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Logic in seventeenth-century Scottish academic philosophy

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Abstract

For a seventeenth-century Scottish regent, logic was preliminary to all other disciplines and secondary only to Latin. Logic was the trait-d'union between natural language (Latin, grammar, classical literature, the Bible) and the technical philosophical jargon. Logic was also important for theology and apologetics.
Until the 1650s, logic is scholastic, centred on the trivium of logic, rhetoric, and grammar. The influence of Humanism, especially Ramism, is visible in the importance of induction, the treatment of method as a branch of logic, the orientation of logic towards practical tasks. Later in the century, alongside Aristotle, the key figures are René Descartes and Francis Bacon. The "old" Aristotelian logic is made compatible with the "new" method for the acquisition of new truths developed from Cartesian and Baconian insights. The reception of Descartes and Bacon has a common root in scholastic empiricism.

Chapter Seven

Logic in seventeenth-century Scottish academic philosophy

Giovanni Gellera

Introduction

The teaching of logic has an important place in the curriculum the seventeenth-century Scottish Faculties of Arts.[1] It can be broadly divided into the pre-1650s period and the post-1650s period, during which 'modern'—that is, for the present purposes, non-scholastic—philosophers are integrated into the curriculum.

Until the 1650s, logic is scholastic, centred on the trivium of logic, rhetoric, and grammar, and especially on Aristotle's *Categories* and *Posterior Analytics*. Underneath the scholastic surface, one can detect the influence of Humanism on the regents' conception of logic, especially Ramism: the importance of induction, the treatment of method as a branch of logic, the orientation of logic towards practical and useful tasks. This latter aspect is characteristic of the Scottish academic philosophy of the period, including ethics and natural philosophy.[2] Though Rudolph Agricola and Pierre de la Ramée appear very rarely in the early seventeenth-century texts, there is a "general accrued baggage of intellectual discourse as shaped by both scholasticism and humanist logic",[3] and a "mixed approach which combines Aristotelian logic with Ramist method."[4]

In the second half of the century, alongside Aristotle the key figures are René Descartes and Lord Francis Bacon.[5] The Aristotelian stress on clear premises and consistence in the

1 As argues Broadie 2009: 87–90, logic has an illustrious history in Scottish philosophy, from the circle of John Mair in the early 16c Paris, to the "lively fashion" in which philosophy continued during the 16c. See Chapter 5 for a survey of 16c Scottish philosophy and the arrival of Humanism.

2 Shepherd 1975: 166–168: "the emphasis was above all on the practical nature of ethics, and its usefulness as a guide to life." See Christian Maurer's chapter in this volume on moral philosophy.

3 Reid 2011: 189.

4 Hutton 2015: 38.

5 Shepherd 1975: 62: "One feels that Descartes and others have been fitted into a framework which is basically Aristotelian."

arguments is enriched with the method for the acquisition of new truths developed from Cartesian and Baconian insights. Towards the end of the century, Bacon's philosophy finds its place within an empiricist interpretation of Descartes. Arguably, the common root here is scholastic empiricism. Though Bacon is chronologically earlier than Descartes, the reception of Cartesianism in the Scottish universities is earlier and more systemic, and it ultimately shapes the reception of Bacon. The regents have a generally compatibilist understanding of the relations between 'old' and 'new' logic, where 'old' is understood in the modern sense of scholastic logic in general, not as in the medieval division of the Aristotelian corpus into *logica vetus* (Isagoges, Categories, On Interpretation) and *logica nova* (Analytics, Topics, On Sophistical Refutations). Like other first-generation Cartesians, such as Johannes Clauberg, the regents propose a *Logica Vetus et Nova*: Aristotelian logic deals with inference and exposition of truth, Cartesian "logic" deals with the acquisition of the material principle of logic: clear and distinct ideas. Arguably, the regents substituted Aristotle's *Topics* with Descartes' analytic method and methodological doubt of *Meditationes I–III*.

To a 17c Scottish regent, logic was preliminary to all other disciplines. In a way, it was secondary only to Latin, studied since child age, and grammar, both necessary for higher studies. Logic was the trait-d'union between natural language (Latin, grammar, classical literature, the Bible) and the technical philosophical jargon. Though not properly a part of philosophy nor a science—logic was considered an *art*—logic is inseparable from philosophy teaching. It was taught during the first year of the four-year curriculum, and in the following years trained in the many hours that the students spent formalising arguments and debating. Rhetoric was integral to this teaching style, and the *Theses philosophicae* themselves are an exercise in the presentation of philosophical views. During the graduation ceremony, the students would publicly debate *pro et contra* a given view to show their eloquence and knowledge. The debate was conducted in strict respect of syllogistic logic. Finally, logic was also important for theology and apologetics. Admittedly less so than the Catholic universities, the Reformed Faculties of Theology praised the importance of logic—hence of philosophy—in the defence of true faith. A seventeenth-century student at a Scottish university would then see, in good scholastic fashion, a strong unity in the education he received from the dual perspective of its Reformed credentials and of the application of logic to all disciplines.

The first part of this paper covers the scholastic, Reformed, and Humanist elements of logic teaching until the 1650s, with focus on the logical dimension of the Doctrine of the Fall, and the theses by Edinburgh regent William King (1612) and Glasgow regent James

Dalrymple (1646). The second part of the paper investigates logic teaching after the 1650s: the influence of Cartesian and Baconian philosophy, and the legacy of the Aristotelian categories of thought. The regents taught a synthesis of Aristotelian logic and the new philosophical method. Considering how little known the Scottish *Theses logicae* are, ample space is given to the original texts.

1. Scholasticism, Humanism, and the Reformation

Logic and the psychology of the doctrine of the Fall

Belief in the corruption of human nature because of the Fall was fundamental in the worldview of a seventeenth-century Scottish regent. When subjected to philosophical scrutiny, the Doctrine of the Fall bears directly on the understanding of the capacities and limits of our intellectual powers. Depending on the definitions we find in the *Theses philosophicae*, logic is the *ars* or the *habitus instrumentalis* which directs and orders our second intentions (the *intentiones secundae*, or concepts, are the proper object of logic and represent the *intentiones primae*, the things) to make good judgments and arguments. The St Salvator regent John Baron writes in 1627: "Logic is the effective habit of the secondary notions, to which the human mind is directed in the acquisition and conservation of the knowledge of things."[6] The regents were aware that logic, though essential, has to do with faulty raw materials and instruments: the external things are obscure to us, and error lurks in the operations of the mind, apprehension, judgment, and discourse.

The discussion of the Fall typically introduces the *Theses logicae*. This belief could find supporting evidence in some scholastic topoi: chiefly the limits of natural reason and philosophy, especially with respect to the higher discipline of theology, and the experience of the fallibility of our judgments. It is not surprising that the regents would take corruption as a psychological fact of our nature and a sensible philosophical principle. The Edinburgh regent William King writes in 1612 that: "The human intellect or reason, especially after the lamentable Fall of man from his primeval integrity, cannot apply itself with certitude and confidence to the ordinate and distinct understanding of things, and cannot judge truth only

[6] Baron 1627: TL I: "Logica est habitus effectivus, secundarum notionum, quibus mens humana dirigitur in acquirenda, et conservanda rerum cognitione." All translations are my own.

with its own powers."[7] Similar views in the Edinburgh regent George Robertson in 1596,[8] and St Leonard regent Jacob Wemyss, who writes in 1612 about "Adam's lamentable fall".[9]

Logic works as a remedy to the Fall. Regent Wemyss argues that, because of the Fall, "the connection of philosophy and the human condition clearly manifests itself, for the former is the end of the latter."[10] St Salvator regent John Ramsay in 1629 claims that the human mind is in an original state of darkness,[11] but also that we drive a desire to philosophy precisely from this state, and quotes Cicero on this matter.[12] The 'original darkness' is the psychological motif behind the desire to put order in our mental states by the use of logic.[13] There is a good Humanist vibe to Ramsay's talk of particles of the divine spark innate in the human mind ("particula divinae aurae hominibus insita"), and to his optimism about logic directing the operations of the mind.[14] In this context, a recurring expression in the *Theses* is "morbis mentis mederi": whoever wants "to cure the disease of the mind" has to teach and direct the mind,[15] and the use of order and method is a necessary condition for such a cure.[16]

Though only occasionally, the regents treat the relationship between logic and theology, and regent Ramsay is uniquely outspoken for the usefulness of philosophy. In theology, many practical terms recur, such as virtue, justice, liberality; likewise, many things in the Psalms, the book of Moses, and Job pertain to astronomy, physics, and geography. Without a solid knowledge of philosophy these terms, and the Scriptures, would not be correctly understood.[17] Ramsay reads an incentive to philosophy in the Apostle Paul's *Letter to Titus*

7 King 1612: TL 1.I: "Intellectus seu Ratio humana, praesertim post flebilem illum hominis lapsum a primaeva sua integritate, non potest sese certo ac fideliter determinare ad rerum naturas ordinate et distincte comprehendendas, veritatemque proprijs virtutibus disjudicandam."

8 Robertson 1596: TP I: "Lapsu flebili, non modo paralysi dissoluti affectus, transuersum acta voluntas, sed & Thebanis sphingibus, Cymmerijs tenebris obtenebrata mens."

9 Wemyss 1612: TL I.2: "flebilem Adami lapsum".

10 Wemyss 1612: TL 2.II: "Hinc tanta refulget Philosophiae cum hominis conditione connexio, ut unius sit utriusque finis."

11 Ramsay 1629: TL I: "Mens humana in tenebris".

12 Ramsay 1629: TL I.1: "*Cicer*. lib. I. offic. innatum scientiae atque adeo Philosophiae desiderium."

13 Beautifully clear, though not motivated by the Fall, is King's College regent John Forbes' psychological justification of logic (Forbes 1624: TL I-VII): from the division of sciences, to the realisation that some things are mental (*entia rationis*), to the need to arrange them in imitation of the order of the external things.

14 Ramsay 1629: TL II.3. See also Fairley (1615): TL XIV: "Certum est lumen intellectuale nostrum".

15 Knox 1605: TL I.1: "Qui morbis mentis mederi velit, oportet doceat, oportet dirigat."

16 Wemyss 1612: TL 7.I: "Ordinis et methodi usus necessario requiritur."

17 Ramsay 1629: TL II.4-5: "quae absque Philosophiae cognitione solide, seu par est explicari nequeunt."

I.9, when he writes that the bishop has to be potent in exhorting the faithful and in arguing against the unfaithful. Neither can be accomplished by a theologian without a philosophical background.[18]

The students of the Scottish universities were taught that logic is necessary to put order to our mental states, originally affected by the Fall. Logic has great scope in both philosophy and theology, and it exemplifies how philosophy is propedeutic to theology. So believed Andrew Melville, in "a clear blend of [...] Ramism and Aristotelianism, working together to give divinity students a firm and logical grounding in the articulation of doctrine."[19] Before Melville, in the circle of John Mair "the logic and philosophy developed by the medieval logicians were theologians' tools."[20] I now turn to the presentation of the core views in logic and of the Humanist and scholastic aspects.

Logic between Humanism and scholasticism

Besides the Reformed doctrine of the Fall, logic teaching follows some identifiable patterns.[21] The regents debate the status of logic as an art or as an instrumental habit,[22] and the related question of whether logic is a part of philosophy.[23] The regents typically interpret the *Categories* as a metaphysical text and basically treat metaphysics in logic.[24] Syllogism and order are typically understood as the two main instruments of logic,[25] in its task to direct the

[18] Ramsay 1629: TL II.7: "quod sane Theologus sine Philosophia ad Graecas Calendas praestabit." Note the pun: *calendes* are in the Roman, not Greek, calendar: "Graecae calendes" means "never".

[19] Reid 2011: 7. Reid argues that Ramus' method was part of the ideological programme to recruit students to radical Presbyterianism (59).

[20] Broadie 2009: 87.

[21] See Reid 2011: 20 and ff. for the outline of the logic curriculum, and chapters 7-8 for the analysis of logical theses until 1625; see Hutton 2015: chapter 2 for a comparison of logic teaching in England and Scotland in the 17c.

[22] Logic is ars: Craig 1599: TL I.; King 1612: TL II-III; Baron 1621: TL 4. Habitus effectivus: Baron 1627: TL I; Habitus directivus: Stevenson 1625: TL I.5; Habitus instrumentarius: Sibbald 1625: TL II.

[23] In favour: Aedie 1616: TL II.3: logic is both an instrument and a part of philosophy "quum manus fabri sit instrumentum simul et pars". Against: Wemyss 1612: TL 7.II; Ramsay 1629: TL II.3; Sibbald 1625: TL I.

[24] Baron 1621: TL 17-24 discusses God, Angels, substance, quantity, place, time, and movement. Similarly, Lunan 1622. On the contrary, the Saumur regent Marc Duncan argues that the *Categories* is only a logic text in Duncan 1610: TL IIII.

[25] Craig 1599: TL 4.I; Baron 1621: TL 6; Baron 1627: TL I.5.

mind.[26] The syllogism is routinely praised as a very useful instrument: only the Edinburgh regent Knox criticizes the syllogism as the offspring of ignorance because the real experts do not need it.[27]

Regent Knox opposes Ramus to the Peripatetics, in one of the rare direct quotations of Ramus (par. 3). Knox probably believed, like most regents, that the syllogism is very apt at presenting a truth, but much less so at discovering one. So the Edinburgh regent James Fairley writes in 1615 that: "experiments and induction are required in order to give assent to whatever first principles".[28] Or St Leonard's regent Jacob Wemyss, who in 1612 gives a psychological reason for the importance of induction: "every argument must proceed from unknown to known [...] Induction is the best instrument for the notification [of ideas], and is most congruous to our nature."[29] It is tempting to conclude that some regents reflected the general shift in early modern philosophy from the *Categories* and *Posterior Analytics* to the practical and epistemological concerns of the *Topics*: hence, from the exposition of an acquired truth, to the acquisition of new truths.[30] The importance of induction, centrality of method treated under logic, clarification of the error of the mind,[31] clarity and simplicity of exposition are all themes plausibly influenced by Ramus' legacy in the Scottish universities via Melville. Different approaches to scholastic and Humanist logic are found in regents William King and James Dalrymple.

William King and James Dalrymple

William King at Edinburgh in the 1610s and James Dalrymple, later First Viscount Stair, in Glasgow in the early 1640s are among the most qualified regents of the seventeenth century. King taught for nearly two decades and authored five sets of theses in 1612, 1616, 1620, 1624, and 1628. Dalrymple was a regent in Glasgow between 1641 and 1647. His early thought is particularly interesting considering his later fame as jurist and natural philosopher, quite an exceptional career with respect to the average regent.

[26] Schewer 1614: TL VI; Fairley 1615: TL I.6.I.

[27] Knox 1605; TL 6. Interestingly, regent Knox is also critical of Ramism: see Reid 2011: 215–216.

[28] Fairley 1615: XIV.4: "ad primum assensum quoruncumque Principiorum requiritur experimentum et inductio".

[29] Wemyss 1612: TL 28 and 28.II: "Omnis argumentatio, a noto ad ignotum debet procedere [...] Inductio instrumentum etiam notificandi aptissimum est, et naturae nostrae congruens."

[30] Losonsky 2006: 171.

[31] Knox 1605: TL 2.

William King's Theses Logicae, 1612

As we have seen above, regent King introduces his theses with the discussion of the Fall and of how our mind wanders in the dark in need of guidance (par. 1.I). Logic is the "queen and leader of the arts" ("artium reginam et dominam", par. 1.II) and defined as "the rule of understanding, and of the direction of the intellect [...] so that the obscurities of our mind be dissipated by the rays of its precepts."[32] There is a clear consequentialist sense of the utility and goal of logic in King: logic is useful because it teaches us to discern truth from falsehood, and because it clarifies what is unclear. Logic is about reasoning (*ratio*) and discourse (*oratio*) (par. III) because it directs how we think as well as how we communicate our thoughts. The adequate object of logic is the mode of knowledge common to all instruments,[33] and its foundation, at once psychological and ontological, is the real operations of the intellect: apprehension, judgment, and discourse. The diverse parts of logic correspond to these distinct operations of the mind. The two main instruments of logic are *syllogismus* and *ordo* (par. 3.I). 'Order' is defined as "the disposition of prior and posterior things for a more distinct and easy understanding."[34] By nature, we assent more easily to things which are presented in a clear way. The first four paragraphs of King's theses seem to bear the influence of Ramism (though Ramus is never mentioned) in the stress on clarity, usefulness, order, method, presentation of truth, and the attention to the psychological aspect of assent.

The rest of the theses treat the following topics, not always with a clear connection with logic per se: second notions, as in similitude with the things (par. 7), *actio* (par. 8), *essentia* (par. 10) where King seems to hold that metaphysical and logical predicaments are the same (par. 10.IIII), quantity and accidents (par. 11), a reductionist account of *relatio* (par. 14), a representationalist view of *voces* (par. 17), truth (par. 19), which King defines as the "conformity of the thing understood and the intellect, or words" ("conformitate rei intellectae, et intellectus seu vocis"). Paragraph 24 goes back to the initial methodological remarks: we ought to infer in a careful way because the principles are more evident than the conclusions, and because "evidence is the cause of certainty". King does not structure his theses as a commentary to Aristotle: there is no direct treatment of the *Categories*, *Isagoges*, or *Analytics*, and of the syllogism and the predicables. King's main preoccupations are the

[32] King 1612: TL 1.III: "Logica ars, ac regula intelligendi, ad intellectum dirigendum [...] suis preceptorum radijs mentis nostrae nebulas discutiat."

[33] King 1612: 3.III: "modus sciendi omnibus instrumentis communis".

[34] King 1612: 4.I: "priora cum posterioribus ad distinctiorem, facilioremque nostra cognitionem disponere."

importance of logic for the Reformed faith, the clarity and usefulness of the right method in philosophy, and an ontology vaguely inspired to a metaphysical interpretation of Aristotle's *Categories*.

James Dalrymple's Theses Logicae, 1646

James Dalrymple stands out as a rather original regent. His theses suggest that in the 1640s some news of modern philosophy must have reached Glasgow. It is regrettable that no other theses have survived from the same period in Glasgow, though it seems fair to assume that Dalrymple's stature surpassed that of his colleagues.

Dalrymple seems to hold that some content of our mind is innate in his talk of *ennoia* and *dianoia* (par. II): this is not strictly speaking a scholastic view and it might have been influenced by some versions of Stoicism, Platonism, or perhaps early Cartesianism. Logic is an art and it is said, somehow circularly, that: "the whole art, in the realisation of the object, inclines to the proposed idea according to the precise imitation of the precepts of the art."[35] What does the art of logic do? It provides the very short and certain rules for categorisations, definitions, and enunciations. Dalrymple invokes logic as the "clearest, shortest, and easiest" of all disciplines ("clarissima, brevissima, et facillima", par. XI). He conceives logic not as a complex system of rules, inferences, ontological interpretations of the predicables and categories, and a discipline with ramifications in dialectics and rhetoric; rather, as a lean, practical set of rules for thinking clearly. The practical dimension of logic is exemplified in the division in paragraph IX. There, the arts in general are said to be invented to make up for our (physical) shortcomings: some pertain to the external body (the mechanical arts) and some others to the mind, and are called liberal, chiefly logic. It is a tantalisingly Baconian passage, though no reference to Bacon is made.

Dalrymple takes side in the old scholastic, as well as modern, debate on the enumeration of the categories. In Paragraph XVI he writes that it does not matter whether the categories are ten, twelve, or six, because what matters is their psychological grounding: our need to put an order to "the indistinct multiplicity of things" ("rerum indistinctam multiplicitatem"). Our nature is such that we learn better step by step than all at once (par. XXIV). He then concludes with some interesting remarks on method: "Method lies undeservedly neglected amidst the tools of logic. Although it only just yields to the syllogism, method by far

[35] Dalrymple 1646: TL V: "Ars in objecti effectionem propositam Ideam secundum praecepta Artis praecise imitando tota propendit."

surpasses all the other instruments [of logic] in light of the nobility and utility of its service."[36] Method's main service is to facilitate the process of learning by providing cohesion and order, hence it is the source of memory ("methodus ergo est Mater memoriae", par. XLVI).

King 1612 and Dalrymple 1646 show a similar interest, of Ramist influence, in the treatment of method in logic. Dalrymple seems to strike more modern notes than King, which remind us of Descartes' *Discours de la méthode*.

The Theses as an example of philosophical texts

Logic includes rhetoric, and the *Theses philosophicae* are an example of what the regents considered as a proper philosophical text. The *Theses* do not aim at comprehensiveness in the way essays and dictates do, yet "they contain more advanced views than were being voiced in the dictates"[37] because of their dual nature as a public pronouncement by the regents and of examination text for the students.

Humanist influence is visible in the outlook of the *Theses.* The *Theses* vary in style. They are usually structured with a main thesis [I, II, ...], followed by sub-theses [1, 2, ...] with a clarificatory aim and a more or less evident deductive chain. It can be a direct citation of Aristotle, or a philosophical proposition. Occasionally short treatises are included (as in Lundie, 1627), and the lists of the questions that the students will discuss (as in Ramsay 1629). Quite interesting are the attempts to, in all likelihood, apply some Ramist principles in the use of graphics for the clarification of concepts. A good example is found in the *Theses* of 1605 by Edinburgh regent Knox. The main thesis (TL II) is the now familiar view that our mind is riddle with errors in its first operations. Sub-thesis 2 (par. II.2) states that the instruments of logic serve the investigation of truth, the enlightening of obscurity, and the provision of order in knowledge. Sub-thesis 3 splits into two sub-paragraphs, visually arranged into two opposite columns. Paragraphs II.3–4–5 discuss logic vis-a-vis philosophy, while paragraphs II. 3*–4*–5* discuss logic vis-a-vis theology. The regent then presents two different arguments. In philosophy, no logic is perfect, and neither Plato's nor Aristotle's opinion is evidence of truth. In theology, logic is supremely useful because it teaches against

[36] Dalrymple 1646: TL XLV: "Methodus inter Instrumenta Logica immerito neglecta jacet, quae vix syllogismo cedit, reliquisque omnibus longe supereminet, pro nobilitate et utilitate offici sui."

[37] Shepherd 1975: 62.

errors, and theological errors are impious and dangerous. Nevertheless, it is ultimately arrogant to ask whether theology can be treated with logic.[38]

2. Logic and modern philosophy

The critique of scholastic logic

Part of the rhetoric of the new philosophy was the critique of scholasticism as pointlessly complex, excessively verbal, and detrimental to good philosophy. The regents are no exception. Before the enthusiasm for the new philosophy of Descartes, which gains popularity in the 1670s, the critique of scholastic logic targets two specific debates: whether logic is an art, a science, or an instrumental habit, and the enumeration of the predicables and categories. The Marischal College Alexander White in 1657 complains of the numerous lists of predicables (par. 6). His colleague George Meldrum in 1659 writes that the debates on the definition of logic are quarrels about words ("de voce litigia", par. I) and that the number of categories is decided by each philosopher ("pro opponentis arbitrio", par. 5). The St Salvator's regent William Campbell in 1657 writes that logic is propedeutic to philosophy and gives a traditional definition of it; yet, quite uniquely, he argues that "to the greater benefit of the students, and less labour for the teacher" metaphysics, arithmetic, and geometry ought to be studied before logic, and that logic is included in these disciplines, when the correct method is applied. Consequently, he is the only regent who does not treat logic at all: "We shall discuss no logical theses."[39]

The declining consideration for scholasticism is inversely proportional to the status of the Jesuits as the regents' polemical targets. St Leonard's regent William Sanders attacks the Jesuits, especially in natural philosophy, for the "violence" they did to philosophy. He claims that the traditional role of logic as the gateway to philosophy is in tatters because of the futile questions and poor achievements of scholastic logic: logic has become an obstacle to learning (par. I). Logic needs to be restored with the elimination of strange topics and the detection of prejudices thanks to the use of right reason, "so that we are set free from the confusion and obscurity of our perceptions, the error and doubt in our judgments, and the weakness of our

[38] Knox 1605: II.3–5. See also Stevenson 1625; 1629.

[39] Campbell 1657: Theses proemiales II: "Nullas itaque Theses logicas ponimus."

memory."[40] The right application of this new logic would bring about a "massacre of Jesuit philosophy".[41]

The antischolastic verve of the regents did not lose momentum later in the century. King's College regent George Skene attacks the scholastic "laughable division of termini" and the enumerations of predicables "which are two, five, or five-hundred", and which ultimately rest on the philosopher's fancy.[42] The Edinburgh regent Robert Lidderdale writes in 1685 that the Peripatetics left logic in a lamentable state, burdened with empty questions about its genus and end, object, status, name, usefulness, mental beings, universals, and the number of the categories.[43] The three operations of the mind and the syllogism aside, this list tellingly includes all the main topics of logic teaching early in the century.

The regents do not defect in irony in their polemics either. The Edinburgh regent Herbert Kennedy opens his 1686 theses with the following words: "huge volumes swarm with useless questions repeated to the reader's nausea [...] in which one cannot hear anything but *formaliter et subjective*, *primo et secundo intentionaliter*, *akrizas, paxulas, kai aitidikrimonias*; these monstrous words are better suited for an exorcism than for a school."[44] Indeed, rhetoric is not missing in the *Theses*. Let us now look at the regents' solution to all of logic's faults: Descartes's method.

Logic as method: Descartes and Bacon

The regents put a strong accent on the practical conception of logic already in the first half of the century. Logic's task is to direct the mind, clarify error, order our thoughts and language. This is the meaning they attach to the scholastic definitions of logic as *ars* or *habitus instrumentalis*. Some regents talk of induction as the right method in philosophy, and in general Ramist methodological concerns seem to occupy them as much as the treatment of

40 Sanders 1674: I: "ut a confusione et obscuritate Perceptionum, errore et dubitatione Judiciorum, ac oblivione Memoriae liberemur." From the 1670s the theses are not anymore arranged per discipline: the reference thus changes from, e.g. 'Logical theses par. I' to simply 'paragraph I'.

41 Sanders 1674: II: "Vah quanta definitionum strages in Philosophia Jesuitica committeretur, si rite haec regula colatur!"

42 Skene 1688: V.4 and V.5: "Duo sunt, quinque, aut quingenta."

43 Lidderdale 1685: IV. The scholastics have left behind them a "horridum Logicae desertum".

44 Kennedy 1686: I: "ingentia volumina scatent inutilibus et ad nauseam usque repetitis quaestionibus [...] Ubi nihil audiri potest, praeter *formaliter et subjective*, *primo et secundo intentionaliter*, *akrizas, paxulas, kai aitidikrimonias*; ac istiusmodi vocum monstra, Exorcismis quam scholis aptiora."

the predicables, categories, and syllogism. It seems that the mixed scholastico/Humanist logic of the first half of the century was ready for the reception of Descartes' new method of discovery. From the 1670s, the accent is on acquisition of truth, scepticism, avoidance of error, epistemology of certitude and belief. The main themes are: 1) the Cartesian co-implication of the formal and material aspects of method: the new method delivers the new metaphysics of Descartes; 2) the importance of belief in judgment; and 3) Baconian induction.

Cartesian method

Whereas the old scholastic logic delivered endless debates, the new method is simple, self-evident (something hoped by Dalrymple in 1646), and univocal in its deliverance: the Cartesian Cogito, substance dualism of mind and matter, the existence of God, all follow from the right application of method. This connection between method and a specific metaphysics is common in the *Theses*. The right method clears the mind of the obstacles to knowledge, so the mind can obtain the true perceptions which, if correctly understood and arranged, produce knowledge of the external things.

Regent Sanders in 1674, among the first regents to teach Descartes' metaphysics, writes that the new logic finally provides instructions on how to obtain the sought-after "clarity in perceptions" ("perceptionum perspicuitas") which is needed to form true and certain judgments on things (par. III). The Aristotelians might reply that this is precisely the goal of the *Topics*, although the scholastics seem to have been overall negligent with this book.[45] The Humanists might argue, in their own right, that the regents (and Descartes) took this approach from Rudolph Agricola and Pierre de la Ramée; this is probably correct, though a direct influence on the Scottish sources is difficult to prove. It is fair to say that the regents subscribed to a widespread assumption in modern philosophy: that our knowledge has to be rebuilt on solid foundations. Hence "cum Cartesio dubitare" is the gateway to avoiding mistakes and prejudices, to the suspension of judgment, and to obtaining clear and distinct perceptions.[46]

[45] Gaukroger 2006: 160: "Aristotle's original method of discovery, the topics, became lost [...] and his method of demonstration—syllogistic—came to be construed as method per se."

[46] These points are very common in the *Theses*, for example: Sanders 1674: III; Cockburn 1675: I and III; Middleton 1675: IV; Grant 1676: I; Lidderdale 1685: IV, More 1699: II.

The Edinburgh regent MacMurdo in 1682 seals the connection of logic and the principle of clear and distinct ideas: "Since Logic is the art of using well our reason in the acquisition of knowledge [...] if we follow it well we can only accept as true [the principle] that what has been thought of in a certain and evident way, is true."[47] The new method seems to reinforce the psychological dimension of the scholastic tripartition ("trina operatio") of apprehension, judgment, and discourse. The mind works in three stages in order to produce knowledge but also, the simplicity of the new method reflects some important psychological facts about the mind: that "the mind naturally moves from the few to the many, from simple to composite things, and from awareness of particulars to the knowledge of universals."[48] Hence, two considerations arise: the reliability of such perceptions, and the status of induction.

Perceptions and belief[49]

Regent Dalrymple in 1646 discussed certainty in these terms: "Certainty does not belong to the first utterance, rather to judgment and assent."[50] He had in mind the scholastic tripartition of apprehension, judgment, and discourse and the view that truth (and falsehood) are the product of a complex act of the mind which reflects upon itself and judges the correspondence of the thing represented in the mind and the mental act. Truth is not obtained directly in perception or in first utterances. The Marischal College regent Robert Forbes emended this view in 1660: "Simple apprehension if the first operation of the intellect. It has two aspects, one complex, the other not. Truth is in both, falsehood in neither."[51] The view gains popularity in the latter part of the century, in regent Skene for example: "There is some truth in simple apprehension, but not falsehood; in fact, it is but a bare representation."[52] Skene adds a crucial aspect to Forbes' view: the deliverance of truth is justified by a direct

[47] MacMurdo 1682: I: "Cum Logica sit Ars bene utendi ratione in rerum cognitione acquirenda [...] si eam rite sequamur nihil ut quam tanquam verum admittemus, nisi quod certo et evidenter verum esse cognitum fuerit."

[48] MacMurdo 1682: VI: "Mens naturaliter fertur a paucis ad multa, a simplicibus ad composita, et a particularium notitia, ad universalium cognitionem."

[49] I have treated this theme elsewhere in relation with the Scottish Common Sense view of perception: Gellera 2018.

[50] Dalrymple 1646: TL XXX: "Certitudo non inest primo enunciatum, sed judicio et assensui."

[51] Forbes 1660: TL IX: "Apprehensio simplex est intellectus operatio prima. Estque duplex, una incomplexa, complexa altera. Utrique inest veritas, falsitas neutri."

[52] Skene 1688: V.7: "In apprehensione simplici datur veritas aliqua, falsitas non item; ea namque repraesentatio nuda est."

realist account of apprehension. Coherent with this view is that the mind produces a sort of judgment already at the perception level, as in King's College regent Alexander More in 1695: "Bare and simple *Perception* intimately coheres with *Judgment*; so that a *Judgment* corresponds to each perception."[53]

It is now clearer how the new Cartesian method and logic interact, and how Reformed concerns about the natural corruption of the mind are answered by the new philosophy. Within a direct realist framework of scholastic origin, Cartesian method helps purge the mind of all the obstacles to knowledge (prejudices, hallucinations, errors): the mind is finally equipped to philosophize, and its perceptions become intrinsically reliable. This content is later arranged in scientific order with the instruments provided by traditional scholastic logic: namely, the syllogism. We will see this point below in the discussion of the Aristotelian legacy. In the mind of the regents, Cartesian method helps achieve the desired goal of logic vis-à-vis the Doctrine of the Fall: a clear path towards amending our corrupt faculties.[54]

Bacon and induction

Some of the considerations made by the regents in the early seventeenth century about prejudices and error, the simplification of logic, induction, and the critique of syllogism, have a Baconian ring. Bacon is never mentioned in the early theses, and he himself followed in the wake of Humanists before him, such as Agricola and Ramus. Only in the 1680s one finds an explicit reception of Bacon, within the now established Cartesianism of the philosophy curriculum.

Descartes and Bacon are occasionally pitched against one another as masters of method, and the regents argue for their favourite. Marischal College regent Robert Keith in 1687 ignores Bacon and praises Descartes for freeing us from infancy prejudices, whereas his colleague at Marischal George Peacock is a convinced supporter of Bacon. In 1689, he opens his *Theses* with a remark on induction:

> "the noble *Bacon* who with a heroic attempt approached a new way, and in his new organ or logic set out to himself to [discover] the signs of nature which convince the

[53] More 1695: IV: "Nuda ac simplicis *Perceptio*, intime cum *Iudicio* cohaeret; ita cum suum cuique perceptioni respondere possit *Judicium*."

[54] The regents regard Cartesianism as coherent with the Reformed faith : see my chapter on Reformed scholastic philosophy, part 5, in this volume. On the relationship between doctrines of the fall and empirical method and experimentalism, see Harrison 2007.

> mind, and to demonstrate them non syllogistically, in the fashion of the common logic, but with the most severe induction."[55]

Peacock later compares Descartes and Bacon and declares that the former has imitated the latter and that he betrayed the fundamental empiricism and practical orientation of Bacon's logic.[56] In 1693, George Peacock further describes his idea of induction: "to form a universal judgment from several experiments and examples, which are usually called *Instances*", and adds an account of the instances from Bacon's *Novum Organon*.[57]

Earlier in the century, the Saumur Scottish regent Marc Duncan succinctly tied the praise of induction and trust in the senses (direct realism): "Induction depends on the senses and experience, likewise demonstration depends on induction. Hence, it follows first that all human science comes from the senses: second, that the senses do not deceive us."[58] Before Bacon, Duncan puts the Aristotelian trust in the senses and induction at the core of philosophy. These long-established themes echoed in the Scottish reception of Descartes and Bacon.

One area in which the regents do not follow Bacon (nor Descartes) is the syllogistic theory. They believe that the new logic of discovery, be it inductive with Bacon or methodologically sceptical with Descartes, replaced Aristotle's *Topics* and that it is, just like the *Topics*, complementary to the syllogism.

Logica nova and logica vetus: the syllogism

The regents have an overall compatibilist view on the relations between old and new logic. The critiques to scholastic logic we have seen above are typically about the degeneration of logic, of the diversion from its main goal, not about logic per se. In the path from the scholastic predicables and categories to the Cartesian clear and distinct ideas, the regents did not discard the whole old logic with the dirty water. In addition to the continuities (the

[55] Peacock 1689: I: "nobilis *Verul:* qui ausu heroico novam tentare viam est aggressus, in cujus novo organo seu logica, pro scopo sibi proponit [invenire] indicationes operum naturae quae mentem convincunt, et in ordine demonstrandi non uti syllogismo, sicut ac in Logica vulgari, sed inductione idque castigatissima."

[56] Peacock 1689: I: "auxilia a rebus ad perficiendum intellectum".

[57] Peacock 1693: IV.: "Praecipuus inductionis usus est, ut ex variis experimentis vel exemplis, quae *Instantiae* solent appellari, judicium formetur universale."

[58] Duncan 1610 : TL XXXI : "Inductio nititur sensu et experientia, sicut demonstratio inductione. Hinc liquet primo, omnem scientiam humanam esse a sensu: deinde, sensus non esse falsos nuncios."

clarificatory and methodological aspects of logic, and the inductive method), the "Aristotelian" syllogism stands out in the late seventeenth-century *Theses* as a necessary logical component in the unfolding of the new science. Aristotle himself is saved from the attacks otherwise lent to the Peripatetics and scholastics together.

King's College regent George Fraser in 1695 openly defends Aristotelian logic with the distinction between theory and its misuse: "there are many positive things in Aristotle's logic, and if some abuse of it, the faculty is not to blame, rather the perversity of those who use it: once it is cleansed of empty and useless subtleties, logic guides everything."[59] St Leonard's College regent Alexander Grant in 1676 praises the usefulness of the syllogism: "since the simple representation of a thing, or the comparison of ideas, is not enough for the perfection of knowledge and the exchange between people, the mind steps in with [the faculty of] discourse, insofar as it progresses from one thing to the other; discourse of which the syllogistic construct is the most perfect example."[60] According to Grant, those who denigrate Aristotle's syllogistic theory waste their time. Twenty years later, George Fraser makes the same point almost word for word.[61]

The remark made by regents Grant and Fraser bear a distant resemblance with later Enlightenment views of the utility of philosophy and the intrinsic sociability of the philosopher. Although the regents' remark occurs in the dry discussion of syllogistic theory, admittedly removed from everyday life, it further confirms a general impression about Scottish academic logic teaching. It is marked by a strong practical connotation: logic has to be useful, and what is more useful than an art which dispels mistakes, and clarifies thoughts and speech? One of logic's uses is in the community of people, where a better verbal communication makes a better society. There is a fundamentally Humanist attitude, arguably

[59] Fraser 1695: III: "permulta sunt bonae frugis, in *Aristotelis* Logica, et quod aliqui ea abutantur, facultas ipsa culpabilis non est, sed ea male utentium perversitas: depurgatis enim inaniis et inutilibus argutiis, conducit universa."

[60] Grant 1676: IV: "Cum enim ad cognitionis perfectionem et mutuum mortalium consortium, non sufficit simplex et rei repraesentatio, vel idearum comparatio, mens in subsidium advocat discursum, quatenus ab uno ad aliud progressum facit; cujus perfectissima species est fabrica syllogistica."

[61] Fraser 1695: V: "Simplex rei repraesentatio, vel idearum comparatio, non sufficit ad cognitionis perfectionem, et mutuum mortalium consortium, quare mens in subsidium advocat *Discursum*."

of Ramist origin, behind this conception of logic as an ultimately *useful* and *practical* discipline.[62]

Conclusion

Throughout the century, the regents put the *utilitas* of logic at the centre. In the first half of the century, logic teaching is about Aristotle (especially the *Categories* and *Posterior Analytics*) but with decisive Humanist and Reformed influences. Humanism is felt, rather than declared: the regents make no explicit references, but the themes of *utilitas*, method, induction, clarity and simplicity in logic, bear the mark of the new spirit of Humanist logic, as in Rudolph Agricola, Pierre de la Ramée, and his dissemination in Scotland via Andrew Melville. The complex technical scholastic disquisitions seem to be a thing of the past. The influence of the Reformation is visible in the discussion of the Doctrine of the Fall. Logic's task is to correct our concepts, dispel error, and guide our reasoning. *Ordo et syllogismus* are the two principal instruments of the logician, and the regents perceived a strong coherence between Humanism and certain Reformed themes.

In the second half of the century, logic's *utilitas* remains at the centre of the new, modern logic. It is best experienced in the philosophical method of Cartesian origin: to combat infancy prejudices, to obtain clear and distinct perceptions, and to guarantee our inferences from particular to universal. Some regents, both before and after 1650, show great confidence in induction, but Francis Bacon only appears in the late 1680s, for example in the Aberdeen regent George Peacock. The regents do not take up two controversial aspects of the new philosophical method: the Cartesian view of mathematics as the paradigmatic science, and the Baconian and Cartesian critiques of the syllogism. Only occasionally is mathematics covered in the *Theses* although it was part of the curriculum and chairs in mathematics were being set up in Scotland at that time. The regents are compatibilist: the new logic of discovery has replaced the old *Topics*, but science still has to be delivered syllogistically. *Methodus et syllogismus*.

The teaching of logic highlights a general trend in Scottish academic philosophy teaching: the extent in which the regents understood the diverse philosophical disciplines as defined by their final cause. Respectively, logic is introductory to philosophy and, for some regents, to theology as well. It seeks clarity, simplicity, and guidance for natural reason. Moral

[62] Reid 2011: 58: "Ramist logic was the 'universal skeleton key' that gave students destined to work as priests, civil servants and teachers the skills they needed for careers in public life."

philosophy teaches us what a happy life is, in an intrinsic social dimension. Natural philosophy is the understanding of the natural world, and of the greater divine design revealed in nature. In this sense, the teaching of logic, and of philosophy in general, in the seventeenth-century Scottish universities is deeply Humanist, even when it presents a scholastic appearance. At issue here is a broad understanding of Humanism, one which brings together Andrew Melville, who used it to teach and propagate the Reformed faith more effectively, Pierre de la Ramée, whose anti-Aristotelianism directed the mind towards rhetoric and practical concerns, René Descartes and Francis Bacon, who sought to rebuild philosophy on more solid grounds. The history of logic teaching in the seventeenth-century Scottish universities is the collective unfolding of these three intertwined elements against the backdrop of Reformed scholasticism.

Bibliography

Aedie, A. (1616). *Theses philosophicae*. Aberdeen: Marischal College.

Baron, J. (1627). *Theses aliquot philosophicae*. Edinburgh: St Salvator's College.

Baron, R. (1621). *Positiones et Disputationes aliquot Philosophicae*. St Andrews: St Salvator's College.

Broadie, A. (2009). *A History of Scottish Philosophy*. Edinburgh: Edinburgh University Press.

Campbell, W. (1657). *Theses philosophicae*. Edinburgh: St Salvator's College.

Cockburn, A. (1675). *Theses philosophicae*. Edinburgh: St Leonard's College.

Craig, W. (1599). *Theses philosophicae*. Edinburgh: University of Edinburgh.

Dalrymple, J. (1646). *Theses logicae, metaphysicae, physicae, mathematicae, et ethicae*. Glasgow: University of Glasgow.

Duncan, M. (1610). *Theses ex Logiciis et Ethiciis Selectae*. Saumur: Academy of Saumur.

Fairley, J. (1615). *Theses philosophicae*. Edinburgh: University of Edinburgh.

Forbes, J. (1624). *Theses philosophicae*. Aberdeen: King's College.

Forbes, R. (1660). *Theses philosophicae*. Aberdeen: Marischal College.

Fraser. G. (1695). *Theses philosophicae*. Aberdeen: King's College.

Gaukroger, S. (2006). *The Emergence of a Scientific Culture*. Oxford: Oxford University Press.

Gellera, G. (2018). Common Sense and Ideal Theory in seventeenth-century Scottish philosophy. In Bow, C. B. (ed.), *Common Sense in the Scottish Enlightenment* (19–36). Oxford University Press.

Grant, A. (1676). *Theses hasce ac observationes Philosophicas*. Edinburgh: St Leonard's College.

Harrison, P. (2007). *The Fall of Man and the Foundations of Science*. Cambridge: Cambridge University Press.

Hutton, S. (2015). *British Philosophy in the Seventeenth Century*. Oxford: Oxford University Press.

Keith, R. (1687). *Theses philosophicae*. Aberdeen: Marischal College.

Kennedy, H. (1686). *Theses hasce philosophicas*. Edinburgh: University of Edinburgh.

King, W. (1612). *Theses philosophicae*. Edinburgh: University of Edinburgh.

Knox, J. (1605). *Theses philosophicae*. Edinburgh: University of Edinburgh.

Lidderdale, R. (1685). *Theses hasce philosophicas*. Edinburgh: University of Edinburgh.

Losonsky, M. (2006). Language and Logic. In D. Rutherford (ed.), *The Cambridge Companion to Early Modern Philosophy* (170–197). Cambridge: Cambridge University Press.

Lunan, A. (1622). *Theses philosophicae.* Aberdeen: King's College.

Lundie, J. (1627). *Positiones aliquot logicae & philosophicae.* Aberdeen: King's College.

MacMurdo, G. (1682). *Theses hasce suas philosophicas*. Edinburgh: University of Edinburgh.

Meldrum. G. (1659). *Theses philosophicae.* Aberdeen: Marischal College.

Middleton, G. (1675). *Theses philosophicae.* Aberdeen: King's College.

More, A. (1695). *Theses philosophicae*. Aberdeen: Marischal College.

More, A. (1699). *Theses philosophicae*. Aberdeen: Marischal College.

Peacock, G. (1689). *Theses philosophicae.* Aberdeen: Marischal College.

Peacock, G. (1693). *Theses philosophicae.* Aberdeen: Marischal College.

Ramsay, J. (1629). *Decermina quaedam Philosophica*. Edinburgh: St Salvator's College.

Reid, S. J. (2011). *Humanism and Calvinism. Andrew Melville and the Universities of Scotland, 1560–1625*. Farnham-Burlington: Ashgate.

Robertson, G. (1596). *Theses philosophicae*. Edinburgh: University of Edinburgh.

Sanders, W. (1674). *Theses philosophicae.* Glasgow: St Leonard's College.

Schewer, J. (1614). *Theses logicae, ethicae, physicae.* Edinburgh: St Salvator's College.

Shepherd, C. M. (1975). *Philosophy and Science in the Arts Curriculum of the Scottish Universities in the 17c century*. Doctoral dissertation, University of Edinburgh.

Sibbald, J. (1625). *Theses philosophicae*. Aberdeen: Marischal College.

Skene, G. (1688). *Positiones aliquot philosophicae*. Aberdeen: King's College.

Stevenson, A. (1625). *Theses philosophicae*. Edinburgh: University of Edinburgh.

Stevenson, A. (1629). *Theses philosophicae*. Edinburgh: University of Edinburgh.

Wemyss, J. (1612). *Theses philosophicae*. Edinburgh: St Leonard's College.

White, A. (1657). *Theses philosophicae*. Aberdeen: Marischal College.