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Arabic as a Polycentric Scientific Commons: Translational Surplus and the Making of Knowledge (8th–17th Centuries)

العربية بوصفها مشاعًا علميًّا متعدد المراكز: الفائض الترْجمي وصناعة المعرفة (من القرن الثامن إلى القرن السابع عشر)

L'arabe comme commun scientifique polycentrique : surplus traductionnel et fabrique des savoirs (VIIIe–XVIIe siècles)

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Résumé

This article proposes a new interpretation of Arabic's place in the history of science between the eighth and seventeenth centuries. It moves beyond two reductive models: Arabic as a passive repository of Greek knowledge and "Islamic science" as the homogeneous expression of a religious civilization. The study conceptualizes Arabic instead as a polycentric scientific commons—a learned, transregional system in which access to concepts, problems, texts, diagrams, and procedures was organized across confessional and political boundaries. Using a critical narrative review and connected-history method, it analyses representative trajectories in medicine, mathematics, optics, astronomy, geography, and natural history across Greek, Syriac, Persian, Sanskrit, Arabic, Hebrew, and Latin. The central result is the identification of translational surplus: translation did not merely preserve semantic content but generated new terminologies, classifications, commentarial problems, diagrammatic solutions, and standards of demonstration. This surplus was sustained by recursive transmission, since translated works repeatedly returned as revised syntheses, teaching texts, tables, instruments, and counterarguments. Arabic scientific culture was consequently neither a single center nor a one-way bridge to Europe. It was an asymmetrical network of courts, hospitals, observatories, libraries, workshops, itinerant circles, and manuscript communities. The study further shows that the early modern period transformed rather than simply extinguished this commons. Arabic's decisive historical contribution thus lies in the durable architecture of epistemic revisability it created: inherited knowledge became shareable because it could be translated, contested, recomposed, and transmitted again.

Mots-clés

Arabic scientific commons, translational surplus, history of science, manuscript transmission, epistemic infrastructure

مستخلص

تقترح هذه الدراسة تأويلًا جديدًا لمكانة العربية في تاريخ العلوم بين القرنين الثامن والسابع عشر، متجاوزةً نموذجين اختزاليين: العربية باعتبارها مستودعًا سلبيا للمعرفة اليونانية، و»العلم الإسلامي» باعتباره تعبيرًا متجانسًا عن حضارة دينية واحدة. وتنظر الدراسة إلى العربية بوصفها مشاعًا علميًّا متعدد المراكز، أي نظامًا معرفيًا عابرًا للأقاليم نظم الوصول إلى المفاهيم والمسائل والنصوص والرسوم والإجراءات عبر الحدود الدينية والسياسية. وبالاعتماد على مراجعة سردية نقدية ومنهج التاريخ المتصل، تحلل الدراسة مسارات ممثلة في الطب والرياضيات والبصريات والفلك والجغرافيا والتاريخ الطبيعي، عبر اليونانية والسريانية والفارسية والسنسكريتية والعربية والعبرية واللاتينية. وتتمثل النتيجة المركزية في الكشف عن »فائض ترْجمي»: فالترجمة لم تحفظ الدلالة فحسب، بل ولدت مصطلحات وتصنيفات ومسائل شارحة وحلولًا رسمية ومعايير للبرهنة. وقد استمر هذا الفائض بفضل انتقال تكراري عادت فيه الأعمال المترجمة في صورة تركيبات منقحة، ونصوص تعليمية، وجداول، وأدوات، واعتراضات. ومن ثم لم تكن الثقافة العلمية العربية مركزًا واحدًا ولا جسرًا أحادي الاتجاه نحو أوروبا، بل شبكة غير متناظرة من البلاطات والمستشفيات والمراصد والمكتبات

والـورش والدوائـر المتنقلـة وجماعـات المخطـوط .كمـا تبيـن الدراسـة أن العصـر الحديـث المبكـر أعـاد تشـكيل هـذا المشـاع ولـم يلغِ ه ببسـاطة .وعليـه ،يكمـن إسـهام العربيـة الحاسـم فـي بنيـة دائمـة مـن القابليـة للمراجعـة الإبسـتيمية ،جعلـت المعرفـة الموروثـة قابلـةً للاقتسـام لأنهـا أصبحـت قابلـةً للترجمـة والاعتـراض وإعـادة التركيـب ثـم الانتقـال مـن جديـد.

الكلمات المفتاحية

المشاع العلمي العربي ،الفائض التر ْجمي ،تاريخ العلوم ،انتقال المخطوط ،البنية التحتية الإبستيمية

Abstract

Cet article propose une interprétation renouvelée de la place de l'arabe dans l'histoire des sciences entre le VIIIe et le XVIIe siècle. Il dépasse deux modèles réducteurs : celui de l'arabe comme dépôt passif du savoir grec et celui d'une « science islamique » conçue comme l'expression homogène d'une civilisation religieuse. L'arabe est appréhendé comme un commun scientifique polycentrique, c'est-à-dire comme un système savant transrégional organisant, par-delà les frontières confessionnelles et politiques, l'accès aux concepts, aux problèmes, aux textes, aux diagrammes et aux procédures. Fondée sur une revue narrative critique et une histoire connectée, l'étude examine des trajectoires représentatives en médecine, mathématiques, optique, astronomie, géographie et histoire naturelle, entre le grec, le syriaque, le persan, le sanskrit, l'arabe, l'hébreu et le latin. Son principal résultat est la mise en évidence d'un surplus traductionnel : la traduction ne conserve pas seulement un contenu sémantique ; elle engendre des terminologies, des classifications, des problèmes de commentaire, des solutions diagrammatiques et des normes de démonstration. Ce surplus est entretenu par une transmission récursive, les œuvres traduites revenant sous forme de synthèses révisées, de textes pédagogiques, de tableaux, d'instruments ou de contre-arguments. La culture scientifique arabophone ne constitue donc ni un centre unique ni un simple pont orienté vers l'Europe, mais un réseau asymétrique de cours, d'hôpitaux, d'observatoires, de bibliothèques, d'ateliers, de cercles itinérants et de communautés manuscrites. La période moderne transforme ce commun sans l'abolir uniformément. L'apport décisif de l'arabe réside ainsi dans l'architecture durable de la révisabilité épistémique qu'il a instituée.

Keywords

Commun scientifique arabophone, surplus traductionnel, histoire des sciences, transmission manuscrite, infrastructure épistémique

Introduction

Arabic cannot be treated as a self-explanatory historical cause. No language becomes scientific by possessing an intrinsically rational grammar, a uniquely rich lexicon, or a sacred status. Conversely, no language is condemned to scientific marginality by its structure. The historical problem begins elsewhere: under what conditions did Arabic make statements produced in distant places available for correction, reuse, and disagreement? This question displaces the familiar celebration of a "language of science" in favour of the material and intellectual operations that made scientific work shareable.

Between the eighth and seventeenth centuries, Arabic connected scholarly environments that were neither politically unified nor confessionally homogeneous. It was learned and used by Muslims, Christians, Jews, Sabians, converts, court officials, physicians, mathematicians, instrument makers, and itinerant teachers. Its scientific history, therefore, cannot be contained in an ethnic subject called "the Arabs," a religious subject called "Islam," or a geographical opposition between "East" and "West." Arabic mattered because it allowed partially incompatible traditions to enter a common space without becoming identical.

This article calls that space a polycentric scientific commons. "Commons" does not imply equality, universal access, or the absence of ownership. Patronage, courtly competition, professional secrecy, social hierarchy, and uneven manuscript circulation structured participation. The term instead designates a shared but contested set of resources—technical vocabularies, canonical texts, problem repertoires, proof forms, diagrams, tables, genres, and pedagogical sequences—whose value increased through reuse. "Polycentric" indicates that no single city, dynasty, confession, or institution controlled their production.

The argument advances a second concept: translational surplus. When a scientific text moves between languages, the result is not exhausted by equivalence with a source. Translators choose, define, compare, interpolate, diagram, abridge, and sometimes correct. These operations create questions and conceptual distinctions absent from the source in precisely the form they acquire in the target tradition. Translation can therefore produce epistemic value beyond semantic conservation. The history of Arabic science is exa-

mined here as a history of that surplus and of the infrastructures that made it recursively transmissible.

The corpus ranges from the Graeco-Arabic movement of the eighth and ninth centuries to seventeenth-century manuscript and teaching networks. This periodization rejects both the title of the initial manuscript—which announced the thirteenth to eighteenth centuries while discussing mainly earlier authors—and the conventional plot of rise, golden age, transfer to Europe, and decline. It follows the changing functions of Arabic instead: as a translation language, a language of original composition, a pedagogical medium, an archive, an interconfessional interface, and an object of early modern philology.

1. Methodological construction: corpus, scales, and thresholds of proof

The study is a critical narrative review organized by connected history. It does not claim exhaustive coverage of Arabic scientific production, whose chronological and geographical extent would make such a claim untenable. It selects trajectories in which the work of mediation can be reconstructed with relative precision: Graeco-Arabic medical translation, algebraic and astronomical procedures, optical demonstration, medical and natural-historical compilation, Arabic–Hebrew–Latin transfer, and early modern manuscript circulation. The unit of analysis is not the isolated "discovery" but the epistemic operation that makes a claim reusable.

Four selection criteria govern the corpus. A case must show identifiable textual or material transformation; it must illuminate Arabic's function rather than merely the identity of an author; it must connect at least two scholarly settings; and it must allow preservation to be distinguished from conceptual reorganization. This excludes retrospective lists of priorities unsupported by textual history. It also excludes quotations of admiration offered as evidence that one civilization acknowledged a debt to another. Recognition is an object of reception history, not proof of scientific transformation.

The analysis moves among three scales. At the microhistorical scale, it follows terms, variants, diagrams, classifications, and argumentative sequences. At the mesohistorical scale, it examines patronage, teaching, manuscript production, hospitals, observatories, and circles of collaboration. At the transregional scale, it reconstructs movements across languages and political

formations. No scale is sufficient alone: lexical change without institutions remains disembodied, while institutional history without textual operations cannot explain what changed in knowledge.

Causal claims are graded. Documented translation, explicit citation, and identifiable manuscript dependence constitute strong evidence. Shared formal structures combined with plausible contact justify comparison but not direct filiation. Broad civilizational resemblance has the weakest evidentiary value. This hierarchy is especially necessary in discussions of Arabic astronomy and Copernicus, where mathematical parallels are significant, but transmission routes remain debated. Methodological restraint is not a diminution of Arabic scholarship; it protects its demonstrable achievements from claims that cannot withstand scrutiny.

The approach also has limits. Surviving manuscripts disproportionately represent learned written traditions and named authors. Artisanal, oral, gendered, and embodied practices remain less visible. Modern disciplinary categories only imperfectly fit premodern classifications, and the Arabic textual record is unevenly edited. These limitations are incorporated into the argument: a scientific commons is known through surviving traces that were themselves selected by institutions, collectors, copyists, and later historiographies.

2. From Linguistic Medium to Epistemic Commons

2.1. Translational surplus: equivalence, friction, and conceptual gain

The Graeco-Arabic translation movement did more than enlarge a library. It reorganized the conditions under which inherited propositions could be discussed. Greek works frequently passed through Syriac; Persian and Indian materials followed other routes; Arabic versions were then revised, commented upon, excerpted, and translated again. Each passage introduced friction. A term might resist equivalence, a syntactic relation might conceal a causal claim, and a diagram might require a new ordering of its labels. Such difficulties were intellectually productive because they compelled explicit decisions.

The work associated with Ḥunayn ibn Isḥāq illustrates this point. The search for manuscripts, comparison of copies, differentiation of audiences, and revision of earlier versions made translation inseparable from textual criticism and medical understanding. Vagelpohl (2011) shows that the Arabic

Galenic tradition can reveal both lost Greek readings and the translator's interpretive procedure. A translation was thus not a transparent window. It was an epistemic intervention whose choices became available to later scrutiny.

Translational surplus appears at four levels. Lexically, new technical families stabilize relations among concepts. Architecturally, translated works are divided, ordered, or summarized for new curricula. Diagrammatically, figures are relabeled or reconstructed to keep demonstrations operable. Polemically, ambiguity or contradiction becomes the object of commentary. The surplus is not necessarily an "improvement"; it may include distortion or loss. Its defining feature is the production of consequences that cannot be reduced to the faithful transport of an original meaning.

This perspective avoids attributing scientific power to Arabic morphology itself. Derivational patterns offered resources, but only repeated collective use turned a lexical proposal into a term. Scientificization was a process of uptake: readers, teachers, copyists, practitioners, and critics stabilized or rejected formulations. Language worked because communities made it answerable to texts, observations, calculations, and objections.

2.2. Polycentricity and differential commensurability

Arabic created neither a perfectly unified scientific world nor unrestricted mutual intelligibility. Baghdad, Cairo, Damascus, Córdoba, Maragha, Samarqand, Fez, and other sites possessed distinct patronage structures and intellectual agendas. Yet shared textual resources allowed arguments to travel between them. The resulting commensurability was differential: scholars could recognize a problem or proof while disputing its philosophical assumptions, technical vocabulary, or confessional implications.

This differential commensurability is more historically precise than the metaphor of a bridge. A bridge imagines two stable shores and a one-time crossing, usually from Greece through Arabic to Europe. The Arabic scientific commons instead altered the shores. Greek materials became Arabic philosophical and technical corpora; Arabic syntheses reshaped Hebrew and Latin curricula; Latin and early modern philological interests in turn affected the collection and reading of Arabic manuscripts. Transmission was recursive, not linear.

The commons was also asymmetrical. Access depended on literacy, training, proximity to patrons, possession of manuscripts, and membership in

scholarly networks. Some works circulated widely; others remained local or disappeared. A history centered only on canonical authors reproduces these inequalities by mistaking survival for representativeness. Attention to copyists, glossators, teachers, instrument makers, and translators restores the distributed labor through which a text became durable.

3. Knowledge Made Revisable

3.1. Problem forms across mathematics, optics, and astronomy

The most significant unit of transmission was often not a proposition but a problem form: a repeatable arrangement of unknowns, operations, diagrams, and acceptable solutions. Al-Khwārizmī's *Kitāb al-jabr wa-l-muqābala* organized classes of equations and linked rhetorical procedures to inheritance, commerce, and measurement. Its importance lies less in a civilizational claim to the "invention of algebra" than in the stabilization of teachable transformations. The later Latin term records only the most visible trace of a deeper reformatting of mathematical practice.

Ibn al-Haytham's *Kitāb al-Manāẓir* similarly reorganized a field of problems. By connecting geometrical analysis, the physiology of the eye, controlled observation, and criticism of emission theories, it produced an investigative architecture rather than a single discovery. The Latin *De aspectibus* transmitted this architecture into perspectivist traditions. What moved was a disciplined way of making vision problematic: how light reaches the eye, how geometry relates to perception, and where experimental arrangements can arbitrate among explanations.

Astronomy reveals another form of revisability. Arabic astronomers inherited Ptolemaic predictive models but also confronted tensions between mathematical devices and physical commitments. The models associated with Naṣīr al-Dīn al-Ṭūsī and Maragha scholarship show how geometrical reconstruction could preserve predictive efficacy while addressing physical objections. Formal parallels with Copernican devices are historically important but insufficient to prove a direct route. The distinction between similarity, plausible contact, and documented dependence is itself part of a rigorous history of transmission.

Across these fields, Arabic operated as a language in which procedures could be detached from one application, generalized, and inserted into another

argumentative setting. This capacity for recontextualization—not lexical richness in the abstract—made the scientific commons productive.

3.2. Compilation as a technology of inquiry

Modern narratives often oppose compilation to originality. Arabic medical and natural-historical works show why this opposition is misleading. Al-Rāzī's *Kitāb al-Ḥāwī* assembled excerpts, disagreements, and observations in a form that kept heterogeneous authorities available for comparison. Ibn Sīnā's *al-Qānūn fī al-ṭibb* performed a different operation: it transformed a plural archive into a systematic architecture of principles, materia medica, organ-specific diseases, general diseases, and compound remedies. Compilation could therefore be cumulative, critical, or systematizing.

The epistemic value of a compilation depends on its ordering devices. Headings, cross-references, lexical equivalences, classifications, and degrees of authority determine what a reader can compare. Al-Jāḥiẓ's Kitāb al-Ḥayawān, for example, moves among philology, poetry, testimony, theology, and observation. Judged by the norms of a modern zoological treatise, this heterogeneity appears defective; reconstructed historically, it shows a complex procedure for coordinating different kinds of evidence.

Pharmacology and geography likewise relied on controlled aggregation. Ibn al-Bayṭār's plant knowledge and al-Idrīsī's spatial descriptions combined books, reports, itineraries, observation, and patronage. The resultant works did not merely store data. They assigned data a place in a searchable conceptual order. Compilation was an interface between dispersed experience and portable knowledge.

Medicine also demonstrates why the category "Qur'ānic science" is analytically insufficient. Religious values could legitimize learning, and religious practices generated technical problems, but medical reasoning engaged Galenic corpora, clinical experience, pharmacological markets, philosophical classification, and professional lineages. Treating scripture as the direct source of every science suppresses the historical labor that made knowledge revisable.

3.3. Manuscripts as dynamic graphs

A scientific work should not be imagined as a stable text moving unchanged from author to reader. Manuscript transmission created a graph of versions: copies, abridgements, translations, commentaries, marginalia, diagrams, corrections, and teaching exemplars. Each node could redirect later reception.

Lost originals sometimes survive through Arabic versions; Arabic originals may in turn be partially recoverable through Hebrew or Latin translations. The object of history is therefore not only the authored work but the changing relations among its witnesses.

This graph model makes the materiality of language visible. A miscopied numeral can alter a table; a displaced diagram can break a proof; a gloss can enter the main text; vocalization can disambiguate a technical term. Copyists and readers were not external to scientific content. Their interventions shaped what later communities could calculate, observe, or contest.

Recursive transmission occurred when a transformed text re-entered new scholarly work. A translated table generated recalculation; a commentary produced a new problem; an abridgement became a textbook; an instrument materialized a geometrical relation. Knowledge circulated not because it remained identical but because formats allowed controlled transformation.

4. The Politics and Afterlives of the Commons

4.1. Institutions without a single founding institution

The scientific commons depended on courts, hospitals, observatories, libraries, workshops, book markets, teaching circles, and travel. None of these can be promoted as its single origin. The "House of Wisdom," often represented as a modern academy coordinating all Abbasid science, condenses a more dispersed ecology of patronage and textual work. Removing this founding myth does not diminish Abbasid investment; it makes institutional causality more exact.

Collaboration crossed confessional boundaries without abolishing hierarchy. Christian translators, Jewish physicians and philosophers, Muslim patrons and scholars, and actors of other affiliations participated in Arabic intellectual life. Their roles cannot be reduced to intermediary service between civilizations. They selected, interpreted, argued, taught, and produced. The common language enabled collaboration while religious, professional, and political differences continued to matter.

Teaching circles show the portability of institutions. A scholar's movement could carry a curriculum, manuscripts, and practices of collation across cities. Tavakol's (2024) analysis of Bahā' al-Dīn al-ʿĀmilī's mobile circle in Safavid Iran demonstrates that early modern scholarly organization remained per-

son-centered and mobile. The institution was sometimes a network embodied in travel rather than a building.

4.2. Arabic–Hebrew–Latin recursivity and the end of the bridge metaphor

From the twelfth century onward, Arabic works and Arabic versions of Greek works entered Latin scholarship through multiple Iberian and Mediterranean networks. Toledo was important, but the convenient image of a unified "school of translators" can conceal varied patronage and collaborative arrangements. Burnett (2001, 2015) shows that mathematical, medical, astronomical, and philosophical translations helped reorganize Latin learning.

What crossed into Latin included terminologies, tables, diagrams, instruments, proof strategies, curricular sequences, and disagreements. Loanwords such as "algebra," "azimuth," "nadir," and "zenith" are lexical fossils of a transformation that reached much further than vocabulary. Latin readers did not simply recover Greek antiquity. They encountered antiquity as it had been selected, translated, criticized, and supplemented within Arabic traditions.

Hebrew translation created another recursive field. Jewish scholars in Islamicate societies often accessed scientific works directly in Arabic, whereas communities elsewhere increasingly used Hebrew versions. Translation responded to new audiences and could mediate later access to Arabic arguments. The relevant topology is triangular and branching, not bipolar. "Islam" and "Europe" are not adequate names for the interacting textual communities.

Reception was selective. Works could be appropriated, censured, excerpted, or absorbed without attribution. Renaissance preference for Greek sources sometimes devalued Arabic mediation even as Arabic medicine, astronomy, and lexicography remained active resources. Prestige changed more quickly than dependence.

4.3. Early modern reconfiguration rather than generalized decline

The classical plot of a golden age followed by decline mistakes a retrospective hierarchy for an explanation. Political fragmentation, changing patronage, and uneven adoption of print altered scientific work, but they did not affect every region or field in the same way. Copying, teaching, commentary, calculation, instrument use, and local adaptation persisted in Ottoman, Safavid, Mughal, Maghribi, and other contexts.

Early modern manuscript mobility connected Arabic-reading communities with European collections, universities, and confessional projects. Ghobrial (2016) demonstrates that these movements produced new expertise and creative rearrangements. Arabic became simultaneously a working scholarly language, a manuscript archive, a pedagogical medium, and an object of European philology. These functions could coexist while carrying unequal prestige.

Decline can be a conclusion only after indicators, geography, discipline, and chronology have been specified. A decrease in one kind of theoretical production may coexist with sophisticated pedagogy or instrument practice. The more useful question is how the common resources of Arabic science were redistributed, restricted, or reformatted under new political economies of knowledge.

This historical result has a contemporary implication, but not the banal one that Arabic must recover a lost essence. Scientific vitality does not follow from lexical commemoration or terminological academies alone. It requires research communities that publish, translate in both directions, teach advanced concepts, expose claims to criticism, and create incentives for knowledge to circulate. A scientific language exists where new work can become answerable to other work.

4.4. Historiographical consequences: beyond preservation, priority, and debt

The model proposed here changes the grammar of historical attribution. "Preservation" is too weak when translators collated witnesses, coined conceptual distinctions, and reconstructed demonstrations. "Invention" is often too strong when it isolates an author from inherited problems and collaborative labor. "Influence" remains vague unless a carrier, route, chronology, and transformation can be identified. The vocabulary of the polycentric commons replaces these all-or-nothing categories with operations whose evidence can be assessed.

It also displaces the rhetoric of civilizational debt. The statement that Europe "owes" science to the Arabs may correct exclusionary memory, but it leaves intact the image of two self-contained civilizations exchanging property. The manuscript record shows something more consequential: scientific traditions were internally multilingual, and their borders were repeatedly

made and unmade by translation. Latin science could be constituted through Arabic materials without becoming Arabic; Arabic science could appropriate Greek materials without remaining Greek. Transformation, not ownership, is the historical relation.

The concept of a commons must nevertheless remain political. Shared resources did not circulate freely or equally. Patrons could concentrate access; confessional and professional affiliations could facilitate or restrict careers; conquest relocated libraries; markets priced manuscripts; and later colonial collecting reclassified Arabic works within European archives. Polycentricity does not mean horizontality. It identifies several centers whose relations were marked by competition, dependence, and asymmetrical visibility.

These asymmetries help explain historiographical disappearance. When Renaissance narratives privileged direct access to Greek, Arabic mediation could be represented as secondary even when it had already shaped curricula and questions. When modern national histories searched for ethnically bounded achievements, multilingual collaboration became inconvenient. When apologetic histories reacted by compiling Muslim priorities, they reproduced the same proprietary logic. A connected history must recover contribution without converting it into possession.

The innovative value of the framework is therefore double. Analytically, translational surplus names the new epistemic consequences created at linguistic interfaces; structurally, the polycentric commons names the distributed institutions that retained and recirculated those consequences. Together, the concepts explain why Arabic mattered without attributing agency to an abstract language and why transmission mattered without reducing Arabic scholarship to an intermediary stage.

Conclusion

Arabic's decisive place in the history of science does not rest on an inventory of inventions or on an intrinsic linguistic property. It rests on the historical construction of a polycentric scientific commons. Across unequal and shifting networks, Arabic made texts, problems, diagrams, procedures, and classifications available to communities separated by geography, confession, and political rule.

The concept of translational surplus identifies the originality of this process. Translation generated more than equivalence: it produced terminology,

commentary, formal reconstruction, curricular order, and new disagreement. Compilation converted dispersed authorities and observations into comparable structures. Manuscript transmission created dynamic graphs in which copies, glosses, translations, and diagrams repeatedly changed the epistemic object. Arabic–Hebrew–Latin movements extended this recursivity rather than completing a one-way transfer.

The article therefore replaces both the passive-repository thesis and civilizational triumphalism with a history of revisability. Knowledge became shareable because it could be contested and recomposed. This is also why the early modern period cannot be reduced to disappearance: the functions, centers, and prestige of the commons changed, while its textual resources continued to move.

The most defensible historical claim is consequently the least essentialist. Arabic did not "contain" science; Arabic-reading communities built arrangements through which inherited knowledge could acquire new consequences. Their legacy lies in that architecture of consequence: a proposition could travel, return altered, and become the premise of another inquiry.

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