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UNFOLDING PARALLEL REASONING IN ISLAMIC JURISPRUDENCE

Epistemic and Dialectical Meaning in Abū Isḥāq al-Shīrāzī's System of Co-Relational Inferences of the Occasioning Factor

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To the memory of my late Great-Uncle Alama Khalil Bin Mohammad Arab and to his son Yahya Ansari (S. Rahman)

Abstract: One of the epistemological results emerging from this initial study is that the different forms of *co-relational inference*, known in the Islamic jurisprudence as *qiyās*, represent an innovative and sophisticated form of reasoning that not only provides new epistemological insights into legal reasoning in general but also furnishes a fine-grained pattern for *parallel reasoning* which can be deployed in a wide range of problem-solving contexts and does not seem to reduce to the standard forms of analogical argumentation studied in contemporary philosophy of science. However, in the present paper we will only discuss the case of so-called *co-relational inferences of the occasioning factor* and only in the context of Islamic jurisprudence.

Résumé. Cette première étude permet notamment de dégager ce résultat épistémologique: les différentes formes d'"inférence co-relationnelle" connues dans la jurisprudence islamique sous le nom de *qiyās* représentent une forme innovante et sophistiquée de raisonnement qui permet non seulement d'avoir une conception épistémologique plus claire du raisonnement légal en général, mais aussi de produire une mécanique bien huilée pour le "raisonnement parallèle"; cette mécanique du "raisonnement parallèle" peut être déployée selon un large spectre dans différents cadres de résolution de problèmes et ne semble pas se réduire aux formes standard de l'argumentation analogique étudiées en philosophie des sciences contemporaine. Nous n'aborderons cependant dans la présente étude que le cas de la dénommée "inférence co-relationnelle du facteur occasionnel", et ce seulement dans le contexte de la jurisprudence islamique.

I. INTRODUCTION

Uṣūl al-fiqh, that is, Islamic Legal Theory, is deeply rooted in the notion of rational knowledge and understanding. Indeed, *uṣūl al-fiqh* constitutes the body of knowledge and methods of reasoning that Islamic jurists— led by the aim of delving into God's intended norms for human conduct—deploy in order to provide solutions to legal problems based on the juridical understanding of the sources. According to *uṣūl al-fiqh*, legal knowledge is achieved by rational endeavour, the intellectual effort of human being: this is what is meant when the term *ijtihād*, endeavour of the intellect, is attached to *fiqh*. Let us quote the beautiful paragraph on *ijtihād* by Wael B. Hallaq in his landmark work *A History of Islamic Legal Theories*:

> In his Mustaṣfā Ghazali depicts the science of legal theory in terms of a tree cultivated by man. The fruits of the tree represent the legal rules that constitute the purpose behind planting the tree; the stem and the branches are the textual materials that enable the tree to bear the fruits and to sustain them. But in order for the tree to be cultivated, and to bring it to bear fruits, human agency must play a role. […]. We shall now turn to the "cultivator," the human agent whose creative legal reasoning is directed toward producing the fruit, the legal norm. The jurist (*faqīh*) or jurisconsult (*muftī*) who is capable of practising such legal reasoning is known as the *mujtahid*, he who exercises his utmost effort in extracting a rule from the subject matter of revelation while following the principles and procedures established in legal theory. The process of this reasoning is known as *ijtihād*, the effort itself.[1]

One of the most remarkable features of the practice of *ijtihād* is that it presupposes that *fiqh* is dynamic in nature. Indeed, since the ultimate purpose of such a kind of rational endeavour is to achieve decisions for new circumstances or cases not already established by the juridical sources, the diverse processes conceived within Islamic jurisprudence were aimed at providing tools able to deal with the evolution of the practice of *fiqh*. This dynamic feature animates Walter Edward Young's main thesis as developed in his book *The Dialectical Forge*.[2] In fact the main claim underlying the work of Young is that the dynamic nature of *fiqh* is put into action by both the dialectical understanding and the dialectical practice of legal reasoning. The following lines of Young set out the motivations for the development of a dialectical framework such as the one we are aiming at in the present paper.[3]

[1] W. Hallaq, *A History of Islamic Legal Theories: An Introduction to Sunnī Uṣūl al-Fiqh* (Cambridge/New York, 1997), p. 117.

[2] W. E. Young (*The Dialectical Forge. Juridical Disputation and the Evolution of Islamic Law* [Dordrecht, 2017], pp. 21–32) acknowledges and discusses his debt to the work of Hallaq in many sections of the book.

[3] Also relevant are the following lines of Hallaq (*A History of Islamic Legal Theories*, pp. 136–7), quoted by Young (*The Dialectical Forge*, p. 25): "In one sense, dialectic constituted the final stage in the process of legal reasoning, in which two conflicting opinions on a case of

The primary title of this monograph is "The Dialectical Forge," and its individual terms provide a suitable launching point for discussing the current project as a whole. As for the first, the most common Arabic terms for "dialectic" are jadal and munāẓara, both denoting formal disputation between scholars in a given domain, with regard to a specific thesis. When one encounters the term "dialectical" in the present work, one should think foremost of procedure-guided debate and the logic inherent to this species of discourse. A dialectical confrontation occurs between two scholars, in question and answer format, with the ultimate aims of either proving a thesis, or destroying it and supplanting it with another. A proponent-respondent introduces and attempts to defend a thesis; a questioner-objector seeks (destructively) to test and undermine that thesis, and (constructively) to supplant it with a counter-thesis. Through progressive rounds of question and response the questioner endeavours to gain concession to premises which invalidate the proponent's thesis, justify its dismantling, and provide the logical basis from which a counter-thesis necessarily flows.

Ultimately, and most importantly, a truly dialectical exchange – though drawing energy from a sober spirit of competition – must nevertheless be guided by a cooperative ethic wherein truth is paramount and forever trumps the emotional motivations of disputants to "win" the debate. This truth-seeking code demands sincere avoidance of fallacies; it views with abhorrence contrariness and self-contradiction. This alone distinguishes dialectic from sophistical or eristic argument, and, in conjunction with its dialogical format, from persuasive argument and rhetoric. And to repeat: dialectic is formal – it is an ordered enterprise, with norms and rules, and with a mutually-committed aim of advancing knowledge.[4]

According to this perspective, the practice of *ijtihād* takes the form of an interrogative enquiry where the intertwining of giving and asking for reasons features the notion of meaning that grounds legal rationality.[5] More precisely,

law were set against each other in the course of a disciplined session of argumentation with the purpose of establishing the truthfulness of one of them. The aim of this exercise, among other things, was to reduce disagreement (*ikhtilāf*) among legists by demonstrating that one opinion was more acceptable or more valid than another. Minimizing differences of opinion on a particular legal question was of the utmost importance, the implication being that truth is one, and for each case there exists only one true solution."

4 Young, *The Dialectical Forge*, p. 1.

5 See too W. Hallaq, "A tenth-eleventh century treatise on juridical", *The Muslim World*, 77, 3–4 (1987): 151–282; "The development of logical structure in Islamic legal theory", *Der Islam*, 64/1 (1987): 42-67; *Continuity and Change in Islamic Law* (Cambridge/New York, 2004); *The Origins and Evolution of Islamic Law* (Cambridge/New York, 2009); *Sharīʿa: Theory, Practice, Transformation* (Cambridge/New York, 2009). Another early study that stressed this point is Larry Miller's PHD thesis of 1984 (*Islamic Disputation Theory: a Study of the Development of Dialectic in Islam from the Tenth Through Fourteenth Centuries*, Unpublished dissertation, Princeton University) on the development of dialectic in Islam. Hassan Tahiri discusses the crucial role of dialectical reasoning for astronomy and for the development of sciences in general ("The birth of scientific controversies: the dynamic of the Arabic tradition and its impact on the development of science: Ibn al-Haytham's challenge of Ptolemy's *Almagest*", in S. Rahman, T. Street and H. Tahiri [eds.], *The Unity of Science in the Arabic Tradition* [Dordrecht, 2008], pp. 183–225). See also H. Tahiri, "Al

the conception of legal reasoning developed by Islamic jurisprudence is that it is a combination of deductive moves with hermeneutic and heuristic ones deployed in an epistemic frame. Let us once more quote Hallaq:

> Armed with the knowledge of hermeneutical principles, legal epistemology and the governing rules of consensus, the mujtahid is ready to undertake the task of inferring rules. Inferring rules presupposes expert knowledge in hermeneutics because the language of the texts requires what may be called verification; namely, establishing, to the best of one's ability, the meaning of a particular text as well as its relationship to other texts that bear upon a particular case in the law. For this relationship, as we have seen, may be one of particularization, corroboration or abrogation. Before embarking on inferential reasoning, the mujtahid must thus verify the meaning of the text he employs, and must ascertain that it was not abrogated by another text. Knowledge of the principles of consensus as well as of cases subject to the sanctioning authority of this instrument is required to ensure that the mujtahid's reasoning does not lead him to results contrary to the established consensus in his school. This knowledge is also required in order to ensure that no case that has already been sanctioned by consensus is reopened for an alternative rule.[6]

In fact, the dissatisfaction with the efficiency of the standard post-Aristotelian notion of syllogism in jurisprudence led to an ambitious dialectical frame for argumentation by parallelisms (including exemplification, symmetry and analogy) which should offer a new unifying approach to epistemology and logic for the practice of *ijtihād*.[7] The finest outcome of this approach to legal reasoning within *fiqh* is the notion of *qiyās*, known as *co-relational inference*.[8]

The aim of co-relational inferences is to provide a rational ground for the application of a juridical ruling to a given case not yet considered by the original juridical sources. It proceeds by combining heuristic (and/or hermeneutic) moves with logical inferences. The simplest form follows the following pattern:

> In order to establish if a given juridical ruling applies or not to a given case, we look for a case we already know that falls under that ruling – the so-called source-case. Then we search for the property or set of properties upon which the application of the ruling to the source-case is grounded. If that grounding property (or set of them) is known, we ponder if it can also be asserted of the new case under consideration. In the case of an

Kindi and the universalization of knowledge through mathematics", *Revista de Humanidades de Valparaíso*, 4 (2014): 81–90; *Mathematics and the Mind. An Introduction to Ibn Sīnā's Theory of Knowledge* (Dordrecht, 2015); "When the present misunderstands the past. How a modern Arab intellectual reclaimed his own heritage", *Arabic Sciences and Philosophy*, 28 (2018).

6 Hallaq, *A History of Islamic Legal Theories*, p. 82.

7 Cf. *Ibn Taymiyya against the Greek Logicians*, edited and translated by W. Hallaq (Oxford, 1993).

8 Cf. Young, *The Dialectical Forge*, p. 10. The term has quite often a broader meaning encompassing legal reasoning in general. However, Young's choice for its translation renders a narrower sense that stems from al-Shīrāzī's approach.

affirmative answer, it is inferred that the new case also falls under the juridical ruling at stake, and so the range of its application is extended.

Complications arrive when the grounds behind a given juridical ruling are not explicitly known or even not known at all. In such a case, other devices are put into action. The latter situation, as discussed in the next sections, yields a system of different forms of *qiyās* that are hierarchically organized in relation to their epistemic strength.

More generally, one interesting way to look at the contribution of the inception of the juridical notion of *qiyās* is to compare it with the emergence of European Civil-Law (not Common Law). Indeed, European Civil Law emerged as a system of general norms or rules that were thought to generalize the repertory of cases recorded mainly by Roman-Law. The idea of *qiyās* can be seen as providing an epistemological instrument to establish those general norms behind the cases recorded by the sources and the tradition. The dynamics triggered by implementing such instrument "forges" the general norms that structure Islamic Law.

According to our view, the dialogical conception of Per Martin-Löf's *Constructive Type Theory* provides both a natural understanding and a fine-grained instrument to stress three of the hallmarks of this form of reasoning:[9] (a) the interaction of heuristic and epistemological processes with logical steps, (b) the dialectical dynamics underlying the meaning-explanation of the terms involved,[10] (c) the unfolding of parallel reasoning as similarity in action.

Our study is focused on Abū Isḥāq al-Shīrāzī's classification of *qiyās* as discussed in his *Mulakhkhaṣ fī al-Jadal* (*Epitome on Dialectical Disputation*).[11] Let us point out that, though our paper is grounded on confrontation with the

[9] In fact there is ongoing work on deploying the dialogical setting in order to reconstruct logical traditions in ancient philosophy (see B. Castelnérac and M. Marion, "Arguing for inconsistency: dialectical games in the Academy", in G. Primiero and S. Rahman (eds.), *Acts of Knowledge: History, Philosophy and Logic* [London, 2009], pp. 37–76, M. Marion and H. Rückert, "Aristotle on universal quantification: a study from the perspective of game semantics". *History and Philosophy of Logic* [2015], Online first, DOI: 10.1080 / 01445340.2015.1089043) and medieval logical theories (C. D. Novaes, *Formalizing Medieval Logical Theories* [Dordrecht, 2007]; A. Popek, "Logical dialogues from Middle Ages", in C. Barés Gómez, S. Magnier and F. J. Salguero (eds.), *Logic of Knowledge. Theory and Applications* [London, 2012], pp. 223–44).

[10] The term *meaning-explanation* stems from Martin-Löf's CTT (see Appendix I). It refers to a way of providing meaning to an expression by setting out rules that determine what needs to be known in order to make an assertion involving that expression.

[11] Actually, al-Shīrāzī, who was a follower of the *Shāfiʿī* school of jurisprudence, endorsed the mistrust of the *Shāfiʿī-s* in relation to what they considered *subjective features* of *istiḥsān* and *maṣlaḥa*. Indeed, although he accepted that the extension of the scope of a juridical ruling is necessary, he was convinced that extensions should result from a rational process such as the one deployed by a *qiyās*.

original textual sources, we deploy the thorough studies of these texts (and others) by Hallaq and Young.[12]

Furthermore, we are not claiming (yet) that the framework we propose in the present paper is either a literal description or a complete formalization of the *jadal*-disputation-form in which the *qiyās* is carried out. Our study provides a *dialectical meaning-explanation* of the main notion of co-relational inference relevant for the development of al-Shīrāzī's system of *qiyās*. In other words, what we are aiming at is to set out a kind of interactive language game that makes apparent the dialectical meaning of the main notions involved in these forms of reasoning.

Actually, since all of the steps prescribed by our dialogical framework are based on moves involved in al-Shīrāzī's dialectical conception of *qiyās al-ʿilla*, we think that our proposal can be further developed into a system for actual juridical disputation that provides a full reconstruction of *jadal* as deployed in *uṣūl al-fiqh.*[13]

Thus, on the one hand our reconstruction might provide researchers on the Arabic tradition with some instruments for epistemological analysis, and on the other, we hope to motivate epistemologists and researchers in argumentation theory to explore the rich and thought-provoking texts produced by this tradition. Indeed, one of the main epistemological results emerging from this initial study is that the different forms of *qiyās* as developed in the context of *fiqh* represent an innovative approach that not only provides new epistemological insights into legal reasoning in general but also furnishes a fine-grained pattern for *parallel reasoning*[14] that can be deployed in a wide range of problem-solving contexts where degrees of evidence and inferences by drawing parallelisms are relevant.

II. A DIALECTICAL GENEALOGY OF ABŪ ISḤĀQ AL-SHĪRĀZĪ'S SYSTEM OF *QIYĀS*

In the classical studies on juridical argumentation or *jadal* by Abū al-Ḥusayn al-Baṣrī (436H/1044 CE) in his *Kitāb al-Qiyās al-Sharʿī* (*Book of Correlational Inference Consonant to God's Law*, edited 1964) and by Abū Isḥāq al-Shīrāzī (393–476H/1003–1083 CE) in his *Mulakhkhaṣ fī al-Jadal* (*Epitome on

[12] See above, n. 2 and 5.

[13] It is also worth mentioning that, to the best of our knowledge, there is no systematic study yet comparing the theory of juridical argumentation as developed within the Islamic tradition with the dialectical form of medieval disputations known as *Obligationes*. Such a study, that will fill up some flagrant gaps in the history of the development of rational argumentation, is certainly due.

[14] We have borrowed the term parallel reasoning from P. F. A. Bartha, *By Parallel Reasoning. The Construction and Evaluation of Analogical Arguments* (Oxford, 2010).

Dialectical Disputation), recorded, commented and worked out by Young,[15] we can find the following description of the *qiyās*: the aim of a *qiyās*, in its more general form, is to provide a rational ground to the ascription of some *juridical ruling* or *ḥukm* such as (forbidden, allowed, obligatory) to a given case not yet considered by the sources acknowledged by *uṣūl al-fiqh* (for short, *juridical sources*).[16]

In fact, in this context, a *qiyās* involves bringing forward a case to which, according to the claim of the thesis, a particular *ḥukm* applies. The point is to ground this claim by relating it to an already juristically acknowledged application of such a ruling. Accordingly, the grounding is carried out in two main steps (involving two alternative developments):

1. It starts by bringing forward a case, known as *al-aṣl* or *the root-case*, which the juridical sources have already established falls under the scope of the same juridical ruling as the one claimed to apply to the new case, called *al-farʿ*, *the branch-case*.[17]
2.
   2.1. (First alternative). It proceeds by the assumptions that the property (*waṣf*) determining the *ground* or *occasioning factor* (*ʿilla*) for the ruling of the root-case can be found,[18] and this property also applies to

[15] Young, *The Dialectical Forge*, chapter 4.3.

[16] In general the term *ḥukm* refers to norm or ruling. In the context of the *qiyās* it indicates the ruling of the *aṣl* which the proponent seeks to transfer to the *farʿ* (see Young, *The Dialectical Forge*, p. 610).

[17] The Arabic terminology makes use of the botanic metaphor of, respectively, *root* and *branch* in order to express the relation between the case established by the juridical sources, *al-aṣl*, and the case under consideration, *al-farʿ*. The idea is not that the *farʿ* is a subcase of the *aṣl*, but that the ruling claimed to apply to the *farʿ* is rooted on that of the *aṣl*.

[18] According to a personal email to S. Rahman, Young indicated that his translation of the term *ʿilla* – namely, *occasioning factor* – is based on the one by Bernard Weiss, *The Search for God's Law, Islamic Jurisprudence in the Writings of Sayf al-Din al-Amidi* (Salt Lake City, 1992).The term is also translated into as *effective cause*, *operative cause, ratio legis and ratio decidenci*. Some of these translations do not seem to bear the causal significance of the term. The term *ʿilla* is derived from ancient Syriac, where it means a "fault" or "blame" constituting the cause for returning articles or property. The term penetrated from Syriac into the lexicon of rational thought even before Aristotelianism penetrated Arabic culture (we owe the remark on the etymology of the term *ʿilla* to David Joseph ("Legal comparability and cultural identity: the case of legal reasoning in Jewish and Islamic Traditions", *Electronic Journal of Comparative Law*, vol. 14.1 [2010]; *Jurisprudence and Theology* [Dordrecht, 2014]). In a general context, a distinction is drawn between providing a *ground* (*ʿilla*) and providing a *factual cause* or *reason* (*sabab*): while grounding is a rational endeavour, providing a *sabab* might be limited to an empirical task. It seems to be related to St. Thomas' (*Summa Theologiae* I.2.2c:) distinction between *propter quid* and *quia* that stems from Aristotle's distinction in *Posterior Analytics* I.13) (for a discussion in the context of CTT see J. Granström, *Treatise on Intuitionistic Type Theory* (Dordrecht, 2011), p. 157. In the context of the *qiyās* the notion of *sabab* seems to allude to the justification underlying the choice of one specific occasioning factor. This use is witnessed by al-Shīrāzī's

the branch-case. Moreover, the proceeding assumes that the relevant property is to be found either by inspecting the sources or by epistemological considerations.

2.2. (Second alternative). It proceeds by finding some way to relate the branch-case to the root-case *in absence of knowledge of the occasioning factor* by developing a parallel reasoning based on some kind of similarity and it includes three cases:

2.2.1. both the root-case and the branch-case share some other juridical ruling,

2.2.2. in the absence of the similarities between the root-case and the branch case, it can nevertheless be established that there is some parallelism between a pair of source-cases and a pair of branch-cases such that if some particular juridical ruling applies to the pair of source-cases, it also applies to the pair of branch-cases,

2.2.3. both the root-case and the branch-case share some properties.

The second of the alternatives to step two is called *qiyās al-dalāla* or *correlational inference of indication*, also known as *qiyās al-shabah*, and also as *correlational inference of resemblance* – though it might be perhaps useful to restrict the term *qiyās al-shabah* for the last form of *qiyās al-dalāla*.[19] *Qiyās al-dalāla* based on the resemblance of the branch-case to the root-case in relation to a *set of properties* is considered to be the weakest, epistemically speaking, and is very close to what is known in other traditions as analogical argumentation by similarity or agreement. By contrast, the *qiyās* based on the resemblance of the branch-case to the root-case in relation to a *set of juridical rulings* is considered to be epistemically the strongest form of inference of the type *al-dalāla.* The form of inference-form of *qiyās al-dalāla* based on double parallelisms constitutes a generalization and a deeply innovative approach to what is known as *proportionality-based analogical reasoning.*[20] In relation to its epistemic strength it is placed between the former two.

denomination of the second subtype of *qiyās al-ʿilla* as *qiyās plainly evident by reported reason* (*al-wāḍiḥ bi-al-sabab*). That is, those *qiyās* where the *ʿilla* is not found in the *naṣṣ* but specified on the basis of some reason stemming from a specific historical background of *naṣṣ* reported by the Companion of the Prophet. In fact we should also mention the notion *ḥikma* that stands for the underlying higher purpose of the *ʿilla*. Moreover, the notion of *ḥikma* underlies the *doctrine of rational juridical preference* or *istiḥsān*, and *the theory of public welfare* or *maṣlaḥa* mentioned before. However, this notion does not seem to play a role in the inferential processes deployed by the use of a *qiyās*.

[19] See al-Shīrāzī, *Mulakhkhaṣ, fī al-Jadal*, fol. 5a.

[20] Cf. C. Cellucci, *Rethinking Logic: Logic in Relation to Mathematics, Evolution and Method* (Dordrecht, 2013), pp. 340–1. Moreover, it seems to be very close to Bartha's own model (*By Parallel Reasoning*).

وأما قياس الدلالة فهو أن يحمل الفرع على الأصل بضرب من الشبه غير العلة التي علق الحكم عليها في الشرع. وهذا ضرب من القياس لا تعرف صحته إلا بالاستدلال بالأصول وهو على ثلالة أضرب.[21]

As for *Qiyās al-Dalāla*, it is that one that link the branch-case with the source-case by way of a type of resemblance other than the occasioning factor upon which the ruling is made contingent in God's Law. The validity of this type of correlational inference is not known except by way of drawing indication from the authoritative source-cases; and it is [also] of three types.[22]

Al-Shīrāzī calls the first alternative to the second step *qiyās al-ʿilla* (*co-relational inference of the occasioning factor*) – that provides the subject of our paper – and distinguishes three main cases classified by the strength of the evidence for the *ʿilla*:

(i) the evidence for the determination of the *ʿilla* stems from unambiguous and explicit passages in the texts (*naṣṣ*) of the Qurʾān and of the prophetic tradition (*al-jalī bi-al-naṣṣ*), or from a consensus of the jurists (*al-jalī bi-al-ijmāʿ*)

(ii) it stems from some hermeneutical process of the texts (*al-wāḍiḥ bi-al-nuṭq*) or it is based upon some historical background reported by the Companion of the Prophet (*al-wāḍiḥ bi-al-sabab*)

(iii) the *ʿilla* is specified by positing some suitable hypothesis (*al-khafī*) about the general law occasioning the ruling of the root-case.[23] The latter has some relation to Aristotle's *argument from example* (*paradeigma*) described in the *Rhetoric* (1402b15) and the *Prior Analytics* (*Pr. An.* 69a1).

فأما قياس العلة فهو أن يحمل الفرع على الأصل بالعلة التي علق الحكم عليها في الشرع وذلك على ثلاثة أضرب جلي وواضح وخفي.[24]

[21] See al-Shīrāzī, *Mulakhkhaṣ fī al-Jadal*, fol. 5a.
[22] Cf. Young, *The Dialectical Forge*, p. 115.
[23] See al-Shīrāzī, *Mulakhkhaṣ fī al-Jadal*, fol. 5a, cf. Young (The Dialectical Forge,pp. 113–14). al-Baṣrī distinguishes a positive inferential process (*Qiyās al-Ṭard*, correlational inference of co-presence), covered by the description above, from a negative one (*Qiyās al-ʿAks*, correlational inference of the opposite). The result of the negative one is to deny that some designated juridical ruling that applies to the root case also applies to the branch-case, on the grounds that the occasioning factor does not apply to the branch-case – see Abū al-Ḥusayn al-Baṣrī, *Kitāb al-Muʿtamad fī Uṣūl al-Fiqh*, ed. Muḥammad Ḥamīd Allāh, Muḥammad Bakīr, and Ḥasan Ḥanafī (Damascus, 1964), pp. 697–9; and *K. al-Qiyās al-Sharʿī*, pp. 1031–3 (trans. of the latter in Hallaq, "A tenth-eleventh century treatise on juridical"; quoted by Young, The Dialectical Forge, p. 109).
[24] See al-Shīrāzī, *Mulakhkhaṣ fī al-Jadal*, fol. 5a.

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As for *Qiyās al-ʿIlla*, it is that one link the branch-case with the source-case by way of the occasioning factor upon which the ruling is made contingent in God's Law; and that is according to three types: *al-jalī* (clearly-disclosed), *al-wāḍiḥ* (plainly-evident), and *al-khafī* (latent).[25]

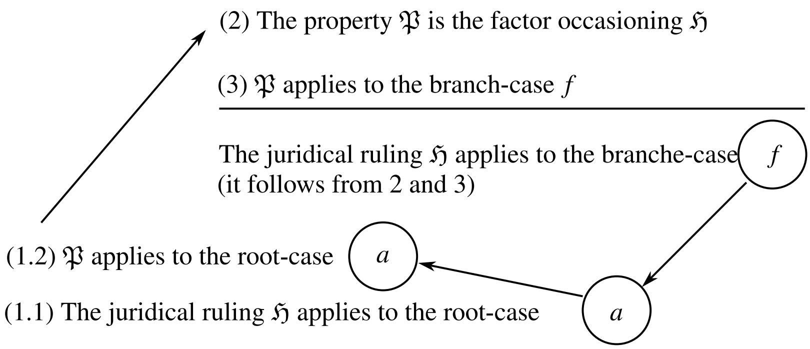
Remarks:

1) One way to express the rationale behind al-Shīrāzī's typology (not shared by all of the other authors) is that he conceives *qiyās* as a system of parallel reasoning that deploys arguments by
   a) exemplification (of a general law): *qiyās al-ʿilla.*
   b) symmetry between structures (established by either chains of rulings or pairs of parallel rulings) (the two first forms of *qiyās al-dalāla*).
   c) resemblance between the root-case and the branch-case (*qiyās al-shabah*).
2) Some paragraphs of al-Shīrāzī's *al-Lumaʿ fī Uṣūl al-Fiqh* seem to support a three-fold rather than a two-fold classification – the three-fold classification comes close to the triad a, b, c.[26] However the *Mulakhkhaṣ* and the *Maʾūna* provide solid textual evidence of a two-fold classification, where b and c are both included in a general category of *qiyās* where the occasioning factor is not present.[27]
3) *Qiyās* constitutes a system of juridical reasoning that is in the middle of two other (sometimes contested) forms of rational juridical change deployed in *fiqh* called, respectively, *the doctrine of rational juridical preference* or *istiḥsān*, that might produce the withdrawal of a conclusion achieved by a *qiyās*-procedure, and *the theory of public welfare* or *maṣlaḥa*, that can trigger the production of a new juridical ruling. Indeed, while the use of a *qiyās* might extend the scope of application of a particular juridical ruling, it does not actually refute the ruling or the occasioning factor that the juridical source explicitly declares as the ground for that ruling. The changes possible by the use of *qiyās* are, in some sense, of a more logical and semantic nature.

Before delving into the structure of *qiyās al-ʿilla*, let us motivate the underlying dialectical processes with the help of an informal diagram. The diagram presents the most general form of the *qiyās al-ʿilla*, without (for the moment) drawing a distinction between subdivisions inside each type of co-relational inference.

[25] Cf. Young, *The Dialectical Forge*, p. 109.
[26] See Abū Isḥāq al-Shīrāzī, *al-Lumaʿ fī Uṣūl al-Fiqh* (Beirut, 2003), pp. 99–101; ed. Muḥyī al-Dīn Dīb Mustū and Yūsuf ʿAlī Badīwī (Damascus,1995), pp. 204–10.
[27] See Abū Isḥāq al-Shīrāzī, *al-Maʿūna fī al-Jadal*, ed. ʿAlī b. ʿAbd al-ʿAzīz al-ʿUmayrīnī, al-Ṣafāh (Kuwait, 1987), pp. 36–8.

Schema 1: Qiyās al-ʿIlla[28]



The point of the *al-ʿilla*-form of co-relational inference is to find a general law and a property, shared by both the branch and the source-case, which allows the inference of the ruling we are looking to ground. It is not really a case of analogy by resemblance, but a kind of what is nowadays called *deductive parallel reasoning*, since it combines some kind of *symmetric* reasoning with inferential moves. Notice that neither 1.1. nor 1.2 are premises for the last inferential step. Indeed, steps 1.1 and 1.2 have the heuristic role of leading to the required general rule, and these steps are moves carried out within a dialectical structure. In order to extract from the diagram the underlying *jadal*-structure, we need to read the arrows as dialectical actions or argumentative moves, whereby the first action (the arrow right of the diagram) amounts to the heuristic move of finding a suitable root-case, then the short arrow from 1.1 to 1.2 indicates the result of finding out the property that provides the occasioning factor specific to the ruling of the root-case, and the last arrow stresses the core of the process, namely: *to learn from the ruling of the root-case that it instantiates a general juridical norm*. Once this has been achieved, a simple logical mechanism leads us to the conclusion sought.

Now, before delving into the dialectical structure, let us motivate the use of a notation inspired by Constructive Type Theory. In fact, we only deploy very basic features of the CTT-framework; a deep and thorough development is still due.

[28] The diagram has been adapted from Bartha's (*By Parallel Reasoning*, p. 36) figure for Aristotle's reasoning by *paradeigma.*

III. MOTIVATING THE DEPLOYMENT OF A CTT-FRAMEWORK

The expressive power of Per Martin Löf's Constructive Type Theory[29] allows the following features underlying the *qiyās* to be expressed at the object language level:

1) The stress on assertions (or judgements) rather than on propositional sentences. The dialectical process underlying co-relational inferences is triggered by both an assertion concerning the identification of the factor occasioning the relevant ruling and the process of the justification of such an assertion. In the specialized literature these assertions are called *taʿlīl* (affirmation of the relevance of a particular property for the determination of the *ʿilla*), or more generally *ithbāt* (affirmation).
2) The intensional rather than extensional understanding of the sets underlying the semantics of the *qiyās*.
3) The deployment of hypothetical judgements. This dovetails with the *qiyās*-notion of dependence of a given juridical ruling on a particular occasioning factor.
4) The restrictive form of the substitution rules.

In the present paper the last point will be left out since it relates to co-relational inferences by indication, which will not be discussed here.

Certainly, other formal reconstructions are possible, and in particular, we might not need an intensional framework in order to deal with changing extensions. However,

1) the deployment of intensional frameworks seems to be a natural approach in historical contexts,[30]

[29] See Appendix I. For a systematic presentation of CTT see P. Martin-Löf, *Intuitionistic Type Theory. Notes by Giovanni Sambin of a Series of Lectures given in Padua, June 1980* (Naples, 1984); *id.*, "On the meanings of the logical constants and the justifications of the logical laws", *Nordic Journal of Philosophical Logic*, 1 (1996): 11–60; B. Nordström, K. Petersson, and J. M. Smith, *Programming in Martin-Löf's Type Theory: An Introduction* (Oxford, 1990), 2000) and "Martin-Löf's Type Theory", in S. Abramsky, D. Gabbay, and T. S. E. Maibaum (eds.), *Handbook of Logic in Computer Science*. Volume 5: *Logic and Algebraic Methods* (Oxford, 2000), pp. 1–37; A. Ranta, *Type-Theoretical Grammar* (Oxford, 1994); Granström, *Treatise on Intuitionistic Type Theory*. For philosophical and historical insights into CTT see A. Ranta, "Propositions as games as types", *Synthese*, 76 (1988): 377–95; G. Primiero, *Information and Knowledge* (Dordrecht, 2008); B. G. Sundholm, "A century of judgement and inference, 1837–1936: some strands in the development of logic", in L. Haaparanta (ed.), *The Development of Modern Logic* (Oxford, 2009), pp. 263–317; *id.*, "'Inference versus consequence' revisited: inference, conditional, implication", *Synthese*, 187 (2012): 943–56.

[30] See for example, Marion and Rückert, "Aristotle on universal quantificatio" and P. Martin-Löf, "Aristotle's distinction between apophansis and protasis in the light of the distinction between assertion and proposition in contemporary logic", Workshop "Sciences et Savoirs

2) CTT provides a solid theory for the deployment of intensionally grounded sets,
3) CTT seems to match well with dialectical approaches to meaning and normative approaches to logic, such as the dialogical one. This is particularly so in a CTT-framework where non-mathematical propositions are understood as language-games, as suggested by Ranta.[31]

The main idea to be developed in sections III.1 and III.2 is that the relevance of a given property $\mathfrak{P}$ (conceived as a set) for the correspondent juridical ruling $\mathfrak{H}(x)$ is displayed by explaining the meaning of the latter as being defined over that set. In this context the factor occasioning the ruling of some particular case under scrutiny obtains as the application to this case of a method that provides the justification of applying the ruling to every instance of $\mathfrak{P}$ (and dually, the justification of applying $\neg\mathfrak{H}(x)$, given instances of $\neg\mathfrak{P}$).

III.1. The Meaning-Explanation of Juridical Rulings in Qiyās al-ʿIlla

As mentioned in Appendix I, the CTT-framework includes hypothetical judgements of the form

$$B(x) : \text{prop}\,(x).$$

These judgements are part of the formation rules that prescribe how to build a proposition out of the expression $B(x)$ and the set A. For example, the judgement above can be glossed as "$B(x)$ (*being forbidden*), renders a proposition once the free-variable x is substituted by some element a of the set A of cases of *violating privacy*". If "a" stands for "*entering in someone else's house without permission*" we obtain $B(a)$, that is, *"entering in someone else's house without permission is forbidden*".

According to this analysis, the juridical meaning of a given ruling is rendered by the rules that establish its dependence upon a property called *waṣf* (in our example the set A) that determines the occasioning factor (the causal link) relevant to that ruling. Thus, assertions such as *Drinking wine is forbidden* obtain their juridical meaning from those rules that establish how to justify this interdiction. The required form of justification is rooted in the causal link between the interdiction and the relevant property, in our case the property *Having toxic effects*.

We will proceed in two main steps:

a) by working out the formation rules that causally link *waṣf* and juridical ruling,

de l'Antiquité à l'Age classique" (2012). Lecture held at the laboratory SPHERE–CHSPAM, Paris VII. Seminar organized by Ahmad Hasnaoui.

[31] Ranta, *Type-Theoretical Grammar*, pp. 55–7.

b) by developing how this leads to the dialectical meaning-explanation of the notions that characterize *qiyās al-ʿilla*.

In relation to the first main step, let us start by pointing out that Islamic jurisprudents identified three general conditions to be met by the *waṣf* occasioning a ruling:[32]

1. Efficiency (*taʾthīr*).
2. Co-extensiveness (*ṭard*) – the presence of the property when the judgment is present.
3. Co-exclusiveness (*ʿaks*) – the absence of the property when the judgment is absent.

In fact, as we discuss in the next sections, arguments for endorsing some proposed property as efficient are based on showing both that when the property is present (*wujūd*) the ruling at stake is present, and that when the property is absent (*rafʿ*) so is the property. It is quite often the case that an argument for endorsing a property as constitutive of the occasioning factor ends with the formulation: *Therefore, the presence of the ḥukm is due to the presence of the property, and the absence of the ḥukm is due to its absence.* Thus, a property is efficient (*taʾthīr*) in relation to a given ruling *if the ruling is defined over this property* and the property satisfies both co-extensiveness (*ṭard*) and co-exclusiveness (*ʿaks*).

Given this background, we propose to take the branch-case of our example, *reading the e-mails of someone else*, to instantiate a certain set, namely the set determined by all those cases that are instances of *Violating privacy*. This set can be exemplified by instances such as *reading the e-mails of someone else, inspecting the bags of someone else*, and so on.

$$x : \textit{Privacy-Violation} \text{ (where } \textit{Privacy-Violation} \text{ is a set)}$$

Over the set *Privacy-Violation* we can then define the juridical ruling $\mathfrak{H}(x)$ ($\mathfrak{H}$ for *ḥukm*), that expresses a juridical ruling relevant to cases of *Privacy-Violation*:

$$\mathfrak{H}(x) : \text{prop}\,(x : \textit{Privacy-Violation}).$$

This displays the relations of content linking ruling and property: the relevance of the property for the ruling. What we need now is to make it apparent that *Privacy-Violation* has the efficiency (*taʾthīr*) required to occasion the relevant juridical ruling. Let us then analyze:

Privacy-Violation occasions the juridical ruling sanctioning its proscription (given the efficiency of Privacy-Violation in relation to that proscription)

as the construction:

[32] W. Hallaq, "The logic of legal reasoning in religious and non-religious cultures: the case of Islamic law and common law", *Cleveland State Law Review*, 34 (1985): 79–96, pp. 88-91; "The development of logical structure", pp. 50–8. See also Young, *The Dialectical Forge*, p. 162.

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Cases of Privacy-Violation ($\mathfrak{P}$) *occasion the interdiction* $\mathfrak{H}$ *(given the efficiency of* $\mathfrak{P}$ *in relation to* $\mathfrak{H}$*)*

Furthermore, if the property $\mathfrak{P}$ is efficient in relation to the ruling $\mathfrak{H}$, then there is a method that provides the justification of applying the ruling to every instance of $\mathfrak{P}$ (and dually, the justification of applying $\neg\mathfrak{H}(x)$, given instances of $\neg\mathfrak{P}$).

In such a context the factor occasioning the application of the ruling $\mathfrak{H}$ to some case *a* is conceived as the application of the method to this case:

$$\text{`}illa^{\mathfrak{H}(\mathfrak{P})}.a : \mathfrak{H}(a)$$

More generally each particular instance of *Privacy-Violation* occasions the proscription of that instance. *E.g. entering into the house of someone else without permission*, an instance of *Privacy-Violation*, provides the *ʿilla* occasioning the proscription of such an action. In other words, the occasioning factor *ʿilla*$^{\mathfrak{H}(\mathfrak{P})}$ in relation to a juridical ruling $\mathfrak{H}(x)$ defined over the set $\mathfrak{P}$ is the application of the function from all instances of $\mathfrak{P}$ into the set of instances of $\mathfrak{H}(x)$.[33]

Establishing that a given ruling applies to the branch-case of the thesis involves two main steps

(1) recognizing that ruling at stake is defined over the property and that there is root-case which is an application of the function that takes us from every instance of $\mathfrak{P}$ to a suitable instance of $\mathfrak{H}(x)$ (and dually, the application takes every instance of $\neg\mathfrak{P}$ to the negation of the ruling) – that is, the function that verifies the universal norm *Every* $\mathfrak{P}$ *falls under the ruling* $\mathfrak{H}$ (and its dual),

(2) recognizing that this general norm also applies to the branch-case.

The point is that the construction underlying the meaning of application of the ruling to the root-case is, to put it in Bartha's terms, *precursor to a generalization*.[34] However, the idea is quite different from what is nowadays called *one-step induction*.[35] Indeed, identifying the occasioning factor for the root-case under consideration amounts grasping it as exemplifying (the application of) a general law: this is what the notion of causality in *uṣūl al-fiqh* comes down to.

Let us point out that the property occasioning the juridical rule is more naturally conceived as a predicate defined over a set rather than a set. For example, the property of *being a toxic drink*, is naturally formulated as *the set of drinks to which the predicate being toxic applies*, rather than as the *set of toxic drinks* – a construction extensively discussed by the commentators of

[33] For the notions of *function*, *application* and *universal quantifier* in CTT see Appendix I.
[34] Bartha, *By Parallel Reasoning*, p. 109.
[35] See *e.g.* Bartha, *By Parallel Reasoning*, pp. 36–40.

Aristotle.[36] In CTT this alternative form of characterizing the relevant property yields the following:

$$\mathfrak{H}(x) : \text{prop}\,(\{x : Drinks \mid Toxic\,(x)\})$$

(subset-separation: the set of those elements of the set of drinks that are toxic), instead of the simpler:

$$\mathfrak{H}(x) : \text{prop}\,(x : Toxic\ Drinks)$$

(the set of toxic drinks).

However, for the sake of perspicuity, and despite the fact that this will lead us to the somewhat awkward formulation *instantiating the property*, we will deploy the second, simpler notation.

Let us have now a closer look at the notion of efficiency.

III.1.1. On Taʾthīr, Ṭard and ʿAks

In the context of *jadal* and dialectical frameworks, there are moves aimed at refusing to accept that the selected property is the one occasioning the juridical ruling. Let us take the widely discussed example of the *prohibition of consuming wine*. Let us further assume that the property selected as relevant was *being red*. The, refusal to accept *being a red drink* as determining the factor occasioning the relevant ruling is not only a refusal to endorse the generalization *Every red drink is to be forbidden*. The refusal lies deeper in the structure. It is about denying that *being a red drink is* relevant to the *prohibition of consuming wine*.[37]

The latter considerations suggest that the structure of the general norm that binds the occasioning factor with the ruling is more complex. One possible formalization follows from the following.

Let the expression $x : \mathfrak{P}$, stand for the set of drinks x that are toxic, and likewise $\neg\mathfrak{P}$ for non-toxic drinks.[38]

Let the expression $\mathfrak{H}(x)$ stand for the juridical ruling that the consumption of x is forbidden. Similar paraphrase admits the negation $\neg\mathfrak{H}(x)$.

If we spell out the precise formulation of the property as determined by *ṭard* and *ʿaks*, the point is that:

ṭard: If *x* is a toxic drink then its consumption is forbidden.

ʿaks: If *x* is not a toxic drink then its consumption is not forbidden.

[36] Alexander of Aphrodisias called such a form of construction *prosleptic proposition* – see L. Gili, "Alexander of Aphrodisias and the heterdox dictum de omni et de nullo", *History and Philosophy of Logic*, vol. 36, no. 2 (2015):114–128.

[37] We borrowed the example from Hallaq, "The logic of legal reasoning in religious and non-religious cultures", pp. 88–9.

[38] We deploy here the expression *set toxic drinks* for simplicity. As discussed in the last sections, the set at stake is rather the *set of all those substances of which the property of having euphoric intensity applies*.

This yields the general norm:

$$(\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$$

That reads: *The consumption of toxic drinks is forbidden and the consumption of non-toxic drinks is not*. Notice that the formation of each side of the conjunction still presupposes the dependence of the ruling upon the property:

$$\mathfrak{H}(x) : \text{prop}\,(x : \mathfrak{P})$$
$$\neg\mathfrak{H}(x) : \text{prop}\,(x : \neg\mathfrak{P})$$

Accordingly, the formation of the conjunction underlying the efficiency of the property in relation to the ruling $\mathfrak{H}$ is structured as follows:

$$ta\text{'}th\bar{\imath}r^{\mathfrak{H}(\mathfrak{P})} \begin{cases} \underset{.}{t}ard^{\mathfrak{H}(\mathfrak{P})}(x) : \mathfrak{H}(x)\,(x : \mathfrak{P}) \\ \text{'}aks^{\mathfrak{H}(\mathfrak{P})}(x) : \neg\mathfrak{H}(x)\,(x : \neg\mathfrak{P}) \end{cases}$$

Furthermore, the efficiency of the property $\mathfrak{P}$ for our example is the pair:

$$ta\text{'}th\bar{\imath}r^{\mathfrak{H}(\mathfrak{P})} := \left(\underset{.}{t}ard^{\mathfrak{H}(\mathfrak{P})}, \text{'}aks^{\mathfrak{H}(\mathfrak{P})}\right) : (\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x),$$

which presupposes:[39]

$$\mathfrak{H}(x) : \text{prop}\,(x : \mathfrak{P}) \text{ and } \neg\mathfrak{H}(x) : \text{prop}\,(x : \neg\mathfrak{P}).$$

According to this analysis the occasioning factor is the following pair of applications:

given $ta\text{'}th\bar{\imath}r^{\mathfrak{H}(\mathfrak{P})} : (\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$ and $a : \mathfrak{P}$ or $a : \neg\mathfrak{P}$, we obtain

The application of the ruling $\mathfrak{H}(x)$ to $a : \mathfrak{P}$ witnesses the co-extensiveness of $\mathfrak{P}$ in relation to $\mathfrak{H}(x)$ – we express this with the abbreviated notation $\text{'}illa^{\mathfrak{H}(\mathfrak{P})+}.a : \mathfrak{H}(a)$. In other words, such an application constitutes the occasioning factor for the ruling $\mathfrak{H}(a)$.[40]

The application of the ruling $\neg\mathfrak{H}(x)$ to $a : \neg\mathfrak{P}$ witnesses the co-exclusiveness of $\neg\mathfrak{P}$ in relation to $\neg\mathfrak{H}(a)$, we express this with the abbreviated notation $\text{'}illa^{\mathfrak{H}(\mathfrak{P})-}.a : \neg\mathfrak{H}(a)$. In other words, such an application constitutes the occasioning factor for the ruling $\neg\mathfrak{H}(a)$.[41]

[39] The expressions "$\underset{.}{t}ard^{\mathfrak{H}(\mathfrak{P})}$", "$\text{'}aks^{\mathfrak{H}(\mathfrak{P})}$", stand for the lambda-abstract of the functions $\underset{.}{t}ard^{\mathfrak{H}(\mathfrak{P})}(x)$, $\text{'}aks^{\mathfrak{H}(\mathfrak{P})}(x)$ (for the notion of lambda-abstract see Appendix I). As discussed in Appendix II, in a dialectical framework they correspond to those strategic-objects that justify the universal assertions of co-extensiveness and co-exclusiveness – in a nutshell: they stand for those objects that instruct the defender of the universal how to produce evidence for the ruling from every evidence brought forward by the challenger.

[40] The full notation yields $\text{'}illa(\underset{.}{t}ard^{\mathfrak{P}}.a) = \underset{.}{t}ard^{\mathfrak{P}}(a) : \mathfrak{H}(a)$.

[41] The full notation yields $\text{'}illa(\text{'}aks^{\mathfrak{P}}.a) = \text{'}aks^{\mathfrak{P}}(a) : \neg\mathfrak{H}(a)$.

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Useful are also the notations:

$$!\,\text{‘}illa^{\mathfrak{S}-\mathfrak{H}(\mathfrak{P})}\ldots$$

$$!\mathfrak{H}^{\mathfrak{S}}\ldots$$

$$!\mathfrak{P}^{\mathfrak{S}}\ldots$$

The first expression indicates that the identification of $\mathfrak{P}$ as relevant for the occasioning factor of the root-case is to be found in the sources. Similar applies to the exponent $\mathfrak{S}$ of the three other expressions.

III.1.2. Requiring Justification: muṭālaba

The conditions of efficiency, co-extensiveness and co-exclusiveness determine the way to challenge and defend the assertion that links property and ruling. According to the analysis of the preceding section, a counterexample to the condition of *efficiency* amounts to bringing up a case where the purported property is present but does not provide the material for the occasioning factor (for example vinegar, as counterexample to identifying *red liquid* as the factor leading to the interdiction of consuming wine).

In the context of a debate structured by the *qiyās*, if there is no evidence from the sources of a property $\mathfrak{P}$ being the relevant one for the ruling $\mathfrak{H}(aṣl)$, then $\mathfrak{P}$ is only assumed to constitute the application $\text{‘}illa^{\mathfrak{H}(\mathfrak{P})+}.aṣl$. So, we indicate this fact with the notation $\text{‘}illa^{\mathfrak{H}(\mathfrak{P})+}.aṣl : \mathfrak{H}(aṣl)$, instead of $\text{‘}illa^{\mathfrak{S}-\mathfrak{H}(\mathfrak{P})+}.aṣl : \mathfrak{H}(aṣl)$ – while the former indicates that the selection of the property $\mathfrak{P}$ as occasioning the presence of the ruling is based on some factual and / or epistemological considerations, the second indicates that this selection is backed by the sources.

In the case, where we have $\text{‘}illa^{\mathfrak{H}(\mathfrak{P})+}.aṣl : \mathfrak{H}(aṣl)$ rather than $\text{‘}illa^{\mathfrak{S}-\mathfrak{H}(\mathfrak{P})+}.aṣl : \mathfrak{H}(aṣl)$, a justification for the selection can be required: the request is called *muṭālaba*. The justification process involves showing that the proposed property satisfies efficiency, co-extensiveness and co-exclusiveness. This suggests the following dialectical structure:

a) the original claim on the applicability of a ruling to a case not recorded by the sources presupposes singling out a particular property;
b) a *qiyās al-ʿilla* process contemplates the possibility of making explicit the reasons that led to select one property rather than a different one: this is what *muṭālaba* is about.

III.2. The Dialectical Framework

In order to provide meaning explanations to the basic notions al-Shīrāzī's System of *qiyās* we deployed CTT, but al-Shīrāzī's approach is a dialectical framework. Thus, we need now to motivate the interface of CTT with a

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dialectical framework. We will develop this motivation in two main steps, namely

1) by a (brief) discussion of the interface *epistemic-assumption*, *formal rule* and the notion of *epistemic strength*
2) by the distinction of play and strategic level and the notion of winning and losing within the dialectical framework underlying the system of *qiyās al-ʿilla*

III.2.1. Epistemic-Assumptions, the Formal Rule and Epistemic Strength

In recent lectures in Paris, Per Martin-Löf (2015) advanced some important motivations for linking CTT with a dialectical conception of logic. They mainly involve the normative approaches to logic in general and to CTT in particular. The main proposal of Martin-Löf involves the deployment of the so-called *formal rule* of dialogical logic in order to provide a normative understanding of Göran Sundholm's[42] notion of *epistemic assumption*.[43] Indeed, one of the main features of the dialogical framework is the so-called *formal rule*, nowadays more aptly named the *Socratic Rule*, by Marion / Rückert (2015), by the means of which:

the Proponent is entitled to use the Opponent's moves in order to develop the defence of his own thesis.

According to this perspective, the Proponent takes the assertions of the Opponent as *epistemic assumptions* (to put it in Sundholm's happy terminology), and this means that the Proponent trusts them only because of their force, just because the Opponent claims that he has some grounds for them.

As we will see below, the Socratic Rule is crucial for the dialectical reconstruction of the logic underlying the *qiyās*, however, in such a context, the Socratic Rule needs to be refined and levelled: it must be extended to a context where content is at the basis of any concession of the Opponent.[44] In fact, the

[42] "Inference and consequence in an interpeted language", p. 17.

[43] "The solution […], it seems to me now, comes naturally out of this *dialogical analysis* (not in italic in the original text). […] the premisses here should not be assumed to be known in the qualified sense, that is, to be demonstrated, but we should simply assume that they have been asserted, which is to say that others have taken responsibility for them, and then the question for me is whether I can take responsibility for the conclusion. So, the assumption is merely that they have been asserted, not that they have been demonstrated. That seems to me to be the appropriate definition of epistemic assumption in Sundholm's sense." Transcription by Ansten Klev of Martin-Löf's talk in May 2015.

[44] Such kinds of dialogue are related to what is referred to as *material dialogues*. See E. C. Krabbe, "Dialogue logic", in Dov M. Gabbay and J. Woods (eds.), *Handbook of the History of Logic*, vol. 7 (Amsterdam, 2006), pp. 665–704; L. Keiff, "Dialogical logic". in Edward N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy* (2009), URL http://plato.stanford.edu/entries/logic-dialogical.

epistemological aims of the dialectical structure of the *qiyās* require the claims to be backed either by the sources or by some arguments. Only after this has been achieved will he (the Opponent) be prepared to provide a concession upon which the logical argument will rely.

1) If a player backs his claim with a reference to the sources, it has the maximal authoritative force and it must be conceded.
2) If the Proponent backs his claim by appealing to the Opponent's own concessions during the dialectical process, then it has a logical force. *Logical force* underlies the logical fragments of a *qiyās*-process. However, Opponent's concessions (leaving aside the sources) might be the result of a cooperative move by the means of which the Opponent brings forward some kind of justification for the selection of a particular property, based on its efficiency in relation to the relevant ruling.
3) The deployment of concessions based on similarities and/or resemblances, without any appeal to the occasioning factor, has less authoritative and epistemic force than all the previous ones. This form of justification involves the deployment of *qiyās al-dalāla* (not discussed in the present paper).

Furthermore, one crucial step for the successful ending of the play by the Proponent is to force the Opponent to concede that the branch-case under consideration instantiates the proposed property. Before responding, the Opponent might ask for some kind of justification that this is the case. Take the example of acknowledging that the branch-case *date-wine* is a *toxic drink* – in a sense that causes its interdiction. The Proponent might need to bring some factual evidence of the presence of toxicity. There are several forms to implement this, for example assuming some sort of measurement that provides the required evidence.[45] In fact, if we examine closely at al-Baṣrī's and al-Shīrāzī's own examples of debates it is clear that their dialectical procedure assumes that, when this point of the debate has been achieved, the issue has been settled positively. Following their practice we will keep only those plays where it is assumed that there is evidence that the branch-case instantiates the relevant property. In other words, we will assume that, once the general law expressing the occasioning factor has been identified and acknowledged by the Opponent, he will respond positively to the further request to acknowledge that the branch-case is an instance of the relevant property. For short such sort of assertions will be given the status *of epistemic assumptions*. We will proceed in a similar way with requests concerning the acknowledgement that the root-case is an instance of the proposed property (but, this move *does not* amount recognizing the property as relevant for the determination of the occasioning factor). The point of such a way to proceed is that, if the Opponent rejects such

[45] Cf P. Martin-Löf, "Truth of empirical propositions", Lecture held at the University of Leiden, February 2014. Transcription by Ansten Klev.

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kind of requests there is something fundamentally wrong in the way the Proponent is developing his argumentation: if the property does not apply to either the root-case or the branch case it is not really relevant for carrying out a *qiyās*-process. If the proposed property does not apply; then the dialogues should start from scratch. Al-Baṣrī's and al-Shīrāzī's strategy has the desirable effect that the whole dialectical process focus on the central point of *qiyās al-ʿilla*, namely finding out the occasioning factor and deciding if it does or not apply to the branch-case: victory and defeat will be determined by the achievement or not of these main tasks.

The whole logical structure basically depends on those moves of the Opponent by means of which he is prepared to concede the relevant claims and even to contribute to the task of grounding the thesis. It is important to note that the process relies on the cooperative attitude of both of the contenders. So, can this be made compatible with *jadal*'s notions such as *winning* and *losing*, and moreover with the contemporary notion a *winning strategy*.

III.2.2. Inqiṭāʿ *(termination),* ifḥām *(bringing the antagonist to silence),* ilzām *(concession of defeat) and the aims of* Qiyās al-ʿIlla

As mentioned above, it is not our intention to develop a formalization of the *jadal*-structure underlying the *qiyās al-ʿilla* but to provide the dialectical meaning-explanations of the main notions involved in this form of reasoning. This does not mean that we are not aiming at a formalization of the *jadal* theory at all. It is rather the case that in the present paper we are engaged with the more modest target of setting the basic conceptual elements for such a development.

Today there are numerous dialectical frameworks to choose from for our task. Our choice is the dialogical framework of Paul Lorenzen and Kuno Lorenz[46] which seems natural given that we made the choice to deploy the formal language of CTT, and as argued in the preceding sections there are some good motivations for linking the epistemic perspectives of CTT with the dialogical approach to logic. We should now explain our choice of the dialogical conception of logic as our instrument for the study of dialectical structure underlying the theory of *qiyās* – letting aside the important fact that Miller's work, that set a landmark in the understanding of *jadal*, deploys for his reconstruction notions stemming precisely from the dialogical framework of Lorenzen and Lorenz. In this context let us recall that the very idea of developing a general system of *qiyās* was to achieve knowledge in an interactive setting that engaged hermeneutical, heuristical and logical moves.[47] One important feature of the objectives of deploying *qiyās* is that attaining victory by the use of linguistic traps or fallacies is absolutely excluded. In other

[46] P. Lorenzen and K. Lorenz, *Dialogische Logik* (Darmstadt, 1978).

[47] See Miller, *Islamic Disputation Theory*, pp. 9–49; Hallaq, *A History of Islamic Legal Theories*, pp. 136–7, and Young, *The Dialectical Forge*, p. 1.

words, what distinguishes the dialectical framework of the *jadal* from sophistical dialectics is its ambition of pursuing truth. This feature of the *qiyās* dovetails nicely with the main normative tenets of the dialogical approach to logic. Indeed, the dialogical approach was developed in order to implement an epistemic and pragmatist conception of logic where meaning and knowledge are constituted by interaction, not in order to describe the logic of a dialogue. This is the main idea behind the Socratic Rule mentioned above: epistemological assumptions and textual data are internalized within a dialectical frame in such a way that all notions are cast into what Young calls the *dialectical forge*.

Furthermore, most (but not necessarily all) of the developments within the dialogical framework define plays as being finite and ending with victory or defeat of one of the players. This feature of Lorenzen-Lorenz's dialogical framework makes good sense in the context of *jadal* since it is crucial that juridical debate ends, given that the final aim is to come to a juridical decision. In fact, the theory of *jadal* has three main notions that capture these last two points, namely *ilzām*, *ifḥām*, *inqiṭā*ʿ.

While *ilzām* refers to *conceding inexorable defeat*, and *ifḥām* refers to *bringing the antagonist to silence*, the latter *inqiṭā*ʿ or *termination* amounts to a description of all cases where a debate terminates and leads to defeat of one of the contenders – because of self-contradiction or some other form of mistake, or because of evidence of a counterexample.[48]

So, it is assumed that some end of the debate must be reached and when reached one of the players concedes defeat (or is brought to silence). There has been some evolution in relation to the meaning of these terms: in the early times it looks as if *ilzām* described the general situation of the defeat of one of the contenders, later on it was attached to the Questioner's (Opponent's) concession of defeat. While developing our own dialogical reconstruction we adopted the following usage:

1) We describe the end of a debate where the Proponent has been brought to silence with the term *ifḥām*.
2) We describe the end of a debate where the Opponent concedes defeat with the term *ilzām*.

Be that as it may, Young convincingly argues that both of them describe the end-situation of a debate rather than a special form of objection deployed during such a debate, as sometimes suggested by Miller.[49] In fact, Miller while translating al-Samarqandī's *Qusṭās*, translates these terms precisely in the sense defended by Young:[50]

[48] Cf. Miller, *Islamic Disputation Theory*, p. 211; Young, *The Dialectical Forge*, pp. 183–8.
[49] Young, *The Dialectical Forge*, p. 183; Miller, *Islamic Disputation Theory*, p. 134.
[50] Young, *The Dialectical Forge*, p. 183

The debate continues until R is silenced (*ifḥām*) or Q is forced to accept his argument (*ilzām*).[51]

Miller explains al-Samarqandī's argument for the finite termination, *inqiṭāʿ*, of a debate:

[…] al-Samarqandī explains why a debate is necessarily finite. He argues in the following way. If P and Q each make use of the techniques at their disposal, Q making objections and P countering them with further evidence in support of his thesis, then there must necessarily come a point in the debate where P is unable to answer Q's objections or Q must accept P's thesis, whether it be true or false. In the first case Q wins, in the second, P wins. If an opponent should deny the second alternative, al-Samarqandī argues that either P would be forced to bring an infinite number of proofs or he would be unable to respond (*ʿajz*). But the first possibility is excluded because it would entail an infinite chain of reasonings from a single beginning (*mabdaʾ*) or cause (*ʿilla*). This is because al- Samarqandī understands the relation of the "proof" (*dalīl*) to the "proven" (*madlūl*) as that of the cause to its effect. An infinite chain of reasonings is absurd, and, therefore, it follows that P has been refuted since he cannot establish an infinite number of things.[52]

In the context of *qiyās al-ʿilla*, the finiteness of the debates is assured by the fact that challenges to the efficiency of a proposed property amount to finding a counterexample within the sources (including the consensus of the experts). Certainly, a new debate might start later on; but then data and assumptions will have changed and we will be in the presence of a new cycle of the dialectical forge.

Still, it might look as if the terminology *winning* and *losing* a play and the resulting notion of *winning strategy*, an important feature of standard games within this dialogical framework, works against the *jadal* conception of a *cooperative endeavour* towards the pursuit of truth – recall our quote of Young[53] in the introduction to the present paper.

In our view, one of the epistemological results gathered by the examination of *jadal* is that it suggests a novel perspective on how to integrate cooperative and revision moves in a dialectical framework: a winning strategy is to be thought of as a kind of *recapitulation* of the different attempts to attain truth. According to our reconstruction, the existence of a winning strategy in this context includes the following steps:

1) *internal cooperation*: keeping only the successful moves (including sub-arguments) of the actual plays developed

[51] Miller, *Islamic Disputation Theory*, p. 211.
[52] Miller, *Islamic Disputation Theory*, pp. 219–20.
[53] Young, *The Dialectical Forge*, p. 15.

2) *external or metalogical cooperation*: including moves and plays that have not actually been played but that due the background of existing factual and logical knowledge should have been considered

The second step assumes the perspective of an expert in the field that prescribes how the debate should have proceed.

What is at stake here is a particular form of what Kuno Lorenz calls *dialogische Geltung*,[54] or legitimacy, instead of logical validity. More precisely it is *material legitimacy*. In the context of *qiyās al-ʿilla* legitimacy amounts to establishing whether there is or not enough evidence to decide about the application of a juridical ruling to the case at stake, given the epistemological circumstances involving the thesis, and the logical features of the framework.

So the real target is to achieve a conclusion in relation to some particular legitimacy claim (*Geltungsanspruch*). Legitimacy claims are not to be thought of as bounded by the particular identity of a player: it is an intersubjective notion. If a claim is legitimate it is independent of the particular skills of the player who sustains it. Moreover, the existence of a winning strategy does not amount to the victory of any particular player. However, it is not about claims of logical universality either, but about content-based truth. A winning strategy within a debate structured by a system of *qiyās* displays the collective effort towards pursuing truth.

As we will illustrate below, the development of a debate includes cooperative moves, called *muʿāraḍa*, by means of which a player might collaborate, with the task of grounding the main claim. As just explained, at the strategy level (the level at which the result of the whole dialectical procedure is evaluated), only the outcome of the collaboration will be displayed. This indicates that the normativity of the dialectical process underlying the *qiyās* admits the following stages

1) conceptual normativity: the dialectical framework provides the notions by means of which the reasoning involving the legitimacy of the claims underlying a debate is to be developed
2) heuristic normativity: the inclusion of cooperative moves allows correction and revision during a play in order to obtain the optimal moves for selecting the relevant property
3) strategic normativity: the optimal moves in order to test the legitimacy of the main claim

Summing up, while the first level involves the core of what normativity is, by providing us with what Jaroslav Peregrin calls the *material for reasoning*, the second and the third level correspond to normativity in the sense of *tactics*, or on *how to move*.[55] Al-Shīrāzī's dialectical framework leaves the precise

[54] K. Lorenz, "Sinnbestimmung und Geltungssicherung", First published under the title "Ein Beitrag zur Sprachlogik", in G.-L. Lueken (ed.), *Formen der Argumentation* (Leipzig, 2000), pp 87–106.

[55] J. Peregrin, *Inferentialism. Why Rules Matter* (New York, 2014), pp. 228–9.

description of the optimal moves open, since the inclusion of means for cooperation intends to provide a contextually dependent instrument for heuristic normativity. We will illustrate this point with an example in section IV.2.

Notice that revision takes place at the play-level. If it is the main claim that must be revised by adding some fresh information, then strictly speaking there is not revision but rather a new start – because the original claim was thought to be knowledge but has been shown to be ungrounded. Thus, the dynamics underlying al-Shīrāzī's dialectical system of *qiyās* seems to be closer to what we nowadays call epistemic approaches rather than to non-monotonic reasoning.

IV. A DIALOGICAL FRAMEWORK FOR CO-RELATIONAL INFERENCES OF THE OCCASIONING FACTOR

As discussed in the preceding sections, our analysis of the dialectical structure of the *qiyās* deploys a version of the dialogical conception of logic. The dialogical conception of logic is not a specific logical system, but rather a framework rooted in a rule-based approach to meaning in which different forms of inferences can be developed, combined and compared. More precisely, in a dialogue, two parties argue about a thesis while respecting certain fixed rules. The player that states the thesis is called Proponent (**P**), and his rival, who contests the thesis, is called Opponent (**O**). Dialogues are designed in such a way that each of the plays ends after a finite number of moves, with one player winning while the other loses. Actions or moves in a dialogue are often understood as speech-acts involving *declarative utterances* or *posits* and *interrogative utterances* or *requests*. The rules prescribing the moves are divided into rules for *local meaning*, including the rules for the logical constants (*Partikelregeln*), and for *global meaning*, determined by *structural rules* (*Rahmenregeln*). The structural rules determine the general course of a dialogue game, whereas the particle rules regulate those moves (or utterances) that are requests and those moves that are answers (to the requests).

At this stage, we advise the reader to see the presentation of the overall argumentative structure of a dialogue for *qiyās al-ʿilla* provided in Appendix II.3, *without looking at the* formulae. The formal presentation of the the dialogical framework is developed in the other sections of Appendix II.

IV.1. Some Special Moves: Constructive and Destructive Criticism

IV.1.1. Constructive Criticism: Muʿāraḍa

Assume that the Proponent backed his choice of the property $\mathfrak{P}$ as constituting the occasioning factor for the juridical ruling $\mathfrak{H}$. Let us further assume that the Opponent is not convinced, however, he is willing to collaborate with the task of searching for the suitable property. The Opponent becomes now the defender in a sub-play where he is committed to bring forward a new argument that either make the formulation of the proposed property more precise or proposes a new property. In the practice, the Opponent launches such a form of cooperative move when he thinks that the claim of the thesis is correct, however the Proponent made wrong choices during his argumentation in support for it. The sub-play proceeds in the following way:

1. The Opponent starts by asserting that the relevant factor for the root-case at stake is the property $\mathfrak{P}^{\star}$ rather than $\mathfrak{P}$.
2. If the assertion of the Opponent is rooted in the sources, the Proponent must accept it and the play will continue from step 5. If it is not based on the sources the Proponent responds by challenging the Opponent to open a *sub-play* where the latter must defend his thesis.
3. In the sub-play, before providing the required justification, the Opponent might first choose to force the Proponent to accept that there is a root-case that contradicts the Proponent's choice of $\mathfrak{P}$ as relevant for the juridical ruling at stake.
4. The Opponent will proceed then by showing that the new property $\mathfrak{P}^{\star}$ satisfies the conditions *taʾthīr*, *ṭard* and *ʿaks* in relation to $\mathfrak{H}$.
5. Once the new property $\mathfrak{P}^{\star}$ has been accepted by both contenders as the relevant one for $\mathfrak{H}$, the sub-play ends and the dialogue continues with the Proponent endorsing that $\mathfrak{P}^{\star}$ applies to the branch-case involved in the thesis. Then he will proceed to show that this leads to justify the thesis.
6. The tree displaying the winning strategy will delete the unsuccessful attempts and also the justification of the sub-play.

This challenge is a *muʿāraḍa*-move, profusely discussed in the *jadal*-literature. Young calls it *constructive criticism*.[56] It is opposed to the *destructive criticism*.

The launching of a constructive criticism will be indicated with the following notation: $\mathbf{O}!\mathbb{V}$ *'illa*$^{\mathfrak{H}(\mathfrak{P}^{\star})+}$.*aṣl* : $\mathfrak{H}(aṣl)$. In bringing forward such a move the Opponent is committed to sub-play where he advances the thesis that the relevant property is $\mathfrak{P}^{\star}$ rather than the proposed $\mathfrak{P}$.

[56] Young, *The Dialectical Forge*, p. 151.

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IV.1.2. Forms of Destructive Criticism

The Opponent might also react by *strongly* rejecting the Proponent's proposal. We distinguish two cases that we call (1) d*estruction of the thesis*; (2) *destruction of the ʿilla*.

The main target of the first form of objection, *destruction of the thesis*, is the thesis rather than only objecting against to the Proponent proposal for determining the *ʿilla*. In such a case it is he, the Opponent, who has to bring forward a counterexample from the sources. This will trigger a sub-play where the Opponent develops his counter argumentation. In the practice, the Opponent launches such a form of destructive criticism when he thinks that the claim of the thesis is incorrect and the only way to correct it is to start from scratch.

This form of criticism declines in different kinds of objections distinguished by the sort of counterexample brought forward. We will restrict ourselves to only three main forms of non-cooperative criticism. Let us point that we decided to include the third one as implementing the destruction of the thesis, because of the examples found in the texts, but in principle it does not need to be classified in that way. Thus, according to our classification destruction of the thesis amounts to:

1) Bringing forward a root-case of which it is recorded that exactly the opposite of the claimed ruling applies, despite the fact that the property does.[57] It is called *qalb* (reversal). The counterexample undermines the *ṭard*-condition of the purported property – the property applies but the opposite of the ruling is the case.
2) Bringing forward a root-case of which it is recorded that a ruling different to the claimed ruling applies and that it has been acknowledged that both rulings are incompatible, despite the fact that the property does. It is called, *naqḍ* (*inconsistency*). The counterexample can be seen as it also undermines the *ṭard*-condition (provided both rulings are incompatible).
3) Bringing forward a root-case of which it is recorded that a ruling different to the claimed ruling applies despite the fact that the property does, and this shows that the proposed property unifies cases that must be kept apart. The point is that a particular subset of the proposed property does not lead to the expected ruling. It is called, *kasr* (*breaking apart*). The counterexample

[57] Our formulation is slightly more general than the one of Young (*The Dialectical Forge*, p. 166), since according to our setting the root-case that triggers the counterargument does not need to be the same as the one choosen by the Proponent. The point is that if we follow Young's restriction to only one root-case then all comes down to accepting or not that the ruling of the thesis applies to that root-case – this assumes that the Proponent either missinterprets the sources or misses some relevant evidence that can be found in those sources. Our formulation might be closer to a specific form of reversal called reversal and oppositeness (*al-qalb wa-al-ʿaks*) (see Young, *The Dialectical Forge*, pp. 166–7).

can be also understood as a particular form of *naqḍ* triggered by the assumption called by the Middle-Ages *dictum de omni*: what applies to all should apply to its parts.[58]

One crucial feature of destructive criticism of the thesis is that the counterexample must involve a root-case that is closely related to the branch-case proposed. In fact quite often, the counterexamples brought forward by a destructive criticism involve a root-case that is some subset of the branch-case. Thus, the criticism will proceed by forcing the Proponent to concede that the counterexample shows that the ruling to be applied contradicts the one claimed to hold for the branch-case.

The second form of objection, *destruction of the ʿilla*, will trigger a sub-play where the Opponent brings forward objections against to the efficiency of the proposed *waṣf.* Destruction of the *ʿilla is* implemented by:

4) Bringing forward a root-case of which it is recorded in the sources that a property assumed to apply to the branch-case occasions in fact, the opposite ruling to the one posited by the Proponent in the thesis. It is called *fasād al-waḍʿ* (invalidity of occasioned status) and unlike the next one it amounts to producing evidence for a new *ʿilla*.[59]
5) Bringing forward a root-case of which it is recorded that the claimed ruling applies despite the absence of the property claimed to specify the occasioning factor. It is called, *ʿadam al-taʾthīr* (lack of efficiency). The counterexample undermines the *taʾthīr* condition of the purported property—the occasioning factor for the ruling is not specified by the proposed property (is not dependent upon the property). This also undermines the other two conditions.[60]

In the following section we will develop dialogues involving constructive criticism, but let us illustrate first the different forms of objection in a succinct manner and introduce a suitable formal notation. The assertion $\mathbf{O}!\mathbb{F}\ \varphi$ indicates that the Opponent is committed to a sub-play where he will bring up a counterexample to the Proponent's assertion φ. When applied to destructive criticism it yields:

1) $\mathbf{O}!\mathbb{F}(\forall x : \mathfrak{P})\mathfrak{H}(x)$ (*qalb*): the Opponent is committed to a sub-play where he brings forward a root-case of which it is recorded that an opposite ruling to the claimed ruling applies. Hence the root-case is presented as a counterexample to the Proponent's claim that every $\mathfrak{P}$ falls under the ruling $\mathfrak{H}$ and in particular to the claim that this ruling applies to the branch-case.

[58] Cf. Aristotle, *Prior Analytics*, A, 2, 24b28–29. See W. Hodges, "The laws of distribution for syllogisms", *Notre Dame Journal of Formal Logic*, 39 (1998): 221–30, pp. 226–8; T. Parsons, *Articulating Medieval Logic* (Oxford, 2014), pp. 45–8; Marion and Rückert,"Aristotle on universal quantification".
[59] Young, *The Dialectical Forge*, pp. 158–9.
[60] Young, *The Dialectical Forge*, pp. 150–64.

Thesis: Saliva of beasts of prey (*farʿ*) is impure ($\mathfrak{H}$). *Claim:* "Having canine teeth" determines the *ʿilla*. *Counterexample:* The saliva of cats which are beasts of prey with canine teeth is not impure.[61]

2) $\mathbf{O}!\mathbb{F}\,(\forall x:\mathfrak{P})\mathfrak{H}(x)$, given $aṣl^{\star}:\mathfrak{P}$, $\mathfrak{H}^{\mathfrak{S}\star}(aṣl^{\star})$, and $\neg(\mathfrak{H}(aṣl^{\star})\wedge\mathfrak{H}^{\star}(aṣl^{\star}))$ (*naqḍ)*: the Opponent is committed to a sub-play where he brings forward a root-case of which it is recorded that a different ruling to the claimed ruling applies and both rulings are incompatible. Hence the root-case is presented as a counterexample to the Proponent's assertion that every $\mathfrak{P}$ falls under the ruling $\mathfrak{H}$ and in particular to the claim that this ruling applies to the branch-case. *Thesis:* Killing (*farʿ*) should be punished with jail ($\mathfrak{H}$). *Claim:* "Having commited homicide" determines the *ʿilla*. *Counterexample:* Some forms of homicide do neither lead to jail nor to be set free but to the obligation of carrying out certain specific social services.[62]

3) $\mathbf{O}!\mathbb{F}\,(\forall x:\{x:\mathfrak{P}\mid B(x)\})\,\mathfrak{H}(x)$ (*kasr*): the Opponent is committed to a sub-play where he brings forward a root-case which instantiates a subset of $\mathfrak{P}$ and of which it is recorded that the claimed ruling does not apply. Hence the root-case is presented as a counterexample to the Proponent's assertion that every $\mathfrak{P}$ falls under the ruling $\mathfrak{H}$ and in particular to the claim that this ruling applies to the branch-case. *Thesis:* Interdiction ($\mathfrak{H}$) of transaction of goods that the buyer did not see those goods before the contract was closed (*farʿ*). *Claim:* "Establishing a contract with someone in such a way that the benefactor has no access to the object of the contract" determines the *ʿilla*. *Counterexample:* Contract-Marriages closed before the members of the couple have acquaintance with each other are not forbidden.[63]

4) $\mathbf{O}!\mathbb{F}\,(\forall x:\mathfrak{P})\,\mathfrak{H}(x)$ (*fasād al-waḍʿ*): the Opponent is committed to a sub-play where he brings forward a root-case of which it is recorded in the sources that a property assumed in the thesis to apply to the branch-case occasions in fact, the opposite ruling to the one posited by the Proponent. In other words, the Opponent brings forward a *ʿilla* that destroys the thesis. *Thesis:* Saliva of beasts of prey (*farʿ*) is impure ($\mathfrak{H}$). *Claim:* "Having canine teeth" determines the *ʿilla*. *Counterexample:* Saliva of beasts of prey cannot be impure, since cats are beasts of prey and according to the sources they are not impure.[64]

5) $\mathbf{O}!\mathbb{F}(\forall x:\mathfrak{P})\,\mathfrak{H}(x)\wedge(\forall x:\neg\mathfrak{P})\neg\mathfrak{H}(x)$ (*ʿadam al-taʾthīr*): the Opponent is committed to a sub-play where he brings forward a root-case which constitutes a counterexample to the efficiency of the proposed property

[61] Young, *The Dialectical Forge*, p. 159, p. 166.
[62] Young, *The Dialectical Forge*, p. 170.
[63] Young, *The Dialectical Forge*, p. 174.
[64] Young, *The Dialectical Forge*, pp. 158–9.

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asserted by the Proponent. *Thesis:* Interdiction of the consumption of wine (*farʿ*). *Claim:* "Presence of euphoric intensity and having red-colour" determines the *ʿilla*. *Counterexample:* White wine is forbidden, despite the fact that it is not red.[65]

IV.2. Examples of Dialogues

Most of the examples discussed in the present section are based on textual sources, with the exception of the branch-case of our first example (on reading the emails of someone else). The point of the anachronism is to illustrate how to apply an ancient juridical rule to a new branch-case. However, the root-case and the identification of the property determining the relevant occasioning factor is based on textual sources to which we refer.

We will only display the tree of the resulting winning strategy for the last example, since the other examples follow basically the same pattern. Let us first provide the general schema that determines the development of our examples.

We slightly changed the usual notation of the dialogical framework and added some further indications specific to the *qiyās.* More precisely:

1. Proponent's moves are numbered with even numbers starting from zero. Those moves are recorded at the outmost right column.
2. Opponent's moves are numbered with odd numbers starting from one. Those moves are recorded at the outmost left column.
3. The inner columns record the form (challenge or defence) of response and the line to which the move responds. So, while "? 0" indicates that the corresponding move is a challenge (by the Opponent) to line 0 of the Proponent; "! 3" indicates that corresponding move is a defence of a challenge launched by the Opponent in move 3.
4. Formal expression *with preceding exclamation mark* such as $!\mathfrak{H}^{\mathfrak{S}}(a\d{s}l)$ indicates the assertion that there is some (not yet specified) occasioning factor for the fact that, according to the sources the ruling $\mathfrak{H}$, applies to the root-case. Similar applies to expression such as $!\mathfrak{H}(far\text{‘})$.
5. Formal expressions *without preceding exclamation mark* such as $\text{‘}illa^{\mathfrak{H}(\mathfrak{P})+}.far\text{‘} : \mathfrak{H}(far\text{‘})$ by the Proponent indicate that the justification for the application of the ruling to the branch-case follows from applying that branch-case to the universal $(\forall x : \mathfrak{P})\, \mathfrak{H}(x)$ conceded by the Opponent. The point of the Proponent is that he will try during the play to force the Opponent to provide the missing justification for the thesis. In other words, the Proponent will try to motivate the passage from $!\mathfrak{H}(far\text{‘})$ to $\text{‘}illa^{\mathfrak{H}(\mathfrak{P})+}.far\text{‘} : \mathfrak{H}(far\text{‘})$.
6. For the sake of notational simplicity we did not include the moves related to the repetition rank.

[65] Hallaq, "The logic of legal reasoning in religious and non-religious cultures", pp. 88–9).

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Schema 2: Development of a play for *qiyās al-ʿilla*

P! The ruling ℌ applies to the branch-case

O! Why?

P Don't the Sources record that the ruling ℌ applies to the root-case?

O! Yes they do

P Doesn't the root-case instantiate the property 𝔓?

O! Yes it does

P Given your previous assertions, and the *evidence from the sources* you must concede that the property 𝔓 has the efficiency to determine the occasioning factor for the ruling ℌ. Don't you?

O! Indeed, every case that instantiates the property 𝔓 falls under the ruling ℌ

P Doesn't the branch-case instantiates the property 𝔓?

O! Yes it does

P! Accordingly the ruling also applies to the branch-case, doesn't it?

O! Yes it does

P! *This answer justifies* the thesis

P Given your previous assertions, you must concede that the property 𝔓 has the efficiency to determine the occasioning factor for the ruling ℌ. Don't you?

O! Why should I? Justify!

P! the presence of the ruling is due to the presence of the occasioning factor and the absence of the ruling is due to its absence (*ta'thīr*)

O Constructive criticism

O Destructive criticism

O! I am convinced now. Every case that instantiates the property occasions the ruling on that case.

P Doesn't the branch-case instantiate the property 𝔓?

O! Yes it does

P! Accordingly the ruling also applies to the branch case. Doesn't it?

O! Yes it does

P! *This answer justifies the thesis*

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The dialectical framework for *qiyās al-ʿilla* deploys not only the usual challenges and defences but also requests. With a request a player brings forward an assertion and asks the contender to endorse it.

The notation deployed for a request has the form "¿ 1, ! 2" (that reads: the Proponent responds to move 1 of the Opponent by requesting him to endorse assertion brought forward in move 2).

Sometimes a request formulated in move *k* responds to move *n* of the antagonist **X**, given a previous move *m* of **X**, this request will be indicated with the notation "¿ *n* (*m*), ! *k*".

Before endorsing the requested assertion brought forward with move *m* the requested contender might ask for justification of this request. This response will be indicated with the notation "? *m* ¿".

IV.2.1. Example of a qiyās al-ʿilla al-jalī bi-al-naṣṣ

See Tab. 1 below. The importance of this form of this *qiyās al-ʿilla*, despite its simplicity, is that it has the canonical form of a *qiyās al-ʿilla*. Moreover, it is related to Aristotle's reasoning by exemplification or paradigmatic inference,[66] though, as pointed out before (III.1.1), it is not to be understood as involving one-step induction.[67]

IV.2.2. Examples of qiyās al-ʿilla al-khafī

The following example, on Tab. 2 below, is a reconstruction that follows closely al-Shīrāzī's[68] refutation of Ḥanafī's analysis of the argument on the purity status of beasts of prey. As pointed out by Young[69] al-Shīrāzī himself thought that the argument should be developed following a *fasād al-waḍʿ* (invalidity of the occasioned status) move.[70] Indeed, al-Shīrāzī sees the argument as indicating that the main thesis is fundamentally false since it assumes that beasts of prey are impure, but there is direct evidence from the sources contradicting this. Thus, according to al-Shīrāzī we do not need to be involved in a discussion about the suitability or not of the property chosen by the Proponent. Our take on the example corresponds rather to Miller's presentation of *qalb* or *destructive criticism by reversal*.[71] Moreover, it corresponds to a particular form

[66] Cf. Aristotle, Pr. An. 69a1; Bartha, By Parallel Reasoning, pp. 36–40.

[67] It might be argued that Aristotle's notion does not involve one-step induction either.

[68] *Al-Maʿūna fī al-Jadal*. ed. al-ʿUmayrīnī, p. 112.

[69] *The Dialectical Forge*, p. 159.

[70] Different to Young's (*The Dialectical Forge*, p. 159) analysis, Miller (*Islamic Disputation Theory*, p. 119) concludes that al-Shīrāzī's presentation suggests that both forms of destructive criticism, namely *qalb* and *fasād al-waḍʿ*, are indistinguishable.

[71] Miller, *Islamic Disputation Theory*, p. 119.

of *qalb* called *reversal* and *oppositeness* (*al-qalb wa-al-ʿaks*).[72] We made the choice to reconstruct the *qalb*-version of this argument since it provides the chance to display the deployment of a sub-play while developing a *destructive criticism*.

What the Opponent is doing is displaying a winning strategy for a claim that denies that $\mathfrak{P}$ determines the relevant occasioning factor. Notice that it is stronger than the rejection of endorsing a claim. The opponent is changing the roles and defending that he has a winning strategy in order to reject $\mathfrak{P}$ as determining occasioning factor. This move is *a switch of roles* pointed out by scholars as Hallaq ("The logic of legal reasoning") and Young (*The Dialectical Forge*).

The following example, the *Wine-example* on Tab. 3 below, is one that has received very much attention in the specialized literature.

Finally, on Tab. 4 below is the Wine-example with deployment of a *muʿāraḍa*-move. As already mentioned *muʿāraḍa*-moves assume a cooperative attitude of the challenger. In this example, we assume that the original argument in favour of choosing the property of being a drink made of pressed fruit-juice as relevant for the determining the relevant example misses one of those conditions, namely co-presence (the counterexample is vinegar). Let us sketch the winning strategy, which, as discussed in section III.2.2, only keeps the result of the cooperation in the example depicted on Tab. 4:

0. **P**$!\mathfrak{H}(far\text{‘})$
1. **O** Why (? 0)
2. **P** $\mathfrak{H}^{\mathfrak{S}}(a\d{s}l)$?
3. **O**$!\mathfrak{H}^{\mathfrak{S}}(a\d{s}l)$
4. **P** $a\d{s}l : \mathfrak{P}^{\star}$?
5. **O** $a\d{s}l : \mathfrak{P}^{\star}$
6. **P** $\text{‘}illa^{\mathfrak{H}(\mathfrak{P}^{\star})+}.a\d{s}l : \mathfrak{H}^{\mathfrak{S}}(a\d{s}l)$?
7. **O**$!(\forall x : \mathfrak{P}^{\star})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P}^{\star})\neg\mathfrak{H}(x)$
8. **P** $far\text{‘} : \mathfrak{P}^{\star}$?
9. **O** $far\text{‘} : \mathfrak{P}^{\star}$
10. **P** $far\text{‘} : \mathfrak{P}^{\star}$ (? 7)
11. **O** $\text{‘}illa^{\mathfrak{H}(\mathfrak{P}^{\star})+}.far\text{‘} : \mathfrak{H}(far\text{‘})$
12. **P** $\text{‘}illa^{\mathfrak{H}(\mathfrak{P}^{\star})+}.far\text{‘} : \mathfrak{H}(far\text{‘})$ (! 1)

This winning-strategy is essentially the same as the one depicted on Tab. 3: the only difference is that this strategy deletes the unsuccessful attempts.

[72] See Young, *The Dialectical Forge*, pp. 166–7.

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Tab. 1: reading the mail of someone else is forbidden

	O			**P**	
		responses	responses	$!\mathfrak{H}(\mathit{far}`)$ Reading (without permission) the mail of someone else is forbidden	0
1	Why?	? 0 (challenges move 0)	¿ 1, ! 2 (responds to 1 with the request of endorsing 2)	$\mathfrak{H}^{\mathfrak{S}}(\mathit{aṣl})$? Entering (without permission) into a house of someone else is forbidden by the Quran, isn't it?	2
3	$!\mathfrak{H}^{\mathfrak{S}}(\mathit{aṣl})$ Yes	! 2 (responds to the request of move 2)	¿ 3, ! 4	$\mathit{aṣl} : \mathfrak{P}$? Entering (without permission) into a house of someone else violates privacy. Don't you agree?	4
5	$\mathit{aṣl} : \mathfrak{P}$ Yes I do	! 4	¿ 5 (3), ! 6	$\text{‘}\mathit{illa}^{\mathfrak{S}\mathfrak{H}(\mathfrak{P})+}.\mathit{aṣl} : \mathfrak{H}(\mathit{aṣl})$? Given 3 and 5, and the evidence from the sources you must concede that violation of privacy has the efficiency to determine the *‘illa* of that *ḥukm*. Don't you?	6
7	$!(\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$ I see. I endorse it since it comes from the sources.	! 6	¿ 7, ! 8	$\mathit{far}` : \mathfrak{P}$? Does reading (without permission) the mail of someone else violate the privacy of that person?	8

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	O			P	
9	*far'* : $\mathfrak{P}$ Yes, it does.	! 8	? 7	*far'* : $\mathfrak{P}$ So, since reading (without permission) the mail of someone else violates the privacy of that person, it instantiates the antecedent of the *ṭard*-component of your assertion linking privacy-violation and interdiction. You should now assert the consequent. Right?	10
11	*'illa*$^{\mathfrak{SH}(\mathfrak{P})+}$.*far'* : $\mathfrak{H}$(*far'*) Indeed, I endorse this interdiction to the branch-case too	! 12	! 1	*'illa*$^{\mathfrak{SH}(\mathfrak{P})+}$.*far'* : $\mathfrak{H}$(*far'*) So, this provides the justification for the thesis you were asking for with your first move: the branch-case falls under the ruling because it instantiates the property you just endorsed as constituting the occasioning factor.	12
	ilzām				

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Tab. 2: on beasts of prey, impure saliva and the deployment of *qalb*

	O			P	
				$!\mathfrak{H}$(*far‘*) The saliva of the beast of prey qualifies as impure (*najāsa*)	0
1	Why?	? 0	¿ 1, ! 2	$\mathfrak{H}^{\mathfrak{S}}$(*aṣl*)? Does the saliva of pigs qualify as impure?	2
3	$!\mathfrak{H}^{\mathfrak{S}}$(*aṣl*) Yes it does	! 2	¿ 3, ! 2	*aṣl* : $\mathfrak{P}$? Does the saliva of pigs come from an animal that has canine teeth (*dhū nābin*)?	4
5	*aṣl* : $\mathfrak{P}$ Yes it does	! 4	¿ 5 (3), ! 6	‘*illa*$^{\mathfrak{H}(\mathfrak{P})+}$.*aṣl* : $\mathfrak{H}^{\mathfrak{S}}$(*aṣl*) Given 3 and 5 it seems plausible to conclude that the saliva of animals with canines has the required efficiency for determining the relevant ‘*illa* for its impurity. Don't you agree?	6
7	$!\mathbb{F}\,(\forall x : \mathfrak{P})\,\mathfrak{H}(x)$	? 6			
	start of the sub-play				
			? 7	$!(\forall x : \mathfrak{P})\,\mathfrak{H}(x)$ I rather endorse the following: it is true that impurity applies to any saliva of an animal possessing canines.	8
9	!*cat-saliva* : $\mathfrak{P}$ Cats possess canine teeth. Thus, according to your characterization of $\mathfrak{P}$(*saliva of animals possessing canines*), their saliva is impure.	? 8	! 9	‘*illa*$^{\mathfrak{H}(\mathfrak{P})+}$.*cat-saliva* : $\mathfrak{H}$(*cat-saliva*) Indeed I have to concede this.	10

Continued on next page

	O			P	
11	$\neg\mathfrak{H}^{\mathfrak{S}}(\textit{cat-saliva})$? We know (from the sources) that the saliva of cats is not impure. Do you see this?	¿ 10, ! 11	! 11	$!\neg\mathfrak{H}^{\mathfrak{S}}(\textit{cat-saliva})$ I must. It comes from the sources.	12
13	$!\mathfrak{H}(\textit{cat-saliva})$ *tanāquḍ*! You asserted before that according to your view on the occasioning factor, it follows that the saliva of cats is impure. You contradict yourself!	? 12		I concede.	14
15	*far‘* : $\mathfrak{P}$? Moreover, cats are beasts of prey. So, their saliva is the saliva of a beast of prey. Furthermore, the saliva of a beast of prey is a case of the saliva of animals with canines. Right?	¿ 14, ! 15	! 15	*far‘* : $\mathfrak{P}$ Yes, it is.	16
17	$\neg\mathfrak{H}^{\mathfrak{S}}(\textit{far‘})$? So you must also concede that neither their saliva is impure?	¿ 16, ! 17		$\textit{‘illa}^{\mathfrak{H}(\mathfrak{P})+}.\textit{far‘} : \neg\mathfrak{H}^{\mathfrak{S}}(\textit{far‘})$ Indeed.	18
19	$!\mathfrak{H}^{\mathfrak{S}}(\textit{far‘})$ *tanāquḍ*! This contradicts your main thesis.	? 18		*ifḥām.* I give up	

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Tab. 3: the Wine-example

	O			P	
				$!\mathfrak{H}(\mathit{far}`)$ (Consuming) date-wine (*nabīdh*) is forbidden (*ḥarām*).	0
1	Why?	? 0	¿ 1, ! 2	$\mathfrak{H}^{\mathfrak{S}}(\mathit{aṣl})$? Isn't drinking grape-wine (*khamr*) forbidden by the Quran?	2
3	$!\mathfrak{H}^{\mathfrak{S}}(\mathit{aṣl})$ Yes, it is forbidden.	! 2	¿ 3, ! 4	$\mathit{aṣl} : \mathfrak{P}$? Isn't grape-wine a drink made of fruit-juice which contains *euphoric intensity* (*shidda muṭriba*)?	4
5	$\mathit{aṣl} : \mathfrak{P}$ Yes	! 4	¿ 3 (5), ! 6	$`\mathit{illa}^{\mathfrak{H}(\mathfrak{P})+}.\mathit{aṣl} : \mathfrak{H}^{\mathfrak{S}}(\mathit{aṣl})$? So, according to your moves 3 and 5, the presence of euphoric intensity occasions the proscription of consuming grape-wine. Right?	6

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	O			P	
7	*muṭālaba*! Justify!	? 6	! 7	$!(\forall x : \neg\mathfrak{P})\,\neg\mathfrak{H}(x)$ *ʿaks*: before the occurrence of the euphoric intensity, the lawfulness of consuming a drink made of fruit-juice is the object of consensus. $!(\forall x : \mathfrak{P})\,\mathfrak{H}(x)$ *ṭard*: after the euphoric intensity occurs (*i.e.*, when it becomes wine) and nothing else occurs the proscription of consuming a drink made of fruit-juice is the object of consensus. (Ratification of) *ʿaks*: when the euphoric intensity of a drink made of fruit-juice falls away (*i.e.*, when it becomes vinegar) and nothing else falls away it is object of consensus that it should not be forbidden. $!(\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$ *ta'thīr*: therefore, the presence of the *ḥukm* is due to the presence of the *ʿilla*, and the absence of the *ḥukm* is due to its absence.	8
9	$!(\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$ Given these arguments I concede your previous request	! 6 (8)	¿ 9, ! 10	*farʿ* : $\mathfrak{P}$? Isn't *nabīdh* a drink made of fruit-juice which contains *euphoric intensity*?	10
11	*farʿ* : $\mathfrak{P}$ Yes, I agree.	! 10	? 9	*farʿ* : $\mathfrak{P}$ If it is the case that date-wine contains euphoric intensity, and, given 9, should not this lead to its interdiction?	12
13	*ʿilla*$^{\mathfrak{H}(\mathfrak{P})+}$.*farʿ* : $\mathfrak{H}^{\mathfrak{S}}$(*farʿ*) Indeed, the presence of euphoric intensity should occasion its interdiction.	! 10	! 1	*ʿilla*$^{\mathfrak{H}(\mathfrak{P})+}$.*farʿ* : $\mathfrak{H}^{\mathfrak{S}}$(*farʿ*) So, this provides the justification for the thesis you were asking for with your first move: the branch-case falls under the ruling because it instantiates the property you just endorsed as constituting the occasioning factor.	14
	ilzām				

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Tab. 4: the Wine-example and the deployment of *mu‘āraḍa*

	O			P	
				$!\mathfrak{H}(far')$ (Consuming) date-wine is forbidden.	
1	Why?	? 0	¿ 1, ! 2	$\mathfrak{H}^{\mathfrak{S}}(aṣl)$? Isn't drinking grape-wine forbidden by the Quran?	2
3	$!\mathfrak{H}^{\mathfrak{S}}(aṣl)$ Yes, it is *ḥarām*.	! 2	¿3, ! 4	$aṣl : \mathfrak{P}$? Isn't grape-wine made of pressed fruit-juice?	4
5	$aṣl : \mathfrak{P}$ Yes	! 4	¿ 3 (5), ! 6	$\text{‘}illa^{\mathfrak{H}(\mathfrak{P})+}.aṣl : \mathfrak{H}^{\mathfrak{S}}(aṣl)$? So, according to your moves 3 and 5, the proscription of consuming grape-wine is caused by the fact that it is made of pressed fruit-juice. Right?	6
7	$!\mathbb{V}\ \text{‘}illa^{\mathfrak{H}(\mathfrak{P}^{\star})+}.aṣl : \mathfrak{H}^{\mathfrak{S}}(aṣl)$ I am not convinced. I rather think that the relevant property is containing euphoric intensity ($\mathfrak{P}^{\star}$).	? 6	? 7	*muṭālaba*! Justify!	8
	start of the sub-play				
9	$aṣl^{\star} : \mathfrak{P}$? Vinegar is made of pressed fruit-juice. Isn't it?	¿ 8, ! 9	! 9	$aṣl^{\star} : \mathfrak{P}$ Indeed.	10
11	$(\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$? Given 6, you must agree that being a pressed-juice is efficient property for sanctioning them as *ḥarām*. Right?	¿ 6, ! 11	! 11	$!(\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$ Yes	12

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	O			P	
13	*aṣl** : $\mathfrak{P}$ But, given that you just agreed that vinegar is made of pressed-juice, (according to the *ṭard*-component of your assertion) it should be *ḥarām*.	? 12	! 13	*'illa*$^{\mathfrak{H}(\mathfrak{P})+}$.*aṣl** : $\mathfrak{H}$(*aṣl**) Indeed.	14
15	!$\neg\mathfrak{H}^{\mathfrak{S}}$(*aṣl**)? But its consumption is not forbidden. Isn't it?	¿14, ! 15	! 15	!$\neg\mathfrak{H}^{\mathfrak{S}}$(*aṣl**) Yes it is not *ḥarām*.	16
17	!$\mathfrak{H}$(*aṣl**) *tanāquḍ*! You contradict yourself.	? 16		I concede!	18
19	Herewith my argument for the relevance of $\mathfrak{P}^\star$. !$(\forall x : \neg\mathfrak{P}^\star)\neg\mathfrak{H}(x)$ (*'aks*): before the occurence of the euphoric intensity, the lawfulness of consuming a drink made of fruit-juice is the object of consensus. !$(\forall x : \mathfrak{P}^\star)\mathfrak{H}(x)$ (*ṭard*): after the euphoric intensity occurs (*i.e.*, when it becomes wine) and nothing else occurs the proscription of consuming a drink made of fruit-juice is object of consensus. (Ratification of) *'aks*: when the euphoric intensiy of a drink made of fruit-juice falls away (*i.e.*, when it becomes vinegar) and nothing else falls away it is object of consensus that it should not be forbidden. *'illa*$^{\mathfrak{H}(\mathfrak{P}^\star)}$: $(\forall x : \mathfrak{P}^\star)\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P}^\star)\neg\mathfrak{H}(x)$ (*ta'thīr*): therefore, the presence of the *ḥukm* is due to the presence of the *'illa*, and the absence of the *ḥukm* is due to its absence.	! 8			
	end of the sub-play				

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	O			P	
21	*far*‘ : $\mathfrak{P}^{\star}$ Yes, it does.	! 20	¿ 19, ! 20	*far*‘ : $\mathfrak{P}^{\star}$? Doesn't *nabīdh* contain *euphoric intensity*?	20
23	‘*illa*$^{\mathfrak{H}(\mathfrak{P}^{\star})+}$.*far*‘ : $\mathfrak{H}$(*far*‘) Indeed!	! 22	? 19	*far*‘ : $\mathfrak{P}^{\star}$ If it is the case that date-wine contains euphoric intensity, and, given 19, should not this lead to its interdiction?	22
			! 1	‘*illa*$^{\mathfrak{H}(\mathfrak{P}^{\star})+}$.*far*‘ : $\mathfrak{H}$(*far*‘) So, this provides the justification for the thesis you were asking for with your first move: the branch-case falls under the ruling because it instantiates the property you just helped to identify as the one determining the occasioning factor.	24
	ilzām				

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V. FINAL REMARKS AND WORK AHEAD

The meaning of *ijtihād* in Islamic jurisprudence presupposes that the notion of law is dynamic in nature. This dynamic was performed in the process of the development of *uṣūl al-fiqh* that occurred in the conceptual venue that Young (2017) calls the *dialectical forge*. In such a dialectical setting premises of legal theory were continually produced, tested and reproduced in order to yield a deeper systematization. To put it another way, it seems that the dialectical forge is not only the venue but moreover it is a dialectical engine which powered the process by which the legal theory had been continuously forged and refined. Moreover, different to other dialectical frameworks the focus of the dialectical forge is on developing methods of dialectical interaction aimed at the winning of knowledge and meaning, beyond the rhetoric purposes of a legal trial or debate. This gave *jadal* a crucial epistemological role on the pursuit of truth.[73]

In this context Islamic jurists studied and developed several instruments suitable for implementing the dialectical forge. One of the most important of these instruments is *qiyās*, that constitutes the subject of our study. The aim of this form of inference is to provide a rational ground for the application of a *ḥukm* to a given case not yet considered by the original juridical sources. As a product of legal theory shaped by the dialectical forge, it is fair to say that a dialogical framework as the one developed in the present paper provides a suitable setting in order to delve into the structure and meaning underlying the legal notion of *qiyās.* The dialogical framework displays three of the hallmarks of this form of inference.

First, the interaction of heuristic with logical steps. This interaction was displayed by two main steps: (1) finding the root-case from which the occasioning factor can be inferred; (2) linking the root-case logically with the branch-case by means of a generalization that links the occasioning factor with the relevant juridical ruling.

Second, the dynamics underlying the extension of the legal terms involved. This dynamics is displayed by the intertwining of confirmations and refutations that contribute to establish the most suitable conclusion in relation to the consideration of a new case.

Third, the unfolding of parallel reasoning as similarity in action. Parallel reasoning is about unfolding the process by the means of which similarity is constituted. All in all argumentation is nothing-more and nothing-less than a collaborative enquiry into the ways of building up those symmetries that ground rationality and harmony within inquisitive interaction.

In order to complete our study about al-Shīrāzī's system of *qiyās*, our forthcoming paper will be concerned with the epistemic and dialectical meaning of the two other types of this form of inference, namely: *Qiyās al-*

[73] Hallaq, "A tenth-eleventh century treatise on juridical".

Dalāla (Correlational Inference of Indication) and *Qiyās al-Shabah* (Correlational Inference of Resemblance).

One of the main epistemological results emerging from this initial study is that the different forms of *qiyās* as developed in the context of *fiqh* represent an innovative approach that does not only provide new epistemological insights of legal reasoning in general but they also furnish a fine-grained pattern for *parallel reasoning* that can be deployed in a wide range of problem-solving contexts where degrees of evidence and inferences by drawing parallelisms are relevant. Let us mention here the important work of Bartha (*By Parallel Reasoning*), that includes a dialectical device to develop his theory of parallel reasoning as applied to sciences.[74] However, Bartha's *articulation-model*, is not thoroughly argumentative.[75] The argumentative device does not really deal with the heuristic moves, but rather with the justificatory ones while searching for counterexamples. In contrast, as discussed above, the dialectical framework underlying the notion of co-relational inferences is meaning constitutive. In fact, we are convinced that a comparative study between both paradigms, Bartha's argumentative approach and the *qiyās*-approach, will be beneficial for the development of a general framework of parallel reasoning. The dialogical setting for CTT, this is our last claim, provides a bridge to launch such a study.

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[74] Unfortunately neither Bartha nor other contemporary researchers in philosophy of science seem to be aware of the rich literature on analogy developed by the Arabic tradition.

[75] Bartha, *By Parallel Reasoning*, chapter 4.

APPENDIX I: SOME BASIC NOTIONS OF CONSTRUCTIVE TYPE THEORY

[76]Within Per Martin-Löf's Constructive Type Theory (CTT for short) the logical constants are interpreted through the Curry-Howard correspondence between propositions and sets. A proposition is interpreted as a set whose elements represent the proofs of the proposition. It is also possible to view a set as a problem description in a way similar to Kolmogorov's explanation of the intuitionistic propositional calculus. In particular, a set can be seen as a specification of a programming problem: the elements of the set are then the programs that satisfy the specification.[77] Furthermore in CTT sets are also understood as types so that propositions can be seen as data (or proof)-types.[78]

There are two basic forms of categorical judgement in constructive type theory:

$$a : A$$
$$a = b : A$$

The first is read "a is an object of type A" and the second is read "a and b are identical objects of type A". We require, namely, that any type A occurring in a judgement of constructive type theory be associated with

1) a criterion of application, called meaning explanation which tells us what an A is; that a meets this criterion is precisely what is expressed in the assertion $a : A$;
2) a criterion of identity, which tells us what it is for a and b to be identical objects of type A; that a and b together meet this criterion is precisely what is expressed in the assertion $a = b : A$

In such a setting,

$b : A$	A *true*
can be read as	
b is an element of the set A	A has an element
b is a proof of the proposition A	A is true
b *fulfills* the expectation A	A if fulfilled
b is a solution to the problem A	A has a solution

[76] The appendix is based on Ranta (*Type-Theoretical Grammar*) and A. M. Klev, "A brief introduction to constructive type theory", to appear in S. Rahman, N. Clerbout and J. Redmond, *Interaction and Equality. The dialogical interpretation of CTT* (in Spanish). *Critica*. A. M. Klev's "A brief introduction" is online in www.academia.edu/29876170/A_brief_introduction_to_Martin-Löfs_type_theory.

[77] Martin-Löf, *Intuitionistic Type Theory*, p. 7.

[78] *Cf.* Nordström, Petersson and Smith, *Programming in Martin-Löf's Type Theory*, and Granström, *Treatise on Intuitionistic Type Theory*.

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The four basic forms of *categorical judgements* in CTT are:

$$A : \text{set}$$
$$A = B : \text{set}$$
$$A : \text{prop}$$
$$A = B : \text{prop}$$

One of the characteristic features of constructive type theory is that it recognizes hypothetical judgement as a form of statement distinct from the assertion of the truth of an implicational proposition $A \supset B$. In fact, *hypothetical judgements* are fundamental to the theory. It is, for instance, hypothetical judgements that give rise to the various dependency structures in constructive type theory, by virtue of which it is a dependent type theory.

Assume $A : \text{set}$. Then we obtain the followin four basic forms of hypothetical judgements with one assumption:

$$B(x) : \text{set} \ (x : A)$$
$$B(x) = C(x) : \text{set} \ (x : A)$$
$$b(x) : B(x) \ (x : A)$$
$$b(x) = c(x) : B(x) \ (x : A)$$

We read the first as "$B(x)$ is a set under the assumption $x : A$". Similar remarks apply to the other three forms of hypothetical judgement. Let us consider the more precise meaning explanations of these forms of judgement.

A judgement of the form "$B(x) : \text{set} \ (x : A)$" means that

$B(a/x) : \text{set}$, whenever $a : A$, and $B(a/x) = B(a'/x)$, whenever $a = a' : A$.

Here $B(a/x)$ signifies the result of substituting a for x in B.[79] Thus we may think of B as a *function* from A into set; or using a different terminology, B may be thought of as a family of set s over A. We are assuming that x is the only free variable in B and that A contains no free variables, hence that the judgement $A : \text{set}$ holds categorically, that is, under no assumptions. It follows that $B(a/x)$ is a closed term, hence that $B(a/x) : \text{set}$ holds categorically; by the explanation given of the form of categorical judgement $A : \text{set}$ we therefore know the meaning of $B(a/x) : \text{set}$.

[79] In CTT there is no notion of assignation but the notion of substitution is not the one of the standard substitutional semantics either—see Ranta, *Type-Theoretical Grammar*, p. 9. In such a context when a free variable is substituted by a the latter stands for an arbitrary but fixed object, Granström (*Treatise on Intuitionistic Type Theory*, pp. 44-9) calls it *parameter*.

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If we recall the Curry-Howard isomorphism between sets and propositions we obtain

$$B(x) : \text{prop} \ \ (x : D),$$

that reads: "$B(x)$ renders a proposition if x is an element of D" (or "if x exemplifies D").

Cartesian product of a family of sets Given a set A and a family $B(x)$ of set s over A we can form the product of $B(x)$ over A. That is the content of the Π-formation rule:

$$\frac{A : \text{set} \qquad B(x) : \text{set} \ \ (x : A)}{(\Pi x : A)\, B(x) : \text{set}}(\Pi\text{-form})$$

This rule lays down the conditions for when we can judge that $(\Pi x : A)\, B(x)$ is a set. There is a second Π-formation rule that lays down the conditions for when we can judge that two sets of the form $(\Pi x : A)\, B(x)$ are identical:

$$\frac{A = A' : \text{set} \qquad B(x) = B'(x) : \text{set} \ \ (x : A)}{(\Pi x : A)B(x) = (\Pi x : A')B(x)' : \text{set}}$$

All formation, introduction, and elimination rules are paired with identity rules of this kind, but we shall state these rules explicitly only in the present case of Π.

The conclusion of Π-formation says that $(\Pi x : A)B(x)$ is a set. Since we have the right to judge that C is a set only if we can say what the canonical elements of C are as well as what equal canonical elements of C are, we see that the rule of Π-formation requires justification.

The required justification is provided by the Π-introduction rules:

$$\frac{b(x) : B \ (x : A)}{\lambda x.b(x) : (\Pi x : A)\, B(x)}(\Pi\text{-intro}) \qquad \frac{b(x) = b'(x) : B(x) \ (x : A)}{\lambda x.b(x) = \lambda x.b'(x) : (\Pi x : A)\, B(x)}$$

According to this rule a canonical element of $(\Pi x : A)\, B(x)$ has the form $\lambda x.b(x)$, where $b(a) : B(a)$ whenever $a : A$. Note that such a $b(x)$ is of a type different from the type of $\lambda x.b(x)$. Namely, $b(x)$ is of type $B(x)$ $(x : A)$ whereas $\lambda x.b(x)$ is of type $(\Pi x : A)\, B(x)$. It was noted above that we may regard such a $b(x)$ as a function from A into the family $B(x)$. We may think of $\lambda x.b(x)$ as an individual that codes this function.

The role of the elements of $(\Pi x : A)\, B$ as codes of functions is made clear by the Π-elimination rule:

$$\frac{c : (\Pi x : A)\, B(x) \qquad a : A}{\text{ap}\,(c, a) : B(a)}(\Pi\text{-elim}) \qquad \frac{c = c' : (\Pi x : A)\, B(x) \qquad a = a' : A}{\text{ap}\,(c, a) = \text{ap}\,(c', a') : B(a)}$$

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The conclusion of this rule asserts that ap (c, a) is an element of the set $B(a)$. Since we have the right to judge that c is an element of a set C only if we can specify how to compute c to a canonical element of C, we see that the rule of Π-elimination requires justification.

The required justification is provided by the rule of Π-equality, which specifies how ap (c, a) is computed in the case where c is of canonical form, namely $\lambda x.b(x)$.

$$\frac{b(x) : B(x)\,(x : A) \qquad a : A}{\text{ap}\,(\lambda x.b(x), a) = b(a) : B(a)}\,(\Pi\text{-eq})$$

The Π-operator allows defining the universal quantifier and the material implication in the following way:

$$(\forall x : A)B(x) = (\Pi x : A)B(x) : \text{prop}\,,\ \text{provided}\ A : \text{set}\ \text{and}\ B(x) : \text{prop}\ (x : A),$$

$$A \supset B = (\Pi x : A)B : \text{prop}\,,\ \text{provided}\ A : \text{prop}\ \text{and}\ B : \text{prop}\,.$$

Disjoint union of a family of sets and the Σ-operator

$$\frac{A : \text{set} \qquad B(x) : \text{set}\ (x : A)}{(\Sigma x : A)\, B(x) : \text{set}}\,\Sigma\text{F} \qquad \frac{a : A \qquad b : B(a)}{(a, b) : (\Sigma x : A)\, B(x)}\,\Sigma\text{I}$$

$$\frac{c : (\Sigma x : A)\, B(x) \qquad d(x, y) : C((x, y))\,(x : A, y : B(x))}{\text{E}\,(c, \lambda(x, y).d(x, y)) : C(c)}\,\Sigma\text{E}$$

$$\frac{a : A \qquad b : B(a) \qquad d(x, y) : C((x, y))\,(x : A, y : B(x))}{\text{E}\,(a, b, \lambda(x, y).d(x, y)) = d(a, b) : C((a, b))}\,\Sigma\text{Eq}$$

The expression E $(c, \lambda(x, y).d(x, y))$ which occurs as the conclusion of Σ-elimination rule, is informally read as the following computational instruction:[80]

Execute c. The result of the execution is a canonical element which has the form of the couple (a, b) such that $a : A$ and $b : B$. Now substitute a and b in the right premise, for x and y respectively. Thus obtain: $d(a, b) : C((a, b))$. The execution of $d(a, b)$ will give for result a canonical element e of $C((a, b))$. It is not difficult to deduce, therefore, that e is a canonical element of $C(c)$.

The Σ-operator allows defining the existential quantifier and the conjunction in the following way:

$$(\exists x : A)B(x) = (\Sigma x : A)B(x) : \text{prop}\,,\ \text{provided}\ A : \text{set}\ \text{and}\ B(x) : \text{prop}\ (x : A),$$

$$A \wedge B = (\Sigma x : A)B : \text{prop}\,,\ \text{provided}\ A : \text{prop}\ \text{and}\ B : \text{prop}\,.$$

[80] See Martin-Löf, *Intuitionistic Type Theory*, p. 40.

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In the case of conjunction, we obtain the standard elimination rules from the elimination rules of Σ, (1) if we decide that C is either A or B, and (2), if we decide the projection rules $p(c)$ and $q(c)$, mentioned in the previous section, in the following way: $p(c) = \mathrm{E}\,(c, \lambda(x, y).x)$ and $q(c) = \mathrm{E}\,(c, \lambda(x, y).y)$. That is, if we carry out steps (1) and (2), from ΣE we get:

$$\frac{c : A \wedge B}{p(c) : A} \wedge \mathrm{E1} \qquad \frac{c : A \wedge B}{q(c) : B} \wedge \mathrm{E2}$$

Recalling the equality rules, we come to the following computational rules for the execution of $p(c)$ and $q(c)$, where c is constituted by the pair (a, b) such that $a : A, b : B$:

$$p(a, b) \rightarrow a, \qquad q(a, b) \rightarrow b.$$

Notice that in the lower-order presentation of CTT, most primitive constant symbols such as Π, $\forall$, Σ, $\exists$, ap , *etc.* are what medieval grammarians and logicians would call *syncategorematic*: they have no meaning in isolation, but only in composition with other expressions.

APPENDIX II: THE MAIN RULES OF THE DIALOGICAL FRAMEWORK FOR QIYĀS AL-ʻILLA

We will not be able to present here the full-formalization of the dialogical framework for *qiyās al-ʻilla*. However, the following presentation should provide the reader the means to follow how to develop a dialogue for this kind of *qiyās*.

The dialogical approach to logic is not a specific logical system but rather a framework rooted on a rule-based approach to meaning in which different logics can be developed, combined and compared. More precisely, in a dialogue two parties argue about a thesis respecting certain fixed rules. The player that states the thesis is called Proponent (**P**), his rival, who contests the thesis is called Opponent (**O**). Dialogues are designed in such a way that each of the plays end after a finite number of moves with one player winning, while the other loses. Actions or moves in a dialogue are often understood as speech-acts involving *declarative utterances or posits and interrogative utterances or requests*. The point is that the rules of the dialogue do not operate on expressions or sentences isolated from the act of uttering them. The rules are divided into particle rules or rules for logical constants (*Partikelregeln*) and structural rules (*Rahmenregeln*). Particle rules provide an abstract description of how the game can proceed locally: they specify the way a formula can be challenged and defended according to its main logical constant. In this way the particle rules govern the local level of meaning. Strictly speaking, the expressions occurring in the table above are not actual moves because they feature formula schemata and the players are not specified. Moreover, these rules are indifferent to any particular situations that might occur during the game. For these reasons we say that the description provided by the particle rules is abstract. The structural rules determine the development of a dialogue game.[81]

[81] The main original papers are collected in Lorenzen / Lorenz (*Dialogische Logik*)—see too K. Lorenz, *Logic, Language and Method: On Polarities in Human Experience* (Berlin, New York, 2010); *id.*, *Philosophische Variationen: Gesammelte Aufsätze unter Einschluss gemeinsam mit Jürgen Mittelstraßgeschriebener Arbeiten zu Platon und Leibniz* (Berlin, New York, 2010); W. Felscher, "Dialogues as a foundation for intuitionistic logic", in D. Gabbay and F. Guenthner (eds.), *Handbook of Philosophical Logic* (Dordrecht, 1985), vol. 3, pp. 341–72: Krabbe, "Dialogue logic". For an account of recent developments see L. Keiff, "Dialogical logic"; S. Rahman and T. Tulenheimo, "From games to dialogues and back: towards a general frame for validity", in O. Majer. A. Pietarinen and T. Tulenheimo (eds.), *Games: Unifying Logic, Language and Philosophy* (Dordrecht, 2009), pp. 153–208; H. Rückert, *Dialogues as a Dynamic Framework for Logic* (London, 2011); N. Clerbout, "First-order dialogical games and tableaux", Journal of Philosophical Logic, 43(4) (2014): 785–801; *id.*, *Étude sur quelques sémantiques dialogiques: Concepts fondamentaux et éléments de metathéorie* (London, 2014). The most recent work links dialogical logic and Constructive Type Theory: see N. Clerbout and S. Rahman, *Linking Game-Theoretical Approaches with*

II.1 Local meaning of the logical constants

It is presupposed in standard dialogical systems that the players use well-formed formulas. The well formation can be checked at will, but only with the usual meta reasoning by which the formula is checked to indeed observe the definition of a well formed formula. We want to enrich the system by first allowing players to enquire on the status of expressions and in particular to ask if a certain expression is a proposition. We thus start with dialogical rules explaining the formation of propositions. These rules are local rules which are added to the particle rules giving the local meaning of logical constants.

Moreover, we extend the first-order language assumed in standard dialogical logic with two labels **O** and **P**, standing for the players of the game, and the two symbols '!' and '?'. When the identity of the player does not matter, we use variables **X** or **Y** (with $\mathbf{X} \neq \mathbf{Y}$).

A move M is an expression of the form $\mathbf{X} - e$, where e is one of the forms specified by the particle rules.

Local meaning: Formation

Posit	Challenge	Defence
$\mathbf{X}\ A \vee B$: prop	$\mathbf{Y}?_{F\vee 1}$ or $\mathbf{Y}?_{F\vee 2}$	$\mathbf{X}\ A$: prop $\mathbf{X}\ B$: prop
$\mathbf{X}\ A \wedge B$: prop	$\mathbf{Y}?_{F\wedge 1}$ or $\mathbf{Y}?_{F\wedge 2}$	$\mathbf{X}\ A$: prop $\mathbf{X}\ A$: prop
$\mathbf{X}\ A \supset B$: prop	$\mathbf{Y}?_{F\supset 1}$ or $\mathbf{Y}?_{F\supset 2}$	$\mathbf{X}\ A$: prop $\mathbf{X}\ B$: prop
$\mathbf{X}\ \neg A$: prop	$\mathbf{Y}?_{F\neg}$	$\mathbf{X}\ A$: prop
$\mathbf{X}\ (\forall x : A)\ B(x)$: prop	$\mathbf{Y}?_{F\forall 1}$ or $\mathbf{Y}?_{F\forall 2}$	$\mathbf{X}\ A$: set $\mathbf{X}\ B(x)$: prop $(x : A)$
$\mathbf{X}\ (\exists x : A)\ B(x)$: prop	$\mathbf{Y}?_{F\exists 1}$ or $\mathbf{Y}?_{F\exists 2}$	$\mathbf{X}\ A$: set $\mathbf{X}\ B(x)$: prop $(x : A)$

Besides the formation rules, the rules described by the local meaning for some

Constructive Type Theory: Dialogical Strategies as CTT-Demonstrations (Dordrecht, 2015); Rahman / Clerbout / Redmond, *Interaction and Equality*.

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posit π indicate those moves that constitute the *canonical argumentation form of the play object* specific to the proposition / set at stake in π.

Because of our deployment expressions coming from Constructive-Type Theory the language contains expressions such as the following (further expressions are provided in the section on terminology in the main text):

$\mathbf{X}!a : A$	Player **X** claims that a instantiates A, *i.e.*, that a provides a *local reason* for A.
$\mathbf{X}\, b.\mathbf{Y}^a : B(a)$	Player **X** claims that b provides a *local reason* for a being B given that the antagonist **Y** claims that a provides a *local reason* for **A**, and given that $B(x)$: prop $(x : A)$.
$\mathbf{X}\, b.\mathbf{Y}^a : B$	Player **X** claims that b provides a *local reason* for B given that the antagonist **Y** claims that a provides a *local reason* for A, and given that $A \supset B$.
$\mathbf{X}\, b : B(\mathbf{X}^a)$	Player **X** claims that b provides a *local reason* for a being B given that it is himself (**X**) who claims that a provides a *local reason* for A, and given that $B(x)$: prop $(x : A)$.

The canonical argumentation form of a local reason as determined by the local rules is given by the triple: posit by **X**, challenge by **Y**, defence by **X**.

This yields the following table:

Canonical argumentation form

Posit	Challenge	Defence
$\mathbf{X}\, p : (\exists x : A)\, B(x)$	$\mathbf{Y}?_L$	$\mathbf{X}\, p_1 : A$
	or	
	$\mathbf{Y}?_R$	$\mathbf{X}\, p_2 : B(\mathbf{X}^{p_1})$
$\mathbf{X}\, p : \{x : A \mid B(x)\}$	$\mathbf{Y}?_L$	$\mathbf{X}\, p_1 : A$
	or	
	$\mathbf{Y}?_R$	$\mathbf{X}\, p_2 : B(\mathbf{X}^{p_1})$
$\mathbf{X}\, p : A \wedge B$	$\mathbf{Y}?_L$	$\mathbf{X}\, p_1 : A$
	or	
	$\mathbf{Y}?_R$	$\mathbf{X}\, p_2 : B$
$\mathbf{X}\, p : (\forall x : A)\, B(x)$	$\mathbf{Y}\, p_1 : A$	$\mathbf{X}\, p_2.\mathbf{Y}^{p_1} : B(\mathbf{Y}^{p_1})$
$\mathbf{X}\, p : A \supset B$	$\mathbf{Y}\, p_1 : A$	$\mathbf{X}\, p_2.\mathbf{Y}^{p_1} : B$
$\mathbf{X}\, p : \neg A$	$\mathbf{Y}\, p_1 : A$	–
$\mathbf{X}\, p : A \vee B$	$\mathbf{Y}?_\vee$	$\mathbf{X}\, p_1 : A$ or $\mathbf{X}\, p_2 : B$

We add too rules for the operators $\mathbb{F}$ and $\mathbb{V}$ adapted to the purposes of our present paper.

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The operator $\mathbb{F}$ [82]In uttering the formula $\mathbb{F}A$ the argumentation partner **X** claims that he can find a counterexample during a play where the antagonist **Y** asserts A.

The antagonist **Y** challenges $\mathbb{F}A$ by asserting that A can be challenged successfully. Thus, the challenge of **Y** compels **Y** to open a *sub-play* where he (**Y**) utters A.

X!$\mathbb{F}A$	Challenge	Defence
	Y?$\mathbb{F}$	
	Sub-play $\mathfrak{D}_1$	Sub-play $\mathfrak{D}_1$
	Y!A **Y** must play under the restriction of the *Socratic-Rule* in the sub-play	**X**?$_A$ (he challenges A)

In uttering the formula $\mathbb{V}A$ the argumentation partner **X** claims that he can win a play where he (**X**) asserts A.

The antagonist **Y** responds by challenging **X** to open a *sub-play* where he (**X**) defends A.

X $\mathbb{V}$**A**	Challenge	Defence
	Y?$\mathbb{V}$	
	Sub-play $\mathfrak{D}_1$	Sub-play $\mathfrak{D}_1$
	Y?$_A$ (he challenges A) **Y** must play under the restriction of the *Socratic Rule*	**X**!A

Special Local Rules for *Qiyās al-ʻIlla* Expressions "p" in "$p : A$" stand for either some branch-case *farʻ* or some root-case *aṣl*:

[82] *Cf.* S. Rahman and H. Rückert "Dialogical connexive logic", *Synthese*, vol. 127, nos. 1–2 (2001): 105–39. The main difference of the present formulation of $\mathbb{F}$ is that here it is the defender of the operator and not the challenger who must play under the *copy-cat* rule. The changes is due to the fact that in the context of the present paper the assertion of $\mathbb{F}A$ occurs only as a *challenge* to a previous move of the Proponent.

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Posit	Challenge	Defence
X *ṭard*$^{\mathfrak{H}(\mathfrak{P})}$: $(\forall x : \mathfrak{P})\, \mathfrak{H}(x)$ Notation for a posit without specified reason: **X**!$(\forall x : \mathfrak{P})\mathfrak{H}(x)$	**Y** $p : \mathfrak{P}$	**X** *'illa*$^{\mathfrak{H}(\mathfrak{P})+}.p : \mathfrak{H}(p)$
X *'aks*$^{\mathfrak{H}(\mathfrak{P})}$: $(\forall x : \neg\mathfrak{P})\, \neg\mathfrak{H}(x)$ Notation for a posit without specified reason: **X**!$(\forall x : \neg\mathfrak{P})\, \neg\mathfrak{H}(x)$	**Y** $p : \neg\mathfrak{P}$	**X** *'illa*$^{\mathfrak{H}(\mathfrak{P})}.p : \neg\mathfrak{H}(p)$
X *ta'thīr*$^{\mathfrak{H}(\mathfrak{P})}$: $(\forall x : \mathfrak{P})\mathfrak{H}(x)$ $\wedge(\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$ Notation for a posit without specified reason: **X**!$(\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$	**Y** $p : \mathfrak{P}$ or **Y** $p : \neg\mathfrak{P}$	**X** *'illa*$^{\mathfrak{H}(\mathfrak{P})+}.p : \mathfrak{H}(p)$ resp. **X** *'illa*$^{\mathfrak{H}(\mathfrak{P})-}.p : \neg\mathfrak{H}(p)$
X!A (or $p : A$) . . . **X** $\neg A$ (or $p' : \neg A$) (it can also be the case that one explicitly displays the local reason but the other not)	**Y**!*tanāquḍ* φ The antagonist indicates the contradiction	**X**! I concede

Qiyās al-'illa also require the following moves prescribed by the *development rules* specific to the dialectical frameword underlying this form of *qiyās*.

Requests Our framework for *qiyās al-'illa* includes moves by the means of which players can request the contender to endorse some particular assertion. The general form of a request and the positive response is the following:

$$\mathbf{X}\ A?$$
$$\mathbf{Y}!A$$

If the request has a form that indicates sources, it *must* be endorsed by the respondent:

$$\mathbf{X}\ p^{\mathfrak{S}} : A? \qquad\qquad \mathbf{X}!A^{\mathfrak{S}}?$$
$$\mathbf{Y}\ p^{\mathfrak{S}} : A \qquad\qquad \mathbf{Y}!A^{\mathfrak{S}}$$

This general form of the request might trigger a different form of answer if it involves the endorsement of a particular occasioning factor. In such a case, the following responses are possible:

$$\mathbf{X}!\ \textit{'illa}^{\mathfrak{H}(\mathfrak{P})+}.\textit{aṣl} : \mathfrak{H}^{\mathfrak{S}}(\textit{aṣl})?$$

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Y Cooperative criticism	**Y** Destructive criticism	**Y**!*muṭālaba* Asking for justification	**Y**!$(\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$ Endorsing the request by asserting the efficiency of the property $\mathfrak{P}$

Which of the options are available is determined by the rules prescribing the overall development of a play for *qiyās al-ʻilla*. We proceed to describe the development of the first three responses, the development of the fourth one (the conjunction of universals) has been already described above.

Muṭālaba This move presupposes that player **X** requested the contender to endorse that the property $\mathfrak{P}$ occasions the ruling of the root-case. That is, it presupposes the following request:

X! *ʻilla*$^{\mathfrak{H}(\mathfrak{P})+}$.*aṣl* : $\mathfrak{H}^{\mathfrak{S}}$(*aṣl*)?
Y!*muṭālaba*

X must be able to bring forward arguments showing that the property satisfies *ṭard* !$(\forall x : \mathfrak{P})\mathfrak{H}(x)$, *ʻaks* $(\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$, and *ta'thīr* !$(\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$.

***Muʻāraḍa* or cooperative criticism** This move presupposes that the Proponent requested the Opponent to endorse that the property $\mathfrak{P}$ occasions the ruling of the root-case. That is, the deployment of cooperative criticism presupposes the following request:

P! *ʻilla*$^{\mathfrak{H}(\mathfrak{P})+}$.*aṣl* : $\mathfrak{H}^{\mathfrak{S}}$(*aṣl*)?

1) The Opponent refuses to endorse the requested assertion and starts by asserting that the relevant factor for the root-case at stake is the property $\mathfrak{P}^{\star}$ rather than $\mathfrak{P}$– however, the Opponent believes that the main thesis is correct though it was poorly defended.

O!$\mathbb{V}$ *ʻilla*$^{\mathfrak{H}(\mathfrak{P}^{\star})+}$.*aṣl* : $\mathfrak{H}^{\mathfrak{S}}$(*aṣl*).

2) If the assertion of the Opponend is rooted in the sources, the Proponent must accept it and the play will continue from step 5. If it is not based on the sources the Proponent responds by challenging the Opponent to open a *sub-play* where the latter must defend his thesis.

P!*muṭālaba*

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3) In the sub-play, before providing the required justification, the Opponent might first choose to force the Proponent to accept that there is a root-case that contradicts the Proponent's choice of $\mathfrak{P}$ as relevant for the juridical ruling at stake. Driving the Proponent to contradiction is carried out by means of the following steps:

O *aṣl** : $\mathfrak{P}$?	**O** searches for a new root-case to which $\mathfrak{P}$ applies.
P!*aṣl** : $\mathfrak{P}$	
O!$(\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$?	**O** forces **P** to agree that according to the presupposition $\mathfrak{P}$ has the efficiency required for producing the ruling.
P!$(\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$	
	O forces then **P** to contradict himself in relation to the applicability of the ruling to the new root case.
O!*aṣl** : $\mathfrak{P}$	(the Opponent challenges the *ṭard*-component of **P**'s last assertion)
P! : *'illa*$^{\mathfrak{H}(\mathfrak{P}^\star)+}$.*aṣl** : $\mathfrak{H}^{\mathfrak{S}}$(*aṣl*)	(the Opponent responds by conceding that the ruling applies to the new root-case)
O!$\neg\mathfrak{H}^{\mathfrak{S}}$(*aṣl**)?	
P!$\neg\mathfrak{H}^{\mathfrak{S}}$(*aṣl**)	
O!*tanāquḍ* $\mathfrak{H}^{\mathfrak{S}}$(*aṣl**)	(the Opponent indicates that **P** just contradicted himself by asserting both that the ruling applies and not to the new root-case)
P!	I concede The Opponent starts now his constructive contribution by displaying the efficiency of a new property. Herewith he answers to the request of justification.

P *concedes, and this ends the sub-play.*

4) The Proponent accepts the suggestion and making use of the fact that the new property applies to the branch-case he will proceed that this will lead to the justification of the thesis.

5) The tree displaying the winning strategy will delete the unsuccessful attempts and also the justification of the sub-play.

Destructive Criticisms This move also presupposes that the Proponent requested the Opponent to endorse that the property $\mathfrak{P}$ occasions the ruling of the root-case. That is, the deployment of cooperative criticisms presupposes the following request: **P**! *'illa*$^{\mathfrak{H}(\mathfrak{P})+}$*.aṣl* : $\mathfrak{H}^{\mathfrak{S}}$(*aṣl*)?. However, different to cooperative criticism the Opponent aims to refute the main thesis. We will be more succinct in the description since after the description of the cooperative criticism and after the examples in the main text, the development is quite straightforward.

$$\mathbf{O}!\mathbb{F}(\forall x : \mathfrak{P})\, \mathfrak{H}(x) \quad (\textit{qalb})$$

The Opponent is commited to a sub-play where he brings forward a root-case of which it is recorded that an opposite ruling to the claimed ruling applies. Hence the root-case is presented as a counterexample to the Proponent's claim that every $\mathfrak{P}$ falls under the ruling $\mathfrak{H}$ and in particular to the claim that this ruling applies to the branch-case.

$$\mathbf{O}!\mathbb{F}(\forall x : \mathfrak{P}), \text{ given } \textit{aṣl}^{\star} : \mathfrak{P},\ \mathfrak{H}^{\mathfrak{S}\star}(\textit{aṣl}^{\star}),\ \text{and } \neg(\mathfrak{H}(\textit{aṣl}^{\star}) \wedge \mathfrak{H}^{\star}(\textit{aṣl}^{\star}))\ (\textit{naqḍ})$$

The Opponent is committed to a sub-play where he brings forward a root-case of which it is recorded that a different ruling to the claimed ruling applies and both rulings are incompatible. Hence the root-case is presented as a counterexample to the Proponent's assertion that every $\mathfrak{P}$ falls under the ruling $\mathfrak{H}$ and in particular to the claim that this ruling applies to the branch-case.

$$\mathbf{O}!\mathbb{F}(\forall x : \{x : \mathfrak{P} \mid B(x)\})\, \mathfrak{H}(x) \quad (\textit{kasr})$$

The Opponent is committed to a sub-play where he brings forward a root-case which instantiates a subset of $\mathfrak{P}$ and of which it is recorded that the claimed ruling does not apply. Hence the root-case is presented as a counterexample to the Proponent's assertion that every $\mathfrak{P}$ falls under the ruling $\mathfrak{H}$ and in particular to the claim that this ruling applies to the branch-case.

$$\mathbf{O}!\mathbb{F}(\forall x : \mathfrak{P})\, \mathfrak{H}(x) \quad (\textit{fasād al-waḍ'})$$

The Opponent is committed to a sub-play where he brings forward a root-case of which it is recorded in the sources that a property assumed in the thesis to apply to the branch-case occasions in fact, the opposite ruling to the one posited by the Proponent. In other words, the Opponent brings forward an *'illa* that destroys the thesis.

$$\mathbf{O}!\mathbb{F}(\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x) \quad (\textit{'adam al-ta'thīr})$$

The Opponent is committed to a sub-play where he brings forward a root-case which constitutes a counterexample to the efficiency of the proposed property asserted by the Proponent.

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II.2 Global meaning

As mentioned above global meaning is defined by means of *structural rules* that determine the general development of the plays, by specifying who starts, what are the allowed moves and in which order, when does a play end and who wins. The structural rules include the following rule on elementary expressions, *i.e.*, expressions of one of the forms $a : B$, $a : B(c)$, A, B:

P may not utter an elementary expression unless **O** uttered it first. Elementary expressions cannot be challenged.

This, rule is one of the most salient characteristics of dialogical logic. As discussed by Marion / Rückert,[83] it can be traced back to Aristotle's reconstruction of the Platonic Dialectics: the main idea is that, when an elementary expression is challenged then, from the purely argumentative point of view—that is, without making use of an authority beyond the moves brought forward during an argumentative interaction—, the only possible response is to appeal to the concessions of the challenger:

My grounds for the proposition you are asking for are exactly the same as the ones you bring forward when you conceded the same proposition.[84]

In previous literature on dialogical logic this rule has been called the *copy-cat rule* or *Socratic rule*. Now, if the ultimate grounds of a dialogical thesis are elementary propositions and if this is implemented by the use of the copy-cat rule, then the development of a dialogue is in this sense necessarily asymmetric. Indeed, if both contenders were restricted by the copy-cat rule no elementary proposition can ever be uttered. Thus, we implement the copy-cat rule by designing one player, called the *Proponent*, whose utterances of elementary propositions are, restricted by this rule. It is the winning of the Proponent that provides the dialogical notion of validity. More precisely, in the dialogical approach validity is defined via the notion of *winning strategy*, where winning strategy for **X** means that for any choice of moves by **Y**, **X** has at least one possible move at his disposal such that he (**X**) wins:

Validity (definition): A proposition is valid in a certain dialogical system if and only if **P** has a winning strategy for this formula.

In present context we will deploy a variant of the formal-rules. Before providing the structural rules let us precise the following notions:

[83] Marion and Rückert, "Aristotle on Universal Quantification".

[84] *Cf.* L. Keiff and S. Rahman, "La dialectique entre logique et rhétorique", *Revue de métaphysique et de morale*, vol. 2 (April-June 2010): 149–78.

Play: A play is a legal sequence of moves, *i.e.*, a sequence of moves which observes the game rules. Particle rules are not the only rules which must be observed in this respect. In fact, it can be said that the second kind of rules, namely, the *structural rules* are the ones giving the precise conditions under which a given sequence is a play.

Dialogical game: The dialogical game for φ, written $D(\varphi)$, is the set of all plays with φ being the *thesis* (see the Starting rule below).

The *structural rules* are the following:[85]

SR0 (Starting rule). Any dialogue starts with the Opponent positing initial concessions, if any, and the Proponent positing the thesis. After that the players each choose a positive integer called *repetition rank*. The *repetition rank* of a player bounds the number of challenges he can play in reaction to a same move.

SR1i (Classical game-playing rule). Players move alternately. After the repetition ranks have been chosen, each move is a challenge or a defence in reaction to a previous move and in accordance with the particle rules.

SR1ii (Intuitionistic game-playing rule). Players move alternately. After the repetition ranks have been chosen, each move is a challenge or a defence in reaction to a previous move and in accordance with the particle rules. Players can answer only against the *last non-answered* challenge by the adversary.[86]

SR2 (Socratic-rule).

The following rule only applies to elementary posits (of the form $a : A$, or $!A$) covered neither by the rules for requests stemming from the sources described above nor by the prescriptions involving the development rule for *qiyās al-ʿilla*.

Modified SR2 rule. **O** can challenge a **P**-elementary move if and only if he (**O**) did not posit the same elementary posit before. The challenge and correspondent defence is ruled by the following table where **P** *sic* (n) means that **P** indicates that **O** posited $a : A$ at move n (for elementary A). Once **P** answered the challenge on this posit is not any more available.

Posit	Challenge	Defence
P$!a : A$	**O**?	**P** *sic* (n)

SR3 (The overall development of a dialogue for *qiyās al-ʿilla*). We describe this rule below.

The following structural rule requires some additional terminology:

[85] For a formal formulation see Clerbout, "First-order dialogical games and tableaux" and *Étude sur quelques sémantiques dialogiques*.

[86] This last clause is known as the *Last Duty First* condition, and is the clause making dialogical games suitable for Intuitionistic Logic, hence the name of this rule.

Terminal play: A play is called terminal when it cannot be extended by further moves in compliance with the rules.

X-*terminal*: We say it is **X**-terminal when the last move in the play is an **X**-move.

SR4 (Winning rule). Player **X** wins the play ζ only if it is **X**-terminal.

Strategy: A strategy for player **X** in $D(\varphi)$ is a function which assigns an **X**-move M to every non terminal play ζ having a **Y**-move as last member such that extending ζ with M results in a play.

X-*winning-strategy*: An **X**-strategy is *winning* if playing according to it leads to **X**-terminal play no matter how **Y** moves.

Winning strategies constituted by plays where cooperative moves took place, will disregard the unsuccessful attempts and also the justification of the sub-play. More precisely it will proceed as if the Proponent has chosen the property resulting from the sub-play. Accordingly the winning strategy will include moves where the Proponent rather than the Opponent asserted the efficiency of the right property.

II.3 The overall development of a dialogue for qiyās al-ʻilla

1. A dialogical play starts with the Proponent claiming that some specific legal ruling applies to a certain branch-case:

$$\mathbf{P}!\mathfrak{H}(\textit{far}‘).$$

2. After agreement on the finiteness of the argument to be developed, the Opponent will launch a challenge to the assertion by asking for justification:

$$\mathbf{O}\ \text{Why?}$$

   The Proponent's aim is to develop an argument in such a way that if forces the Opponent to concede the justification of the challenged assertion. In other words P will try to obtain (see step 13):

$$!\ \textit{‘illa}^{\mathfrak{H}(\mathfrak{P}^{\star})+}(\textit{far}‘) : \mathfrak{H}(\textit{far}‘).$$

3. In order to develop his argument, the Proponent will start by choosing (to the best of his juridical knowledge) a suitable root-case from the sources for which the ruling at stake has been applied. The move consists in the Proponent forcing the Opponent to acknowledge this fact:

$$\mathbf{P}\ \mathfrak{H}^{\mathfrak{S}}(\textit{aṣl})?$$

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4. Since the evidence comes from the sources the Opponent is forced to concede it:

$$\mathbf{O}\ \mathfrak{H}^{\mathfrak{S}}(aṣl).$$

5. Once conceded, the Proponent will start by choosing (to the best of his juridical and epistemological knowledge) a suitable property (that should lead to the relevant occasioning factor). The move consists in the Proponent forcing the Opponent to acknowledge that the root-case instantiates that property—recall (section III.2.1) that we adopt here al-Baṣrī's and al-Shīrāzī's practice of keeping only those plays where the Opponent responds positively to this form of request.

$$\mathbf{P}\ aṣl : \mathfrak{P}?$$

$$\mathbf{O}!aṣl : \mathfrak{P}$$

6. Once the Opponent concedes both that the ruling and the selected property apply to the root-case, the Proponent will ask the Opponent to concede that the property just selected is the one that constitutes the relevant occasioning factor.[87] The request can carry out indicating to the sources or not.

$$\mathbf{P}\ \text{‘}illa^{\mathfrak{S}\mathfrak{H}(\mathfrak{P})+}.aṣl : \mathfrak{H}(aṣl)?$$

$$\mathbf{P}\ \text{‘}illa^{\mathfrak{H}(\mathfrak{P})+}.aṣl : \mathfrak{H}(aṣl)?$$

7. If the *‘illa* has been determined by the sources the Opponent must accept by endorsing the efficiency of the property; thus, the Opponent must assert the universal $!\ (\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\neg\mathfrak{H}(x)$. Otherwise he might ask for justification (*muṭālaba*), cooperate in the justification or *strongly* reject it.
8. If the Opponent asks for a justification, the Proponent will switch to the development of a dialogue of the form *qiyās al-‘illa al-khafī* and will develop an argument towards establishing its efficiency. In other words, the Proponent must be able to bring forward arguments showing that the property satisfies *ṭard* $(!\ (\forall x : \mathfrak{P})\mathfrak{H}(x))$, *‘aks* $((\forall x\ :\ \neg\mathfrak{P})\neg\mathfrak{H}(x))$, and *ta’thīr* $(!\ (\forall x : \mathfrak{P})\mathfrak{H}(x) \wedge (\forall x : \neg\mathfrak{P})\mathfrak{H}(x))$. If he does not succeed, the play stops unless the Opponent decides to cooperate as described in the next step.
9. The Opponent might react by deciding to cooperate by first proposing a more precise formulation of the property advanced or by proposing a new property for the constitution of the occasioning factor.[88] This will trigger a sub-play where the Opponent will defend the choice of an alternative property following the procedure prescribed for a *mu‘āraḍa*-move or

[87] In the context of *jadal* this move is called *ta‘līl* by the means of which the Proponent asserts that a given property determines the factor occasioning the relevant ruling (see Young, *The Dialectical Forge*, p. 568, pp. 24–5, p. 624).

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constructive criticism. Once the sub-play ended, the play proceeds to step 12. A *muʿāraḍa*-move assumes (1) that the choice of the root-case and the choice of ruling are relevant for the thesis, despite the fact that the Proponent chooses the wrong property for determining the occasioning factor; (2) that the branch-case instantiates the "right" (newly proposed property). The launching of a constructive criticism will be indicated with the following notation:

$$!\mathbb{V}\ \text{‘}illa^{\mathfrak{H}(\mathfrak{P}^{\star})+}.a\d{s}l : \mathfrak{H}(a\d{s}l).$$

10. The Opponent might also react by strongly rejecting the Proponent's proposal. We distinguish two cases that we call (1) *Destruction of the thesis*. The main target of this form objection is the thesis rather than only objecting against to the Proponent proposal for determining the *ʿilla*. In such a case it is he, the Opponent, who has to bring forward a counterexample from the sources. This will trigger a sub-play where the Opponent develops his counter argumentation, following the prescriptions for one of the forms of destructive criticism, namely: *qalb* (reversal), *naqḍ* (inconsistency), or *kasr* (breaking apart). (2) *Destruction of the ʿilla*. The counter-argument involves bringing forward objections against the proposed *waṣf* proposed as determining the *ʿilla*, following the prescriptions for attacks of the forms *fasād al-waḍʿ* (invalidity of occasioned status) or *ʿadam al-taʾthīr* (lack of efficiency). If the Opponent succeeds the play stops.
11. If the Opponent concedes that the property determines the occasioning factor for the ruling of the root-case, the Proponent will ask the Opponent to acknowledge that this exemplifies a general law binding the ruling with the relevant property.[89]
12. If the Opponent concedes that the property does determine the occasioning factor for the ruling of the root-case, the Proponent will ask the Opponent to acknowledge that the property also applies to the branch-case—recall that we adopt here again the practice of keeping only those plays where the Opponent responds positively to this form of request. If the property does not apply, though it determines the occasioning factor, then it is the main thesis that should be rejected. In other words, if the Opponent refuses to concede that the branch-case instantiates the relevant property a kind of strong rejection results. The request and answer will be expressed by means

[88] This counterattack of the Opponent is a *muʿāraḍa*-move, extensively discussed by Miller (*Islamic Disputation Theory*, pp. 33–9) and by Young (*The Dialectical Forge*, p. 151), who calls it *constructive criticism*. It is opposed to the *destructive criticism* or *naqḍ* displayed in the following step.

[89] Recall our remark in section III.1.1 concerning the fact that identifying an occasioning factor amounts to characterizing it as a general law.

of the following notation:

$$\mathbf{P}\ \textit{far}\text{‘} : \mathfrak{P}?\ (\text{or } \mathfrak{P}^{\star})$$
$$\mathbf{O}\ \textit{far}\text{‘} : \mathfrak{P}\ (\text{or } \mathfrak{P}^{\star})$$

13. After the Opponent concedes that the property does apply to the branch case, and since the Opponent also concedes that the property is the one that characterizes the relevant occasioning factor, the Proponent will ask the Opponent to acknowledge that the branch-case falls under the ruling at stake. This move forces the Opponent to concede the challenged thesis. A play ends if there are no other moves allowed. If the Proponent's defence is successful the play will end by a move where he indicates that the Opponent has finished by endorsing the thesis under scrutiny. Otherwise it is a play won by the antagonist. The final moves of a successful play have the following form:

    P *far‘* : $\mathfrak{P}$ (challenging the universal that expresses the *ṭard*-condition)

    O *‘illa*$^{\mathfrak{H}(\mathfrak{P})+}$(*far‘*) : $\mathfrak{H}$(*far‘*)

    P *‘illa*$^{\mathfrak{H}(\mathfrak{P})+}$(*far‘*) : $\mathfrak{H}$(*far‘*)

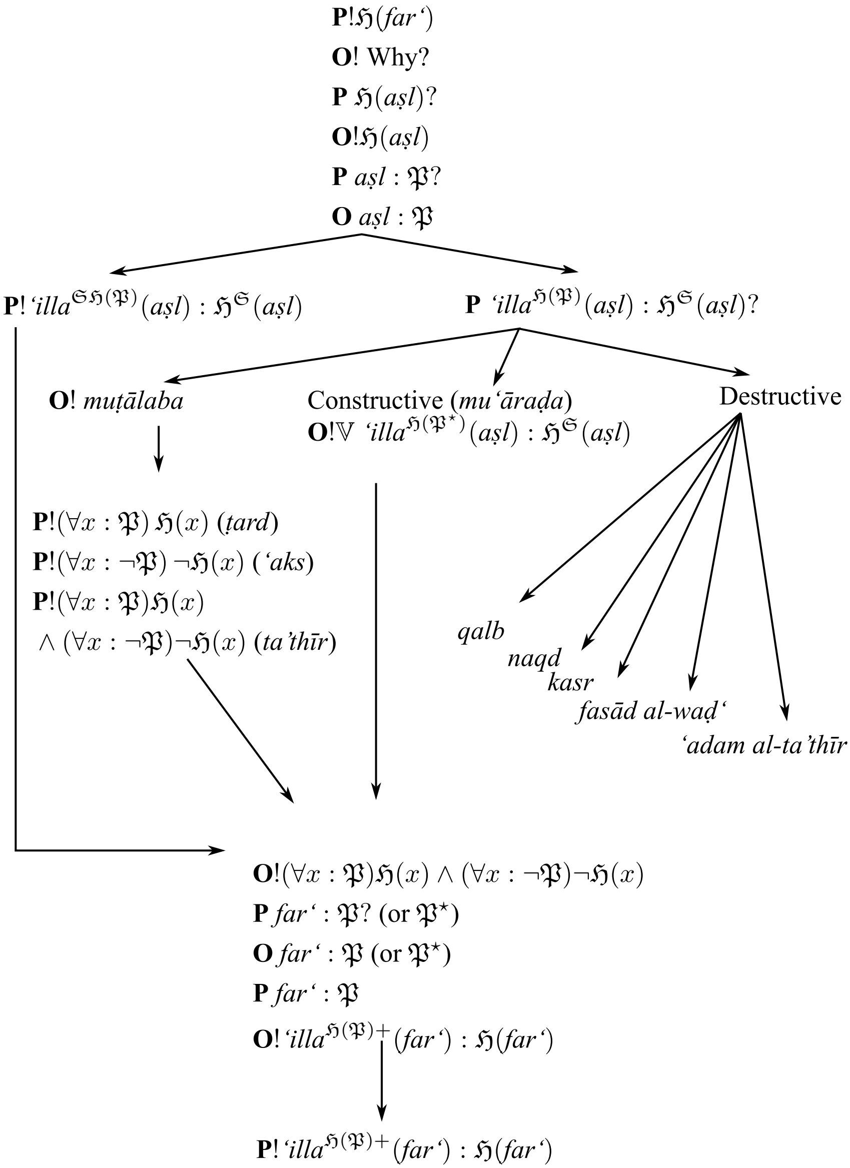
    (answer to the request for justification of the thesis)

    (or involving the alternative property $\mathfrak{P}^{\star}$)

II.4 Global Reasons, Applications and the Constitution of Strategies

While building the core of a *winning* **P**-strategy play objects are linked not only to the local meaning of expressions, but also to their justification. This cannot be achieved while considering single plays nor non-winning strategies. Consider for example the case of a **P**-conjunction such that the Proponent claims that it has a (winning) strategic object for it. Single plays cannot provide a way to check if a conjunction is justified: this would require **P** to win the play for the two conjuncts. However, if the repetition rank chosen by the Opponent is 1, then in no single play can **P** bring forward the strategic object for the whole conjunction. It is only within the tree that displays the winning-strategy that both plays can be brought together as two branches with a common root. Indeed, if we think of the tree as developed through the plays, the root of the tree will not explicitly display the information gathered while developing the plays. When a play starts it is just a posit. Only at the end of the construction-process of the relevant plays **P** will be able to have the knowledge required to assert the thesis. Similarly, in the case of a disjunction, we will able to display the strategic object correspondent to the choice that yielded the canonical argumentation form of the strategic object, only after the choices involving the defence have been made.

Schema 3: Diagram of *Qiyās al-ʻilla*



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More generally, the *assertion* of the thesis that makes explicit the reason resulting from the plays is a recapitulation of the result achieved after running the relevant plays, after **P**'s initial posit of that thesis. This is, what the canonical argumentation form of a reason is at the strategic level, and this is what renders the dialogical formulation of a canonical proof-object. We call those reasons that constitute a winning strategy *global reasons*.

In the case of material implication (and universal quantification) a winning **P**-strategy literally displays the procedure by which the Proponent chooses the local reason for the consequent depending on the local reason chosen by the Opponent for the antecedent. What the canonical argumentation form of a global reason does is to make explicit the relevant *choice-dependence* by means of a recapitulation of the thesis.

This corresponds to the general description of proof-objects for material implications and universally quantified formulas in CTT: a method which, given a proof-object for the antecedent, yields a proof-object for the consequent. The dialogical interpretation of this functional dependence amounts rendering the canonical argumentation form of a global reason for **P**$!A \supset B$ as **P** $p(x)[\![O^{x:A}]\!] : A \supset B$ that expresses that if **P** is looking to make his claim legitimate he must be able to assert the consequent for any reason that the Opponent brings forward for backing his (the Opponent's) own assertion of the antecedent. Thus, the global reason for the material implication $A \supset B$ is the "strategic-object" $p(x)[\![O^{x:A}]\!]$. In CTT it corresponds to the lambda-abstract of the local reason for the consequent, namely the lambda-abstract of the function $p(x) : B$.

We have expressed all this in the form of a table, see Tab. 5.

Notice that the canonical form of a global reasoning has been defined only for **P**. There is no general reason to do so; however we proceeded in this way since we are after a notion of winning strategy that corresponds to that of a CTT-demonstration, and these strategies have been identified as those where **P** wins. In fact the table above is the dialogical analogue to the *introduction rules* in CTT. Dialogically speaking those rules display the *duties* required by **P**'s own assertions—we will come back to this issue later on.

Now, we also need to specify the global-reason that provides the legitimation of the (Proponent's) thesis, when it is the Opponent who made the choice: a winning-strategy for **P** should also include those cases where it is the contender who brought forward some assertion. In our context, the dialectical meaning of the notion of occasioning factor, is that the Proponent justifies his thesis relying on the endorsements of the Opponent. In particular, if the Opponent endorses the efficiency of the property $\mathfrak{P}$ in relation to the ruling $\mathfrak{H}$, and also concedes that the branch-case instantiates $\mathfrak{P}$; then the Proponent can legitimate his thesis by claiming that the reason endorsed by the Opponent provides the occasioning factor that justifies his thesis.

Tab. 5: Canonical argumentation form and global reasons within winning strategies for **P**. Strategic objects as *Recapitulation*.

Posit	Challenge	Defence	Recapitulation
$\mathbf{P}!(\forall x : A)\, B(x)$	$\mathbf{O}?_L$ or $\mathbf{O}?_R$	$\mathbf{P}\ p_1 : A$ resp. $\mathbf{P}\ p_2 : B(p_1)$	$\mathbf{P}\ (p_1, p_2) : (\exists x : A)\, B(x)$
$\mathbf{P}!(\forall x : A)\, B(x)$	$\mathbf{O}\ p_1 : A$	$\mathbf{P}\ p_2.\mathbf{O}^{p_1} : B(\mathbf{O}^{p_1})$	$\mathbf{P}\ p(x)[\![\mathbf{O}^{x:A}]\!] : (\forall x : A)\, B(x)$
$\mathbf{P}!(\forall x : \mathfrak{P})\, \mathfrak{H}(x)$	$\mathbf{O}\ p_1 : \mathfrak{P}$	$\mathbf{P}$ *ṭard*$^{\mathfrak{H}(\mathfrak{P})}.\mathbf{O}^{p_1} : \mathfrak{H}(\mathbf{O}^{p_1})$	$\mathbf{P}$ *ṭard*$^{\mathfrak{H}(\mathfrak{P})}(x)[\![\mathbf{O}^{x:\mathfrak{P}}]\!] : (\forall x : \mathfrak{P})\, \mathfrak{H}(x)$
$\mathbf{P}!(\forall x : \neg\mathfrak{P})\, \neg\mathfrak{H}(x)$	$\mathbf{O}\ p_1 : \neg\mathfrak{P}$	$\mathbf{P}$ *‘aks*$^{\mathfrak{H}(\mathfrak{P})}.\mathbf{O}^{p_1} : \neg\mathfrak{H}(\mathbf{O}^{p_1})$	$\mathbf{P}$ *‘aks*$^{\mathfrak{H}(\mathfrak{P})}(x)[\![\mathbf{O}^{x:\neg\mathfrak{P}}]\!] : (\forall x : \neg\mathfrak{P})\, \neg\mathfrak{H}(x)$

Tab. 6:

Posit	Challenge	Defence	Application
$\mathbf{O}$ *ṭard*$^{\mathfrak{H}(\mathfrak{P})} : (\forall x : \mathfrak{P})\, \mathfrak{H}(x)$ Notation for a posit without specified reason: $\mathbf{O}!(\forall x : \mathfrak{P})\, \mathfrak{H}(x)$	$\mathbf{P}\ p : \mathfrak{P}$ (provided **O** endorses this assertion)	$\mathbf{O}$ *‘illa*$^{\mathfrak{H}(\mathfrak{P})+}.p : \mathfrak{H}(p)$	$\mathbf{P}$ *‘illa*$^{\mathfrak{H}(\mathfrak{P})+}[\![\mathbf{O}^{x:\mathfrak{P}}]\!].\mathbf{O}^{p:\mathfrak{P}} : \mathfrak{H}(p)$ where “*‘illa*$^{\mathfrak{H}(\mathfrak{P})+}[\![\mathbf{O}^{x:\mathfrak{P}}]\!].\mathbf{O}^{p:\mathfrak{P}}$” stands for the application “*‘illa*$^{\mathfrak{H}(\mathfrak{P})}($*ṭard*$^{\mathfrak{H}(\mathfrak{P})}(x)[\![\mathbf{O}^{x:\mathfrak{P}}]\!]).\mathbf{O}^{p:\mathfrak{P}}$”
$\mathbf{O}$ *‘aks*$^{\mathfrak{H}(\mathfrak{P})} : (\forall x : \neg\mathfrak{P})\, \mathfrak{H}(x)$	$\mathbf{P}\ p : \neg\mathfrak{P}$ (provided **O** endorses this assertion)	$\mathbf{O}$ *‘illa*$^{\mathfrak{H}(\mathfrak{P})}.p : \neg\mathfrak{H}(p)$	$\mathbf{P}$ *‘illa*$^{\mathfrak{H}(\mathfrak{P})}[\![\mathbf{O}^{x:\neg\mathfrak{P}}]\!].\mathbf{O}^{p:\neg\mathfrak{P}} : \neg\mathfrak{H}(p)$ where “*‘illa*$^{\mathfrak{H}(\mathfrak{P})}[\![\mathbf{O}^{x:\neg\mathfrak{P}}]\!].\mathbf{O}^{p:\neg\mathfrak{P}}$” stands for the application “*‘illa*$^{\mathfrak{H}(\mathfrak{P})}($*‘aks*$^{\mathfrak{H}(\mathfrak{P})}(x)[\![\mathbf{O}^{x:\neg\mathfrak{P}}]\!]).\mathbf{O}^{p:\mathfrak{P}}$”