on the issue; 'some' is one of many terms used to determine (*déterminer*) an undetermined idea; for Arnauld and Lancelot, it is likened to an article, a demonstrative, a numeral or a universal quantifier

*This, some, many, numerals like two, & three, & all, no, none, &c. determine as well as articles.*<sup>32</sup>

But in the *GGR*, determination is restricted to *étendue*; in *LAP*, there is a possibility that it may operate on both *compréhension* and *étendue*, because the validity of some arguments containing a particular premise is established on

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<sup>32</sup>"*Ce, quelque, plusieurs, les noms de nombre, comme deux, & trois, &c. tout, nul, aucun, &c. déterminent aussi bien que les articles.*" (*GGR*, 84; underlined terms appear in italics in the French text)

the basis of a part of the *compréhension*.<sup>33</sup> In fact, the converse of the *I* proposition (an inference acknowledged to be legitimate by the Port-Royal authors<sup>34</sup>) 'Some triangles are isoceles' is 'Some isoceles are triangles,' which, given an extensional interpretation, does not sound right because all isoceles are triangles. In this case, the speaker is encouraged to think of 'some' as meaning "part of the *compréhension*," and indeed, part of the *compréhension* of isoceles is triangularity. Even in cases where the *I* proposition connects parts to parts, instead of connecting parts to wholes, a case can be made that 'some' modifies the *compréhension*. The propositions 'Some tulips are red,' and its converse 'Some red things are tulips' clearly connect part of the *étendue* of tulips to parts of the *étendue* of red things. However, the *compréhension* of tulips can be stretched, if push comes to shove, to comprise the general attribute of colourfulness, the *étendue* of which includes redness, in which case 'Some tulips' can be understood to mean "part of the *compréhension* of tulips." Of course, this latter restriction must be a *distinction de raison*, since no part of the *compréhension* of an idea can be removed without destroying the idea. At this point, then, all that is known about the idea signified by 'some' is that it does

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<sup>33</sup>See Chapter Six.

<sup>34</sup>LAP, 171

not belong to any of the categories of ideas stipulated by *LAP*. Let us temporarily call it a determinant idea.

### b.2. All and No

The *GGR* lumps 'some' with 'all' and 'no' and views all three as having a determinative function on the *étendue* of the term they modify. But while the authors single out 'some' in expressions like 'some triangles,' that is to say they make it look as if 'some' modifies a term, they often speak of 'all' and 'no' as having the power of "universalizing" propositions, and rarely (if ever) speak of 'all' modifying a term outside a proposition. This characterization resembles the "binding" function of modern quantifiers. However, close analysis of *LAP*'s examples reveal that in many cases universality applies to *compréhension* as well as to *étendue*; this is consonant with the Aristotelian way of expressing universality, and it lends strong support to the view that *LAP*'s logical syntax is determined by the meaning of the terms contained in the proposition rather than by particles of quantity. What became 'All S is P' in the works of the early medievalists, originally was expressed as 'P is in all A' by Aristotle in the *Prior Analytics*. What is dissonant with the tradition, however, is that, since coextensional terms cannot have varying *compréhension*, some universal propositions, which

are intended to have predicative force, turn out to be equivalences.<sup>35</sup>

In *LAP*, 'All' and 'no' are called "universal signs" that direct the attention to the *étendue* of the term they modify

Universal terms can be taken either in their entire extension, by joining them to the universal signs that are explicit or implicit, as *all* for affirmative propositions, and *no* for negative propositions, *all men*, *no men*.<sup>36</sup>

At another point, the authors add that it is necessary "to distinguish two kinds of universality" (*Il faut distinguer deux sortes d'universalité; LAP, 149*)

I call a universality metaphysical, when the universality is perfect and without exception, as in *All men are living beings*, this admits no exception.

And I call a universality moral, that which admits some exception, because within the world of moral things we are happy with things being so

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<sup>35</sup>Modern quantification theory does not recognize, in its symbolic language, the difference between the predicative proposition 'All cats are animals', and the equivalence 'All bachelors are unmarried males', unless the quantifier of the latter is changed to 'All and only'.

<sup>36</sup>"*Et les termes universels peuvent être pris ou selon toute leur étendue, en les joignant aux signes universels exprimés ou sous-entendus, comme omnis, tout, pour l'affirmation' nullus, nul, pour la negation, tout homme, nul homme."* (*LAP*, 114; underlined words are italicized in the French text.)

customarily, *ut plurimùm*.<sup>37</sup>

Universal morality can be in the affirmative as well as in the negative, but this kind of universality is so confusedly described by Arnauld and Nicole that it even baffles an occasionally illogical adept. Whether in the affirmative or in the negative, it makes the authors look as if they wanted to have their cake and eat it too. They give 'All Cretans are liars' as an example of a morally universal proposition; the example can be expanded to its obverse 'No Cretans are truth-tellers' to show that universal morality is proper to both qualities of propositions. These propositions are characterized by the fact that "great caution" (*grand jugement*) is to be used when drawing inferences to particulars because some Cretans may not "possess the vices common to others" (*quelques-uns de cette isle pouvoient n'avoir pas les vices qui étoient communs aux autres; LAP, 150*). The moral world has the unenviable privilege of making corresponding A and O propositions hospitable to contrariness and accordingly impervious to contradictoriness. This is so, simply because these

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<sup>37</sup>"*J'appelle universalité métaphysique, lorsqu'une universalité est parfaite & sans exception, comme, tout homme est vivant, cela ne reçoit point d'exception.*

*Et j'appelle universalité morale, celle qui reçoit quelque exception, parce que dans les choses morales on se contente que les choses soient telles ordinairement, ut plurimùm." (LAP, 149)*

propositions cannot "be denied or rejected as false, although some counterexamples can be found" (*ne les contredire pas, ni ne les rejeter comme fausses, quoiqu'on puisse opposer des instances où elles n'ont pas de lieu; LAP, 150*). To confuse the reader even further, Arnauld and Nicole, a few pages after, argue that propositions, the subject of which is the name of the members of a community, and which are or are not modified by 'all,' are neither universal nor particular, but singular. The subject of the proposition 'The Romans conquered the Carthaginians' is to be understood as a singular moral person, "they [the propositions] are singular because we consider each people as a moral person the duration of which is several centuries, who subsists as long as it makes up a state, and who acts during these times by means of those who are part of it, as a man acts by means of his limbs."<sup>38</sup> If moral universalities are singular expressions, their discussions belong to the section on proper names; this section appears in the next chapter.

On the other hand, the case of "metaphysical universality," e.g., 'All men are living things,' is clearly what we would understand today as a universally quantified

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<sup>38</sup>"*mais elles sont singulieres, parcequ'on considere chaque peuple comme une personne morale dont la durée est de plusieurs siecles, qui subsiste tant qu'il compose un état, & qui agit en tous ces temps par ceux qui le composent, comme un homme agit par ses membres.*" (LAP, 156)

statement, that is to say a statement about the *étendue* of both subjects and predicates. *LAP* is quite explicit about this kind of proposition, but only once it has been identified as a metaphysical universality (it seems that, as usual, the only criterion available for deciding is clarity and distinctness of ideas)

The predicate is placed in the subject by an affirmative proposition according to the whole extension the subject has in the proposition.

The extension of the predicate is decreased by that of the subject, so that it only signifies that part of its extension which befits the subject.<sup>39</sup>

Here, the particles 'all' and 'some' function like a binding quantifier; their occurrences in a proposition guarantee that the extension of the predicates will be made to match that of the subject.

Unfortunately, we cannot stop here, because within universalities (of the metaphysical kind), an additional distinction is made by the authors: "there are two kinds of 'all'" (*il y a deux sortes de tout*; *LAP*, 161)

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<sup>39</sup>"*L'attribut est mis dans le sujet par la proposition affirmative selon toute l'extension que le sujet a dans la proposition.*

*L'extension de l'attribut est resserré par celle du sujet, en sorte qu'il ne signifie plus que la partie de son extension qui convient au sujet."* (*LAP*, 170)

There is a whole composed of several, really distinct, parts, called in Latin *totum*, and the parts of which are called *integral parts*.

The other *all* is called in Latin *omne*, and its parts *subjective* or *inferior* parts ; because this whole is a common term, and its parts are the subjects comprised in its *étendue*[.]<sup>40</sup>

The second 'all' could very well be the metaphysical 'all' that refers to the *étendue* of both subjects and predicates. In LAP's first example, 'All men are living things,' the entire *étendue* of the subject is contained in (is part of) that of the predicate, and the entire *compréhension* of the predicate is contained in (is part of) that of the subject. In the second example, however, 'All animals are man or beast,' both *compréhension* and *étendue* of the subject are contained in the predicate in their entirety; so, we have an equivalence with a curious and familiar (Chapter Three) twist, namely that coextensional terms must share the same *compréhension*. Today, the proposition 'All cordates are renates' is considered an equivalence, but only from the point of view of extension. Everyone recognizes that the term 'cordate' signifies the presence of a heart-like system, and that the term 'renate' signifies the presence of

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<sup>40</sup>"Il y a un tout composé de plusieurs parties réellement distinctes, appelé en Latin totum, & dont les parties sont appelées parties integrantes.

L'autre tout est appelé en Latin omne, & ses parties parties subjectives, ou inferieures; parceque ce tout est un terme commun, & ses parties sont les sujets compris dans son *étendue*[.]" (LAP, 161; underlined words are italicized in the French text)

a kidney-like system. Although no one can have one without the other, we maintain that each term has different "sense." For the Cartesian logicians, the sounds [renate] and [cordate] signify exactly the same idea. The fact that we use different sounds to signify the same ideas probably would be charged to the connotation (*idée accessoire*) of terms; when we need to emphasize a particular part of the *compréhension* of a term.

The first 'all' occurs in propositions like 'All men have body and soul'; the division within the predicate is here conjunctive rather than disjunctive, but the statement is also an equivalence statement that could either refer to *compréhension* or *étendue*. So, what is the difference between the two? Since both kinds of universalities are equivalences, they can be said to be definitional; the first 'all' yields a real definition and the second 'all' a definition by examples. The conjuncts of the predicate of the first 'all' can never be separated. So, in metaphysical universalities that are equivalences, the particles 'all' and 'no' can address both *compréhension* and *étendue*, and in metaphysical universality *tout court*, the particles only affect the *étendue*. The important morale of this discussion is that the precise nature of a universality is determined by the meanings of the terms contained in the proposition, and not by the particles; the particle 'all', itself, contributes the notion of universality to one or several

terms of the proposition.

### b.3. Only and Except

Considerations about the particle of exclusivity confirms the essential importance of the meaning of terms. The particle 'only' occurs in what Arnauld and Nicole call "exclusive propositions,"<sup>41</sup> stressing, as in the case of 'all,' their binding rôle. These propositions share the characteristic of being "complex in sense" (*composées dans le sens*, LAP, 138) with exceptive ('All men, except the sage, are mad'), comparative ('The greatest loss is the loss of a friend'), inceptive or desitive propositions ('Jews only started to use dots to indicate vowels in the fifth century after Jesus Christ'). They are "in need of exposition and explanation" (*[elles] ont besoin d'être exposées ou expliquées*, LAP, 138); this is why the medievalists called them *exponibles*. Unfortunately, Port-Royal exposition of the *exponibles* is limited to moral propositions. It is unfortunate because moral propositions, in the Jansenist context, privilege *compréhension*. This section argues that such a reading, besides confirming that the sense of terms determine the logical syntax, turns all exceptive propositions into equivalences, thereby ignoring

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<sup>41</sup>See Appendix for a classification of propositions according to LAP.

the extensional meaning of the particle 'only.'

Exceptive propositions are "complex in the sense" because they can be contradicted in more than one way.

Thus,

(1) Only S is P

can be contradicted by

(2) Some P is not S,

(3) No P is S, and

(4) All P is S and T.<sup>42</sup>

Today, following Boole, we would say that only (2) is the contradictory of (1) since (1) is transformed into the A proposition (1') ' $(\forall x)(Px \supset Sx)$ '; neither (1) and (3), nor (1) and (4), on the other hand, are contradictory since

(5)  $(\forall x)(Px \supset Sx) \nrightarrow (\forall x)(Px \supset \neg Sx)$

(6)  $(\forall x)(Px \supset Sx) \nrightarrow (\forall x)(Px \supset (Sx \wedge Tx))$

Of course, LAP would recognize (5) as a valid inference

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<sup>42</sup>LAP's examples again confirm the insidiousness of Arnauld and Nicole in their attempt to coat moral claims with logical rigor: "Only God must be loved for his sake, other things for God's sake" and "There is one sole and unique nobility." Both examples occur in both French and Latin: "*Deus solus fruendus, reliqua utenda*," "*Nous devons aimer Dieu pour lui-même, & n'aimer les autres choses que pour Dieu*"; "*Nobilitas sola est atque unica virtus*," "*La vertu fait la noblesse ; & toute autre chose ne rend point vraiment noble*." (LAP. 138) Clair & Girbal, the editors of the modern version of LAP, note that the second example was borrowed and modified by the authors from Juvenal (they added 'atque'). But, as we have seen and will see again, it is not unusual for Arnauld and Nicole to bend quotations to fit their moral and theological agenda.

because universal propositions were given existential import, and

$$(7) \neg(\forall x)(Px \supset \neg Sx) \Leftrightarrow (\exists x)(Px \wedge Sx)$$

but (6) can only be justified if the property *S* is a necessary and sufficient condition for *P*: it is true that only citizens are voters or that all voters are citizens, but if I refuse to admit that other properties, besides that of being-a-citizen, like that, for example, of being-over-eighteen, fit the property of being-a-voter I am turning the property of being-a-citizen into a necessary and sufficient condition for the property of being-a-voter, and I am conferring the status of an equivalence onto (1').<sup>43</sup>

This intensional approach is not too surprising since Arnauld and Nicole describe and define an exclusive proposition in terms of its sense ("complex in the sense") rather than extension: "We call exclusive those [propositions] that indicate that an attribute befits a subject, and that it only befits that subject, which

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<sup>43</sup>This inflated interpretation of exceptive propositions even applies to propositions that are obviously extensional. Consider LAP's explication of the proposition, 'Only friends of God are happy,' as the conjunction of 'All friends of God are happy,' with 'All other men who are not friends of God are not happy.' In other words, X is a friend of God if and only if X is happy. ("*Les seuls amis de Dieu sont heureux; Les amis de Dieu sont heureux: Et, tous les autres hommes qui ne sont point amis de Dieu ne sont point heureux.* LAP, 209)

indicates that it does not befit other subjects."<sup>44</sup> The property of being-able-to-vote can only apply to citizens (does not apply to non-citizens), that seems fairly clear. However, (6) signifies that no other properties can be added to that of being-a-citizen, if it befits the property of being-a-voter; the two properties are portrayed as equivalent. The examples of the text confirm the reading, for Arnauld and Nicole wish the properties of being-God and being-loved-for-oneself, and the properties of being-noble and being-virtuous to be equivalent, but the reading is infirmed by the example of being-a-citizen and being-a-voter. Clearly, when *compréhension* is privileged, the proposition 'Only S is P' can mean 'S if and only if P'. But how does one determine when to, so to speak, double the conditional? The answer to the question again lies in the quality of the perception. It depends how well we "know" the ideas contained in the proposition, and this knowledge determines the logical syntax of the proposition.

Thus, logic hinges more on the clarity of idea-perception than on the presence of logical particles. This is made clear in a chapter of *LAP* where the rules of *modus ponens* and *modus tollens* are discussed. The authors cite the special case of the legitimacy of an inference that

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<sup>44</sup>"On appelle exclusives celles qui marquent qu'un attribut convient à un sujet, & qu'il ne convient qu'à ce seul sujet, ce qui est marquer qu'il ne convient pas à d'autres:" (*LAP*, 138)

denies the antecedent in present and past counterfactual propositions; they defend Cicero against Pierre Ramus' charge that the former had committed the fallacy in one of his arguments in *Pro Murena*

For indeed, if I were confessing that a bribe had been given, and if I were defending that it had been done legally, I would be acting improperly, even if another man had proposed the law: but since truly I defend that nothing has been committed against the law, how is it that my helping of the law hinders my defense?<sup>45</sup>

The form of the argument can be reproduced as follows

- (8) If I were  $F_1, F_2, \wedge F_3$ , I would be  $G$   
 (8') I am not  $F_1$   
 (8'')  $\therefore$  I am not  $G$

but Arnauld and Nicole's translation into French makes the major premise of the argument a conditional of the form

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<sup>45</sup>The authors quote the passage in Latin and translate it into French. The French translation is free and loose: "*Etenim si largitionem factam esse confiterer, idque recte factum esse deffenderem, facerem improbe, etiam si alius legem tulisset; cum verò nihil commissum contra legem esse deffendam, quid est quod meam deffensionem latio legis impediat?*" "Ce seroit alors seulement qu'on me pourroit reprocher avec raison d'agir contre ma loi, si j'avouois que Murena eût acheté les suffrages, & que je ne laissasse pas de justifier son action: Mais je prétends qu'il n'a point acheté les suffrages; Et par consequent je ne fais rien contre ma loi. (LAP, 219) The presence of imperfect subjunctives in both antecedent and consequent clauses of a conditional proposition clearly indicates that the proposition is a present counterfactual, which is, as far as I know, translated into English by the form "If I were  $F$ , I would be  $G$ ."

(9) Only if  $F_1, F_2, \wedge F_3, G$

which validly yields the conclusion. The particle 'only' does not occur in the Latin text, but Arnauld and Nicole argue that "it contains in the sense the particle of exclusivity." (*"il enferme dans le sens une particule exclusive, LAP, 219*) And this particle is interpreted intensionally. Thus, (8) and (9) are equivalent or both (8) and (9) are equivalences.

There are cases, however, when propositions of the forms of (8) and (9) cannot be interpreted as equivalences: it happens when the antecedent of the counterfactual is only a necessary condition of the consequent. For example

(10) If I denied God's existence, I would be evil  
But, although I curse, I do not deny God's existence  
 $\therefore$  I am not evil.<sup>46</sup>

is not a valid argument because other things besides atheism make a man evil. This fact can be known only through clear and distinct ideas. Thus, the logical form of an exclusive proposition is not determined by the particle, but by the clarity and distinctness of the ideas contained in the proposition, and by our knowledge of the terms conferred upon us by the criteria of clarity and distinctness.

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<sup>46</sup>"*Si je niais qu'il y eût un Dieu, je serois un méchant : Mais quoique je blasphème, je ne nie pas qu'il y ait un Dieu: Donc je ne suis pas méchant.*" (LAP, 219)

The authors' explication of exceptive propositions add support to their strange interpretation of exclusive propositions. An exceptive proposition has the form

All except A are B,

which is generally translated into the exclusive proposition

All and only non-A are B,

and *LAP* recognizes the equivalence by arguing that an exceptive proposition can be denied in more than one way.

The example offered is the following

He doesn't think anything right unless he does it himself<sup>47</sup>

which, according to the above analysis has the following logical form

(11) All things he does are right **and**

All things he doesn't do are wrong

or

All and only the things he does are right.

But now, Arnauld and Nicole tell their reader that this very exceptive proposition is equivalent to the following exclusive proposition

The only right things are the things he does <sup>48</sup>

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<sup>47</sup>"*Imperitus nisi quod ipse facit, nil rectum putat.*" (*LAP*, 141)

<sup>48</sup>"*Hoc tantum rectum quod facit ipse putat.*" (*LAP*, 141)

whose logical form is

All right things are things he does

which is only the second conjunct of the logical form of (11)<sup>49</sup> unless they want us to interpret the exclusive proposition as an equivalence. Here again, the form alone (the logical particle), cannot determine the precise logical form of the proposition; the logician must rely on the ideas, and on the clarity of the perception of the ideas that are contained in the proposition.

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<sup>49</sup>'All right things are things he does' is the contrapositive of 'All things he doesn't do are wrong.'

## CHAPTER FIVE

### RETICENT IDEAS

Let a reticent idea be a confused Cartesian idea that does not wear its objective reality on its sleeve, but that is not materially false. Examples of such ideas are those signified by proper names, definite descriptions, demonstratives and logical connectives. I call them reticent because, for Arnauld and Nicole, all, except connectives, confusedly designate individual things (people, places, hosts and mental operations), and their senses (meanings), which they need to have, cannot be likened to *compréhension*; their senses have nothing to do with their essence. However, they need to have a sense because they occur in arguments, the soundness of which often is decided on the basis of *compréhension* rather than extension. Logical connectives are reticent for different reasons: on the one hand, and very much in keeping with the scholastic *syncategoramata*, their senses are often parasitic on the terms they modify; on the other hand, the Port-Royal authors want them to have a "proper" signification. Arnauld and

Nicole do not zero in the senses of proper names, demonstratives and logical connectives as if it were an issue in philosophy of language and logic, but rather, they address the issue in an effort to resolve a religious controversy. However, their explanation is more than *ad hoc* because it is consistent with their general principle of containment.

### 1. Proper Names

For Arnauld and Nicole, ideas are either singular ("*singulieres ou individuelles*," LAP, 58) or universal ("*universelles, communes, generales*." *Ibid.*). Singular ideas represent individual things, and are expressed by proper names ("*noms propres*," *ibid.*), for instance, 'Socrates,' 'Rome,' and 'Bucephalus' (LAP's examples).<sup>1</sup> Universal ideas represent many individual things (*plusieurs individus*, *ibid.*), and furthermore possess *compréhension* and *étendue*; singular ideas, on the other hand, do not display similar qualities. Thus, singular ideas, in contrast to universal ideas, even including general ideas signifying *species infimæ*, appear to be nothing but extension, and

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<sup>1</sup>The GGR notes that some proper names may signify several individual ideas, such as the name *Louis*. Arnauld and Lancelot argue that a proper name applies to several individuals "by accident" (*par accident*), and that either the context or additional determinant names restore the referential function of the proper name. (GGR, 28)

appear to signify nothing other than an individual idea. This reading of *Port-Royal* makes its two authors adherents to a view that resembles a doctrine of direct reference. However, closer examination dispels this appearance.

a. The argument for senses of proper names

The last chapter made clear that some universal propositions, called "moral universalities", like 'All Cretans are liars' and 'All French eat brains', have for a subject a universalized general name that Arnauld and Nicole wanted to be a singular name (195). If they are right, then we have a case where a singular name has *compréhension*. But this hardly is conclusive; this is a case where a general term usurps the rôle of a singular name; what we want is a case where a singular name usurps the rôle of a universal term, and where, as such, it requires a sense.

Within the *Port-Royal* project, a difficulty surfaces when proper names occur in arguments (or when singular ideas are present in reasonings). For example, the following argument:

Socrates is Greek  
Socrates is a philosopher

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∴ Someone is a Greek philosopher

although provable in modern quantification theory ('Gs, Ps  $\vdash$   $(\exists x)(Gx \wedge Px)$ ') is provable by the traditional rules of the syllogism only if the middle term 'Socrates' is distributed at least once.<sup>2</sup> The difficulty is eliminated when the authors explicitly acknowledge and legitimize the universalization of singular propositions. They justify the maneuver by arguing that a singular name occurring as the subject of a proposition brings along its entire extension, exactly like a universal term preceded by a universal quantifier:

Individual terms, distinctly expressed are always taken in their entire extension, being determined as much as they can be. (*LAP*, 65)

But although this singular proposition [*Louis XIII captured La Rochelle*] is different from the universal because its subject is not common, it must nonetheless be more closely related to a universal than to a particular, because its subject, for the very reason of being singular is necessarily taken in its entire extension, which is what constitutes the essence of a universal proposition, and what distinguishes it from the particular. For it matters little that the extension of the subject is small or large to

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<sup>2</sup>It should be noted that if 'Socrates' is taken universally twice the argument, though valid by the traditional rules of the syllogism, commits the existential fallacy and is not provable in quantification theory. Of course, the argument with two universal premises (*Darapti* form), converts into the *Darii* form, by following the standard rules of conversion. *Darapti* is converted back to the first figure by (1) choosing the mood of the first figure that begins with the letter 'D' (i.e., *Darii*), and by (2) converting the second A proposition *per accidens*, as indicated by the middle position of the letter 'p'. *Darii* is provable in modern quantification theory.

confer universality to a proposition; what matters is that whatever the extension is, it is taken in its entirety. And that is why singular propositions stand for universal ones in reasonings. (LAP, 115)<sup>3</sup>

To say that a term is taken in its entire extension is tantamount to saying that it is distributed. Of course, a proposition gains the status of universality in virtue of its subject being distributed, not in virtue of containing universal terms. 'Socrates' remains a singular term, and one must be careful not to confuse a universal term with a universal proposition; the term 'Socrates' should not become a universal term as a result of occurring as the subject of a universal proposition. According to Arnauld and Nicole, a universal term is so called because it represents an idea of many (*plusieurs*) individual things; the term 'Socrates' can never be made to represent the idea of more than one individual, even if there are many individuals named

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<sup>3</sup>"Car les termes individuels distinctement exprimés se prennent toujours dans toute leur étendue, étant déterminés tout ce qu'ils le peuvent être." (LAP, 65) "Mais quoique cette proposition singulière ['Louis XIII. a pris La Rochelle'] soit différente de l'universelle en ce que son sujet n'est pas commun, elle s'y doit néanmoins plutôt rapporter qu'à la particulière; parce que son sujet, par cela même qu'il est singulier, est nécessairement pris dans toute son étendue, ce qui fait l'essence d'une proposition universelle, & qui la distingue de la particulière. Car il importe peu pour l'universalité d'une proposition que l'étendue de son sujet soit grande ou petite, pourvu que quelle quelle soit on la prenne toute entière. Et c'est pourquoi les propositions singulières tiennent lieu d'universelles dans l'argumentation." (LAP, 115)

Socrates (see footnote 1). This is how a name and a noun differ; a list of things named Socrates is a different matter than an extension of things denoted by the term 'man.' Something belongs to the extension of the term 'man' as a result of possessing certain properties; something belongs to the list of things named Socrates as a result of an arbitrary decision. For example, the individual Socrates was not named Socrates as a result of being the husband of Xanthippe and the teacher of Plato.

Thus, by making a singular proposition universal, the subject term is fully distributed at least once, and the argument is provable by the traditional rules. In this case, a proper name is not required to do more than signify an individual. However, when it comes to the evaluation of the soundness of an argument containing proper names by a general principle of containment rather than by the traditional rules, more is required from a proper name than simply signifying an individual. For Arnauld and Nicole, proper names need a meaning besides a denotation, not because, as in the case of Frege, identity statements like 'Davy is Arnauld' would lose cognitive value, but because the soundness of arguments containing a proper name is evaluated by means of the sense of that proper name.<sup>4</sup> A *Darii* argument, as the next chapter explains, is evaluated

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<sup>4</sup>'Davy' was one of the many aliases Arnauld used while he was in hiding either in Paris or Holland.

from the point of view of *compréhension*. For example, in the argument

(All) Socrates is Greek  
 (Some) Socrates is a Philosopher

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∴ Some Philosopher is Greek

the attribute of being-Greek is part of (is contained in) the "*compréhension*" of the Socrates who is said to be a philosopher in the minor premise; and the major premise, interpreted from the standpoint of *compréhension*, precisely and explicitly says it: Socrates is Greek. This may sound rather unorthodox, but it is what happens when content holds sway over form. Besides, current orthodoxy is bound to the ways of modern quantification theory, ways that were far from the concepts of the *Port-Royal* logicians. What is important is that the universalization of a singular proposition and the general principle intended to replace the traditional rules demand that a proper name have sense; but what is the sense of a proper name? The next section shows that it is fairly evident that it cannot be its *compréhension*.

#### **b. Senses of proper names**

The text of *LAP* is not explicit on the senses of proper

names. However there is some indication that the sense of a proper name cannot be equated with its *compréhension*, and other less explicit considerations lend support to the view. First, Arnauld and Nicole explain that proper names are confused ideas. In the proposition: "Augustus found Rome built of bricks and left Rome built of marble", the proper names *Rome* truly signify two distinct cities. And what is true of Rome is true of all ideas of individuals who undergo uncessant changes; their signification depends, in great part, on the circumstances surrounding the assertion. Ideas are confused because no complete or precise knowledge of them is attainable. Therefore, no complete knowledge of individuals (no *compréhension*) is possible.<sup>5</sup>

Secondly, propositions having a proper name as subject term are "explicative" because the subject is fully distributed, not because the predicate explains out the *compréhension*. The *LAP* authors suggest that complex terms (the joining of two ideas as in the expression 'a prudent man') can be turned into incidental propositions by the addition of a relative pronoun, and that these incidental

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<sup>5</sup>Pariante, (*op. cit.*) suggests that Arnauld shared Leibniz' view of the sense of proper names. Leibniz had argued in the *Discourse on Metaphysics* (Art. XIII) that every predicate of an individual substance is contained virtually (*in-esse*) in the individual. Thus, every proposition having an individual substance as a subject is analytic. Only God, however, possessed knowledge of individual substances. Arnauld, in his correspondence with Leibniz was more concerned about the freedom of God than with the semantic properties of terms.

propositions are of two kinds: they are either "explications" (*explications*) or "determinations" (*déterminations*). It is an explication when the proposition

does nothing other than develop either that which is enclosed in the *compréhension* of the idea of the first term, or at least what befits it as one of its accidents, provided it befits it generally and in its entire *étendue*.<sup>6</sup>

There are then two kinds of explications: one vents out the *compréhension* of a universal idea, as in the expression 'man, who is mortal'; and the other attributes a property that befits the subject in its entire extension, as in the expression 'Louis XIV, who is king of France.' The latter kind is introduced exclusively for proper names, because "individual terms that are distinctly expressed always are taken in their entire extension, being determined all they can be."<sup>7</sup> Moreover, the authors argue that in clauses where the relative pronoun is "explicative", the expression can be turned into a true affirmative proposition:

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<sup>6</sup>"...elle ne fait que développer ou ce qui étoit enfermé dans la compréhension de l'idée du premier terme, ou du moins ce qui lui convient comme une de ses accidents, pourvû qu'il lui convienne généralement & dans toute son étendue." (LAP, 65)

<sup>7</sup>"les termes individuels distinctement exprimés se prennent toujours dans toute leur étendue, étant déterminés tout ce qu'ils le peuvent être." (LAP, 65)

But when the relative pronoun *who* is explicative, the attribute of the relative clause is affirmed of the subject antecedent to the *who*, [...] in such a manner that the very subject can substitute the *who*, as can be seen in the first example: *Men who were created to know and love God*. For, we can say: *Men were created to know and love God*.<sup>8</sup>

This remark is crucial to the analysis of proper names. The difference between a universal term and an individual term is that the former can have its extension restricted, whereas the latter cannot. The consequence of this feature is that all relative clauses that have a proper name as a subject can be rephrased in affirmations. The difference between

(1) Man, who is mortal, is  $\Phi$

and

(2) Man, who is greedy, is  $\Phi$

is that I can rephrase (1) as 'Man is mortal and  $\Phi$ ', but I cannot rephrase (2) as 'Man is greedy and  $\Phi$ ' because the term 'greedy' has the function to narrow down the extension

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<sup>8</sup>Or quand le 'qui' est explicatif, l'attribut de la proposition incidente est affirmé du sujet auquel le 'qui' se rapporte, [...] de sorte qu'on peut substituer le sujet même au 'qui', comme on peut voir dans le premier exemple: "Les hommes qui ont été créés pour connoître & pour aimer Dieu." Car on peut dire: "Les hommes ont été créés pour connoître & pour aimer Dieu". (LAP, 122)

of the term 'man'.<sup>9</sup> Whereas there is no such difference between

(3) Louis XIV, who is king of France, is  $\Phi$

and

(4) Louis XIV, who is smug, is  $\Phi$ ,

since both can be turned into affirmations. It then turns out that all singular propositions, even the most banal one like 'Louis XIV is smug', are explications. They share the explicative property with what we would today call analytic statements like 'All men are mortal,' i.e., statements that vent out the *compréhension* of the subject term, although they do not share the property of being analytically true. The predicates are true (or false) of the whole subject, of the subject in its generality. The function these predicates perform is that of giving a sense to the subject. But, in view of the fact that (1) is an analytic truth and (3) and (4) are not, we still want to say that there is a difference between universal propositions that have a universal term as subject, and universal propositions that have a singular term as subject. This difference prevents the complete likening of *compréhension* to the sense of a

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<sup>9</sup>A careful interpretation of predicate calculus would show the difference by translating (2) into ' $(\forall x)[(Mx \wedge Gx) \supset \Phi x]$ ' and (1) into ' $(\forall x)[M_1x \supset (M_2x \wedge \Phi x)]$ '.

proper name. So, although *compréhension* of a universal term, and sense of a proper name perform a similar function, a distinction applies to them. The origin of this distinction can be traced to the psychology of the Cartesian authors.

The nature of *compréhension* rigorously forbade tampering with parts of it, lest the idea itself be destroyed. If I take away three-sidedness from the idea of a triangle, I destroy the idea of a triangle. On the other hand, if I take away the property of being-the-husband-of-Xanthippe from Socrates, I have not destroyed the idea of the individual named Socrates. The authors clearly recognize this aspect of the sense of a proper name

Supposing, for example, that Philip was not the real father of Alexander, as Alexander himself led the world to believe, the expression 'son of Philip', which has as its meaning he who was sired by Philip, having been applied by error to Alexander, will signify a person who would not be the true son of Philip.<sup>10</sup>

What the authors fall short of saying, but I believe had in

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<sup>10</sup>"Supposant, par exemple, que Philippe n'ait pas été véritablement père d'Alexandre, comme Alexandre lui-même le vouloit faire croire, le mot 'fils de Philippe,' qui signifie en general celui qui a été engendré par Philippe, étant appliqué par erreur à Alexandre, signifiera une personne qui ne seroit pas véritablement le fils de Philippe." (LAP, 70) This argument contains traces of Kripke's modal argument against the sense of proper names.

mind, was that a cluster of descriptions could be used as the sense of proper names, but could not be used to fix reference. These descriptions, nevertheless, are clearly sufficient to evaluate arguments. Descriptions are not new concepts; Aristotle and all his successors had something to say about them.<sup>11</sup> Arnauld and Nicole mention them as "imperfect definitions". They introduce them in a chapter devoted to definitional propositions (*LAP*, II, XVI). Descriptions are definitions of things (*definitiones rerum*) that perform two functions: they give some knowledge of the thing by giving their properties (*propres accidens*), and they add the notion of uniqueness, without at the same time fixing a reference:

The less exact definition, which we call a description, is that which gives some knowledge of a thing by the accidents which are proper to it, and which determines it enough to give some idea of it that makes it separate from the others. It is in this manner that we describe herbs, fruits, animals, by their figure, by their size, by their color, and other such accidents.

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<sup>11</sup>The making of descriptions the senses of proper names certainly would elevate the logical status the former enjoyed at the time. Descriptions rarely were discussed in details by logicians (the concept goes back to Aristotle's *Topics*); Ramus, for example, wrote that they were used in science to describe plants and animals, and in geography and history to describe rivers, mountains and cities. Sanderson (whose logic text was used by Newton), who thought they could be used to describe people, also thought that some of them were like verbal definitions, implying that they had little logical value. The prevailing sentiment was that they were more suited for poets and rhetoricians than for geometers and logicians.

Poetical and rhetorical descriptions are of this nature.

There are also definitions or descriptions which are given by means of causes, matter, shape, end, etc., as when we define a clock as an iron machine composed of various wheels, the regulated movement of which is fit to mark time.<sup>12</sup>

What is original about *LAP* is that they classify descriptions among "definitions of things" rather than "definition of names", and that the descriptions themselves, because they contain universal terms, have *compréhension*. This feature confers a metaphysical status to descriptions that adds some credibility to a concept that had enjoyed, until then, little recognition. Descriptions are made to look like the ancestors of Russellian definite descriptions and Searlian cluster concepts. Although it may take more than a few descriptions to gain knowledge of an individual, a well-chosen cluster of them may very well constitute the sense or meaning of the individual; but, although it is tempting to use the cluster to fix reference, it is not in

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<sup>12</sup>"La définition moins exacte qu'on appelle description, est celle qui donne quelque connaissance d'une chose par les accidens qui lui sont propres, & qui la déterminent assez pour en donner quelque idée qui la discerne des autres.

C'est en cette maniere qu'on décrit les herbes, les fruits, les animaux, par leur figure, par leur grandeur, par leur couleur, & autres semblables accidens. C'est de cette nature que sont les descriptions des Poètes & des Orateurs.

Il y aussi des définitions ou descriptions qui se font par les causes, par la matiere, par la forme, par la fin, &tc. comme si on définit une horloge, une machine de fer composée de diverses roues, dont le mouvement réglé est propre à marquer les heures." (*LAP*, 165)

the nature of a description to do so. Descriptions are intimately related to the senses of the universal terms contained in the description, and to the notion of uniqueness conveyed by their role as explicative modifiers of proper names. They should be used, as the next section makes clear, as referent fixers. These characteristics make them attractive candidates for senses of proper names. Unfortunately, Arnauld and Nicole make no explicit mention of them in this role, but nothing they say about descriptions rule them out as senses of proper names.

I think that Arnauld and Nicole are essentially correct in wanting proper names to have senses or meanings, and in wanting to distinguish *compréhension* from descriptions. *Port-Royal's* argument, which shows that proper names need senses so that certain reasonings can be evaluated, is as compelling as Frege's argument, which shows that proper names need senses so that identity statements between them can be informative. But it is clear from the remarks above that *Port-Royal's* senses or meanings are not to be equated with the senses or meanings of universal terms. A chick-pea (*cicer*) is a chick-pea in virtue of certain properties, but Cicero (chick-pea) is not Cicero because he bears some relation (cultivates?) to chick-peas; nor is the sense of a proper name equatable with the term's etymology, since not every city named Dartmouth lays at the mouth of the Dart

river.<sup>13</sup> *Port-Royal* introduced universal terms to compensate for the finitude of the human intellect and to avoid redundancy (I suppose that a limitless intellect would have a name and a list of properties for each object of the universe). Universal terms were imposed to signify an individual object's attributes; attributes that could not be removed without conceptually destroying the individual (they were the attributes that could not be peeled off without destroying the ideas). It is no wonder, then, that knowledge of universals is viewed by *Port-Royal* as a more reliable model of knowledge. No knowledge of individuals can match the certainty of knowledge of universals; therefore, the attributes that make up the sense of ideas of proper names cannot possess the character of the attributes that make up the sense of universal terms. Universal terms mean rather than name these attributes (attributes are identical to meanings: "man=rational animal") because the attributes themselves are universals, and because other things that possess these attributes are also signified by the same universal term. These attributes determine what those other things are. On the other hand, proper names do not mean, but name an individual (Socrates is not identical to his meaning: "Socrates≠husband of Xanthippe") because no

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<sup>13</sup>Arnauld and Nicole point out that although any word can be introduced to signify an idea, some respect must be given to common use (*usage ordinaire d'une langue*) and to etymology in order to avoid confusion. (*LAP*, 86-93)

one else can be Socrates but someone else can be the husband of Xanthippe. The attribute of being-the-husband-of-Xanthippe may refer to someone other than Socrates. *Compréhension* and *étendue* perform a function similar to sense and reference, but this seeming resemblance is misleading and conceals a fundamental difference between general and singular ideas. The *compréhension* of a general idea determines its *étendue*, but the sense (definite description) of the idea signified by a proper name does not fix its reference. Incidentally, all Arnauld and Nicole require of senses of proper names is that they function in inferential contexts, not that they be used to fix reference.

## 2. Definite Descriptions

In a seminal article published nearly thirty years ago, "Reference and Definite Descriptions,"<sup>14</sup> the direct referentist Keith Donnellan argued that definite descriptions cannot be the senses of proper names because some descriptions, which are used to refer to individual objects, continue to refer accurately even when the description does not fit the individual. He bases his argument on a distinction between two uses of definite

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<sup>14</sup>Reprinted in *Naming, Necessity, and Natural Kinds*, Stephen Schwartz, Ed., Cornell U. Press, 1977, pp.42-65.

descriptions, *viz.* the attributive and the referential: a speaker uses a definite description attributively when he "states something about whoever or whatever is the so-and-so." (46); he uses it referentially "to enable his audience to pick out whom or what he is talking about and states something about that person or thing." (*ibid.*) Ironically, Dragan Stoianovici, in "Definite Descriptions in Port-Royal Logic", successfully argues that Arnauld and Nicole make use of distinction similar to Donnellan's.<sup>15</sup> In this section, I explain *LAP*'s use of the distinction, and argue, against Stoianovici, that *compréhension* and *étendue* can be made to buttress the distinction if, as Section I of this chapter tried to show, a definite description is understood as the sense of a proper name, and not, as Stoianovici suggests, a singular name.

Section 1 (p. 226) briefly introduced *LAP*'s doctrine of complex terms; the joining of two or more compatible ideas yields a new idea (*idée totale*); as a result, certain attributes, which did not belong to the simple ideas making up the complex terms, can be predicated of the new idea. In addition, the operation of joining ideas either narrows the *étendue* of one term, as in the complex term 'transparent body' where the adjective 'transparent' restricts the *étendue* of the term 'body', or it does not as in the case of

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<sup>15</sup>In *Revue Roumaine des Sciences Sociales - Philosophie et Logique*, 20, 2, pp. 145-154, Bucarest, 1976.

the complex term 'Alexander, son of Philip'. Furthermore, complex terms can be turned into relative clauses; depending whether the *étendue* is restricted or not, the clause is either "determinative" or "explicative." A determinative clause can restrict the *étendue* down to a single individual when it contains certain indexicals (*conditions individuelles*), as when I say 'today's pope' (*le Pape qui est aujourd'hui*). An explicative clause can, in turn, be rephrased as an indicative proposition. For example, the relative clause 'Alexander, who is the son of Philip' can be rephrased as 'Alexander is the son of Philip.' This feature justified making descriptive predicates of proper names their senses.

Definite descriptions are complex terms the *étendue* of which has been restricted to exactly one individual.<sup>16</sup> What is significant, contrary to Stoianovici's view, is that a definite description derives its *raison d'être* from the concept of *étendue* and, *a fortiori*, from *compréhension* (the two are inseparable). The complex term 'the prince of philosophers' (*le prince des philosophes*) contains two general terms, one of which, 'the prince', restricts the *étendue* of the other, 'philosophers', to a single individual. The "general idea" or "total idea" (*idée*

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<sup>16</sup>Whether the individual exists or not is, at this point, irrelevant; the complex term 'the golden mountain' has in its *étendue* what the authors call a "being of reason" (*être de raison*, LAP, 49).

*generale*; LAP, 69 or *idée totale*; LAP, 65) of a complex term is its connotation (it is a "connotative term", 68) or its "form" or "mode" (*forme ou mode*, 69). A connotative term, by its nature, gives a distinct sense; it does not designate a distinct referent (LAP). Somehow, Stoianovici was led to believe that complex ideas, because their *compréhension* contained the attribute of uniqueness, i.e., designated exactly one individual, became singular terms and, as such, ignored the distinction between *compréhension* and *étendue*: "So if the concepts of comprehension and extension (dealt with in the sixth chapter) have been called for to aid a better understanding of the two kinds of term-composition (in the eighth chapter), their application to singular terms may well have seemed to Arnauld pointless and artificial." 152). But complex terms that are definite descriptions are not singular terms; they only contain in their *compréhension* the attribute of applying to one single individual. This attribute takes the place of the Russellian uniqueness component of the logical analysis of definite descriptions, and it is this characteristic that permits the likening of LAP's doctrine to Donnellan's distinction.

A definite description is expressly complex (*complexe dans l'expression*); it wears its composition on its sleeve. It narrows down the *étendue* of a general idea to signify a single individual, without referring to any individual. Ideally, and in isolation, this is all a definite

description signifies. Ideally and in isolation, then, a definite description is intended to be used "attributively," following Donnellan's distinction.

However, definite descriptions, because they are kinds of complex terms, are made to behave like ideas of "modified thing" (*choses modifiées*, LAP, 47); "For, as was said in Chapter 2, these connotative terms directly designate a subject, albeit more confusedly; and indirectly a form or mode, albeit more distinctly."<sup>17</sup> In other words, because they behave like connotative terms, they are (mis)used "referentially." This referential use makes them what Arnauld and Nicole call "complex in the sense" (*complexe dans les sens*, 66) in addition to being complex in the expression; they become *équivoques par erreur*, equivocal because of human intervention. Thus, the complex term 'prince of philosophers', when used attributively (*complexe dans l'expression*) does not refer to any individual in particular, but when used referentially (*complexe dans le sens*), it may end up referring to Aristotle. It appears, then, that the explanation that Arnauld and Nicole give for

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<sup>17</sup>"Car comme il a été dit dans le chapitre 2. ces termes connotatifs marquent directement un sujet, quoique plus confusément; & indirectement une forme ou un mode, quoique plus distinctement." LAP, 67 Stoianovici argues that LAP's decision to make complex terms adjectival rather than substantival is arbitrary (153). However, making them substantival would not solve the problem because they still conserve their universal character and substances are not individuals. Here again, he wants to equate definite descriptions with singular terms.

the seeming irresistible function of referring possessed by definite descriptions is, again, essentially psychological. It is in the nature of a complex idea to designate confusedly. It seems obvious, then, that if the designation is confused there can be no precise reference fixing.

Descriptions that are used referentially may refer to the wrong individual not only because of the confused nature of the mental perception, but also because of "universal equivocity" (*universalité équivoque* or *équivoque d'erreur*). Definite descriptions, like proper names (see footnote 1), can designate many individuals although it is in their meaning to designate only one individual. The name 'Aristotle' and the expression 'prince of philosophers' although intended to pick single individuals, because of their repeated uses can designate the wrong individual. The source of the problem is that, often, the person uttering these descriptions has in mind a specific individual, but the description alone is not sufficient to signify that individual. The speaker can be accused of misusing language.<sup>18</sup> The authors are quick to point out that equivocity generally occurs when the terms of the

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<sup>18</sup>Arnauld and Nicole mention the misuse of language in the example: "The *Gazette de Bruxelles* of 1/14/1662, relating to the event that took place in Paris, is false" (*LAP*, 124); the description (the event that took place in Paris) must refer to a specific event, and that event is known to the speaker, but the sense of the description is not enough for the hearer to know it.

descriptions include qualities that are difficult to ascertain.<sup>19</sup> In other words, they are metaphorical descriptions (or deceptive, as in Donnellan's example of the man with a martini) rather than sense ascriptive, and metaphors are unlikely to find hospitality in arguments where senses of proper names are needed. To say of someone that he is the student of Plato and the teacher of Alexander is far more informative and ascertainable than to say that he is the prince of philosophers. So, the fact that the referential use of definite descriptions can be unreliable should not eliminate "serious" definite descriptions from being considered senses of proper names, simply because the flippant ones are easy to spot, and because inferential contexts do not require reference fixing.

The unreliability of the referential function of definite descriptions is further confirmed by propositions where multiple descriptions occur as subjects. In these cases, the speaker and the listener, although tempted to step out of the "ideal" world of definite descriptions, that is to say definite descriptions that are "complex in the expression," must remain in the realm of senses (meanings), and avoid picking out a single individual. This policy, although consistent with LAP's analysis of particular

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<sup>19</sup>"*Les termes complexes qui sont équivoques par erreur, sont principalement ceux qui enferment des qualités dont les sens ne jugent point, mais seulement l'esprit, sur lesquelles il est facile que les hommes aient divers sentiments.*" LAP, 67.

propositions, brings about a result that is quite different from Russell's logical anatomy of definite descriptions.

Propositions are either complex in the form (*dans la forme*) or in the content (*dans la matière*, LAP, 121). Formal complexion refers to the quality (affirmation or negation) of proposition; material complexion belongs to the senses of propositions. Propositions become materially complex when they embed one or more subordinate clauses (*propositions incidentes*). Many subordinate clauses take the form of relative clauses, some of which, as we saw earlier, are explicative and others determinative. For example, in the proposition

The doctrine, which places the highest good in the voluptuousness of the body, and which Epicurus taught, is unworthy of a philosopher.<sup>20</sup>

the main subject consisting of the general term, 'the doctrine', has its *étendue* restricted to a doctrine that places the highest good in body pleasures;<sup>21</sup> this determination constitutes the first relative clause and

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<sup>20</sup>"*La doctrine qui met le souverain bien dans la volupté du corps, laquelle a été enseignée par Epicure, est indigne d'un philosophe.*" (LAP, 122)

<sup>21</sup>Obviously, neither Arnauld nor Nicole had taken much time reading the ethical writings of the Epicureans. Epicurean materialism, together with its endorsement by their archrival Gassendi, was sufficient fodder to justify the wholesale rejection of their philosophy.

itself becomes the subject of the second relative clause, namely, 'which Epicurus taught'. Contrary to the first relative clause, which is a determination, the second clause is an explication because it does not affect the *étendue* of the first one. The attribute of being-taught-by-Epicurus befits the subject "generally and in its entire *étendue*." But, what is the subject? It is a complex term, which, according to the authors, "directly designate a subject, albeit more confusedly; and indirectly designate a form or a mode, albeit more distinctly."<sup>22</sup> The confusion in the designation refers to the quality of the mental perception. Confused mental perceptions take the blame for universal equivocity (*équivoque par erreur*), meaning that there is a strong likelihood that a wrong subject is picked. The best way to avoid equivocity is to keep the complex term in its sense (*une forme ou un mode*). How would this work? The lack of concreteness of the subject (doctrine) guarantees the difficulty of pinning down one specific thing. I think that the proposition would have to look like an uninstantiable existential proposition

(2) Some doctrine that places the highest good in the voluptuousness of the body is taught by Epicurus, and is unworthy of a philosopher.

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<sup>22</sup>"...marquent directement un sujet, quoique plus confusément: & indirectement une forme ou un mode, quoique plus distinctement." (LAP, 67)

$$(2')(\exists x)[\{((Dx \wedge Gx) \wedge (\forall y)(Gy \supset x=y)) \wedge Ex\} \wedge Ux]$$

where no specific individual object could be said to be D and G. Russell, despite arguing that (2') is false because there is no such doctrine, nevertheless recognizes (2') as the meaning of (2). Arnauld and Nicole indicate that (2) does not need a referent to be meaningful; it is enough that the subject be understood as fully determined. Anyone who understands the subject does not need to know the precise doctrine in question to know that it is unworthy of a philosopher. For any doctrine so described is unworthy of any individual that fits the description of a philosopher. In the authors' words

The second relative clause is, *which Epicurus taught*, and the antecedent of the relative pronoun is the entire complex term, *the doctrine that places the highest good in the voluptuousness of the body*, that designates a singular and individual doctrine, capable of various accidents, as of being-held-by-various-persons, although it is determined in itself always to be understood in the same manner, at least with regard to the precise point, according to which it is understood.<sup>23</sup>

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<sup>23</sup>"La seconde proposition incidente est, 'qui a été enseignée par Epicure', & le sujet auquel ce 'qui' se rapporte, est tout le terme complexe, 'la doctrine qui met le souverain bien dans la volupté du corps', qui marque une doctrine singulière & individuelle, capable de divers accidents, comme d'être soutenue par diverses personnes; quoiqu'elle soit déterminée en elle-même à être toujours prise de la même sorte, au-moins dans ce point précis, selon lequel on l'entend." (LAP, 123)

The complex term simply designates (*marque*) a singular and individual doctrine; this is more a sense than a denotation, and consistent with *Port-Royal's* analysis of particular sentences in arguments. It is no wonder that Arnauld spent a great part of his career in an idle defense of Jansen's *Augustinus* against the church charges that it contained the sense of heretical propositions. The definite description 'the sense of heretical propositions' is all sense and no designation. Arnauld, in order to defend the defunct Jansen, was required to produce as evidence a distinct referent, which the definite description alone (without Jansen) could not provide. The controversy could not leave the level of sense and could not, as a result, hope to help identify any single proposition as the bearer of *this* sense. Ironically, Arnauld and Nicole list, among examples of definite descriptions that are attributive in the Donnellan sense (*équivoques par erreur*), the expression 'the sense of an author' (*le sens d'un auteur*, 68), but do not link the case against Jansen with their example, as they are wont to do when a religious controversy can be defended on the basis of logical analysis.<sup>24</sup>

Further differences with Russell's view of definite descriptions emerge when a truth-value is assigned to

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<sup>24</sup>For example the case of the controversy over the expression "true religion" and the case of the eucharistic statement 'This is my body'.

propositions having complex (but not distinct) subjects.

Consider the following propositions

(3) Alexander, who is the son of Philip, conquered the Persians.

(4) Alexander, who is the son of Philip, is the grandson of Amintas.<sup>25</sup>

In (3), if the relative clause is false the proposition nevertheless remains true because "the affirmation of the principal proposition only concerns Alexander, and whatever was joined to it incidentally, albeit false, does not prevent that it still be true that Alexander conquered the Persians."<sup>26</sup> But, in (4), because the relative clause is related to the main clause, the falsity of the relative clause drags along the falsity of the main proposition.<sup>27</sup> If (3) and (4) are both analysed according to Russell, the distinction disappears and if any one of the conjunct is

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<sup>25</sup>"Alexandre qui a été fils de Philippe, a vaincu les Perses. [...] Alexandre fils de Philippe étoit petit-fils d'Amintas." (LAP, 125)

<sup>26</sup>"...l'affirmation de la proposition principale ne tombe que sur Alexandre, & ce qu'on y a joint incidemment, quoique faux, n'empêche point qu'il ne soit vrai qu'Alexandre a vaincu les Perses." (LAP, 125)

<sup>27</sup>"Que si néanmoins l'attribut de la proposition principale avoit rapport à la proposition incidente, comme si je disois, 'Alexandre fils de Philippe étoit petit-fils d'Amintas', ce seroit alors seulement que la fausseté de la proposition incidente rendroit fausse la proposition principale." (LAP, 125)

false the whole proposition is false. *Port-Royal* does not recognize the analysis; in both (3) and (4), only the term *Alexander* refers, and (4) implicitly contains the proposition (there is a "virtual affirmation" *affirmation virtuelle*, *LAP*, 125) that someone is the son of Philip if and only if he is the grandson of Amintas, because Amintas was the father of Philip. (4) can be turned into an argument: Alexander is the son of Philip; therefore he is the grandson of Amintas, or into a conditional statement: If Alexander is the son of Philip, he is the grandson of Amintas. According to *Port-Royal*, (4)'s logical form is not a Russelian conjunctive definite description, but an entailment. All this is, of course, quite consistent with a program that favors content over form.

But (3) and (4) are not particularly challenging because their subject is a singular name. We now need to ask what happens when the definite description occurs as the subject of a proposition? Although the attribute of being-the-grandson of Amintas hardly can be said to possess the attribute of having-conquered-the-Persians, in the proposition that the grandson of Amintas conquered the Persians, a specific referent is not required; the meaning of the subject is that of an individual having been sired by the son of Amintas. If a referent is added, it is done from untractable habit. The authors blame public opinion (*opinion commune*, *LAP*, 126) for assigning a referent to the

definite description, and adopting that referent as the individual subject. Public opinion is probable knowledge. For example,

(5) The prince of philosophers believed that nerves originated in the heart.<sup>28</sup>

cannot be falsified because, contrary to public opinion, Aristotle was not the prince of philosophers. It is important to note that an individual referent is needed to determine the truth-value of (5), and that the individual is confused because the definite descriptions cannot supply that referent. Definite descriptions do not fix reference because of the confusion of the mental perception. As a result, unless the description entails the predicate, the proposition is classified as probably true or false. It is because of public opinion and popular error that some definite descriptions, which are commonly associated with individuals, continue to refer despite their failure to accurately describe. Public opinion is what explains universal equivocity. Plenty of false descriptions continue to refer because of public opinion. Pope John XII was neither saint, nor chaste, nor pious; however, customs had it that popes were to be referred to by these attributes.

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<sup>28</sup>"*Le prince des philosophes' a crû que l'origine des nerfs étoit dans le coeur.*" (LAP , 126)

Therefore, these attributes could be used to (falsely) describe pope John XII.<sup>29</sup> False descriptions are temporary and expedient measures to speak; when they are spotted (and they easily are spotted) they cannot occur in inferential contexts.

In conclusion, because definite descriptions are not singular terms, they conserve the properties of *compréhension* and *étendue*. Moreover, definite descriptions are essentially attributive; they are used referentially and become universally equivocal by force of habit and because of public opinion. The essentially attributive character of definite descriptions make them likely candidates for senses of a proper name.

### 3. Demonstratives

At times, the mere visual contemplation of a betokened proposition is enough to determine its semantic values, such as its truth, meaning and reference. I am thinking of propositions like 'Grass is green,' 'William Jefferson

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<sup>29</sup>John XII was elected pope at the age of eighteen in 955; he was impeached in 963 by the council of Rome for refusing to submit to the emperor; he died in 964 in the arms of his mistress. Similarly, in modern parlance, the Holy Roman Empire was neither holy, nor Roman, and yet continued to refer to a political unit. But, for Arnauld and Nicole, in contrast to modern direct referentists, a description that falsely describes does not eliminate descriptions as possible senses of individuals, because their concern is limited to inferential contexts.

Clinton eats broccoli,' 'The man in whose arms Arnauld died was arrested in Brussels on May 30th. 1703 by order of the King of Spain.' And so it is with their types. At other times, additional information is required before similar values can be assigned. Typical examples are: 'I am here now,' 'I am that,' 'Today's pope is conservative,' 'This is not a pipe.' The types and written tokens of such propositions, though meaningful, cannot be assigned truth or reference, unless more is known about the context of assertion. What characterizes these propositions is the occurrence within them of pronouns, adjectives or adverbs (sometimes tenses), which, like definite descriptions, have confused reference, and which are potentially falsely equivocal (*équivoques par erreur*). A speaker could be heard saying 'Today's pope', an expression which appeared in *Port-Royal's* discussion of definite descriptions, thinking of some pope other than the current one. But, unlike definite descriptions, these particles possess the property of being relative to a speaker or context. Thus, whatever was said of definite descriptions equally could not be said of these parts of speech; although they are essentially attributive and can be used referentially out of common usage, some also are governed by certain individual conditions (*conditions individuelles*). Arnauld and Nicole, because of a theological agenda, targeted the demonstrative 'this'; their view, which is not without difficulties, likens the

demonstrative to a definite description.

The authors did not, at first, recognize demonstratives and other like particles as having the common property of being relative to a speaker or context, and as having relevance in a logical treatise. In the *GGR*, demonstratives figure with terms that belong to the same grammatical category, and, in the first four editions of *LAP*, the adverb 'today' joins the fray of determinative complex terms; it has the role of tightening the *étendue* of the term it modifies. It took the long controversy between Protestants and Catholics concerning the interpretation of Christ's statement 'This is my body' ('This is my blood'), and the subsequent pronouncements of the same statement by church officials officiating mass, to motivate the authors to reflect on the full meaning of demonstratives. The debate yielded a number of possible interpretations of demonstratives, many of which are part of today's debate. Unfortunately, the Port-Royalists stopped short of committing themselves to one interpretation. Demonstratives primarily have a meaning and a deictic function, and secondarily a referential use that is unreliable for reasons that are similar to the reasons given for the unreliability of the referential function of definite descriptions. For some reason, however, it is not common opinion but psychology that bears the brunt of the responsibility for faulty reference.

The theological controversy was centered around the eucharistic bread and wine. Following the decrees of the Council of Trent (1545-1563), the Catholics held that as a result of the performative aspect of Christ's (or the priest's) consecration, the body (or blood) of Christ was really present in the bread (or wine). The substances of bread and wine were converted into the body and blood of Christ despite the persistence of the qualities (extension and sensible qualities) of the bread and wine.<sup>30</sup> On the other hand, the Protestants protested that the body of Christ was either symbolically present, or copresent with the bread. The latter case represented a consubstantiation, which stood opposed to the Catholics' transsubstantiation.

The issue was debated both from a metaphysical and a semantical point of view. The metaphysical entanglement was the result of the effort, by some Cartesians, to defend Descartes' view of the unseparability of a substance from its mode, against the overwhelmingly damaging consequence that if the body of Christ were present in the bread, it only could be there without its extension. Furthermore, and on a somewhat lighter note, detractors asked how the blood of Christ seriously could be said to have the sensible

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<sup>30</sup>The Catholic world was not unified regarding the details of the metamorphosis. The Thomists argued that the wafer was converted into the body of Christ; the Scotists argued that the substance bread first was destroyed, and then replaced by the substance of the body of Christ.

qualities and the effects of wine. How, for instance, could the pungent violet bouquet, of which some Burgundian *vins de messe* boast, be predicated of the blood of Christ? Arnauld, who, in the *Fourth Objections*, cautioned Descartes that his philosophy flew in the face of the accepted dogma (*AT IX*, 169), later withdrew from the metaphysical aspect of the debate arguing that God could do the unconceivable,<sup>31</sup> and cleverly redefined it as a semantical issue.

A great part of the discussion of the semantical aspect, which occupies this section, appears in a three-volume tome, *La grande perpétuité*, whose authorship is sometimes attributed to Arnauld, and sometimes to Nicole,<sup>32</sup> and relevant parts of which are repeated in the fifth edition of *LAP*. In fact, most of what is added to the fifth edition of *LAP* is directly borrowed from *La grande perpétuité*. All five chapters of *LAP* that offer a semantical explanation to the problem of the eucharist were added to the 1683 edition and, with the exception of an *Avertissement* that warns the reader about these additions, and of a chapter on the verb, which is an inevitable continuation of the chapter on parts of speech that

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<sup>31</sup>See Arnauld's letter to du Vaucel, dated April 29 1683 (the year of *LAP*'s fifth edition), in *OC II*, 245: "the way in which Jesus Christ is in this Sacrament is incomprehensible."

<sup>32</sup>*La perpétuité de la foi de l'Eglise catholique touchant l'Eucharistie défendue contre les livres du sieur Claude, ministre de Charenton, Paris, 3 v., 1669-1774.*

addresses the question of demonstratives, no other chapters were added to the fifth edition.<sup>33</sup>

Two of these chapters relate the problem to a doctrine of signs, which is largely borrowed from Augustine's *De Doctrina Christina*.<sup>34</sup> A sign is defined, and an explanation of signs consists in their division; the account also includes criteria to distinguish a sign from a thing. A third chapter debates the question of improper connotation, a question that is reminiscent of false equivocity, and that is linked also to common usage. A fourth chapter gives a psychological explanation of the added improper connotation. The last chapter locates demonstratives in the taxonomy of parts of speech. The addition of some of the contents of the debate of *La grande perpétuité* to *LAP* is not specifically justified by the authors of *LAP*. I suspect that the debate became part of logic when it was evident that demonstratives needed to have confused reference, in

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<sup>33</sup>Book I: Chapter IV, "About Ideas of Things and Ideas of Signs"; Chapter XV, "About the Ideas which the Mind adds to those which are precisely Signified by Words"; Book II: Chapter I, "About Words and their Relation to Propositions"; Chapter II, "About the Verb"; Chapter XII, "About Confused Subjects which are equivalent to two Subjects"; Chapter XIV, "About Propositions where the Name of Things is given to the Signs".

<sup>34</sup>"*Signum est enim res, præter speciem quam ingerit sensibus, aliud aliquid ex se faciens in cogitationem venire.*" *De Doctrina Christiana*, Book II, I. Arnauld, characteristically takes liberty in quoting Augustine: "*Signum est quod quod præter speciem quam ingerit sensibus facit aliquid aliud in cogitationem venire.*" *Défense de M. Arnauld*, in *OC* 38, 587.

order to salvage the catholic interpretation of the eucharistic statement. It becomes obvious that the authors heavily lean on the confusion, and add some more, to explain the mystery of the eucharist. In the process, however, some relevant insights emerge about the nature of demonstratives. Arnauld and Nicole stumbled upon the logical relevance of demonstratives as a result of a theological debate, the elements of which had been enumerated carefully, and then placed in their proper discipline.<sup>35</sup>

a. Signs and the eucharist

Consider Magritte's realistic painting of a pipe containing the inscription: "*Ceci n'est pas une pipe*" (This is not a pipe). One way to accommodate this apparent contradiction to our logic is to take the word *pipe* as a sign of a pipe, but not to take the painting of the pipe as representative or as a sign of a pipe. Projecting further, yet mindful not to furrow fields foreign to mine, I would venture to speculate that Magritte's point is that art, unlike language, is not representative, is not a sign of real objects, but stands on its own as an object *sui*

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<sup>35</sup>This careful enumeration may constitute a prime example of Cartesian method.

*generis*.<sup>36</sup> Arnauld and Nicole have a very different view of realistic art. For them, a painting of Caesar is so much a sign (*signe naturel*) of Caesar that the painting itself, without losing its quality of sign, could be referred to by the name *Caesar*: "not that this sign is really the thing signified, but that it is it in signification and in figure. And so we shall say, without preparation and without fuss, of a portrait of Caesar that it is Caesar, and of a map of Italy, that it is Italy".<sup>37</sup> This view faithfully echoes Aristotle's "homonymous terms" of the *Categories* (1<sup>a</sup> 1). Realistic paintings are signs without problems because, according to Arnauld and Nicole, they are "in signification and in figure" the thing signified, that is, they are made to look like the things they signify. Not all signs, however, are that simplistic, and even the "simply natural," as confirmed by Magritte's example, are not as straightforward as they appear to be.

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<sup>36</sup>This analysis also applies to the case where the inscription *Ceci n'est pas une pipe* is the work of art (not representative), and the painting takes the role of sign. If both are unrepresentative, our logic is unscathed. Other Magritte's paintings such as *La Grande Captive* and *La Cascade*, where a painting of a painting replaces the exact part of the landscape it hides, may be intended to confuse the viewer as to what the painting is of. So much the better for Magritte, who, in my view, tries to discourage the viewer from associating paintings with objects.

<sup>37</sup>"...non que ce signe soit réellement cette chose, mais qu'il l'est en signification & en figure. Et ainsi l'on dira sans préparation et sans façon d'un portrait de Cesar, que c'est Cesar; & et d'une carte d'Italie, que c'est l'Italie." (LAP, 156)

The *Port-Royal* authors take the Augustinian division of signs into natural and institutional, and expand it to "certain and probable", and to signs "that are conjoined with or separated from the objects they are the signs of."<sup>38</sup> An example of a natural sign is a mirror image<sup>39</sup>, and an example of an institutional sign is language (words and letters). Words are signs of ideas.<sup>40</sup> An example of a certain sign is breathing, which signifies life; an example of a probable sign is paleness in woman, which may signify pregnancy. An example of a sign conjoined with the object it is a sign of is a facial expression; an example of a sign separated from the object is a Hebrew sacrifice as a sign of Christ crucified. Thus, language is an institutional and certain sign of ideas, which is separate from the ideas it is a sign of; a facial expression, like a smile, is a natural and probable sign of a happiness conjoined to the

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<sup>38</sup>My two sources for the Augustinian doctrine of signs are: *On Christian Doctrine*, Tr. by D.W. Robertson, Jr., Library of Liberal Arts, 1983, in particular Book II and Book III, chapter IX; *De Dialectica*, Tr. by Darrell Jackson, D. Reidel Publishing, 1975.

<sup>39</sup>In (*LAP*, 95), the authors list tone of voice, facial expression and gesture as natural signs: "...par le ton de la voix, par l'air du visage, par les gestes, & par les autres signes naturels qui attachent à nos paroles une infinité d'idées."

<sup>40</sup>Of course, ideas are not signs, ideas are the things they represent as those things customarily find themselves in the mind. This view led Steve Nadler, in *Arnauld and the Cartesian Philosophy of Ideas* (PUP, 1989) to argue that Arnauld was a direct realist.

person smiling; the eucharist is an institutional and certain sign that is conjoined with the thing it is a sign of. The third classification gives rise to four regulative maxims intended to ward off against precipitation in making inferences from signs to signified things. All four maxims are manifestly *ad hoc* and are intended to justify the interpretation of the eucharist as a thing (a piece of unleavened bread) and as a sign (of the body of Christ).<sup>41</sup> It is this account of the eucharist, fraught with *ad hoc*ity, that brought about the necessity to explain the function of the demonstrative 'this' in the statement 'This is my body'. The issue hovered around the principal function of the demonstrative in the eucharistic statement, given the nature of the thing being pointed at: is the function principally that of a pointer? is it that of a pronoun standing in for a noun? is it that of an autonomous idea with confused sense and reference? is it that of a determinative article? or

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<sup>41</sup>The four maxims can be summarized as follows: 1. Since no one should conclude from the presence of a sign to the presence or absence of the thing signified, one should never conclude from the presence of the wafer to the absence of the body of Christ. 2. Although nothing is a sign of itself, it is possible for something in a state to represent itself in another state. Thus, the eucharist in its bread state can represent itself in the state of the body of Christ. 3. It is possible for a sign to simultaneously hide and uncover the thing it is a sign of. Thus, the eucharist, "as a thing hides the body of Christ, and as a sign uncover it." 4. Since all ideas of sign give rise to two ideas, both ideas subsist even if the idea of the signifier changes its nature. Thus, the bread can lose its nature, and yet continues to occasion in us the way in which the body of Christ is the food of the soul.

does it have no principal functions, but equally performs all four? I believe that the last suggestion prevails.

Until the controversy with the Protestants, the demonstrative was another pronoun, that is, another part of speech, and as such it belonged to grammar rather than logic. After the controversy, parts of speech became part of logic, and the demonstrative pronoun donned a logical cloak. Its resemblance to ideas that have confused reference may explain the change of view. Demonstratives, like some proper names and definite descriptions, have a confused reference. I believe that, had it not been for this resemblance, the debate would not have gone beyond *La grande perpétuité*.

#### b. The Many Hats of Demonstratives

Demonstratives are pronouns; considerations of style explain their presence in language: "it is inopportune always to repeat the same nouns", "it often is useless and ungraceful to name oneself", and a speaker should have the option not to name his interlocutor;<sup>42</sup> "The use of pronouns is to stand in the place of nouns and to give a means to

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<sup>42</sup>"...il eût été importun de répéter toujours les mêmes noms [...] il était souvent inutile et de mauvaise grâce de se nommer soi-même, [...] Pour n'être pas aussi obligés de nommer celui à qui on parle." (GGR, 44)

avoid their repetition, which is boring."<sup>43</sup> Thus, the first function of a demonstrative is to stand for a noun; but the noun for which it stands is designated only confusedly: "All pronouns have this in common, [...] that they confusedly designate the noun they stand for."<sup>44</sup> Pronouns signify ideas as behind a veil (*voilées*); this is why it is correct to double up a pronoun with the noun it is a deputy of, as when I say: "You, Clodia!" The pronoun *you* only signifies the proper name *Clodia* in a manner that does not permit the fixing of its reference.

The demonstrative pronoun can act as a determinative article; it is one way to determine (reduce the extension of a general name to one) a general term without using an article:

*This, some, several, names of numbers, like two, three, etc., all, no, none, etc., determine as well as articles. This is all to clear to dwell on it.*<sup>45</sup>

So, all remarks that were made with regards to the

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<sup>43</sup>"*L'usage des Pronoms est de tenir la place des Noms, & de donner moyen d'en éviter la répétition qui est ennuyeuse.*" (LAP, 105)

<sup>44</sup>"*Tous les Pronoms ont cela de commun [...] qu'ils marquent confusément le Nom dont ils tiennent la place.*" (LAP, 105)

<sup>45</sup>"*'Ce', 'quelque', 'plusieurs', les noms de nombre, comme 'deux', 'trois', etc., 'tout', 'nul', 'aucun', etc., déterminent aussi bien que les articles. Cela est trop clair pour s'y arrêter.*" (GGR, 59)

quantifier 'some' apply to the demonstrative. Of these remarks, we here retain the confused nature of the determination.

Some pronouns, the demonstrative in particular, function as pointers: "they designate, as a pointer, the thing being spoken of".<sup>46</sup> In this function, the demonstrative pronoun acquires a sense, the sense of 'thing present'. So, the demonstrative, in its deictic function, takes on the status of an autonomous idea. This yields curious results: it suggests that a pronoun can stop being a pronoun, and can gain the status of nounhood by having a sense of its own, rather than a sense of the noun it stands for. But the idea that is precisely signified by the demonstrative is a confused idea; all demonstratives have a precise signification, a signification of their own (*propre signification*) that is confused: "*l'idée formée précisément par le pronom demeurant confuse, LAP, 148*). Thus, if I point to an individual saying: "This is Clodia!", the pronoun *this* only signifies whatever thing is present. And the very general idea, which is signified by the demonstrative, has its *étendue* restricted by the implicit relative clause, "who is Clodia." In this case, the pronoun has its extension reduced, rather than reducing the extension of the term it modifies, when it acts as a

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<sup>46</sup>"...il y en a qui marquent, comme au doigt, la chose dont on parle..." (LAP, 105)

determinative article. But it is not impossible to live with this view; some attributes, which reduce the extension of term they modify, can have their extension reduced by another attribute, e.g., a valid argument and a valid argument with true premises.

However, a not unfamiliar phenomenon happens. When the demonstrative points to a general term, as in the case of the eucharistic statement, the mind, according to Arnauld and Nicole, is impelled to supply a distinct idea.

If I point to a diamond and say 'This!', the demonstrative, in addition to exciting the idea of thing present, excites ideas of attributes that belong to the diamond. The idea of "thing present" is the "primary and principal" idea; the ideas of attributes are "added ideas" (*idées ajoutées*). The mind's psychology is blamed for this addition; the mind seems so uncomfortable in the presence of confused ideas that it takes it upon itself to supply additional ideas to "distinguish" the confusion.<sup>47</sup> When Christ pronounced the words "This is my body", the apostles "added" the idea of bread that was "only excited, and not precisely signified by the term." (*qui était seulement*

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<sup>47</sup>Pariante, in *L'analyse du langage à Port-Royal* (*op. cit.*, 165), links the signified ideas of demonstratives to Kaplan's "character" that is represented by a function from contexts to contents; and he links the added ideas to Kaplan's "content" of demonstrative. The content is represented by a function going from possible worlds to extensions. Pariante notes that LAP does not permit the passage from character to content.

*excitée, & non précisément signifiée par ce terme, LAP, 101*); the added idea is "excited by the circumstances". *Port-Royal's* choice of word, 'excited' (as opposed to the more neutral 'occasioned'), is not fortuitous. The action of the mind is not controlled entirely by reason.

When the manifold functions of the demonstratives are put together with the problematic bread, the resulting eucharistic statement pronounced by a priest is grist for every ideological mill. Arnauld and Nicole rely on the confused signification of proper names and other reference fixing devices, to unearth a deep structure to propositions in which such terms occur. They argue that the statement, "This is my body," is an abbreviation of the "perfectly clear proposition": "This, that is bread in this moment here, is my body in that other moment."<sup>48</sup> The same pronoun designates two different subjects, as the proper name 'Rome' in the proposition: "Augustus found Rome made out of bricks and left Rome made out of marble." Given that the bread, as a sign, both hides and is a sign of that which it hides (the way ashes hide a fire and are a sign of fire), it is not difficult to assign two subjects to the thing designated by 'this'. The demonstrative functions as a pointer/idea, which means a thing present, which thing has its extension reduced to a piece of bread/body of Christ. Unfortunately,

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<sup>48</sup>"*Ceci qui est pain dans ce moment ici, est mon corps dans cet autre moment.*" (*LAP, 148*)

this explanation casts more light on the bread than it does on the demonstrative. The unabbreviated version of the statement explains the occurrence of one demonstrative by bringing in two new ones, "this moment" and "that moment", and an indexical, "here". And the presence of the demonstrative "that" damages *LAP's* account of demonstratives. When I contrast "that moment" to "this moment" the former is not present, and yet the signification of a demonstrative is "thing present." It appears that the general idea signified by demonstratives is not always the same, or that demonstratives cannot be said to have a "proper signification."

I think that *Port-Royal's* account of demonstratives as ideas rests on a confusion between adjective and pronouns. The statement: "This is my body," has an occurrence of the pronoun form of the demonstrative; as a pronoun, the demonstrative stands for the word *body*. The Latin version of the statement makes it clear: in *Hoc est enim corpus*, the pronoun *hoc* stands for *corpus* (the neutral gender of the demonstrative agrees with that of the noun); but by giving *hoc* a sense, that is the status of a noun, Arnauld and Nicole are really changing the syntax of the sentence. They are conferring onto *hoc* the status of an adjective, arguing that it means *hoc negotium* (this matter), and that the demonstrative in the neutral gender always refers to a most general thing: "The neuter, on the other hand, always refers

to a general and confused noun [...] So, there is a double confusion in the neuter, namely that of the pronoun, the signification of which is always confused, and that of the word *negotium*, *chose*, which is also general and also confused."<sup>49</sup> In the statement, *Hoc est enim corpus*, however, the demonstrative is in the neutral because it refers to *corpus*, which is itself a neutral noun. What Christ is doing is calling a piece of bread his body; the only aspect of the statement that can be disputed is the precision of the pointing gesture. The expression *this body* is like the example earlier cited by Arnauld and Nicole, *this diamond*. The ideas that the mind was adding in this case, were ideas of attributes, such as hardness and brilliance.

so when one uses the word 'this' to show a diamond, the mind does not stop at conceiving it as a thing present, but adds the ideas of hard and brilliant body that has such and such a form.<sup>50</sup>

The idea of body cannot be "added" to the idea of thing

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<sup>49</sup> *Le Neutre au-contre se rapporte toujours à un nom general & confus [...] Ainsi il y a une double confusion dans le Neutre, sçavoir celle du Pronom, dont la signification est toujours confuse, & celle du mot 'negotium', 'chose', qui est encore aussi generale & aussi confuse.*" (LAP, 106)

<sup>50</sup> "ainsi quand l'on se sert du mot de ceci pour montrer un diamant, l'esprit ne se contente pas de le concevoir comme une chose présente, mais il y ajoute les idées de corps dur & éclatant qui a une telle forme." (LAP, 100)

present because it is the noun for which the pronoun stands, and as such it signifies, albeit confusedly, that noun. What the authors should argue is that because the signification of *corpus* is confused, and because of the added confusion of the bread of a sign, one is justified in believing that the thing pointed to is really the body of Christ. But Arnauld and Nicole are trying to make a logical point, here, not a point of faith. The point of faith was made in *La grande perpétuité*.

There are clear cases where the demonstrative pronoun signifies a thing in general. Suppose I wished to explain the rule of *modus ponens* by "If, if this then that, and this, then that" (Russell's example); in this case, the demonstrative pronouns stand for any thing in general, and I would not clearly demonstrate the rule because there is no guarantee that the first occurrence of 'this' points to the same object as the second one unless the demonstrative is pointing to itself. The context is not quite enough to establish this point. Russell's example is not very different from what the *LAP* authors would have us believed about the unabbreviated version of the eucharistic statement, namely that the statement has the same meaning as: "If, if this bread then that body, and this bread, then that body." Although Arnauld and Nicole's last explanation purports to clarify the eucharistic mystery, it adds no clarity to the notion of a demonstrative possessing the

sense of thing present.

### 3. Logical connectives

When the authors discuss the parts of speech, (*LAP*, Book II, chapters I and II), they conspicuously omit the Augustinian and scholastic distinction between categoramatic and syncategoramatic terms.<sup>51</sup> Their discussion of words only include nouns (and adjectival nouns), pronouns and verbs. A distinction between logical and non-logical vocabulary was made, however, in the 1660 edition of the *Grammaire*, where the authors, Arnauld and Lancelot devote a small section to what they call "Conjonctions et Interjections". They are presented as "the second kind of words which signify the form of our thoughts" (*GGR*, 102). Verbs are the first kind of terms that signify a form of thought, and their accounts, entirely borrowed from the *GGR*, occupies a prominent place in the fifth edition of *LAP*. Here is what the *GGR* has to say about logical particles:

The second kind of words that signify the form of our thoughts, and not properly the objects of our thoughts, are conjunctions like *et, non, vel, si, ergo, and, not, or, if, therefore*. For, if one pays careful attention, one will see that these particles signify nothing other than the very

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<sup>51</sup>The terminology is owed to the Scholastics (Ockham I think), but the distinction was made by Augustine in *De Magistro*.

operation of our mind, which joins or disjoins things, which denies them, which considers them absolutely, or conditionally. For example, there is no object in the world outside our mind that responds to the particle *non*; but it is clear that it marks no other thing than the judgment that we make that something is not something else.<sup>52</sup>

The principal use of a verb is to affirm, and affirmation is the principal mode of thinking, "the verb is nothing other than a word the principal use of which is to signify affirmation."<sup>53</sup> Thus, all propositions, since they contain verbs, are modes of mind that virtually affirm; even a negation represents a virtual affirmation, the affirmation that I deny P. An express affirmation is a propositional attitude of the form 'I affirm that P'. A propositional attitude is a proposition that is "complex in the form" (*complexe dans la forme*); the underlying affirmation is modified, stressed or not stressed. Modal propositions belong to the class of propositions that are "complex in the

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<sup>52</sup>"La seconde sorte de mots qui signifient la forme de nos pensées, et non pas proprement les objets de nos pensées, sont les conjonctions, comme 'et', 'non', 'vel', 'si', 'ergò', 'et', 'non', 'ou', 'si', 'donc'. Car si on y fait bien réflexion, on verra que ces particules ne signifient que l'opération de l'esprit, qui joint ou disjoint les choses, qui les nie, qui les considère absolument, ou avec condition. Par exemple, il n'y a point d'objet dans le monde hors de notre esprit, qui répond à la particule 'non'; mais il est clair qu'elle ne marque autre chose que le jugement que nous faisons qu'une chose n'est pas une autre." (GGR, 102)

<sup>53</sup>"[le] verbe, qui n'est rien d'autre qu'un mot dont le principal usage est de signifier l'affirmation." (LAP, 109)

form" because they affect the degree of affirmation (or negation). Thus, verbs, like all meaningful words, signify ideas, but the idea signified, instead of being conceived, as in the cases of singular and universal ideas, is affirmed of two or more ideas. If I utter the word 'cat', I conceive the idea of a cat; if I utter 'the cat purrs', I affirm the compatibility of two conceivable ideas, and the mechanism that permitted this mode of affirming is the verb.<sup>54</sup> This is the formulation of LAP's doctrine concerning the simplest subject-predicate sentences; of course, complex sentences, those that contain subordinate clauses (*propositions incidentes*), present the additional difficulty of having to decide the principal affirmation from the subordinate ones. In general, the syntax is helpful in the determination of the principal subject and predicate; the main subject and predicate are the elements of the main affirmation. Other subordinate clauses owe their subordinate status to the fact that they have been affirmed independently at some prior time (*des propositions qui ont été faites auparavant, LAP, 119*).

Other forms of the mind (*forme de nos pensées*) are signified by logical particles. There are five such forms: negation, conjunction, disjunction, conditional form, and

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<sup>54</sup>LAP, naturally, recognizes that verbs have other functions besides affirming: willing, praying, ordering, joining for example. But, affirming is its principal use, and the principal mode of mind.

iliation. According to Arnauld and Nicole, we cannot presume that, although illiation is reducible to conditionalization, illiation and conditional statements are identical operations of the mind (*LAP*, 223). However, a an examination of their argument fails to underline the exact nature of the difference.

All arguments can be rephrased as conditional statements: the argument '*P and Q; therefore P*' can be turned into the true conditional statement: '*If P and Q then P*'. The former is a valid argument (an inference schema, the mind makes an inference); the latter a true proposition; the mind affirms a particular kind of link between ideas.<sup>55</sup> What is the difference? Arnauld and Nicole argue that an argument (*sylogisme absolu*) cannot consented to unless an inference obtains, whereas a conditional statement can be consented to (both antecedent and consequent are true) before a link has been established between antecedent and consequent.

All the difference there is between absolute syllogisms and those the conclusion of which is enclosed with one of the premises in a conditional statement, is that the former cannot be consented to in their entirety, unless we consent to that which the argument tries to persuade us; whereas

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<sup>55</sup>Modern sentential and one-variable quantification theories demonstrate that every valid argument can be proven as a theorem (an argument without premises), which takes the conditional form. Completeness proofs guarantee that every theorem is a tautology and every tautology a theorem.

in the latter, we can consent to the whole, without anything having been gained by the one uttering them, because he still needs to show that the condition on which the consequent, that was consented to, depends obtains.<sup>56</sup>

In the case of an absolute syllogism, if we consent to the argument, we consent to the inference (inference); in the case of a conditional statement, if we consent to the statement, we do not have to consent to the link between antecedent and consequent that is claimed by the condition. In both cases, the operation of the mind in question seems to an act of the will, the will to consent. In one case, the consent to the link guarantees the truth of the propositions being linked, and in the other the truths of the propositions being linked do not guarantee consent to the link between them. The question that Arnauld and Nicole need to address is what it is about an argument that coerces the mind into zeroing in the inference rather than the truth of the proposition, and what it is about conditional statements that pulls the mind away from the link between antecedent and consequent and coerces it into zeroing in the

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<sup>56</sup>"*Toute la difference qu'il y a entre les syllogismes absolus, & ceux dont la conclusion est enfermée avec l'une des prémisses dans une proposition conditionnelle, est que les premiers ne peuvent être accordés tous entiers, que nous demeurions d'accord de ce qu'on auroit voulu nous persuader; au-lieu que dans les derniers on peut accorder tout, sans que celui qui les fait ait encore rien gagné; parce qu'il lui reste à prouver que la condition d'où dépend la consequence qu'on lui a accordée, est véritable.*" (LAP, 223)

truth or falsity of its component parts. The authors of *LAP* argue that a logical particle, in opposition to prepositions like '*therefore*', '*ergo*', and so on, require that the truth or falsity of the propositions being linked be known before the truth or falsity of the whole is determined.

A proposition in which logical particles occur is "complex in the matter" (*complexe dans la matiere*). They are likened to propositions that contain subordinate clauses (*propositions incidentes*) because they contain more than one subject and/or predicate. Conjunctions, disjunctions, and conditional propositions are propositions that have conspicuous multiple subjects and or predicates.<sup>57</sup>

The possibility of denying an affirmation, by the particle of negation, inevitably is linked to the notions of truth and falsity; affirming and denying are related to each other by the fact that if I affirm P, I cannot deny P, and *vice-versa*. Furthermore, if P cannot be affirmed, P is false, and if P cannot be denied, P is true. The link is crucial because, as the next chapter argues, the validity of arguments of sentential logic is decided on the basis of truth and falsity, rather than containment. The verb "marks the action of my mind that affirms, that is that binds

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<sup>57</sup>Exclusive, exceptive, comparative, inceptive and desitive propositions, which were the topics of Chapter Four, have hidden multiple subjects and predicates.

together two ideas [...] as befitting each other."<sup>58</sup> If the verb is modified by the negative particle, then the action of the mind is opposite that of affirming, namely it is denying. Since all propositions are judgments about state of affairs, they are either true or false; no propositions can be without truth-value:

Propositions are further divided according to the matter between true and false. And it is clear that there can be no propositions that are neither true nor false, since any proposition, designating the judgment we make of things, is true when the judgment conforms to the truth, and false when it does not conform.<sup>59</sup>

Thus, the actions of the mind that "join and disjoin things", join and disjoin propositions that are true or false. But, since two or more propositions joined together by a particle generate a new proposition, this new proposition's truth-value is established on the basis of the truth-values of its components, "the truth of these

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<sup>58</sup>"...marque l'action de mon esprit qui affirme, c'est-à-dire, qui lie ensemble les deux idées [...] comme convenant l'une à l'autre." (LAP, 113)

<sup>59</sup>"Les propositions se divisent encore selon la matiere en vraies & en fausses. Et il est clair qu'il n'y en peut avoir qui ne soient ni vraies ni fausses; puisque toute proposition marquant le jugement que nous faisons des choses, elle est vraie quand ce jugement est conforme à la vérité, & fausse lorsqu'il n'est pas conforme." (LAP, 116)

propositions depend on the truth of all its two parts."<sup>60</sup> Each particle dictates the truth-value of the complex proposition. Arnauld and Nicole define the logical particles (not the preposition *ergo*) by means of truth-functions, viz., a conjunction is true if and only if all conjuncts are true; a disjunction is false if and only if both disjuncts are false; a conditional statement is false if and only if the antecedent is true and the consequent false. They recognize the inclusive and exclusive uses of the disjunction, but, not surprisingly, skirt the paradox of material implication; they add to the truth-definition of a conditional the need for the condition between antecedent and consequent to hold.<sup>61</sup> Their definitions are justified by *Port-Royal's* usual self-serving examples, and, for this reason, not very enlightening with regard to the working of the modes of mind involved. What is important, as the next chapter explains, is that the validity of arguments containing conjoined, disjoined or conditional propositions will be determined on the basis of the truth-values of the premises, and not, as in the case of categorical syllogisms, on the basis of containment.

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<sup>60</sup>"*La verité de ces propositions dépend de la verité de toutes les deux parties.*" (LAP, 132)

<sup>61</sup>*Port-Royal* has serious reservations about material implication because logical particles have a "meaning" which is combined with the meanings of the terms contained in the propositions. In the case of material implication, the meaning is ignored.

At first, there was a concern that reticent ideas may jeopardize *LAP's* proposed general principle. It turned out, however, that ideas of proper names, definite descriptions, and demonstratives possessed a meaning, which, although it did not compare to *compréhension*, was adequate to evaluate arguments. Logical connectives signify a modification to the affirmation implied in all propositions. The affirmation is signified by the verb. According to Descartes and the *LAP's* authors a mind (a thinking thing) affirms, wills, doubts, etc.; some of the actions of the mind are heralded by logical connectives.

## CHAPTER SIX

### WHEREFORE VALIDITY?

Two stubborn dogmas of classical logic were that all propositions of natural language were represented adequately by one of the four canonical propositions of the square of opposition, and that all arguments were represented adequately by one of the four moods of the first figure of the syllogism. The *Port-Royal Logic* never questioned either of these tenets; its authors only looked down on the mechanical procedures of conversion and countenanced attentive reflection on the content (*matiere*), rather than on the form, of propositions. They begin the book "On Reasoning" by undermining the usefulness of traditional procedure because: "Most errors committed by men, as we already said somewhere else, do not originate so much from bad reasoning from their principles, as from their reasoning from false principles."<sup>1</sup> Nevertheless, Arnauld and Nicole

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<sup>1</sup>"La plûpart des erreurs des hommes, comme nous avons déjà dit ailleurs, viennent bien plus de ce qu'ils raisonnent sur de faux principes, que non pas de ce qu'ils raisonnent mal suivant leurs principes." (LAP, 177)

give a terse account of the traditional rules, arguing that these "speculative truths" (*verités speculatives*) are good fodder for mental exercises (*elles serviroient toujours à exercer l'esprit, LAP, 178*). The authors also promise to say "more" (*quelque chose même de plus que ce qu'on en dit. LAP, 178*) than what is usually said; I take this bonus to be the general principle of containment, which is introduced after the traditional rules of the syllogism have been presented in a terse manner.

In this chapter, I critically examine LAP's general principle and its authors' claim that all traditional rules are derived from it. I continue by arguing that the principle is more powerful than the *Dictum de omni*, or the *Nota Notæ*, which governed the first figure to which all other figures could be reduced, because it does not require *Baroco* and *Bocardo* forms to be reduced to the first figure. This advantage the principle has over the *Dictum* makes reasoning by *reductio* unnecessary; a boon for the Cartesian agenda of Arnauld who dismissed reasoning by *reductio* simply because the impossible could not be conceived. Finally, I argue that the elimination of reasoning by *reductio* severely undercuts Łukasiewicz's argument that a logic of propositions is logically prior to a logic of terms.

1. Division of the syllogisms

The following table is a schematic rendering of *Port-Royal's* classification:

SYLLOGISMS			
SIMPLE		CONJUNCTIVE	
NON COMPLEX	COMPLEX	CONDITIONAL	DISJUNCTIVE OR COPULATIVE
PisM MisS ∴ SisP	SisPM Misα ∴ SisPα	If SisM then SisP SisM ∴ SisP	SisM or SisP SisnotM ∴ SisP

In a simple syllogism, the middle term is joined (compared) to each term of the conclusion in a separate premise; in a conjunctive syllogism, the middle term is joined to each term of the conclusion in one premise or "the major premise is so complex that it encloses the whole conclusion".<sup>2</sup>

Furthermore, simple syllogisms are divided into noncomplex (*démêlés & incomplexes*) and complex (*impliqués ou complexes*); the former have their terms undivided, and the latter have complex terms that are divided. For people who are familiar with modern quantification logic, a simple complex syllogisms is an awkward way to account for relations. For example, in the following argument, the

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<sup>2</sup>"Les simples sont ceux où le moyen n'est joint à la fois qu'à un des termes de la conclusion: les conjonctifs sont ceux où il est joint à tous les deux." (LAP, 181) "ceux [les conjonctifs] dont la majeure est tellement composée qu'elle enferme toute la conclusion." (LAP, 217)

predicate of the major premise, 'compels to honor kings', contains the middle term 'kings', which reappears in the minor premise as a simple predicate (or subject):

- (1) Divine law compels to honor kings  
 Louis XIV is king  
 ∴ Divine law compels to honor Louis XIV

The method of classification of the simple syllogism adopted by *LAP* is awkward and unusual, but astute. The predicate of the conclusion 'compels to honor Louis XIV' is a complex term one part of which, 'compels to honor', occurs in the major premise, and the other part of which, 'Louis XIV', occurs in the minor premise. A simple syllogism is not complex because a complex term occurs in the argument, but because the complex term that occurs in the conclusion is broken up in the premises. It is clear that the major premise of (1) can be given a categorical form.<sup>3</sup> The minor is a singular proposition and the conclusion has the same categorical form as the major premise. But the middle term occurs once as only a part of the predicate, rather than the predicate; therefore, (1) falls by the rules of the syllogism. But (1) is a good argument; so, the rules are incomplete, and the strange division of simple syllogisms

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<sup>3</sup>The translation of the major premise into quantification theory yields the following *I proposition*:  $(\exists x)[Dx \wedge (\forall y)(Ky \supset Cxy)]$  (Some Divine law Compels to honor all Kings); or an *A proposition* if one wishes to speak of all divine laws.

adopted by Arnauld and Nicole, unearths a flaw in the tradition.<sup>4</sup>

Of course, you can insist that the term 'kings' is distributed in the major premise because the law compels to honor all kings, you have changed the argument from the active to the passive voice:

- (2) All kings are to honored according to divine law  
 Louis XIV is a king  
 ∴ Louis XIV is to be honored according to divine law.

The authors agree that all complex simple syllogisms can be converted into noncomplex ones, but at some rhetorical cost:

(1) stresses the importance of divine law; (2) stresses the importance of kings. Logicians who, like Arnauld and Nicole, favor content over form are not likely to admit that

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<sup>4</sup>J. Jungius (*op. cit.*) included relations among inferences, but his treatment is not terribly original. Relations must conform to one of four patterns (topics) of inferences: (1) *consequentia a compositis ad divisa*; (2) *a divisis ad composita*; (3) *per inversionem relationis*; (4) *a rectis obliqua*. Examples of the inferences are: (1) "12 is divisible by 4 and 3; therefore it is divisible by 4"; (2) "All planets are stars" and "All planets move through the zodiac"; therefore, "All planets are stars which move through the zodiac"; (3) "David is the father of Solomon"; therefore "Solomon is the son of David"; (4) "All circles are figures"; therefore, "Whoever draws a circle, draws a figure." See E.J. Ashworth, "Joachim Jungius (1587-1657) and the Logic of Relations", in *Archiv für Geschichte der Philosophie*, vol. 49, Number 1, 1967. LAP's example is an instance of *a rectis obliqua*, which Jungius explains as the subject and predicate of the premise pass from being in the nominative case to being in another grammatical case.

(1) and (2) share an perfectly identical structure.

Conjunctive syllogisms contain categorical propositions linked together by one of three logical particles, viz., 'if, and, or'. They are literally trapped into the status of syllogisms, when they belong to a logic of propositions. But *Port-Royal* does not make any distinction between a logic of terms and a logic of propositions (one of the two dogmas of classical logic), other than to exempt the latter from the jurisdiction of the general principle.

## 2. Rules of the Syllogisms

*Port-Royal* gives a terse account of the rules of the simple syllogisms. The Kneales in their *The Development of Logic*, praise "the degree of rigour which is creditable but somewhat surprising."<sup>5</sup> The influence of the account is still evident at the beginning of this century; Ralph Eaton, of Harvard, quotes the *Port-Royal* rules *in toto* in his *General Logic*.<sup>6</sup>

The general rules of the syllogism can decide the

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<sup>5</sup>They go on further: "The quasi-mathematical treatment of these subjects may indeed be the first of its kind, as it is certainly the source from which most later writers of logic manuals derive the details of their formal theory, e.g., their determination of the valid moods of syllogism and their proofs of the special rules of the various figures." (pp. 319-320)

<sup>6</sup>Ralph Eaton, *General Logic; an Introductory Survey*, Scribner's Sons, 1931, pp. 86-118.

validity of all simple syllogisms (complex and noncomplex); it is significant that when Arnauld and Nicole talk about reasoning in general, they are thinking about form. They argue that if a syllogism is good then: "given the truth of the premisses, the conclusion must be true".<sup>7</sup> The rules, then, are tests of validity and not of truth. The authors prove six general rules, from which six corollaries follow. They claim that the rules are founded on their four axioms of propositions. Each figure also possesses particular rules; the first three figures have each two rules, and the fourth figure has three. The particular rules help establish the valid moods of each figure. These manifold of rules, which decide validity, are what Arnauld and Nicole propose to replace by their general principle, which decides soundness, and on which the rules are founded. But since the general rules are anchored in the axioms of proposition, the general principle must either be a summary version of these axioms, or the axioms are no axioms. I shall begin with the axioms, which, contrary to the seven axioms (four for affirmative propositions and three for negative propositions) of Book II, exclusively focus on the *étendue* of the terms of the syllogism. What the authors are concerned about, but refuse to name according to the tradition, is the distribution of terms:

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<sup>7</sup>"...supposé la vérité des prémisses, il faut nécessairement que la conclusion soit vraie." (LAP, 179)

1. Particular propositions are included in universal propositions of same subject and predicate.
2. The quantity of the subject determines the quantity of the proposition.
3. The predicate of an affirmative proposition is always particular.
4. The predicate of a negative proposition is always universal.<sup>8</sup>

The general rules continue to paraphrase the notion of distribution:

1. The middle term is universal at least once.
2. The terms of the conclusion cannot be more universal than they are in the premises.
3. Nothing follows from two negative propositions.
4. A negative conclusion cannot follow from two affirmative premises.
5. The conclusion always follows the weaker part; if one premise is negative, it is negative and if one premise is particular, it is particular.
6. Nothing follows from two particular premises.<sup>9</sup>

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<sup>8</sup>"1. Les propositions particulieres sont enfermées dans les generales de même nature. 2. Le sujet d'une proposition pris universellement ou particulièrement, est ce qui la rend universelle ou particuliere. 3. L'attribut d'une proposition affirmative n'ayant jamais plus d'étendue que le sujet, est toujours considéré comme pris particulièrement: parce que ce n'est que par accident s'il est quelquefois pris generalement. 4 L'attribut d'une proposition negative est toujours pris generalement." (LAP, 183)

<sup>9</sup>"1. Le moyen ne peut être pris deux fois particulièrement, mais il doit être pris au-moins une fois universellement. 2. Les termes de la conclusion ne peuvent point être pris plus universellement dans la conclusion que dans les prémisses. 3. On ne peut rien conclure de deux propositions negatives. 4. On ne peut prouver une conclusion negative par deux propositions affirmatives. 5. La conclusion suit toujours la plus foible partie, c'est-à-dire, que s'il y a deux propositions negatives, elle doit être negative; & s'il y en a une particuliere, elle doit être particuliere. 6. De deux propositions particulieres il ne s'ensuit rien." (LAP, 183-

6 is redundant because of 1, 2 and 5; if both premises are particular and affirmative, the middle term is never universal, and if one of the particular propositions is negative with the middle term as predicate, the conclusion must be negative by rule 5, and have its predicate distributed violating rule 2. Likewise, 4 is superfluous because of 2; if both premises are universal, figures one, three and four violate 2, and figure two violates 1; if one of the premises is particular, figures one and three violate 2, and figures two and four violate 1; if both premises are particular, all figures violate 1. But, in a later chapter (212), Arnauld and Nicole claim that all the rules (general and particular) are reducible to rules 1 and 2. Clearly, however, 3 is not reducible to either one. All arguments of the form EEE have their middle term distributed, and no terms in their conclusion are more universal than in the premises. 5 is equally not reducible to either 1 or 2; EAA-2 does not violate either rules, and yet it is invalid. All rules are justified by the concept of *étendue*.

The rules yield nineteen valid argument forms. It is noteworthy that *LAP* does not recognize as valid some forms, which they admit, "are contained" in valid forms. For examples, AAI-1 and EAO-1 respectively are contained in the

valid forms AAA-1 and EAE-1, but are themselves not present in the list of valid forms, even though they violate no general rules. The reason is that the minor term (the subject of the conclusion and the subject or attribute of the second premise) being included or excluded in its entire extension in the middle term "does not prove anything of a part that it also does not prove of the whole."<sup>10</sup> Likewise, EAO-2, AEO-2 and AEO-4, which cannot be invalidated by the rules are not listed among the valid forms. On the other hand, AAI-3, EAO-3, AAI-4 and EAO-4, although they conclude particularly from universal premises are listed as valid because the minor term is not taken in its entire extension in the premises. Moreover, *Port-Royal* excludes from valid syllogisms the forms that are derived from the first figure by interchanging the premises and converting the conclusion. For many logicians, these moods were representative of the fourth figure, or were used instead of the fourth figure. Arnauld and Nicole rejects this figure because it entails changing the conclusion, which properly cannot be tampered with. A conclusion begins as the question and is the given that needs to be proven. Consequently, it should not be

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<sup>10</sup>"Car le moyen étant joint à tout le petit terme, ne peut prouver rien par cette union d'une partie, qu'il ne le prouve aussi des autres, puisqu'il est joint à toutes. De même si la désunion du moyen d'avec le petit terme prouve quelque chose de quelque partie du petit terme, elle le prouve de toutes les parties, puisqu'il est également desuni de toutes les parties." (LAP, 185)

converted. They are

Baralipton	Celantes	Dabitis	Fapesmo	Frisesomorum
All Pism <u>All MisS</u> Some SisP	No Pism <u>All MisS</u> No SisP	All Pism <u>Some MisS</u> Some SisP	All Pism <u>No MisS</u> Some S is not P	Some Pism <u>No MisS</u> Some SisnotP

and the valid moods and figures recognized by *Port-Royal*

FIGURE 1	FIGURE 2	FIGURE 3	FIGURE 4
AAA Barbara	EAE Cesare	AAI Darapti	AAI Barbari
AII Darii	AEE Camestres	AII Datisi	IAI Dibatis
EAE Celarent	EIO Festino	IAI Disamis	AEE Calentes
EIO Ferio	AOO Baroco	EAO Felapton	EAO Fespamo
		EIO Ferison	EIO Fresisom
		OAO Bocardo	

Camestres is sometimes listed as Campestres, but the occurrence of the letter 'p' in the approximate center of the word is misleading; it may be construed as directing to convert the second E proposition per accidens.<sup>11</sup>

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<sup>11</sup>If the letter 's' occurs inside the word, the proposition indicated by the letter preceding it is converted simply; if it is the letter 'p', the conversion is *per accidens*. If the letter 'm' occurs inside the word, the premises are interchanged, the letter 'c', the reduction is indirect. Thus, only Baroco and Bocardo are reduced indirectly. The fourth figure was not recognized by Aristotle (it is attributed to Galen). Aristotle did not base the figures on the position of the middle term (in which case four figures are needed) , but on the scope of the extension of the

### 3. The General Principle

The Vallant manuscript and the 1662 first edition of *LAP* contain a chapter that gives the mechanical procedures needed to convert all syllogisms to the the first figure; the chapter is introduced as "useless" (*fort inutile*) and is dropped from all subsequent editions. The tradition had it that all syllogisms were reducible to one of the four moods of the first figure, and that the first figure was justified by the very "natural" *Dictum de omni et nullo* or the *Nota Notæ*.<sup>12</sup> The elimination of the conversion rules and the conspicuous absence of any mention of the *Dictorum*, of course, are connected with the prominent position given the

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middle term compared to the other two. In this case, there are clearly three figures: the middle has a greater extension than one term and a smaller one than the other; it has a greater extension than both; it has a smaller extension than both.

<sup>12</sup>The *Dicta* considered the syllogism from the point of view of the extension of the terms contained in it, and had varying formulations; I quote the one given by Sanderson: "*Quicquid affirmatur universaliter de aliquo subjecto, affirmari necesse est de ijs quæ sub eo continentur. Quicquid negatur universaliter de aliquo subjecto, negari necesse est de ijs quæ sub eo continentur.*" *Logicæ Artis Compendium*, 126. "Whatever is universally said of some subject, necessarily is to be said of all things that are contained in it. Whatever is universally denied of some subject necessarily is to be denied of all things that are contained in it. The *Nota* considered the syllogism from the point of view of the intension of its terms; I quote Kant's version: "*Nota notæ est etiam nota rei ipsius.*" "The False Subtlety of the Four Figures of the Syllogism", II, 49. "The attribute (*merkmal*) of an attribute is an attribute of the very thing." For Kant, the middle term is an attribute of the subject of the conclusion in the first figure.

general principle. The chapter introducing the principle immediately follows the chapters presenting the rules, and its title heralds a savory promise: "General Principle, by which, without any reduction to figures and modes, one can evaluate the goodness or badness of all syllogisms."<sup>13</sup>

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<sup>13</sup>*"Principe general, par lequel, sans aucune reduction aux figures & aux modes, on peut juger de la bonté ou du défaut de tout syllogisme."* (LAP, 211-213)

Besides having the obvious advantage of elegance and economy over the rules, the principle is a good honing stone for three Cartesian axes that Arnauld and Nicole love to grind. First, and argument moves in a direction going from conclusion to premisses, and not from premisses to conclusion, as the *Dicta* imply. An argument begins with the conclusion, the conclusion is a *questio*; <sup>14</sup> once the question is proven, it becomes the conclusion. <sup>15</sup> The proof is what confers the status of conclusion to the question; it seems in order, therefore, that the proof first be verified by

<sup>14</sup>"The need for reasoning is justified by nothing other than the finitude of the mind, which, having to evaluate the truth or falsity of a proposition, which is then called a *question*, cannot always do it by the mere contemplation of the two ideas that compose the proposition." "*La nécessité du raisonnement n'est fondée que sur les bornes étroites de l'esprit humain, qui ayant à juger de la vérité ou de la fausseté d'une proposition, qu'on appelle 'question', ne le peut pas toujours faire par la considération des deux idées qui la composent.*" (LAP, 178)

<sup>15</sup>"And then there is the conclusion, which is the very proposition that had to be proven, and that was called *question* before it was proven." "*Et puis la conclusion, qui est la proposition même qu'on avoit à prouver, & qui avant d'être prouvée s'appeloit 'question'.*" (LAP, 179)

starting with the question. Moreover, if an argument moved in the direction going from premisses to conclusion, it would be a candidate for method, but we know that Descartes dismissed deduction as a method. Second, the conversions that are needed for the reductions of all syllogisms to the first figure require, in the cases of *Baroco* and *Bocardo*, an indirect proof (proof by *reductio*), that is, it requires that an idea of the impossible be conceived; unless, of course, one wishes to be mechanical about it, i.e., apply rules without thought. But, according to Descartes' doctrine of ideas, neither can an idea of the impossible be conceived, nor can a human being be without thought. Of course, one could apply the rules thinking about something else, but the sincerity of the results would have to seriously be questioned. Finally, the principle eliminates the concept of validity, as a contradistinction to soundness; the concept of validity is founded on form rather than content, and content continues to be privileged over form. Furthermore, given the psychological nature that Arnauld and Nicole confer onto illiation (see *ergò* in the section on logical connectives in the previous chapter), it would be difficult to explain how illiation could yield an absurdity, or how anyone could work one's way back to premisses from an absurdity. Yet, absurdities are not uncommon in unsound valid arguments.

### 3.a. Principle vs. rules

So, the principle is based on what the authors take to be the "natural" movement of reasoning. When a question (*questio*) is contemplated, the contemplator first seeks another proposition that is better known and that contains the question, and then seeks a proposition that confirms it. The first proposition is called the "containing" (*contenante*) and the second one is called the "applicative" (*applicative*). The principle is attractive to Arnauld and Nicole because it reenacts and formalizes the psychological action of reasoning. It is given its formal form in the chapter following its introduction:

That one of the two propositions must contain the conclusion, and the other shows that it contains it.<sup>16</sup>

The tables "Valid Forms of the Syllogisms" and "Vindication of the Valid Forms by the Principle" in the Appendix attest that the principle validates all 19 valid forms; the containment operates at the level of *étendue* for *Barbara*, *Celarent*, *Ferio*, *Cesare*, *Festino*, *Baroco*, *Ferison* and *Fresisom* (in the last two forms the minor premise must be

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<sup>16</sup>"*Que l'une des deux propositions doit contenir la conclusion, & l'autre faire voir qu'elle l'a contient.*" (LAP, 214)

converted), and at the level of *compréhension* for all others. That the principle invalidates all bad arguments follows from the jurisdiction it has over the rules.

Arnauld and Nicole argue that the principle is logically prior to the first two rules to which all other rules can be reduced: "It is not difficult to show that all the rules that we have given have no other function than to make manifest that the conclusion is contained in one of the other two propositions, and that the other says so."<sup>17</sup>

And "all rules are reducible to two principal ones, which are the foundation of all others."<sup>18</sup> However, not far back, it was noted that rules 3 and rules 5 were not reducible to the first two rules: a syllogism could have two negative premises and a negative conclusion (all EEE's and EOO-1, for example), and a syllogism could have a conclusion not follow the weaker premise (EAA-2, for example), without rules 1 and 2 being able to flag it as bad. Thus, in addition to justify the priority of the principle over rules 1 and rule 2, they need to show that the principle at least does the work of rules 3 and 5.

One thing needs to be reemphasized: the principle and

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<sup>17</sup>"*Il n'est pas difficile de montrer que toutes les regles que nous avons données, ne servent qu'à faire voir que la conclusion est contenue dans l'une des premieres propositions, & que l'autre le fait voir.*" (LAP, 212)

<sup>18</sup>"*Car toutes ces regles se reduisent à deux principales, qui sont le fondement des autres.*" (LAP, 212)

the rules operate in different contexts. The rules are governed by distribution, and the principle is governed by universality. What is the difference between universality and distribution? The former only takes *étendue* into account, and the latter takes both *étendue* and *compréhension* (This shows why the authors were reluctant to use the term 'distribution').<sup>19</sup> Universality also takes into consideration the reciproqual relationship between *compréhension* and *étendue* described in chapter 3, namely that

(3)  $\Phi$  is contained compréhension of Y

if and only if

Y is contained étendue of  $\Phi$

So, what I think the authors have in mind here is that universality governs distribution and makes rules 3 and 5

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<sup>19</sup>A reminder is needed here. In the chapter on *compréhension* and *étendue*, it was noted that if A was contained in the *étendue* of B, then B is contained the *compréhension* of A. This duality operates at the level of propositions since the containment of one proposition in another is based on the containment of one term of the proposition in a term of the other proposition. Thus, if the *étendue* of the conclusion is contained in the premises, the premises contain the *compréhension*. The principle is couched in the language of *étendue*.

redundant. What is needed to confirm this reading, in addition to *LAP*'s argument showing that the principle is prior to rules 1 and 2, is an argument showing that the principle makes rules 3 and 5 unnecessary. I shall begin with *LAP*'s arguments.

Rule 2 states that no terms can have a greater universality in the conclusion than it has in the premises; but if the *compréhension* or *étendue* of one of the terms of the conclusion is contained in the *compréhension* or *étendue* of a term occurring in one of the premisses, either cannot be greater than the one it is contained in; and if the other premise shows that it is so, that premise does not introduce any new terms, it avers what is already stated. In *Barbara*, the *étendue* of the subject of the conclusion is contained in the *étendue* of the subject of the major premise, and the minor says it; in *Baroco*, the *compréhension* of the predicate of the conclusion contains that of the predicate of the minor, and the major shows it.<sup>20</sup>

Rule 1 demands that the middle term be distributed at least once. *Port-Royal* explains the rule in the context of distribution: "For, having to join or unjoin the two terms

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<sup>20</sup>As a rule, grammatical subjects are interpreted in their *étendue* and predicates in their *compréhension*. Cases where the *étendue* of a subject is contained in the predicate of another proposition. EAE-2 and EIO-2 are cases where the other proposition is an E or I proposition, that is, a proposition, the converse of which is evidently true. EAE-2 and EIO-2 have a more "natural" formulation in EAE-1 and EIO-1 (see *LAP*, 197).

of the conclusion, it is clear that it [the middle term] cannot do it if it is taken for two different parts of the same whole." <sup>21</sup> Then, the subordination of that rule to the principle is argued by an example. In the following *Disamis* argument

Some saints are poor  
 All saints are friends of God  
 ∴ Some friends of God are poor

the subjects of both the conclusion and the major premise are undetermined. So, I cannot say with certainty whether the *étendue* of the middle term contains that of the minor term. In Chapter One, I noted that *Port-Royal's* interpretation of the particle 'some' differs from that of the scholastic terminists and from that of modern quantification theory. In both scholastic and modern parlance, the particular quantifier is interpreted as a finite (or infinite) disjunction; so, in a world where all saints are friends of God, disjuncts occurring in friends of God also occur in saints. For *Port-Royal*, the particle 'some' restricts the extension of the term it precedes to one (anyone) of its parts; the part is undetermined. Because the part is undetermined, there is no way of

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<sup>21</sup>"Car devant unir ou desunir les deux termes de la conclusion, il est clair qu'il ne le peut faire s'il est pris pour deux parties différentes d'un même tout." (LAP, 183)

ascertaining whether the part designated by 'some friends of God' is contained (or contains) the part designated by 'some saints', even though all saints are friends of God. But, if the middle term, which is taken universally in the minor premise, is understood from the point of view of *compréhension*, the problem is skirted. The *compréhension* of the term 'friend of God' is contained in that of 'saints' (the conclusion is contained in the premises); and the minor premise, interpreted from the point of view of *compréhension*, confirms it (the *compréhension* of 'friend of God' is in that of 'saint').<sup>22</sup>

Universality legitimizes *Port-Royal's* interpretation of the particle 'some'. There is a certain strangeness to the fact that the need for the concept of universality arises out of the novel interpretation given to the particle 'some'. I would rather think that *LAP's* project stands unified behind the distinction of *compréhension* and *étendue*. This does not mean that distribution is a superfluous concept, it can still be used in obvious contexts of *étendue*, where all terms clearly are distributed, but it

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<sup>22</sup>But, by (3), this analysis yields that if the conclusion is contained <sup>compréhension</sup> in the premises, then the premise is contained <sup>étendue</sup> in the conclusion; that is to say, the conclusion is always both containee and container. The informative part of a syllogism resides in the fact that if the conclusion is taken as the containee, the syllogism provides the *étendue* or *compréhension* counterpart of the terms. That counterpart can be considered as new knowledge provided by the syllogism.

cannot be used where particularity is present because of *Port-Royal's* tailor-made interpretation of the particle 'some'. The principle, then, validates everything the first two rules validate; in addition, it can legislate in contexts of *compréhension*, which is introduced as a result of *LAP's* interpretation of the particle 'some', and where rule 1 has no jurisdiction.

Rule 3 states that "one cannot conclude anything from two negative propositions,"<sup>23</sup> because of the fact that both subject and predicate separately are excluded from a third class does not guarantee that subject and predicate are or are not excluded from each other. Clearly, the principle governs this rule: again, beginning with the conclusion, if the *étendue* of the subject of the conclusion is contained in the *étendue* of the subject of a negative premise, the premise that confirms it must be in the affirmative; and if the *compréhension* of the predicate of the conclusion is included in the *compréhension* of the predicate of a negative premise, the other premise, which confirms it must be in the affirmative.

Finally, rule 5 states that the conclusion must follow the weaker premise: if both are affirmative, and one is particular and the other universal, the conclusion is particular; if both are universal, and one is affirmative

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<sup>23</sup>"On ne peut rien conclure de deux proposition negatives." (*LAP*, 186)

and the other negative, the conclusion is negative; if one is particular affirmative and the other universal negative, the conclusion is particular negative. An example similar to the one brought in to show that rule 5 is independent of rules 1 and 2 shows that the principle can flag a bad argument. Consider the invalid EAA-1 form

No dogs are cats  
 All setters are dogs  
 ∴ All setters are cats

the *étendue* of the subject of the conclusion, 'all setters' cannot be contained in that of the subject of the major premise, 'no dogs'; the two subjects cannot be related to each other by the containment because each has a particle that excludes the other. *LAP* does not make explicit that subjects must have compatible particles of containment, but it is quite consistent with the analysis of the particles 'all', 'no' and 'some' that their meaning implies the relation of containing obtains between some of them and not between others. 'All setters' and 'No setters' respectively are contained in 'all dogs' and 'No dogs', and likewise *I* and *O* propositions respectively are contained in *A* and *E* propositions. That particles of quantity are expected to be compatible is also evident from the table "Valid Forms of the Syllogism."

3.b. Principle vs. dicta

The *dicta* insidiously rely on the notion of containment: "whatever is said of something is said of everything contained in it"; whereas the principle openly flaunts its dependence on the notion of containment. In this sense, the principle and the *dicta* have more in common than Arnauld and Nicole may be willing to admit. But there is another sense in which the principle and the *dicta* widely differ: the *dicta* only apply to the first figure, and accordingly require that all figures be logically reducible to the first. They are, but at the cost of bringing in the method of proof by *reductio*. This is a tremendous cost for the authors of *LAP* and in particular for Arnauld who, with the help of Pascal at first, and by himself later, rewrote Euclid's *Elements* without making use of the indirect proof. But *Baroco* and *Bocardo* are reducible to the first figure only by using such proof. The *reductio* consists of inferring the contradictory of the minor premise from an assumed false conclusion and the given true major premise. In the case of *Baroco*, it works as follows:

Baroco

All P is M  
 Some S is not M  
 ∴ Some S is not P

Barbara

All P is M  
 All S is P (negation of conclusion)  
 ∴ All S is M (negation of minor)

and for *Bocardo*:

Bocardo

Some M is not P  
 All M is S  
 $\therefore$  Some S is not P

Barbara

All S is P (negation of conclusion)  
 All M is S  
 $\therefore$  All M is P (negation of major)

To begin with, in the Cartesian context of *Port-Royal*, it would be difficult to take the first step of conceiving a true proposition as false. If the *questio* is true, there cannot be any *reductio*. Only part of the difficulty can be overcome if the *questio* is false, because, in the process of the conversion, the subject of the *questio* has changed. The proof could be acceptable, if the conclusion, which is negated to be made true, remained the conclusion in the argument, but it is not acceptable otherwise because, from the point of view of content, *Barbara* is an altogether different argument from *Baroco* and *Bocardo*.

How much are Arnauld and Nicole giving up by renouncing the reducibility of all syllogisms to the first figure? For one thing, there is the distinction between content and form, and with it the concept of validity; for another thing the evidence of the *dicti*. The distinction between form and content prefigures the modern opposition between what Bar Hillel has termed the "constructionist" and the

"naturalist" camps.<sup>24</sup> Constructionists, like Frege and Tarski, are diffident about natural languages and argue against the coherence of a logical syntax of language, and naturalists, like Chomsky and Katz, are more confident about natural languages and argue for the past inchoateness of grammar citing the present strides made by modern linguistics. *Port-Royal* can be said to have fired the first salvo of the debate. It is no surprise, then, that scholars like Chomsky found so much wealth in their texts. For Arnauld and Nicole, form is what is left after content is removed, form is part of content; they would argue that there are no logical forms hanging out in the universe waiting for a language to capture them. Constructivism is an art movement, which attempts to represent the most depurated forms, but even the most ardent constructivist cannot escape some content in the forms, some of that content out of which the form was extracted. *LAP*, despite its occasional awkwardness, is the first serious attempt at arguing that the content of language includes a logical syntax. Because of the meanings of particles of quantity like 'all', 'some' and 'only', the *étendue* or *compréhension* of terms is affected; other logical particles affect the degree and scope of the mental operation of affirming. Validity is not lost, but it is part of the affirmation of

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<sup>24</sup>Quoted by Fred Sommers, in *The Logic of Natural Language*, Clarendon Press, 1982, 2.

truth; there is no more validity without truth than there is form without content.

The other loss is that of the evidence of the *Dicta*. But the *dicta* rely on the notion of containment; one states that whatever is said of a thing is said of everything contained under that thing. The relation of containment is at least as evident as the relation of being-said-of. It is concrete, graphic and pervasive, and the relation of being-said-of can be translated into a relation of containment. If P is said of S, there is a manner in which S contains P and P contains S; this dual containment is at the heart of *Port-Royal* doctrine of *compréhension* and *étendue*.

What is gained by the principle? Elegance and economy certainly are important gains, but Arnauld and Nicole also argue that the principle is more powerful than the rules because it allows the evaluation of arguments containing intricately complex propositions, including some that resemble propositional attitudes. For example

He who says that you are an animal says the truth  
 He who says you are a bird, says you are an animal  
 ∴ He who says you are a bird says the truth.<sup>25</sup>

This is the way Arnauld and Nicole reason: in the subordinate clause of the subject of the major premise 'you

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<sup>25</sup>"*Celui qui dit que vous êtes animal, dit vrai: Celui qui dit que vous êtes un oison, dit que vous êtes animal; Donc celui qui dit que vous êtes un oison, dit vrai.*" (LAP, 216)

are an animal', the term 'animal' occurs as predicate and as such is taken particularly. Therefore, the term 'bird', which also occurs as the predicate of a subordinate clause in the conclusion, could only be said to be contained in the *compréhension* of 'animal' (nothing can be said with certainty to be the part of the part of something else). But for this to be the case, the term 'animal' would have to be taken universally in the minor in order to confirm that 'bird' is part of the *compréhension* of animal. It does not, because it is taken particularly. Therefore, the argument is invalid.

Here, the authors take the subordinate clauses 'you are an animal', 'you are a bird' as the main assertion of the propositions, and the surrounding clauses 'he who says', 'says the truth' as two further emphases of the affirmation:

It is the same when we say: 'I deny that', 'it is true that', 'it is not true that'; or when we add in a proposition that which reinforces its truth, as when I say: 'Astronomers arguments convince us that the sun is much larger than the earth'. For this first part is nothing but a reinforcement of the truth.<sup>26</sup>

They also add that the speaker's intention (*le dessein*) is

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<sup>26</sup>"C'est de même quand on dit: 'Je nie'; 'il est vrai'; 'il n'est pas vrai'; ou qu'on ajoute dans une proposition ce qui en appuie la vérité, comme quand je dis: 'Les raisons d'astronomie nous convainquent que le soleil est beaucoup plus grand que la terre'. Car cette première partie n'est que l'appui de l'affirmation." (LAP, 129)

what determines the choice of one clause over another, as the main one. The argument quoted gives no clues as to the speaker's intention. Belief clauses, on the other hand, are free from ambiguity; the intention is clearly to articulate one's belief. Thus, the argument

Nicole believes that all politicians are corrupt  
 ∴ Nicole believes that senators are corrupt

is invalid in case Nicole believes that senators are baseball players from Washington. The main assertion of the complex proposition is the articulation of one's belief; it is not the assertion that all politicians are corrupt. So, even though senators are included in the *étendue* of politicians, the argument is not explicit about it. What is required, is a minor premise that explicitly states that Nicole believes that all senators are politicians. In belief contexts, that premise cannot be omitted because the main clause is the belief clause; there can be no enthymematic arguments in belief contexts.

### **3.c. The priority of terms over propositions**

The organization of *LAP* reflects the order in which we learn. We begin by conceiving simple ideas; we continue by joining ideas together, simple ones and complex ones, and in

so doing we judge; finally, we put propositions together and we reason. By the time we have mastered these three fundamental stages, we are ready to do research, for which we need a method. If the order of learning has any logical foundation then a logic of terms is logically prior to a logic of propositions. This view was challenged by Łukasiewicz in his book, *Aristotle's Syllogistic from the Standpoint of Modern Formal Logic*. He argued that a logic of propositions was logically prior to a logic of terms. His argument consisted in showing that a logic of terms, in order to be reducible to the first figure, which is ruled by the desirable evidence of the *dictorum*, relies on a theorem of logic of propositions. The theorem

$$[(p \wedge q) \supset r] \approx [(p \wedge \neg r) \supset \neg q]$$

legitimizes the reduction of *Baroco* and *Bocardo* to the first figure. The conclusion had to be denied and moved to the position of a premise, which was itself negated and moved to the position of conclusion. This account was convenient for the formalist Łukasiewicz who relied on sentential logic to do predicate logic, but is it the right one? Arnauld and Nicole, the antiformalists, find it convenient to think otherwise. Their system requires that terminist arguments be prior to sentential arguments. There is something fundamentally intuitive about *Port-Royal's* position. Sentential logic reduces all sentences to a truth-value; simple sentences are either true or false, and the truth-

value of complex sentences is "computed" on the basis of the truth-value of the components and the definition of the connective. Sentential logic, therefore, cannot be very informative about objects and their relation in the world. On the other hand, terminist logic analyses simple sentences into objects and qualities; terminist logic, therefore, attempts to describe reality. This is a project much more akin to the spirit of Cartesianism that Arnauld and Nicole tried to embody.<sup>27</sup>

Finally, if the introduction of *LAP*'s principle makes the reduction to the first figure superfluous, the theorem is not needed, and the order of learning may be taken as a reflection of a logical order. So much the better (logically) for a method that advocates beginning with simple notions, and so much the worse for a predicate calculus founded on a sentential calculus. I think that, given the dependence of sentential logic on the notion of truth, the Port-Royalists' position is again favored.

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<sup>27</sup>Jean van Heijenoort, "Logic as Calculus and Logic as Language", in *Synthese*, vol. 17 (1967), divides modern quantification logic into three camps. The camp that champions a *lingua characterica* and that attempts to capture the universe; this camp is represented by Frege, Russell and Wittgenstein. The camp that champions a *calculus ratiocinator* and that makes up arbitrary universes; this camp includes Boole, Schröder, and Löwenheim. Finally, the camp that expanded the set-theoretical notions of the *calculus ratiocinator*, and which include Skolem, Herbrand and Gödel.

Consider Arnauld and Nicole's evaluations of arguments of sentential logic.

I indicated that Arnauld and Nicole classified sentential arguments in what they called "conjunctive syllogisms" (*syllogismes conjonctifs*), and that these syllogisms were not ruled by the general principle. It is clear that in the arguments

$$\begin{array}{l} S \text{ is } P \\ \therefore (S \text{ is } P) \text{ or } (R \text{ is } T) \end{array}$$

and

$$\begin{array}{l} \text{If } (S \text{ is } P) \text{ then } (R \text{ is } T) \\ R \text{ is not } T \\ \therefore S \text{ is not } P \end{array}$$

the conclusion cannot be said to be contained in the premises, and the other premise, if there is one, says nothing about the relationship of the conclusion to the other. Term containment is not part of the debate because sentential arguments are not evaluated on the basis of their terms, but on the basis of the truth (or falsity) of propositions. Despite this essential difference, Arnauld and Nicole group them with syllogistic inferences because the major premise contains the whole conclusion ("*la majeure est tellement composée qu'elle enferme toute la conclusion*" 217). Here, the authors stretch the meaning of containment beyond its original restricted sense; its original sense

applied to *étendue* and *compréhension*. The containment in question here, is concrete spatial containment, not conceptual. This insistence that sentential arguments be included with categorical syllogisms is the consequence of one of the two dogmas of classical logic mentioned at the beginning of the chapter, namely that all arguments are adequately represented by one of the four moods of the first figure of the syllogism. That they differ is evident from the way Arnauld and Nicole explain how they are evaluated.

*LAP* divides conjunctive syllogisms into three species that correspond to our modern elimination rules:

Conditionals (*syllogisme conditionel*):

*Modus Ponens*:  $p \supset q, p \vdash q$

*Modus Tollens*:  $p \supset q, \neg q \vdash \neg p$

Disjunctive (*syllogisme disjonctif*):

Disjunctive syllogism:  $p \vee q, \neg p \vdash q$

Copulative (*syllogisme copulatif*):

Disjunctive syllogism:  $\neg(p \wedge q), p \vdash \neg q$

In none of the above examples can the principle be appealed to to adjudicate the legitimacy of the inference. The inferences are based on the truth-value of propositions, not on the meaning of terms. Thus, in order to evaluate them, one must consider the definitions of the connectives that join them. These definitions are given by the authors in Chapter 9, "Of Various Kinds of Compounded Propositions." Conditional syllogisms are bad (*vicieux*) according to

content if the major premise is false, and it is bad according to form, if the antecedent is denied or if the consequent is affirmed. In this, and other "conjunctive syllogisms", it is obvious that the goodness or badness of the argument is determined by the truth-definition of the logical connective. A conditional is false if and only if the antecedent is true and the consequent false; therefore, if the conditional is true (*ex hypothesi*) and its antecedent true, the consequent must be true. Likewise if the conditional is true and the consequent false, the antecedent must be false. A disjunction is false if and only if both disjuncts are false; therefore, if one disjunct is false, the other must be true by definition of the connective. It is clear that sentential arguments do not rely on the meaning of the terms contained in the subordinate clauses, but on their truth-value. The truth-value of the subordinate clauses, however, is determined by the containment (or non-containment) of subjects and predicates. Sentential arguments, for *Port-Royal*, requires at least two notions of terminist logic: the notions of conception and of judgment. Furthermore, and this may help the case for the priority of terminist logic, the third operation of reasoning may be included as a requirement for the determination of the truth of propositions.

The authors acknowledge the legitimacy of conditionalizing traditional syllogisms (*LAP*, 223).

Aristotle presented syllogisms in conditional forms: "If B is contained in all A, and A is contained in all C, then B is contained in all C." This fact did not escape Łukasiewicz, who used it to strengthen his case for the priority of sentential logic. For Arnauld and Nicole, even though the conditionalization of categorical syllogisms is "common and nice" (*très-commune & très-belle*), it presupposes the work of the syllogism. The acceptance of a syllogism entails the acceptance of the truth of all its components; the acceptance of a conditional statement does not entail the acceptance of the truth of all its components

All the difference there is between absolute syllogisms and those the conclusion of which is enclosed with one of the premisses in a conditional proposition, is that the former cannot be agreed to in their entirety unless we remain in agreement on what one wanted to persuade us of; whereas in the latter, we can agree on the whole, without the one stating the conditional having won persuasion, because that one still needs to show that the condition on which the consequence depends is true.<sup>28</sup>

In other words, when a conditional is stated, in addition to

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<sup>28</sup>"*Toute la difference qu'il y a entre les syllogismes absolus, & ceux dont la conclusion est enfermée avec l'une des prémisses dans une proposition conditionnelle, est que les premiers ne peuvent être accordés tous entiers, que nous ne demeurions d'accord de ce qu'on auroit voulu nous persuader; au-lieu que dans les derniers on peut acorder tout, sans que celui qui les fait ait encore rien gagné; parcequ'il lui reste à prouver que la condition d'où dépend la consequence qu'on lui a accordée, est veritable.*" (LAP, 223)

recognizing that the consequent is true, the hearer must agree that it legitimately drawn from the antecedent. Whereas the acceptance of a syllogism is the same as the acceptance of the inference. Thus a good syllogism always yield a true conditional, whereas a true conditional does not always yield a sound syllogism. For Arnauld and Nicole, this is good enough to establish the priority of categorical syllogisms over sentential arguments.

The general principle of *The Port-Royal Logic* undoubtedly confirms the eminence of content over form. The apparatus of *compréhension* and *étendue*, which is introduced to buttress the principle, is anchored in a Cartesian doctrine of ideas and purports to do the work more clearly than the combined Aristotelian doctrine of predicables and the Scholastic doctrine of supposition. This achievement laid the foundation and provided the initial impetus for those who wish to explore the possibility of a logical syntax of language.

**APPENDIX**

VALID FORMS OF THE SYLLOGISM

Figure 1	Figure 2	Figure 3	Figure 4
<p><b>Barbara</b>                      All cat is feline  <u>All tabby is cat</u>                      All tabby is feline</p>	<p><b>Cesare</b>                      No cat is dog  <u>All setter is dog</u>                      No setter is cat</p>	<p><b>Darapti</b>                      All cat is feline  <u>All cat is animal</u>                      Some anim. is fel.</p>	<p><b>Barbari</b>                      All cat is feline  <u>All fel. is animal</u>                      Some animal is cat</p>
<p><b>Darii</b>                      All cat is feline  <u>Some pet is cat</u>                      Some pet is feline</p>	<p><b>Camestres</b>                      All cat is feline  <u>No dog is feline</u>                      No dog is cat</p>	<p><b>Datisi</b>                      All cat is feline  <u>Some cat is tabby</u>                      Some tabby is fel.</p>	<p><b>Dibatis</b>                      Some cat is tabby  <u>All tabby is pet</u>                      Some pet is cat</p>
<p><b>Celarent</b>                      No cat is dog  <u>All tabby is cat</u>                      No tabby is dog</p>	<p><b>Festino</b>                      No cat is dog  <u>Some pet is dog</u>                      Some pet is not cat</p>	<p><b>Disamis</b>                      Some cat is tabby  <u>All cat is feline</u>                      Some fel. is tabby</p>	<p><b>Calentes</b>                      All cat is feline  <u>No feline is dog</u>                      No dog is cat</p>
<p><b>Ferio</b>                      No cat is dog  <u>Some pet is cat</u>                      Some pet is not dog</p>	<p><b>Baroco</b>                      All cat is feline  <u>Some pet is not felin</u>                      Some pet is not cat</p>	<p><b>Felapton</b>                      No cat is dog  <u>All cat is feline</u>                      Some fel. isnt dog</p>	<p><b>Fespamo</b>                      No cat is dog  <u>All dog is animal</u>                      Some anim. isnt cat</p>
		<p><b>Ferison</b>                      No cat is dog  <u>Some cat is tabby</u>                      Some tab. isnt dog</p>	<p><b>Fresison</b>                      No cat is dog  <u>Some dog is setter</u>                      Some setter isnt cat</p>
		<p><b>Bocardo</b>                      Some cat isnt tabby  <u>All cat is feline</u>                      Some fel. isnt tab.</p>	

VINDICATION OF VALID FORMS BY THE PRINCIPLE			
Figure 1	Figure 2	Figure 3	Figure 4
<b>Barbara</b> <i>Etendue</i> Subj. of Concl. in Subj. of Major	<b>Cesare</b> <i>Etendue</i> Subj. of Concl. in Pred. of Major	<b>Darapti</b> <i>Compréhension</i> Subj. of Concl. in Subj. of Major	<b>Barbari</b> <i>Compréhension</i> Subj. of Concl. in Pred. of Major
<b>Darii</b> <i>Compréhension</i> Pred. of Concl. in Pred. of Minor	<b>Camestres</b> <i>Compréhension</i> Pred. of Concl. in Pred. of Minor	<b>Datisi</b> <i>Compréhension</i> Pred. of Concl. in Subj. of Minor	<b>Dibatis</b> <i>Compréhension</i> Subj. of Concl. in Pred. of Major
<b>Celarent</b> <i>Etendue</i> Subj. of Concl. in Subj. of Major	<b>Festino</b> <i>Etendue</i> Subj. of Concl. in Subj. of Major	<b>Disamis</b> <i>Compréhension</i> Subj. of Concl. in Subj. of Major	<b>Calentes</b> <i>Etendue</i> Pred. of Concl. in Subj. of Minor
<b>Ferio</b> <i>Etendue</i> Subj. of Concl. in Subj. of Major	<b>Baroco</b> <i>Etendue</i> Pred. of Concl. in Pred. of Minor	<b>Felapton</b> <i>Compréhension</i> Subj. of Concl. in Subj. of Minor	<b>Fespamo</b> <i>Compréhension</i> Subj. of Concl. in Pred. of Major
		<b>Ferison</b> <i>Etendue</i> Subj. of Concl. in Subj. of Major	<b>Fresison</b> <i>Etendue</i> Subj. of Concl. in Pred. of Major
		<b>Bocardo</b> <i>Compréhension</i> Subj. of Concl. in Subj. of Major	

**N.B. :** The mention of *étendue* and *compréhension* in each cell refers to the mode of containment of the conclusion in one of the two premisses. The other premise articulates the containment.

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