Logic in the Islamic Legacy: A General Overview

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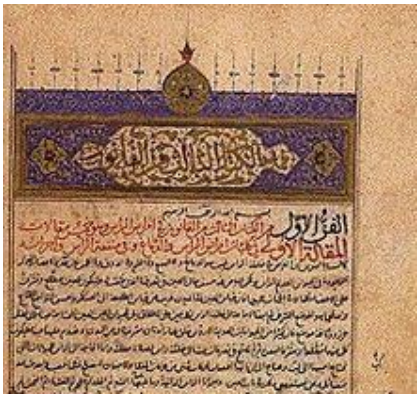

A text by Avicenna (Ibn Sina)

Table of Contents

In this lecture I traverse the following:

-A prelude with reference to Greek logic and the early encounter of Muslims with the Greek logic

-The Aristotelian Proponents: Al Farabi and Averoes (Ibn Rushd)

-The Middle path: Al Gazali

-The Post Aristotelianism: Avicena (Ibn Sina)

-The Anti Greek Logic: Ibn Taimyyah

-Logic-related issues

-Concluding Remarks

Logic: A brief overview

Logic is the discipline of valid reasoning, inference and demonstration. While many cultures have employed systems of reasoning, and logical methods are evident in all human thought, logic descending from the Greek tradition, particularly Aristotelian logic, impacted more on and was further developed by Islamic logicians from the 8th till 14th centuries.

"*Mantiq*" is the Arabic equivalent of "logic". It points to the practice of defending the tenets of Islam through rational argument.

The Beginnings

The study of *mantiq* was initially part of the foreign disciplines, and only in the twelfth century was it was accepted as an essential preliminary to a Muslim education. The other essential elements were the Islamic disciplines which prepared a scholar to read the Koran and Traditions, and to extract from them theological and legal doctrines. One such discipline was the etiquette of debate in which pragmatic arrangements stipulated for a debate about legal principles were extended to serve as rules for any kind of debate at all; it was to be replaced by dialectic by the fourteenth century. Certain other Islamic disciplines deal with language-related questions.

Muslim interest in *Mantiq* and philosophy started in the Abbasid Caliphate (750-1258), approximately two centuries after the advent of Islam. In the Prophetic and Rashidin era (the early few decades of Islam) *Mantiq* philosophy were almost unknown for different reasons. It was the 'nation building' era. The proximity to the Prophet's times and the fresh understanding of the religion which was not influenced by the inter-cultural encounters with other nations raised no need for philosophy. In the Ummayyad era which succeeded the Rashidin Caliphate philosophy and *Mantiq* were the business of non Muslims of the newly incorporated countries such as Syria.

According to Ibn Khuldun's theory of associating prosperity of science with urbanization early Muslims did not show interest in the sciences of old nations as those Muslims were not urbanized yet. When the Islamic State was firmly established and became prosperous they turned their attention to those sciences. The cumulative nature of knowledge and the emergence of Islamic schools of thought and sects contributed to the spread of logic and philosophy as tools to be employed by different groups albeit within the framework of Islam.

The schism which erupted between the intellectual leadership and the political leadership, and the big schism between Islamic sects (in particular Shiaites and Sunni Muslims) led each party to draw upon the Koran and Hadith (Prophet's Tradition), employ exegesis and manipulate human interpretations in ways that were not known during the time of the Prophet and the Rashidin Caliphs. This coincided with the intercultural encounter between Muslims and other nations particularly those which represented the most important centers of earlier civilizations prior to be incorporated within the Islamic civilizational orbit. These cultures were introduced into the controversy.

The Abbasid Caliphate witnessed arousing passion for philosophy among the ruling elite and Muslim scholars. Philosophy, besides that, continued as a business for non Muslims. For Muslims it was meant to be employed in the intra-and-inter religious dialogue and debate.

The above developments ushered in the translation movement which aimed to introduce those cultures particularly the Greek philosophy into Arabic. The beginning was with the Syriac decoctions of philosophy then the Aristotelian texts and commentaries. The translation movement continued to pick up momentum through the 9th century and by the 830s a circle of translators were closely coordinated around Al Kindi (d. 870) who

produced a short overview of the whole Organon and members of his circle produced an epitome of and commentary on the Categories; an epitome of On Interpretation; a version of the Sophisticated Fallacies; and probably an early translation of the Rhetoric. The great Syriac Christian translators Hunayn ibn Ishâq (d. 873) and his son Ishâq ibn Hunayn (d. 910) began to produce integral translations of complete works from the Organon, generally by way of Syriac translations. They translated the Categories, On Interpretation, Prior Analytics and Posterior Analytics. Ishâq provided revised translations of the Topics and the Rhetoric.

The Aristotelian Expositors

Al-farabi

Al-farabi was the outstanding contributor to the Aristotelian project, though not as a translator. Al farabi claimed that logic was indispensable for analyzing the argument-forms used in jurisprudence and theology, a claim that was to be taken up a century later by Abu Hamid al-Ghazali (d. 1111), thereby introducing the study of logic into the madrasa. To support his claim, Alfarabi wrote The Short Treatise on Reasoning in the Way of the Theologians …in which he interpreted the arguments of the theologians and the analogies (qiyâsât) of the jurists as logical syllogisms in accordance with the doctrines of the ancients.

Maybe Alfarabi is the first truly independent thinker in Arabic logic, a fact commemorated by bestowing upon him 'the Second Teacher' (after Aristotle). Al farabi was the first Muslim to bring Greek thinking closer to Islamic understanding, which, then pivoted around the codification and clarification of Qur'anic expression. al-Fiarabi was first and foremost a commentator of Aristotelian texts; his commentary on Aristotle's Organon served as the work of reference for other Muslim scholars. His work, however, went further in analogical reasoning to produce unique ideas not present in the Aristotelian original, and was dedicated to the inclusion of analogical inferences (transference). AI-FarabI's original contribution to analogical inference lay in his systematization of inductive reasoning under the rubric of the categorical syllogism. His intent was to raise the strength of analogy to that of a first order Aristotelian syllogism, i.e. a syllogism which does not deviate from the Greek rendering of two premises, a middle term, and the production of new knowledge which in turn may serve as a premise for further inferences. Drawing general or universal conclusions from premises generated by the scientific study of experience bodes well with the analogical framework of likewise generating general conclusions from particular instances of human experience-foreshadowing the methods of induction not yet fully developed in Western philosophical history. This commensurability between the formal syllogism and analogy is defended by al-Farabl when he uses what he calls "inference by transfer" or, as he notes of the mutakallimiln, "inference from evidence to the absent", or, as Kant would have it, from the phenomenal to the noumenal realms. The act of transference requires that the syllogism have a middle term, what analogy calls similarity. AI-Farabi further contends that, "if we are determined to have the 'transfer' be correct it is necessary that the 'matter' which is similar in the two compared objects be investigated. He presents a case depicting the (evident) createdness of animals or plants with the (absent) notion of createdness in the sky and the stars, and sets out to establish not only a middle term that denotes similarity, but one which also speaks of relevance. If both similarity and relevance obtain, then analogical inference takes on the form and strength of a first order syllogism, and a causal connection is established.

However, problems still arise when similarity might appear to obtain, but, in fact, does not. When this happens, analogical reasoning contains at

least one faulty premise that has not been detected by those forwarding an analogical argument. AI-Farabi refers to this distinction as the method of "raising" whereby conclusions are raised but do not obtain upon further logical investigation. However, leaving room for a legitimate analogy, al-Farabi then speaks of the method of "finding". 'Simply stated, al-Farabl reminds the reader that, "if one establishes a judgment by 'raising' it does not necessarily result that when one' finds' this thing (which is 'raised') one will 'find" the judgment (to be true); rather it is the converse of this that is necessitated, namely if one 'finds' the judgment, one 'finds' (also) the thing (in question)". In this sense, al-Farabi anticipates harsh criticisms against the analogy that he does not necessarily accept. Inductive and analogical arguments were converted into syllogisms making the cause or similarity in analogy the middle term in the syllogism", which compounded the difficulty of defining and determining the exact limits of qiyas. The force of the inferences made in an analogy is identical to those of a first figure syllogism because the similarity (' illa) is the subject term in the major premise and the predicate term in the minor. If the 'illa is absent when the judgment is absent...and present when the judgment is present... the 'illa is all the more true. If one removes animality, for example, from a thing, then one removes from this thing the property of being a man. But it is not necessarily true that if one finds an animal he also finds a man. Rather the converse is true; if one finds a man it necessarily follows that one finds an animal. To establish the truthfulness of a matter by the method of non existence, it necessarily follows that when the 'illa is found the judgment is also found. In order to ensure valid conclusions from an analogy (following this reasoning) the similarity ('illa), has to be relevant to the two cases; the judgments must be true of any case if it has the same' illa; the 'illa itself must be found and verified in each of the cases considered; it must be established that the judgment exists in all cases which possess an 'illa in common. al-Farabi's importance lies in the fact that he placed heavy emphasis on the necessity and importance of the 'illa in all inferences: "For a complete inference and for achieving a high degree of certainty he insists that an illa must accompany the judgment". AI-Fariibi's marriage of analogy to the first order syllogism exists within a neo-Platonic and Aristotelian framework of metaphysics, replete with positivistic inclinations concerning the notions of cause and effect, and its importance for both logic and onto-logic. Thus, his legal concerns cross both «Islamic and Greek boundaries at their very source, and are less tied to simply the a priori sensibilities demanded by the more literal readings of the Koran that were adhered to by the mutakallimun. AI-Farabi managed to transform analogy into a first-figure syllogism, setting a standard by which the legal process could be developed. AI-Farabi had maintained, in accordance with his Neo-Platonic Aristotelian emanative position, that Allah was the God of metaphysical (i.e. causal) statements and that the Koran had to be interpreted metaphorically. This, along with discussions on logic and other sciences, was nonetheless accused of being un-Islamic, and the theological milieu remained highly antagonistic to the Greek "foreign"/heretical sciences. They rejected the concept of natural causation (i.e., arguing from cause to effect and from

effect to cause) that maintained that phenomenal acts advance from a thing's quiddity. They held the view that only divine will held the power to cause. It was in this manner, that they upheld the concept of divine omnipotence. And later, al-Farabi would become the focus of attacks directed against the "School of Baghdad".

Averroes (Ibn Rushd) and the End of Aristotelianism

Averroes was one of the last representatives of a dying Farabian Aristotelianism. Averroes was aware of Alfarabi's attempts to make sense of the difficulties in Aristotle's texts. In one such area, the modal logic, Averroes was to return to the problems four times through his career.

Averroes' project is illustrated in his Philosophical Essays, a number of which are on logical matters. Averroes defends and refines Alfarabi's account of the conversion of modal propositions and then uses that account as the basis of a new interpretation of the modal syllogistic. A second example of the way Averroes works is his reappraisal and vindication of Aristotle's doctrines of the hypothetical syllogistic against Avicenna's alternative division into connective and repetitive syllogisms (Averroes (1983) Maqâlât essay 9, 187-207).

In his fourth attempt to interpret Aristotle's modal system Averroes differs from Avicenna first and foremost by insisting on a consideration Avicenna has been at pains to remove from his syllogistic: is the subject picked out by a term essential to it?

Averroes' final system comprises two distinct aspects. The first aspect - not original to Averroes nor apparently to the Arabic tradition - is seeing the modality of a proposition as a function of the modality of its terms, which in turn is a function of how each term picks out what it refers to. The second aspect is that different classes of modal syllogism are differentiated by the types of terms occurring in them. Rather than looking on the modality of the proposition as something which belongs irreducibly to the proposition, Averroes classifies modals in the following way:

You should know that assertoric propositions have assertoric terms, necessary propositions necessary terms. By “necessary term” I mean that the term is one per se, and these propositions are composed of a subject and an essential predicate (mahmûl jawharî) of that subject, or a subject and an inseparable accident (*‘arad lâzim*) belonging to that subject. Those propositions with assertoric terms are those which are composed of denominative terms which are sometimes present in the denominated thing and sometimes absent (*sifât tûjad lil-mahmûl târatan wa-tufqad târatan*). But when one of these denominative terms is present in the subject, there must be present another denominative term that follows on it necessarily which is the predicate, as in: everything walking is moving. For when walking is actually present the thing must be moving; and when walking is withdrawn from it (*irtafa‘ minhu*), so too is movement. These are the simple assertoric premises (*al-muqaddamât al-wujûdiyya al-basîta*) which are atemporal (*fî ghayri zamân*), and they are what Aristotle intends firstly to talk about in this book. Their subject and predicate alike are one per accidens (*wal-mawdû‘ fîhâ wâhid bil-‘arad wa-ka-dhâlika l-mahmûl*). And there exists another kind of proposition that is partly assertoric and partly

necessary (*min jiha wujûdî wa-min jiha darûrî*) - that is, the subject is composed of a substance and a changeable denomination (*jawhar wa-sifa mutabaddila*), from which follows a predicate composed of the substance of the denomination and its intrinsic essential attribute (*sifa jawhariyya gharîziyya*). The subject here is one per accidents and the predicate is one per se, for example, when we say that everything walking is an animal. And this is assertoric on account of the denomination of the denominated subject, and necessary on account of the predicate of the denomination. For walking, when it occurs, signifies an animal by discontinuous signification (*fal-mashy idhâ wujida dalla ‘alâ l-hayawân dalâlatan ghayra dâ'ima*), but for the times at which walking is present in it. The subject of walking implies being an animal always (*wa-mawdû‘u l-mashy yalzamuhu wujûdu l-hayawân dâ'iman*), because the subject of walking and what is denoted by that is necessarily an animal. And this proposition is in one respect necessary and in another assertoric (*darûrîya min jiha wa-wujûdîya min jiha*) - necessary per accidens and assertoric per se (*darûrîya bil-‘arad wa-wujûdîya bidh-dhât*). A proposition that conversely has a necessary subject and a predicate of assertoric matter (*mâdda*) is just assertoric, and is not necessary per accidens. This is a temporal assertoric, I say, where the subject implies the predicate for a specified time, and necessity is not found in it, only a connexion of the predicate and subject merely for that time. The characteristic of this [proposition] is that the predicate is not connected to the subject for all times at which the subject exists, but only for a certain specified time. And so, as Aristotle says, syllogisms in the sciences are not constructed from this type of assertoric.

With a per se necessity proposition described above, he has truth-conditions which will allow him to make sense of Aristotle's claim that every J is necessarily B converts to some B is necessarily J. In fact, Averroes is able to replicate Aristotle's results with necessity and possibility premises (Thom (2003) 199). He does so, however, at the cost of having to slide between calling a proposition of type 3 a necessity proposition or an assertoric according to the dictates of the exegetical moment.

Dissention from Aristotelian Legacy

The Avicennan Tradition of the Twelfth Century

Avicenna (d. 1037) was beginning his career far away in the east, in Khurasan (Persia). Led by his Intuition, he presented himself as an autodidact able to assess and repair the Aristotelian tradition. Here is what he says in the Syllogism of the Cure, written about midway through his career:

'You should realize that most of what Aristotle's writings have to say about the modal mixes are tests, and are not genuine opinions - this will become clear to you in a number of places…' (Avicenna (1964), Qiyâs 204.10-12)

Of all his many works, it is Avicenna's Pointers and Reminders that had most impact on subsequent generations of logicians. From it we may note a few broad but typical differences from the Prior Analytics in the syllogistic. First, the "absolute" (*mutlaqât*, often translated "assertoric") propositions have truth-conditions stipulated somewhat like those stipulated for possibility propositions (so that, for example, the contradictory of an absolute is not an absolute, absolute e-propositions do not convert, second-figure syllogisms with absolute premises are sterile). Secondly, Avicenna begins to explore the logical properties of propositions of the form every J is B while J. Thirdly, Avicenna divides syllogistic into connective (*iqtirânî*) and repetitive (*istithnâ'î*) forms, a division which replaces the old one into categorical and hypothetical (Avicenna (1971) al-Ishârât 309, 314, 374). We may call a logician "Avicennan" if he adopts these doctrines.

Avicennan logicians embarked upon repairing and reformulating Avicenna's work. Just as Avicenna had declared himself free to rework Aristotle as Intuition dictated, so too Avicenna's school regarded itself free to repair the Avicennan system as need arose, whether from internal inconsistencies, or from intellectual requirements extrinsic to the system. A major early representative of this trend is 'Umar ibn Sahlan as-Sawi (d. 1148) who began, in his Logical Insights for Nasîraddîn, to rework Avicenna's modal syllogistic. It was to be his students and their students, however, who would go on to make the final changes to Avicennan logic that characterized the subject that came to be taught in the madrasa.

Tûsî and the Neo-Avicennan Response

The great Shî'î scholar Nasiraddîn at-Tûsî (d. 1274) explains why Avicenna explores it the way he does:

What spurred him to this was that in the assertoric syllogistic Aristotle and others sometimes used contradictories of absolute propositions on the assumption that they are absolute; and that was why so many decided that absolutes did contradict absolutes. When Avicenna had shown this to be wrong, he wanted to give a way of construing those examples from Aristotle (Tusi (1971) Sharh al-Isharat 312.5-7).

Revisionist Avicennan Logicians

By and large, the Revisionists adopt most of Avicenna's distinctions and stipulations. But - on their preferred reading of the proposition - they reject, among other inferences. If every J is possibly B, and every B is necessarily A, it doesn't follow that every J actually becomes B such that it is necessarily A. Kâtibî does not ampliate the subject term to the possible (so that it would be understood as every possible B is necessarily A), nor does he read each proposition as being embedded in a necessity operator. Rather, he understands the possibility proposition as follows: there are Js, and whatever is at one time J is possibly B. This means that Kâtibî and the other Revisionists have a modal syllogistic that differs significantly from Avicenna's. The way the Revisionists put this difference is as follows:

Our statement every J is B is used occasionally according to the essence (*hasab al-haqîqa*), and its meaning is that everything which, were it to exist, would be a J among possible individuals would be, in so far as it were to exist, a B; that is, everything that is an implicand of J is an implicand of B. And occasionally [it is used] according to actual existence (*hasab al-khârij*), and its meaning is that every J actually (*fî l-khârij*), whether at the time of the judgment or before it or after it, is B actually (*fî l-khârij*).

The distinction between the two considerations is clear. Were there no squares actually (*fî l-khârij*) it would be true to say a square is a figure under the first consideration and not the second; and were there no figures actually other than squares, it would be correct to say every figure is a square under the second consideration but not the first (Kâtibî (1948) Shamsiyya 91.1-4, 96.12-14).

In fact, the Revisionists are prepared to accept the Avicennan inferences given an essentialist reading of the propositions, but this is a half-hearted concession never pursued in their treatises. The question is why, and I conclude this section by speculating as to the answer.

Both groups, the Avicennan and the Revisionists, want to be able not only to trace valid inferences, they want also to use the system they produce for extra-logical purposes. They want arguments that are not only valid, but also sound, that is, arguments that are not only formally perfect, but that have true premises. To use the essentialist reading to say every cow is necessarily four-stomached, as an Avicennan would, is to claim necessarily, every cow is necessarily four-stomached; this is much stronger in one important respect than the Revisionist claim that there are actually cows, and everything that's actually a cow is necessarily four-stomached.

Ghazâlî and Logic

The twelfth century is one of the most complex periods of transformation in Muslim intellectual history. This period has been called the Golden Age of Arabic philosophy. The growth of logic in the preceding two centuries was concordant with the advance of the medical sciences and consequently it gained support with a wider audience. The century before had seen the advent of the madrasa as the prime institution of learning in the Islamic world (Makdisi (1981) 27-32), and Abu Hamid al-Ghazali (d. 1111) had been appointed to the most prestigious of these new institutions. Ghazali had successfully introduced logic into the madrasa which attracted much more gifted logicians (Gutas (2002). al-Ghazali took up Alfarabi's arguments in support of the utility of logic for theology and law, especially in his last juridical summa, Distillation of the Principles of Jurisprudence, a text which soon became a mainstay of the madrasa.

It is in this period that the major change in the coverage and structure of Avicennan logic occurred. The late twelfth century also saw Averroes produce what was effectively the last of the work in the Farabian tradition of logic, work which was to be translated into Hebrew and Latin but which was neglected by Arabic logicians. Finally, through the course of the twelfth century, the modified Avicennan logic that would be adopted by the logic texts of the madrasa began to emerge.

Ghazali argued that, properly understood, logic was entirely free of metaphysical presuppositions injurious to the faith. This meant that logic could be used in forensic reasoning:

We shall make known to you that speculation in juristic matters (*al-fiqhiyyât*) is not distinct from speculation in philosophical matters (*al-'aqliyyât*) in terms of its composition, conditions, or measures, but only in terms of where it takes its premises from (Ghazâlî (1961) Mi'yâr 28.2-4).

Ghazali tended to an even stronger position towards the end of his life: more than being merely harmless, logic was necessary for true knowledge. However for all his historical importance in the process of introducing logic into the madrasa, the logic that Ghazâlî defended was too dilute to be recognizably Farabian or Avicennan.

AI-Ghaziili's position was largely formed by both his philosophical preparation and his theological convictions. al-Ghazali as a jurist/theologian was very much interested in the logical questions that legal discussions could comprise. The attraction that the foreign sciences held for al-Ghazali was in direct relation to their usefulness in furthering the cause of theology. AI-Ghazali raised the possibility that these sciences could be demonstrably true and that they might have some bearing on religion, i.e., that when the specialized sciences (mainly logic and physics) offered demonstrations which conflicted with the literal readings of scripture, the latter must alter their status to one of metaphor. And because al-Ghazali held the view that God could not actuate something self-contradictory, literal readings should therefore be subjected to demonstrable proofs where and when they appear to exist. For example, when dealing with some of the well established facts of cosmology such as eclipses he writes: "thus, when one who studies these demonstrations and ascertains their proofs, deriving thereby information

about the times of the two eclipses, their extent and duration, is told that this is contrary to religion, he will not suspect this science, but only religion.

However, al-GhazalI also wanted to maintain that logic and the sciences were doctrinal1y neutral, particularly where the world of natural causation was concerned, and especially where they attempted to redefine the ontological stature of the Qur'an. He states:

"As for logical sciences, none of these relates to religion either by way of denial or by affirmation. They are no more than the study of the methods or proof and standards of reasoning, the conditions of the premises of demonstration and the manner of their ordering, the conditions of correct definition and the manner of its construction.

In rejecting "the principle of necessary causal connection" which was "the cornerstone of Aristotelian demonstrative science," al-Ghazal'i entered into a paradox viz. the logical sciences to which he was committed. How can logic and science adjudicate scriptures, but remain doctrinally neutral in its first principles? al-Ghazal'i's intent was not to indicate that demonstrative logic is philosophically uncommitted. In stead, his purpose lay in the impossible attempt to prove that its philosophical commitment is not given to an Aristotelian metaphysic.

Al-Ghazal'i was evidently reacting against what was then the well established refusal at the time, to integrate useful aspects of formal logic (i.e., the syllogism) into law. Attempting to avoid a contradictory position where logic is concerned, al-Ghazal'i maintained that logic could be disengaged from the heretical metaphysical framework in which it was imbedded and be used as a tool or method in the realm of al-fiqh. Whether he did so successfully or not is questionable. The answer given by al-Ghazali is motivated by theological reasons first and foremost. It is based on the parent eternal nature of the natural world implied by emanationist (causal) theories which attempt either to lower God's eternality to the finite stature of the world, or raise the finitude of the world to God's eternality, much in the way al-Farabi attempted to move from "evidence to absence". Both would be contradictory statements about the sovereign nature of God as stated in the Qur'an. Instead, al-Ghazali attempts to jettison the metaphysical aspects of Greek thinking, while harmonizing its logical tools with Islamic law.

Al-GhazalI's reformulation of the Greeks' tools of reasoning (qiyas/syllogism) relates primarily to matters of law which denote items given to "less clear speech" as opposed to "clear speech". These ambiguous legal aspects might suggest (I) finding a text relevant to the new case in the Qur'an or HadIth; (2) discerning the essential similarities or ratio legis between two cases; (3) allowing for differences lfuruq) and determining that they can be discounted; and (4) extending or interpreting the ratio legis to cover the new case. But under the auspicious abilities of qiyas that bore some affinity with a fortiori forms of reasoning, al-Ghazali endeavored to include analogy, and argumentum a simile. Al-Ghazal'i demarcates the qiyas from analogy only on the basis that the former bears certain knowledge, while the latter renders only probable inference. AI-GhazalI's insistence on converting analogy to a first figure syllogism, a reformulation of al-FarabI's

systemization of inductive reasoning, intentionally grounded legal theory in an Aristotelian framework of knowledge. Here an awareness of the dubious relationship between analogy and the syllogism (*qiyas*) uncovers an inconsistency in the metaphysical system that supported it. We can leave aside the dichotomous application of logic given by al Ghazali who found it relevant in worldly (legal) affairs, but troublesome when impinging on established metaphysical norms, or theology (viz. the circumstances of God's unlimited freedom).

In sum it was Gazali's madrasa that provided the backbone of the tradition, and a number of jurists came time and again to stress that the study of logic was so important to religion as to be a fard kifâya, that is, a religious duty such that it is incumbent on the community to ensure at least some scholars are able to pursue its study. In Gazali's words:

As for the logic that is not mixed with philosophy …. there is no disagreement concerning the permissibility of engaging in it, and it is rejected only by he who has no inkling of the rational sciences. Indeed, it is a fard kifâya because the ability to reply to heretical views in rational theology (kalâm), which is a fard kifâya, depends on mastering this science, and that which is necessary for a religious duty is itself a religious duty.

lbn Taymiyya

lbn Taymiyya is best considered a theologian and a jurist, one who often leveled polemical accusations at Greek logic. Like al-Ghazali, lbn Taymiyya was concerned with God's unlimited power and freedom of the divine will, and so rejected causal theories which would tie God explicitly to the natural world and qualify his involvement (causality) with his world. Thus, al1 forms of unitary exposition (universals) were rejected as conventions (nominal) by lbn Taymiyya.

Ibn Taymiyya's position rested on its own universal premise: that under no conditions can universals (of any kind) be established outside the mind of the one who experiences. Doubtless, the exception here is prophecy. This amounted to a rejection of universals altogether, i.e., an anti-realist and nominalist position in metaphysics which claims that where universals flourish in logical discourse, they do so only mental1y, and not (in any sense) in reality. Thus, universals can be established so long as it is understood that they function pragmatically within the specific needs of a given context, that which still demands a medium for human communication. Universals cannot obtain either metaphysically, or theologically, where there is open and full communication with God. The substance/accident debate collapses in Ibn Taymiyya's nomimalist schematic. Essence and accident are but arbitrary and relative demarcations set apart from each other in accordance with usage. Ibn Taymiyya writes: "Furthermore, there is no doubt that what the logicians held concerning the theory of definition is of their own invention...Accordingly, it is necessary for them to distinguish between what in their opinion is essential and what is not...whereby they deem one attribute, to the exclusion of the other, to be of the essence.' There is undoubtedly a strong element of relativism in Ibn Taymiyya's epistemological thinking, especially as he contends that "people differ in their faculties of perception in a way that cannot be standardized".

Ibn Taymiyya attacks the most delicate aspects of the syllogism-its definitions and concepts which support its larger (conceptual) relations. It is a strategy employed by lbn Taymiyya, simply because in order for a syllogism to function correctly (demonstrating true, false or even probable conclusions) an agreement must be reached concerning the definitional terms (i.e., the universality of its contents). Here, according to Ibn Taymiyya, philosophers and theologians, whether dealing with an analogy or a syllogism per se, assume too much in the way of universal terms that denote extra-mental realities. Ibn Taymiyya states:

"The universal exists only in the mind. If the particulars of a universal exist in the extra mental world, then this will be conducive to the knowledge that it is a universal affirmative".

The ideas penned by Ibn Taymiyya evoke Hume who also interrogated both philosophy and theology on the matter of universals and their relationship to the external world. In Book 1 (Of the Understanding) of his A Treatise of Human Nature, Hume reduces the perceptions of the human mind to what he calls impressions and ideas. Impressions are more immediate in their presence before the mind and feed our ideas that are faint and subject to greater discontinuity. Because Hume is considered an

empiricist, both impressions and ideas are necessarily derived from the external world. He writes:

"Now since nothing is ever present to the mind but perceptions, and since all ideas are derived from something antecedently present to the mind; it follows, that it is impossible for us so much as to conceive or form an idea of any thing specifically different from ideas and impressions."

As is the case with Ibn Taymiyya, ideas and impressions are unable to form universals that can be placed back upon the external world. Hume writes:

"We can never really advance a step beyond ourselves, nor can conceive any kind of existence, but those perceptions, which have appeared in that narrow compass".

The logical conclusion of this position implies that nothing new in the way of knowledge could ever arise from syllogistics. Where definitions break down, so too does the idea of advancing new knowledge. Ibn Taymiyya holds that the links logicians make between concept and definition is too pronounced. He feels that concepts that belong to this or that vocational field are nothing more than an arbitrary invention of the logician. In a rather dogmatic view of conception (which has no need of formal definitions) Ibn Taimiyyah writes:

... all the communities of scholars, advocates of religious doctrines, craftsmen, and professionals know the things they need to know, and verify what they encounter in the sciences and the professions without speaking of definitions. We do not find any of the leading scholars discussing these definitions-certainly not the leading scholars of law, grammar, medicine, arithmetic- nor craftsmen, though they do form concepts of the terms used in their fields. Therefore, it is known that there is no need for these definitions in order to form concepts.

By attacking the heart of the syllogism (identity), Ibn Taymiyya is left with the circular question of just how legitimate rational concepts are established. He might agree that this presents a problem of sorts, but it is his dogmatism (or faith) which rescues him from having to deal with the problem of phenomena more earnestly. His argumentative style appears to suggest that while definitions are necessary for the articulation of logical concepts, the necessary definitions of existence are already established within the Qur'iin and have no need of logical analysis. Ibn Taimiyyah writes:

He who reads treatises on philology, medicine or other subjects must know what their authors meant by these names and what they meant by their composite discourse; so must he who reads books on law, theology, philosophy, and other subjects. The knowledge of these definitions is derived from religion, for every word is found in the Book of God, the exalted, as well as in the Sunnah of His Messenger.

The Decline

They is as yet so little explored of the logical activity in the post 1400s to the invasions of the Western powers. The first and most dangerous pitfall facing the historian is the assumption that there was a decline in logical studies in the realms under Muslim control that corresponds with the sixteenth century decline of the subject in early modern Europe. It is tempting to make this assumption but it needs to be examined and relevant texts must be edited and studied.

Domains of Logic

The Subject Matter of Logic

Al-Farabi, in his Ihsa' al-'ulum (Enumeration of the Sciences), defines logic as an instrumental, rule-based science aimed at directing the intellect towards the truth and safeguarding it from error in its acts of reasoning. He states:

The subject matters (*mawdû'ât*) of logic are the things for which [logic] provides the rules, namely, intelligibles in so far as they are signified by expressions, and expressions in so far as they signify intelligibles.

He defends the need for such a science of reasoning on the grounds that it is possible for the mind to err in at least some of its acts, for example, in those in which the intelligibles sought are not innate, but are rather attained discursively and empirically 'through reflection and contemplation'. Al-Farabi compares logic to tools such as rulers and compasses, which are used to ensure exactness when we measure physical objects subject to the errors of sensation. Like these tools, logical measures can be employed by their users to verify both their own acts of reasoning and the arguments of others. Indeed, logic is especially useful and important to guide the intellect when it is faced with the need to adjudicate between opposed and conflicting opinions and authorities.

Al-Farabi's view of logic as a rule-based science which governs the mind's operations over intelligibles forms the foundation for Ibn Sina's later refinements. In the opening chapters of his *al-Madkhal* (Introduction), the first logical book of his encyclopedic work *al-Shifa'* (Healing), Ibn Sina describes the purpose of logic as one of enabling the intellect to acquire 'knowledge of the unknown from the known'. He defends the need for logic by arguing that the innate capacities of reasoning are insufficient to ensure the attainment of this purpose, and thus they require the aid of an art. While there may be some cases in which innate intelligence is sufficient to ensure the attainment of true knowledge, such cases are haphazard at best; he compares them to someone who manages to hit a target on occasion without being a true marksman. The most important and influential innovation that Ibn Sina introduces into the characterization of logic is his identification of its subject matter as 'second intentions' or 'secondary concepts', in contrast to 'first intentions'. This distinction is closely linked in Ibn Sina's philosophy to his important metaphysical claim that essence or quiddity can be distinguished from existence, and that existence in turn can be considered in either of its two modes: existence in concrete, singular things in the external world; or conceptual existence in one of the soul's sensible or intellectual faculties.

In *al-Madkhal*, Ibn Sina argues that logic differs from the other sciences because it considers not conceptual existence as such (this would be psychology), but rather the accidents or properties that belong to any quiddity by virtue of its being conceptualized by the mind. These properties, according to Ibn Sina, include such things as essential and accidental predication, being a subject or being a predicate, and being a premise or a syllogism. It is these properties that allow the mind to connect concepts

together in order to acquire knowledge of the unknown; they provide the foundation for the rules of reasoning and inference that logic studies. They are moreover formal properties in the sense that, as properties belonging to all concepts in virtue of their mental mode of existence, they are entirely independent of the content of the thought itself; they are indifferent to the intrinsic natures of the quiddities which they serve to link together.

In the *Ilahiyyat* (Metaphysics) of al-Shifa', Ibn Sina introduces the terminology of first and second 'intentions' or concepts in order to express the relation between the concepts of these quiddities themselves - which are studied in the theoretical sciences - and the concepts of the states and accidents of their mental existence which logic studies: 'As you know, the subject matter of logical science is second intelligible intentions (al-ma'ani al-ma'qula al-thaniyya) which are dependent upon the primary intelligible intentions with respect to some property by which they lead from the known to the unknown' (Ilahiyyat Book 1, ch. 2,). For example, the second intentions of 'being a subject' and 'being a predicate' are studied in logic independently of whatever first intentions function as the subject and predicate terms in a given proposition, for example, 'human being' and 'rational animal' in the proposition 'a human being is a rational animal'. The logical second intentions depend upon the first intentions because the first intentions are the conceptual building blocks of the new knowledge which second intentions link together: but logic studies the second intentions in abstraction from whatever particular first intentions the logical relations depend upon in any given case.

Secondary Intelligibles

A more careful statement is provided by Avicenna. Concepts like “horse”, “animal”, “body”, correspond to entities in the real world, entities which can have various properties. In the realm of the mental, concepts too can acquire various properties, properties they acquire simply by virtue of existing and being manipulated by the mind, properties like being a subject, or a predicate, or a genus. These are the subject matter of logic, and it seems it is only mental manipulation that gives rise to these properties:

If we wish to investigate things and gain knowledge of them we must bring them into Conception (*fî t-tasawwur*); thus they necessarily acquire certain states (*ahwâl*) that come to be in Conception: we must therefore consider those states which belong to them in Conception, especially as we seek by thought to arrive at things unknown from those that are known. Now things can be unknown or known only in relation to a mind; and it is in Conception that they acquire what they do acquire in order that we move from what is known to what is unknown regarding them, without however losing what belongs to them in themselves; we ought, therefore, to have knowledge of these states and of their quantity and quality and of how they may be examined in this new circumstance.

These properties that concepts acquire are secondary intelligibles; here is an exposition of this part of Avicennan doctrine by Râzî:

The subject matter of logic is the secondary intelligibles in so far as it is possible to pass by means of them from the known (al-ma‘lûmât) to the unknown (al-majhûlât) not in so far as they are intelligible and possess

intellectual existence (an existence) which does not depend on matter at all, or depends on an incorporeal matter).. The explanation of "secondary intelligibles" is that man Conceives the realities of things (*haqâ'iq al-ashyâ'*) in the first place, then qualifies some with others either restrictively or predicatively (*hukman taqyîdiyyan aw khabariyyan*). The quiddity's being qualified in this way is something that only attaches to the quiddity after it has become known in the first place, so it is a second-order [consideration] (*fî d-darajati th-thâniya*). If these considerations are investigated, not absolutely, but rather with respect to how it is possible to pass correctly by means of them from the known to the unknown, that is logic. So its subject matter is certainly the secondary intelligibles under the consideration mentioned above (Râzî (1381 A. H.) Mulakhkhas 10.1-10.8).

In identifying the secondary intelligibles, Avicenna is able to place logic within the hierarchy of the sciences, because it has its own distinct stretch of being which is its proper subject matter.

So much for the first problem in Alfarabi's formulation of what the subject matter of logic is; finding it to be secondary intelligibles preserves the topic-neutrality of logic. Avicenna also has a view on the second problem, the question of whether or not expression is essential to a definition of logic and its subject matter.

There is no merit in what some say, that the subject matter of logic is speculation concerning the expressions insofar as they signify meanings… And since the subject matter of logic is not in fact distinguished by these things, and there is no way in which they are its subject matter, (such people) are only babbling and showing themselves to be stupid.

Conceptions and Assents

Khûnajî argued in the second quarter of the thirteenth century that the subject matter of logic was Conceptions and Assents:

A thing is knowable in two ways: one of them is for the thing to be merely Conceived (yutasawwara) so that when the name of the thing is uttered, its meaning becomes present in the mind without there being truth or falsity, as when someone says "man" or "do this!" For when you understand the meaning of what has been said to you, you will have conceived it. The second is for the Conception to be [accompanied] with Assent, so that if someone says to you, for example, "every whiteness is an accident," you do not only have a Conception of the meaning of this statement, but [also] Assent to it being so. If, however, you doubt whether it is so or not, then you have Conceived what is said, for you cannot doubt what you do not Conceive or understand… but what you have gained through Conception in this [latter] case is that the form of this composition and what it is composed of, such as "whiteness" and "accident," have been produced in the mind. Assent, however, occurs when there takes place in the mind a relating of this form to the things themselves as being in accordance with them; denial is the opposite of that.

Note that an Assent is not merely the production of a proposition by tying a subject and predicate together; "Assent, however, occurs when there takes place in the mind a relating of this form to the things themselves as being in accordance with them." All knowledge, according to Avicenna, is

either Conception or Assent. Conception is produced by definition, Assent by proof. All Avicennan treatises on logic are structured in accordance with this doctrine: a first section deals with definition, which conduces to Conception, a second with proof, which conduces to Assent.

Later logicians in the line of Fakhraddîn ar-Râzî made Conceptions and Assents the subject matter of logic. We know that Khûnajî was the first to do this thanks to a report in the Qistâs al-Afkâr of Shamsaddîn as-Samarqandî (d. c. 1310). Samarqandî says:

This is the view adopted by the verifying scholars (al-muhaqqiqûn), but Khûnajî (*sâhib al-kashf*) and the people who follow him differed from them and said: Logic may investigate the universal and the particular and the essential and the accidental and the subject and the predicate; they are among the questions [of the science]. You [Avicennan logicians] are taking the subject matter of logic as more general than the secondary intelligibles so that the secondary intelligibles and (especially) the secondary intelligibles you have mentioned and what follows after them may come under it as logic. It would be correct for you to say that the subject matter of logic is known Conceptions and Assents (*al-ma'lûmât at-tasawwuriyya wa-t-tasdîqiyya*) not in so far as they are [what they are] but in so far as they conduce to what is sought (*al-matlûb*) …

Two logicians who followed Khûnajî on this were Abharî and Kâtibî. Here is Abharî's statement:

The subject matter of logic, I mean, the thing which the logician investigates in respect of its concomitants in so far as it is what it is, are precisely Conceptions and Assents. [This is] because [the logician] investigates what conduces to Conception and what the means [to Conception] depends upon (for something to be universal and particular, essential and accidental, and such like); and he investigates what conduces to Assent and what the means to Assent depends upon, whether proximately (like something being a proposition or the converse of a proposition or the contradictory of a proposition and such like) or remotely (like something being a predicate or a subject). These are states which inhere in Conceptions and Assents in so far as they are what they are. So certainly its subject matter is Conceptions and Assents (Tûsî (1974b) Ta'dîl 144.14-20).

Here is part of Tûsî's rejection:

If what he means by Conceptions and Assents is everything on which these two nouns fall, it is the sciences in their entirety, because knowledge is divided into these two; whereupon what is understood from [his claim] is that the subject matter of logic is all the sciences. Yet there is no doubt that they are not the subject matter of logic…

The truth is that the subject matter for logic is the secondary intelligibles in so far as reflection on them leads from the known to the unknown (or to something similar, as do reductive arguments or persuasive arguments [146] or imaginative arguments and the like). And if they are characterised by the rider mentioned by the masters of this craft, Conceptions and Assents are among the set of secondary intelligibles in just the same way as definition and syllogism and their parts, like universal and particular and subject and

predicate and proposition and premise and conclusion (Tûsî (1974b) Ta‘dîl 144.21-u, 145.pu-146.3).

It is hard to know precisely what is being disputed. What we can note at this stage is that one point at issue has to do with the claim that Avicenna's identification of secondary intelligibles as logic's subject matter is inaccurate, and too narrow to achieve what he hopes it can.

Arguments aim to bring about Assent; more precisely, when Conceptions have been gained that produce in the mind both the meaning of the terms in a given proposition, and the form of composition of these terms, Assent “occurs when there takes place in the mind a relating of this form to the things themselves as being in accordance with them…” In fact, different kinds of discourse can bring about one or other kind of Assent, or something enough like Assent to be included in a general theory of discourse..

Since Avicenna had finished explaining the formal and *quasi*-formal aspects of syllogistic, he turned to its material aspects. With respect to these, syllogistic divides into five kinds, because it either conveys an Assent, or an Influence (ta‘aththur) of another kind (I mean an Imagining or Wonder). What leads to Assent leads either to an Assent which is Truth-apt (jâzim) or to one which is not. And what is Truth-apt is either taken [in the argument] as True (haqq), or is not so taken. And what is taken as True either is true, or isn't.

That which leads to true truth-apt Assent is Demonstration; untrue truth-apt Assent is Sophistry. That which leads to truth-apt Assent not taken as true or false but rather as (a matter of) Common Consent *(‘umûm al-i‘tirâf*) is - if it's like this - Dialectic (*jada*l), otherwise it's Eristic (*shaghab*) which is, along with Sophistry (*safsata*), under one kind of Fallacy Production (*mughâlata*). And what leads to Overwhelming though not Truth-apt Assent is Rhetoric; and to Imagining rather than Assent, Poetry (Tûsî (1971) Sharh al-Ishârât 460.1-461.12).

Tûsî immediately goes on to lay out grounds for Assent to propositions, for example, because they are primary, or because they are agreed for the purposes of discussion. Propositions to be used as premises for Demonstration make the most irresistible demands for our Assent; premises for lower kinds of discourse make weaker demands.

Logic and Language

Al-farabi explains how logic, grammar and language relate to each other:

And this art (of logic) is analogous to the art of grammar, in that the relation of the art of logic to the intellect and the intelligibles is like the relation of the art of grammar to language and expressions. That is, to every rule for expressions which the science of grammar provides us, there is a corresponding [rule] for intelligibles which the science of logic provides us (Ihsa' al-'ulum, in Amin 1968: 68).

al-Farabi argues that logic and grammar both have some legitimate interest in language, but whereas grammatical rules primarily govern the use of language, logical rules primarily govern the use of intelligibles.

More precisely, al-Farabi explains that although grammar and logic share a mutual concern with expressions, grammar provides rules that govern the correct use of expressions in a given language, but logic provides rules that govern the use of any language whatsoever in so far as it signifies intelligibles. Thus, logic will have some of the characteristics of a universal grammar, attending to the common features of all languages that reflect their underlying intelligible content. Some linguistic features will be studied in both logic and grammar, but logic will study them as they are common, and grammar in so far as they are idiomatic. On the basis of this comparison with grammar, then, al-Farabi is able to complete his characterization of the subject matter of logic as follows: 'The subject-matters of logic are the things for which logic provides the rules, namely, intelligibles in so far as they are signified by expressions, and expressions in so far as they signify intelligibles' (Ihsa' al-'ulum, in Amin 1968: 74).

Alfarabi adds:

Logic shares something with grammar in that it provides rules for expressions, yet it differs in that grammar only provides rules specific to the expressions of a given community, whereas the science of logic provides common rules that are general for the expressions of every community. This is to say - logic is something of a universal grammar or, more strictly, providing a universal grammar is one of the tasks of logic.

Avicenna recognizes and attempts to deal with the close nexus between language and thought:

Were it possible for logic to be learned through pure cogitation, so that meanings alone would be observed in it, then this would suffice. And if it were possible for the disputant to disclose what is in his soul through some other device, then he would dispense entirely with its expression. But since it is necessary to employ expressions, and especially as it is not possible for the reasoning faculty to arrange meanings without imagining the expressions corresponding to them (reasoning being rather a dialogue with oneself by means of imagined expressions), it follows that expressions have various modes (ahwâl) on account of which the modes of the meanings corresponding to them in the soul vary so as to acquire qualifications (*ahkâm*) which would not have existed without the expressions. It is for this reason that the art of logic must be concerned in part with investigating the modes of expressions… But there is no value in the doctrine of those who say that the subject matter of logic is to investigate expressions in so far as

they indicate meanings…but rather the matter should be understood in the way we described.

Ibn Sina criticized attempts to introduce linguistic concerns into the subject matter of logic. In al-Madkhal, Ibn Sina labels as 'stupid' those who say that 'the subject matter of logic is speculation concerning expressions in so far as they signify meanings (ma'ani)'. However, Ibn Sina does not deny that the logician is sometimes or even often required to consider linguistic matters; his objection is to the inclusion of language as an essential constituent of the subject matter of logic. The logician is only incidentally concerned with language because of the constraints of human thought and the practical exigencies of learning and communication. 'if logic could be learned through pure thought so that meanings alone could be attended to in it, then it would dispense entirely with expressions'; but since this is not in fact possible, 'the art of logic is compelled to have some of its parts come to consider the states of expressions' (al-Madhkal, in Anawati et al. 1952: 22-3). For Ibn Sina, then, logic is a purely rational art whose purpose is entirely captured by its goal of leading the mind from the known to the unknown; only accidentally and secondarily can it be considered a linguistic art.

As Sabra says, Avicenna seems to hold that “the properties constituting the subject matter of logic would be inconceivable without the exercise of a particular function of language” (Sabra (1980) 764).

However, Ibn Sina and al-Farabi were concerned to distinguish logic from grammar as many Arabic grammarians - whose linguistic theories were developed to a high degree of complexity and sophistication - were contemptuous of the philosophers for importing Greek logic, which they saw as a foreign linguistic tradition, into the Arabic milieu. This attitude toward Greek logic is epitomized in a famous debate reported to have taken place in Baghdad in 932 between the grammarian Abu Sa'id al-Sirafi and Abu Bishr Matta, a Syriac Christian who translated some of Aristotle's works into Arabic and is purported to have been one of al-Farabi's teachers. Abû Bishr argued that speakers of Arabic need to learn Greek logic. For him Logic comes ahead of Grammar:

"The logician has no need of grammar, whereas the grammarian does need logic. For logic enquires into the meaning, whereas grammar enquires into the expression. If, therefore, the logician deals with the expression, it is accidental, and it is likewise accidental if the grammarian deals with the meaning. Now, the meaning is more exalted than the expression, and the expression humbler than the meaning".

The extant account of the debate is heavily biased towards al-Sirafi, who attacks logical formalism and denies the ability of logic to act as a measure of reasoning over and above the innate capacities of the intellect itself. His principal claims are that philosophical logic is nothing but Greek grammar warmed over, that it is inextricably tied to the idiom of the Greek language and that it has nothing to offer speakers of another language such as Arabic.

Yahya ibn 'Adi, makes his case for the independence of logic from grammar based upon the differences between the grammar of a particular nation and the universal science of logic. He argues that the subject matter of grammar is mere expressions (*al-alfaz*), which it studies from the limited

perspective of their correct articulation and vocalization according to Arabic conventions. The grammarian is especially concerned with language as an oral phenomenon; the logician alone is properly concerned with 'expressions in so far as they signify meanings' (*al-alfaz al-dalla 'ala al-ma'ani*) (Maqala fi tabyin, in Endress 1978: 188). To support this claim, Yahya points out that changing grammatical inflections do not affect the basic signification of a word: if in one sentence a word occurs in the nominative case, with the appropriate vocalization, its signification remains unchanged when it is used in another sentence in the accusative case and with a different vocal ending.

Concluding Remarks

We have seen that the Greek syllogism underwent a variety of modifications in the Medieval Islamic environment. The involvement of analogical reasoning with syllogistics was an attempt to aid the process of legal reasoning, but it was the a priori metaphysical assumptions which de marcate thinkers most forcefully. AI-Fiiriibi's successfully raised the strength of analogy to that of a first order syllogism thereby insisting that the 'il/a must exist along with a judgment in all inferences. Inevitably, al-Farabi's departure from the a priori interpretation of the Qur'an attracted much adversity from literalists. It is to al-Farabi that thinkers such as al-Ghazali and Ibn Taymiyya owe their whole point of departure.

In his article, "GhazaI'i's Attitude to the Secular Sciences and Logic", Michael Marmura has stated:

The matter of the syllogism involves the epistemological status of its premises; the form, the rules for valid inference. To take the formal aspect first, the philosopher's logic is the more comprehensive as it includes, for example, the Aristotelian figures which, prior to Ghazali, were not included in nazar. It also included a more precise formulation of analogical reasoning which, for example, Alfarabi reduced to the first Aristotelian figure and which, probably following him, Ghazali urged his fellow theologians to adopt.

AI-Ghazal'i could not deny, at least at the level of social and legal disputation, the auspicious utility of the syllogism, replete with its probable analogies. It is only at the metaphysical level (causality) where al-GhazaI'i becomes uncomfortable with the encroachment of the Greek tools (logic) upon the Muslim texts. If scriptures conflict with the "findings" of the syllogism, then (unlike with Hume and his aversion to religion) the Scriptures are to be assigned metaphorical readings. The dissonance produced by religion and logic is diffused, and the syllogism can remain a welcome addendum to the legal ambiguities pondered by the jurists.

With Ibn Taymiyya we saw that all legitimate definitions proceed from the Qur'an when legal and/or existential conceptions are being formed. His attack on causality and modal logic, employed mainly by philosophers (but also by theologians) places him in a-causal agnostic position where the explication of metaphysics is concerned. One could almost assume that, in relation to logic, analogy and syllogistic proofs, the words of David Hume could be supplanted into the pen of Ibn Taymiyya who resisted all such logical attempts at a definitive metaphysical reconstruction:

But can a conclusion, with any propriety, be transferred from parts to the whole? Does not the great disproportion bar all comparison and inference from observing the growth of a hair? Can we learn anything concerning the generation of a man? Would the manner of a leaf's blowing, even though perfectly known, afford us any instruction concerning the vegetation of a tree?

And elsewhere:

If we see a house, Cleanthes, we conclude, with the greatest certainty, that it had an architect or builder because this is precisely that species of effect which we have experienced to proceed from that species of cause. But

surely you will not affirm that the universe bears such a resemblance to a house that we can with the same certainty infer a similar cause, or that the analogy is here entire and perfect. The dissimilitude is so striking that the utmost you can here pretend to is.

Ibn Taymiyya would undoubtedly agree with much of this, but would reject Hume's skeptical ethos by maintaining revealed Qur'anic foundations. Indeed, he would take literally Hume's ambiguous statement, "Let us fix our attention out of ourselves as much as possible: Let us chase our imagination to the heavens, or to the utmost limits of the universe". However, it would not be adverse to state that Ibn Taymiyya was also a skeptic, "a sceptic who was saved by religion", but nevertheless a skeptic. Thus his bid to question identity goes only so far. In the face of outright skepticism, then, comes outright faith.

There remained the task of determining the proper limits and applications of syllogism so as to define and categorize the term *qiyiis* (a method of inference).

These discussions were the result of the theologically motivated defense of the concept of divine omnipotence that solely actuated existence, events, miracles and their causal links. It follows, then, that Theologians did not accept the doctrine of natural causation where phenomenal acts proceeded from a thing's quiddity. In their view Causal efficacy resided solely with God's divine will and contingent atoms and accidents were created ex nihilo. Thus, no causal uniformity in nature was inherently possible

For Muslims Greek logic was initially a means to defend metaphysical doctrines but the scope of logic was expanded to jurisprudence and language. All of this was attempted under the questionable notion that logic could remain doctrinally neutral and, at the same time, could be used to the advantage and defense of religion. Eventually, the supposed neutrality of logic was vehemently called into question.

The use of analogy formed part of the Qur'anically derived juridical system. Complications arose once the syllogism was introduced. Suddenly, metaphysical assumptions were questioned; this gave rise to the ambiguous relationship between analogy and the syllogism especially when attempting to define qiyas. A variety of arguments surrounds this term and its translation into "analogy": "Qiyiis thus cannot be given the fixed definition of analogy. Instead, it should be regarded as a relative term whose definition and structure vary from one jurist to another." Qiyiis, denotes a way of inferring something from another, and is derived from the logical sciences which embrace both the syllogism and analogy. The concern here is to determine the central method by which juridical qiyas was endowed with "a wider definition as to include formal arguments".