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Elias I. Muhanna (Ed.)

THE DIGITAL HUMANITIES AND ISLAMIC & MIDDLE EAST STUDIES

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Uncertainty and the Archive

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al-ʿumru fāniyyun wa-l-khaṭṭu bāqiyyun – Life withers, but writing remains.

The master calligrapher Abū ʿAmr ʿUthmān al-Warrāq signed off with the above maxim as the final word to a Quranic codex that he had finished copying and gilding in his atelier in 466/1073–4 for a high-ranking religious official in the Ghaznavid court, in eastern Khurasan.[1] Given the magisterial artistry displayed in the folios, the Arabic expression *al-khaṭṭ bāqī* suggests not just writing, with the etymology of *khaṭṭ* rooted in the physical act of carving and engraving, but also the specific art of calligraphy. As for ʿUthmān's title, *warrāq*, it was often applied to copyists of Quranic codices and other religious material.[2] However, during this period the profession of *wirāqa* (and with it the title *warrāq*) could also connote a scribe, bookbinder, or bookseller.[3] Such enthusiasm for the written word is appropriate coming from the pen of a skilled *warrāq*—and also fitting for an age of reading and writing that was shaped so thoroughly by the technological transformation seen in the proliferation of paper, and with it the rise of book culture.[4]

Similar sentiments on the enduring power of the written word were recorded nearly a century earlier by another *warrāq*, the famed Imāmī Shiite bookseller of Baghdad, Ibn al-Nadīm (d. 380/990), in the opening chapter of his bio-bibliographic collection, *al-Fihrist* [The Catalogue]. His catalogue on "the books of

1 Mashhad, Astān-i Quds Raḍawī, MS 4316, at the end of *juzʾ* 30, cited in Aḥmad Gulchīn Maʿānī, "Shāhkārhā-yi hunarī-i shigift-i angīzī az qarn-i panjum hijrī wa-sar *gudhasht-i ḥayrat-āwar-i ān*," *Hunar wa-mardum* 157 (1354 Sh./1975), 56. This overlaps with the first half of the first Hippocratic aphorism, generally translated into Arabic as *al-ʿumru qaṣīrun wa-l-ṣināʿatu ṭawīlatun*. See Franz Rosenthal, "'Life is Short, the Art is Long': Arabic Commentaries on the First Hippocratic Aphorism," *Bulletin of the History of Medicine*, 40 no. 1 (1966), 226–45.

2 See Abū Saʿd ʿAbd al-Karīm al-Samʿānī (d. 562/1166), *al-Ansāb,* ed. Akram al-Būshī et al., 12 vols. (Cairo: Maktabat Ibn Taymiyya, 1976–84), 12:236, s.n. *warrāq.*

3 See Shawkat Toorawa, *Ibn Abī Ṭāhir Ṭayfūr and Arabic Writerly Culture: A Ninth-Century Bookman in Baghdad* (London: Routledge, 2005), 56–60.

4 See Jonathan Bloom, *Paper Before Print: The History and Impact of Paper in the Islamic World* (New Haven: Yale University Press, 2001), 47–56.

all the nations of Arabs and foreigners alike available in the Arabic language" opens with a comparative exposition on writing.[5] Here, in a flourish of worldliness that characterizes the encyclopedic range of the entire collection, Ibn al-Nadīm offers a description of all the different writing systems of the world known to him. In addition to Arabic, Syriac, Persian, Hebrew, and Greek, he includes accounts of the various scripts used in China, Sogdia, Sind, and the Sudan, along with the writing systems of the Turks, the Rus, the Franks, and the Armenians.

Ibn al-Nadīm makes clear that much of his material is derived directly from native informants; this is itself a testament to the power of Baghdad, the capital of the Abbasid Empire, to draw scholars, merchants, and travelers from around the world. Our bookseller even supplies samples written out in his own hand, which—given his penchant for accuracy and authenticity—undoubtedly reflected the scripts described.[6] Unfortunately, as the successive copyists ultimately responsible for the transmission of Ibn al-Nadīm's work evidently found this material largely unrecognizable, the samples preserved in the codicological record bear relatively little resemblance to the promised scripts enumerated, at least as they are known to us today.

Despite the hope that the written word can both convey and perdure, this problem of interference, of the signal and the noise in any transmission, ineluctably shapes the textual condition. As a measure of uncertainty, such entropy of information is, for positivist pursuits, undoubtedly a limiting force. These epistemic boundaries are conditions of communication itself, and as such, they have shaped the transition from the analogue technology of the written word to its digital form. To be sure, the materiality of the digital text in its binary expression raises a host of issues that are often quite distinct from those born of the preceding generations of the analogue corpus.[7] Yet, despite the obvious transformations in access, presentation, distribution, and scale, many of the basic problems occasioned by the textual condition carry over directly into the digital age.

For instance, in the modern academic fields of Middle Eastern and Islamic studies, however construed or configured, the acts of presentation, access, and curatorial selection are often implicated in larger divides that separate secular

5 Ibn al-Nadīm, *Kitāb al-Fihrist*, ed. Ayman Fuʾād Sayyid, 4 vols in 2 (London: Al-Furqan Islamic Heritage Foundation, 2009), "*hādhā fihrist kutub jamīʿ al-umam min al-ʿarab wa-l-ʿajam al-mawjūd minhā bi-lughat al-ʿarab*," 1:3.

6 Ibn al-Nadīm, *Fihrist*, 1:14–46.

7 For more on the question of materiality, see in the present volume Dagmar Riedel, "Of Making Many Copies There is No End: The Digitization of Manuscripts and Printed Books in Arabic Script," 73–79.

academic values of knowledge production, whether implicit or explicitly stated, from those oriented around religious, nationalist, or regional commitments. The historical structure of these competing values, which have found expression in numerous analogue forms, has continued to infuse the construction of Islamic knowledge in this age of information technology. Digitization is not a neutral process; rather, it is tied to what are often competing values, motivations, and commitments that shape the form of digital information and guide its consumption and reduplication. In this light, the present chapter seeks to trace the wider epistemic ramifications of the digital condition for the study of Islamic cultural and intellectual history.

The archival act of preservation is, in a basic sense, predicated upon the socially conditioned value invested in the material to be preserved. In certain contexts and under particular conditions, as ʿUthmān the *warrāq* rightly affirms, the materiality of the written word can indeed outstrip the inevitable decay of the human body. In this regard, the fact that ʿUthmān's artistry as a calligrapher is known to us offers a testament to this reality. Similarly, the survival of Ibn al-Nadīm's collection, not to mention the information contained within it, reflects this written power of dissemination.

Along these lines of preservation, Ibn al-Nadīm also includes, in his menagerie of writing systems, a specimen of the script said to have been developed by the Prophet Mani (d. c. 277 CE), the founder of a dualist religious movement that spread through the Roman and Sasanian empires, traveled across Egypt and North Africa, and penetrated Central Asia and China in late antiquity. According to Ibn al-Nadīm, just as Mani drew his religion from Zoroastrianism and Christianity, so too did he derive his script from Persian and Syriac. Here we learn that the followers of Mani wrote their gospels and their books of religious laws using the same script; and since the residents of Transoxiana and Samarqand used it to write their books of religion, it was called the script of religion (*qalam al-dīn*). These remarks fit into a larger discussion on Manichaean religious thought and doctrines that Ibn al-Nadīm developed in greater depth later in his bibliographic survey.[8]

Until the European archeological discoveries of autochthonous Manichaean writings along the Silk Road in the Turfan Basin during the course of the early

8 Ibn al-Nadīm, *Fihrist*, 1:40–41; cf. 2:378–405. On the Manichaean alphabet and its relation to the Aramaic and Mandean scripts, see Prods Oktor Skjærvø, "Aramaic Scripts for Iranian Languages," in *The World's Writing Systems*, ed. Peter Daniels and William Bright (Oxford: Oxford University Press, 1996), 519 (table 48.2), 530–3; also see Desmond Durkin-Meisterernst, "Manichean Script," *Encyclopædia Iranica*, online edition (New York, 1996–), available at www.iranicaonline.org/articles/manichean-script (accessed 27 May 2015).

twentieth century, the information available to modern scholars on Mani 'the Apostle of Light' and his religious movement was derived almost entirely from hostile sources. Although clearly not a neutral account, Ibn al-Nadīm's chapter on Manichaean beliefs and practices and his list of the Manichaean writings that were known to him in Arabic is one of the more exhaustive treatments of the topic. It demonstrates a thorough familiarity born of the influential presence of Manichaeans in the region and their role in the development of eastern gnosticism. This is further attested by another *warrāq* of Baghdad, Abū ʿĪsā Muḥammad b. Hārūn (fl. 250/865), who took a keen interest in and possessed detailed knowledge of Manichaean thought and the beliefs and practices of other dualist religious groups; indeed, Ibn al-Nadīm identifies Abū ʿĪsā as a self-professed Manichaean.[9] It is of note that Ibn al-Nadīm's material only became widely accessible after Gustav Flügel published his German monograph on Mani, which offered an edition, translation, and extensive commentary on Ibn al-Nadīm's chapter on Mani and his followers (1862).[10] Flügel most famously followed this study with an Arabic edition of and extensive commentary on the *Fihrist* (1871–2). Although imperfect (owing, in great measure, to the manuscripts then available to Flügel), the edition—produced in the readily transmitted capital of mechanical reproduction—made the reading list of the Baghdadi bookseller available to an audience the size of which had never been seen before.[11]

With regard to Manichaean religious thought, the irony, of course, is that we now know (through the fragmentary record that has been pieced together from Turfan and beyond) that Mani's followers envisioned their prophet above all

9 Ibn al-Nadīm, *Fihrist*, 2:405, cf. 1:600; David Thomas, *Early Muslim Polemic against Christianity. Abū ʿĪsā al-Warrāq's 'Against the Incarnation'* (Cambridge: Cambridge University Press, 2002), 25–9; cf. Sarah Stroumsa, *Freethinkers of Medieval Islam: Ibn al-Rawāndī, Abū Bakr al-Rāzī and Their Impact on Islamic Thought* (Leiden: Brill, 1999), 40–6. On Manichaean thought in early Islamic history more broadly, see Melhem Chokr, *Zandaqa et zindiqs in islam au second siècle de l'hégire* (Damascus: Institut Français de Damas, 1993), particularly 49–56; also Karim Douglas Crow, "The 'Five Limbs' of the Soul: A Manichaean Motif in Muslim Garb?" in *Reason and Inspiration in Islam: Theology, Philosophy and Mysticism in Muslim Thought. Essays in Honour of Hermann Landolt*, ed. Todd Lawson (London: I.B. Tauris, 2005): 19–33; cf. Cyril Glassé for a provocative (if overstated) reflection on the matter, "How We Know the Exact Year the Archegos Left Baghdad," in *New Light on Manichaeism: Papers from the Sixth International Congress on Manichaeism*, ed. Jason David BeDuhn (Leiden: Brill, 2009), 129–44.

10 Gustav Flügel, *Mani, seine lehre und seine schriften; ein beitrag zur geschichte des Manichäismus* (Leipzig: F.A. Brockhaus, 1862); see also Friedrich Spiegel, *Erânische Alterthumskunde*, 3 vols. (Leipzig: Von Wilhelm Engelmann, 1871–8), 2:195–232; and Konrad Kessler, *Mani. Forschungen über die manichäische Religion* (Berlin: Georg Reimer, 1889).

11 On the codicological record and the lacunae between the surviving manuscripts, see Sayyid's introduction to his edition, Ibn al-Nadīm, *Fihrist*, 1:66–80.

as an avid writer. Indeed, writing was how Manichaeans distinguished themselves from other religions, for their prophet directly wrote down the scriptures revealed to him. A particularly well-known folio fragment found in Turfan and written in Middle Persian preserves a homiletic account that enumerates ten reasons the Manichaean religion surpasses all previous religions. Among these reasons, Mani is said to have argued that "the religions of those of old were in one land and in one language, while my religion is of that kind that will manifest in every land and in all languages, and it will be taught in far-away lands."[12] Furthermore, the revelation (*abhumišn*) Mani received of the two principles (namely of light and darkness), his wisdom and knowledge, and his living scriptures (*nibēgān zīndagān*) all surpass those of previous religions. The folio takes us through the first four arguments for Manichaean primacy, then breaks off midway, at the fifth point, where the fragment ends.

However, unlike most of these textual lacunae, the remaining ten reasons for religious superiority fortuitously survive in a parallel tradition in the Coptic *Kephalaia*, which was discovered in Egypt during the first half of the twentieth century. This account also states that because Mani wrote his scriptures immediately, they were not subjected to the same kind of tampering, distortion, and alteration that befell the sacred writings of other religions, whose founders did not leave any documents behind, written in their own hands.[13] This same critique is stressed in the opening to the *Kephalaia*, which observes that neither Jesus, nor Zoroaster, nor the Buddha wrote their own scriptures, but rather their disciples after them were charged with writing down their teachings.[14] In a similar

12 Turfan Collection, Berlin M5794 I, "*yek, ku dēn ī ahēnagān pad yek šahr ud yek izwān būd; ēg dēn ī man ād ku pad harw šahr ud pad wisp izwān paydāg bawād; ud pad šahrān dūrān kēšīhād*," transcribed and transliterated in Mary Boyce, *A Reader in Manichaean Middle Persian and Parthian* (Leiden: E.J. Brill, 1975), 29–30, text a, l.1. On this folio and its relation to M5761, see Werner Sundermann, *Mitteliranische manichäische Texte kirchengeschichtlichen Inhalts* (*Berliner Turfantexte XI*) (Berlin: Akademie-Verlag, 1981), 131–2, §24.1.

13 *Kephalaia*, ch. 151, 370.16–375.15, translated by Iain Gardner in *Manichaean Texts from the Roman Empire*, ed. Iain Gardner and Samuel Nan-Chiang Lieu (Cambridge: Cambridge University Press, 2004), 265–8, §91; cf. Samuel Nan-Chiang Lieu's translation of the parallel Middle Persian passage, op. cit., 109. On the discoveries from Narmouthis (Madīnat Māḍī), Fayyum, a military colony from the Ptolemean period, see James Robinson, "The Fate of the Manichaean Codices of Medinet Madi 1929–1989," in *Studia Manichaica: II. Internationaler Kongress zum Manichäismus*, ed. Gernot Wießner and Hans-Joachim Klimkeit (Wiesbaden: O. Harrassowitz, 1992): 19–62; and Iain Gardner and Samuel Nan-Chiang Lieu, "From Narmouthis (Medinet Madi) to Kellis (Ismant el-Kharab): Manichaean Documents from Roman Egypt," *Journal of Roman Studies* 86 (1996), 148–54.

14 *Kephalaia*, ch. 1, 7.22–8.7, translated by Iain Gardner in *The Kephalaia of the Teacher: The Edited Coptic Manichaean Texts in Translation with Commentary* (Leiden: E.J. Brill, 1995), 13. Cf.

vein, Manichaean liturgical prayers preserved in Greek argue that Mani's religion of light reaches around the world, as his teachings have been translated into all languages (*πάσαις ἑρμήνευται φωναῖς*).[15]

Flying in the face of its fragmentary form, the surviving material stresses that writing not only ensures preservation for later generations, but also guards against corruption, contamination, and distortion. Furthermore, written translations are a sound means of transmission and dissemination. In a very basic sense, the modern discovery and decipherment of the Manichaean corpus is a testament to the power of the written word suggested in these texts. Over the course of the last century, the discoveries of Manichaean writing in such languages as Middle Persian, New Persian, Parthian, Sogdian, Bactrian, Old Turkish, Tokharian, Chinese, Coptic, and Greek bear witness to the catholicity of Mani's movement and to the durability of the written word. Yet this stands in stark contrast to the fate of Manichaean practice and institutions, which faced annihilation as a result of persecution and their absorption into other religions.[16] Contrary to the aspirations displayed in the disjointed corpus that remains, the technology of the written word was ultimately not sufficient to protect and preserve it as a living tradition. The Manichaean writings, including notably the *Living Gospel*, known in Middle Persian as the *Ewangelyōn zīndag*, survive in varying states of dispersion and fragmentation, largely through serendipity. As with everything that faces the perfidious passage of time, the written body, unless meticulously preserved—one might even say entombed or enshrined—is easily condemned to oblivion.

In this pastiche of the copyist, the cataloguer, and the prophet, I have sought to highlight that, even before moving from an analogue to a digital means of storage and diffusion, the promise of writing and publishing, of transmitting beyond the material limits of human existence, requires, foremost, a living community invested in preservation, retention, and reinscription. Such communal transmission is, in turn, profoundly implicated in values and norms, as it is also intimately contingent on the structures of power that govern access to the

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Abū l-Rayḥān al-Bīrūnī (d. c. 442/1050), *Kitāb āthār al-bāqiya ʿan al-qurūn al-khāliya*, ed. C. Eduard Sachau (Leipzig: F.A. Brockhaus, 1878), 207.

15 Discussed in Fernando Bermejo-Rubio, "'I Worship and Glorify': Manichaean Liturgy and Piety in Kellis' Prayer of the Emanations," in *Practicing Gnosis: Ritual, Magic, Theurgy, and Liturgy in Nag Hammadi, Manichaean and other Ancient Literature. Essays in Honor of Birger A. Pearson*, ed. April De Conick et al. (Leiden: Brill, 2013), 259.

16 For the later continuation and absorption of Manichaean teachings and devotion in China, see Samuel Nan-Chiang Lieu, *Manichaeism in the Later Roman Empire and Medieval China,* 2d rev. ed. (Tübingen: J.C.B. Mohr, 1992), 263–304.

material capital needed for both writing and preserving. To this end, the endurance of the written word is very much a question of what one generation values sufficiently from the previous generation to preserve for the next. Systems of value—in ethical, aesthetic, religious terms, etc.—are, needless to say, subject to the particularities and demands of time and place, conditioned, as it were, by the vicissitudes of human history. As for the curatorial choice of selection, preservation, and transmission, such value systems—however unstated, implicit, or transparent—are ultimately intermediary forces, not neutral transmitters of information; they serve to encode, reinscribe, and amplify themselves in the very process of transmission.[17] This is obviously the case with canonicity in the formation of any given textual corpus of material. But it also proves true in the archival state that amasses and collects, seemingly in encyclopedic totality, from the quotidian bureaucratic records of institutions to the codicological remains of ancient peoples and foreign lands.

2. The Promise of the Digital Archive

Another *warrāq* sought to change everything—at least with regard to Arabic letters and the classical fields of Islamic writing. It all happened well after the rise of the printed book and the wane of manuscripts, after the guilds of copyists and calligraphers had ceased to provide printed material on any mass scale, after lithographs and moveable type, amid the stylized, calligraphic artistry of typesetters, embossers, and bookbinders who, nonetheless, cumulatively continued to invest the Arabic script with a certain numinous materiality.[18] The move from an analogue to a digital means of dissemination meant that the vast expanse of Arabic classical letters—volumes upon volumes—the encyclopedic weight of which would give pause to even the most hardened bibliophiles, could be collapsed into the easily transportable and—most importantly—searchable form of binary information.

17 For this use of mediation versus intermediation (here and below), see Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford: Oxford University Press, 2005), 37–42.

18 There is a growing body of scholarship on the historical rise of print in Muslim book culture. For a general overview, see Geoffrey Roper, "The Printing Press and Change in the Arab World," in *Agent of Change: Print Culture Studies after Elizabeth L. Eisenstein*, ed. Eric Lindquist, Sabrina Alcorn Baron, and Eleanor Shevlin (Boston: University of Massachusetts Press, 2007), 250–67; see also Nile Green, "Journeymen, Middlemen: Travel, Transculture, and Technology in the Origins of Muslim Printing," *International Journal of Middle East Studies*, 41 no. 2 (2009): 203–24.

The digital library hosted under the name al-Warrāq (al-waraq.net) went online in 2000, with the stated aim of promoting Arabic and Islamic heritage globally through the power of information technology (*taknūlūjiyā l-maʿlūmāt*). The name, al-Warrāq, which evoked at once the papermaker, the copyist, and the bookseller, was now telegraphed through the modern medium of Internet communication and transposed from the physical to the virtual page. A subsidiary of al-Qarya al-ilaktrūniyya (The Electronic Village), a company based in the United Arab Emirates, al-Warrāq offered a potpourri of classical Arabic texts organized under broad categories: literature and poetry, Quranic and *ḥadīth* studies, jurisprudence, geography and travelogues, history, Islamic doctrine, mysticism, medicine, dream interpretation, genealogies, biographies, philosophy, and bibliographic studies. Here a digital text of Ibn al-Nadīm's *Fihrist* could be searched alongside the travelogues of Ibn Baṭṭūṭa (d. c. 779/1377) and Ibn Jubayr (d. 614/1217), the poetry of al-Mutanabbī (d. 354/965), the *Maqāmāt* of al-Ḥarīrī (d. 516/1112), the ancient tales of *Kalīla wa-Dimna*, al-Ṭabarī's (d. 310/923) multivolume history, and Ibn Saʿd's (d. 230/845) vast compendium of early religious scholars. It was as though a promethean power had been handed to humanity, or at least to those working in the fields of Arabic letters, who were now granted the ability to instantaneously retrieve detailed information from a vast and disparate corpus that stretched back over a millennium.[19]

Even before the rise of the Internet, the movement from analogue to digital, from physical print to binary encoded letters, already marked a transformation of the book. In the 1990s and early 2000s, several software companies, many based in the Gulf and Iran, began designing, distributing, and selling proprietary computer programs—stored on CDs, DVDs, and external hard drives—of text-searchable books selected from the various fields of classical Islamic learning. Programs such as the software designed by Turāth (heritage; aljamea.net) enabled full-text searches of a broad array of classical Islamic sources and, with increasing success, performed advanced procedures, such as field-restricted, proximity, and phrase searches, as well as Boolean queries.

19 In addition to my personal experience as an early user of al-Warrāq, this information on the website and its stated mission is drawn from: http://www.alwaraq.net/arabic_books_About.htm; http://www.electronicvillage.org; archives of the website captured through the Internet Archive Wayback Machine, http://web.archive.org/web; and a report by the technical administrator for al-Warrāq, Muʿtaṣim Zakkār, "Istiʿmāl taknūlūjīyā l-maʿlūmāt fī istikshāf wa-nashr alturāth al-ʿarabī," presented at *al-Nadwa al-iqlīmiyya ḥawl "Tawẓīf taqniyāt al-maʿlūmāt wa-l-ittiṣālāt fī l-taʿlīm ʿan buʿd (maʿ al-tarkīz ʿalā l-muḥtawā l-ʿarabī ʿalā shabakat al-intarnat)*" July 15–17, 2003, published online: http://www.ituarabic.org/PreviousEvents/2003/E-Education/Doc8-alwaraq.doc.

The disciplines of religious learning were particularly well represented, with software dedicated to classical exegesis, jurisprudence, *ḥadīth*, etc. Programs focusing on belletristic, historical, and lexicographical material were also featured. In addition to designing software, which ran exclusively on Microsoft Windows operating systems, these companies contracted teams of typists to manually key in text from printed editions of books widely available in published form. The advertising invariably promoted the vast quantity of material—millions of pages, thousands of books!—now readily accessible in a compact digital form that could be navigated with the lightning speed of complex text searches.

Generally, references to the actual printed editions were not given. This made citation for scholarly purposes rather difficult, as it involved finding the corresponding material in its printed form. As for the digital texts themselves, it is of note that the modern editions of Arabic and Persian texts exhibit a wide range of variation in terms of accuracy and reliability. Certainly, the rigors of Lachmannian stemmatics can be felt across the modern field of classical Islamic learning, first promoted by Western Orientalists and then adopted by generations of non-European scholars working in classical Arabic and Persian material. Yet, as is well known, many of the modern editions of Islamic sources effectively follow the rather pragmatic practices of classical copyists, who might have had at their disposal only a single manuscript, and who in the course of their transmission may well have introduced a range of errors into the text. Yet, even when drawing on scholarly editions, such software almost universally excised the critical apparatus of marginal notes, and with it the rather important textual history of variants. But such limits—in terms of text selection, redaction, and citation—are admittedly quite minor when compared to the vast array of material that could now be indexed in a way that the technology of printed books could not possibly accommodate.

What made al-Warrāq so powerful was the transposition of these materials onto an online platform, which, rather than relying on particular system specifications, only required an Internet connection. Instead of purchasing physical software to install on a single computer, requiring operating systems and hardware that were subject to the industrial principle of planned obsolescence, users could now turn directly to a single website. After amassing a sizable following, the company that started al-Warrāq tried to monetize the website through a paywall. After all, they had invested significant capital in the digitization of the materials and the production and design of the site. The company, also a digital bookseller, produced and marketed software for Arabic books on CDs. Yet the genie was already out of the bottle, as it were, as many other websites, not motivated so much by the principle of profit as by religion, began to fill the void.

Many of these sites were formed specifically to serve as broad resources for Muslims, such as Nidāʾ al-īmān (The Call of Faith; al-eman.com), which promotes itself as a website for all Muslims (though clearly directed at Sunnis) and hosts a searchable collection of texts from traditional Islamic sources, in the fields of jurisprudence, exegesis, and *ḥadīth*. Similarly, Shabakat mishkāt al-islāmiyya (The Islamic Lamp Network; almeshkat.net), an avowedly Salafī website whose stated goal is to return to the Quran and the sunna according to the understanding of the forefathers of the community (*hadafunā al-ʿawda ilā l-kitāb wa-l-sunna bi-fahm salaf al-umma*), began hosting text files from a range of Sunni religious sources in Arabic that could be downloaded freely. This corpus drew widely from preexisting digitized texts, including al-Warrāq, and built on the power of crowd sourcing, allowing users to contribute material. One of the most extensive sites to emerge is al-Maktaba al-shāmila (The Complete Library; shamela.ws), based in Mecca, Saudi Arabia; it hosts thousands of titles that can be accessed online.

Notably, users can contribute material, download al-Shāmila as a standalone program, and build up a personal library of individual titles hosted on the website, which can also be utilized from mobile devices. All of these sites generally focus on Sunni religious sources, largely in the form of jurisprudence, *ḥadīth*, exegesis, and historical material. A telling contrast can be found in al-Tafsīr (altafsir.com), funded by the Jordanian royal family through the Royal Aal al-Bayt Institute for Islamic Thought. While this website's purview is solely Quranic exegesis, it showcases authorities and texts from an assortment of sectarian, juridical, and ethical frameworks. These commentaries are searchable, mostly in Arabic, though the site has made material available in English translation.

Similarly, the Maktabat Yaʿsūb al-Dīn (Library of the Leader of the Religion, i.e., ʿAlī b. Abī Ṭālib; yasoob.com) hosts a range of largely Arabic religious texts that, while clearly promoting Imāmī Shiite sources, also includes a broad sweep of classical Sunni materials. This site is run under the supervision of Imāmī religious authorities and is aimed at explicitly promoting a Shiite vision of Islamic orthodoxy. Many of these materials can also be found on the Iranian cultural and religious network run by the Muʾassasa-i farhangī wa-iṭṭilāʿ rasānī-i tibyān (The Tebyan Cultural and Informational Institute; tebyan.net), whose website serves as a multimedia platform for the promotion of Islamic and Persian cultural heritage; it is supported under the general auspices of the Sāzmān-i Tablīghāt-i Islāmī (The Organization for Islamic Propagation), a governmental agency of the Islamic Republic of Iran. As part of this emphasis on propagation, large portions of the Tebyan website are available in multiple languages. As for classical material, the site offers a spectrum of literary, historical, and religious sources in Persian and Arabic.

A driving force for the digitization of these particular Arabic and Persian materials has been the Markaz-i taḥqīqāt-i kāmpyūtarī-i ʿulūm-i islāmī (The Computer Research Center of Islamic Sciences; noorsoft.org), an Iranian information technology organization established in 1989 under the aegis of the Supreme Leader Ayatollah Khamenei. An early focus of the center has been text digitization, distributed in the form of the package of Nūr software programs (i.e., light, transliterated *noor*), covering an expansive corpus of Arabic and Persian works. In addition to the major authorities in the fields of Imāmī learning, from gnosis to jurisprudence, it has also included a significant body of materials in the fields of classical Persian literature. Such sweeping breadth is also reflected in their digitization of Arabic and Persian exegetical writing, which, while covering major Shiite sources, also includes a panoply of authorities from various sectarian and juridical professions. While the center continues to focus on software, a good deal of the resources they have developed are available online, represented notably in the Kitāb-khāna-i dījītāl-i nūr (Noor Digital Library; noorlib.ir), which hosts a searchable interface of Arabic and Persian books in a variety of fields. The Pāygāh-i majallāt-i takhaṣṣuṣī-i nūr (Noor Database of Journals, noormags.ir), a searchable portal for modern Persian journals, contains an impressive body of articles by modern Muslim scholars and writers. This website hosts searchable material in Arabic and Persian that spans such fields as literature, language, religion, history, and culture from the late nineteenth century up to the present. As a counterweight to the dominant Sunni presence online, often packaged through the prism of Salafī piety, such materials highlight the theological, juridical, and interpretive heterogeneity of Islamic intellectual history.

The Internet has readily served as a means of articulating and demarking communal identities; it has also empowered both state and non-state actors, from the very large to the rather small. Many sites are tailored to specific groups, as in the case of Anā Zaydī (I am a Zaydī; anazaidi.com), an avowedly Zaydī website run by the Study and Research Center of Imam ʿIzz al-Dīn b. al-Ḥasan, which hosts many Arabic Zaydī religious texts. Likewise, there are an increasing number of religious texts available from the Ibāḍī community, hosted, for instance, on the Istiqāma website (rectitude; istiqama.net), which has benefitted from the collective power of user contributions.

The materials discussed thus far have predominantly been in the form of digital text files. In contrast to the early years of digitization online, when it was often impossible to discern the original print basis for a given digital text, it is now common to find text files keyed to specific editions. Thus, while the search function of the Maktabat Yaʿsūb al-Dīn is not particularly sophisticated or useful, the texts hosted on the website almost always correspond to identified printed materials with page numbers and marginal notes. Many of these materials

were originally digitized by Noor software developers who, with their close ties to seminary education in Iran, prided themselves on the accuracy of their digitized texts, which were generally drawn from published edited sources. Similarly, we find that texts posted on such Sunni sites as al-Mishkāt and al-Maktaba al-shāmila often agree with the page numbers of the printed books from which they were originally copied.

Yet, beyond searchable text files, a new wave of materials has been changing the shape of Islamic textual resources online: the dissemination of printed books scanned in the open standard of the Portable Document Format (PDF). An overwhelming number of the major sources in Arabic and Persian are freely available online as scanned PDFs of published books. Vast collections of scanned material can be downloaded through such file sharing platforms as BitTorrent, 4shared, and Archive.com. The prominence of these resources has been amplified through social media. This has also enabled a large user base, which produces and shares scanned materials. Likewise, platforms specifically designed for the exchange of information have facilitated the movement and circulation of PDF copies, from printed books to manuscripts, through links posted on such sites as the Alūka network (The Message; alukah.net) and the Multaqā ahl al-ḥadīth (The Forum of the People of Hadith; ahlalhdeeth.com). Entire websites are devoted to collecting and hosting scanned copies, from such aggregators as al-Maktaba al-waqfiyya (The Endowment Library; waqfeya.com), which has direct ties with the massive al-Maktaba al-shāmila, to comparatively smaller sites, such as the Jāmiʿ al-kutub al-muṣawwara (The Collector of Scanned Books; kt-b.com) and the Maktabat al-Iskandariyya (Library of Alexandria; bib-alex.com), which has posted links to books that were scanned as part of the digitization project of the Bibliotheca Alexandrina (bibalex.org). Again, many of these sites have a stated Sunni—and often a very explicit Salafī—perspective. However, as with text digitization, by no means have Sunnis cornered the market. A good deal of the Ibāḍī juridical corpus is available as scanned PDFs; similarly, many Zaydī sources are accessible in the same format. Likewise, a wide selection of Imāmī religious material is available in a variety of locations, such as the Maktabat narjis (The Library of the Narcissus; narjes-library.com). In addition, there has been an increasing presence of scanned copies of Persian books on such sites as Kitābnāk (Bookish; ketabnak.com), which enables users to download entire books, in contrast to the Noor Digital Library (referenced above), which allows only a limited number of pages to be downloaded in a given session.

Both the Noor Digital Library and the Noor Database of Journals have made scanned materials available for searches on their respective websites. This service differs from that of other websites, which offer scanned Arabic and Persian

books for download from the Internet. The current technology for consumer-based optical character recognition (OCR) of the Arabic script is still in its infancy and has not been widely integrated into PDF viewers. Optical character recognition, which is widely available for Latin, Greek, Cyrillic, and Hebrew scripts, enables image files of text that has been scanned to be searched much like text files, and with increasing improvements in text recognition software these searches are often quite reliable, even throughout an entire database. The Noor collection, rather than relying on OCR technology, has actually keyed in the text to numerous books and mapped this information onto the corresponding pages of each individual scan, such that searches conducted are made in the separate text files that lie beneath the image files; thus the results retrieve both the scanned pages of the book in question and the underlying text. The main difference between text recognition and this particular search procedure is that optical character recognition allows for an automated digital process, which obviates the need to retype the entire source text. Although it currently has a limited quantity of materials, Google Books hosts an increasingly large number of scans of Arabic and Persian sources, many of which have been uploaded by individual users. As with other alphabets, Google has developed text recognition capability for the Arabic script and can search scans of Arabic and Persian printed material. With the exponential growth in information technology, it is not hard to predict that in the coming years such capability will be widely available at the level of individual users.

Even without the current capacity to search through this vast trove of scanned books, the rapid dissemination of material has radically shifted access to the archives. Extensive bookmarking of scanned files has enabled rapid searches of multivolume works without the physical labor of moving through stacks. Toggling back and forth between text files and scanned editions is one of the most obvious outgrowths of the current digital landscape. This is particularly well suited for the vast encyclopedism that characterizes much in the way of Arabic writing, with its tomes of jurisprudence, historical and encyclopedic literature, lexicography, poetry, philosophy, theology, and Quranic exegesis, not to mention the sprawling *ḥadīth* corpus with its concomitant biographical literature on transmitters, all of which span volumes. Much of this is now widely shared, stored, and searched with incredible speed, collapsing the vast archive of physical books into the reducible digital space of zeros and ones in a computing format that, following the predictions of Moore's Law, has logarithmically sped up processing power and increased storage capacity in ever-smaller configurations of circuits.

The advances in information technology have given a growing circle of readers access to materials that no single research library could physically possess.

The epistemic shifts occasioned by what has rightly been called an information revolution are indeed seismic and by all appearances long-lasting. The promise of the digital archive is, of course, the ability to harness an encyclopedic inclusivity that, in its global scope, is truly universal and that frees the physical capital from its corruptible physical form and from the institutions that historically served as gatekeepers of knowledge and, with it, power.

3. The Threat

In the early and rather heady days of it all, one could not help but feel a certain amount of ambivalence about the ill-gotten gains. Not about the problems of ownership, piracy, or labor, which would all come later, but rather about the actual search capacities that reduced books to configurations of information, to be scanned and quantified in a cycle of input and output that chewed through and spat out voluminous corpora. On list services, before graduate seminars, or at conference proceedings here and there, one could hear the lament for a bygone era. For in many ways, what we were losing was the cult of erudition that had sculpted the ideal of the academic who, over the course of a lifetime, mastered a body of knowledge through the painstaking labor of physically working through and taming this immense corpus. Now, with information so widely available (and thus cheap), it also became apparent that synthesis and analysis were ever more at a premium. Yet, with so much more information and so many new works to be reckoned with and included in the conversation, the very idea of synthesis at times has felt rather forced.

Every technology of writing demands its own mode of reading. The clay bullae with tokens of commercial transitions, the stone reliefs of emperors marking conquest and territory, multilingual cuneiform inscriptions by scribes, and the mystifying hieroglyphics of priests all depended on the economic mastery of tools and materials as well as the capital of literacy to telegraph and to decipher. The move from the clay tablet to the papyrus scroll and then the parchment codex necessitated very different physical means of storing and conveying. Each medium also predicates distinct points of entry. The archeological record reveals that these differing technologies of writing did not immediately replace each other, but rather existed side by side for centuries, just as writing today inhabits different spaces in varied forms, often for very different ends. The genius of the codex lay in its facilitation of movement across the entire body of the text, which could be accessed easily at multiple points and indexed or rubricated with cross-references. It not only occasioned new types of reading practices, but it also allowed for the production of writing in new forms and on distinct topics.

Paper (which required much less in the way of capital), in turn, could accommodate even more information with far less expense. So too, the invention and adoption of the printing press in turn drove down the cost of books and ultimately expanded the market of readers. Not only has the move from an analogue to a digital means of storage and conveyance transcended the physical limitations of the printed page, but it has also opened up new ways of reading. In this ever-expanding horizon of information, the questions that we can ask and the ways that we can reconfigure our corpus give off the sheen of unbounded possibility.

One consequence of the digital revolution of information has been a growing emphasis on quantity and, with it, quantification. With text now liberated from the physical limits of the book, it can be quickly transposed into data sets, mined for patterns and relations, subjected to tests of frequency, occurrence, and proximity—all sped up through the power of automation. What better way to confront the prodigious encyclopedism of Arabic letters, which could otherwise consume the labor of countless lives? Prolixity and volume are truly the hallmarks of this corpus: the *Musnad* collection of *ḥadīth* by the Baghdadi traditionist Aḥmad b. Ḥanbal (d. 241/855), as edited by Shuʿayb al-Arnāʾūṭ and others, consists of over 27,000 *ḥadīth* entries, in 45 volumes, not counting five volumes of indices; the biographical collection on early *ḥadīth* transmitters compiled by Abū l-Ḥajjāj al-Mizzī (d. 742/1341) spans 35 volumes in its modern published form, with over 8,000 biographical entries; the massive compilation of Imāmī sources by the Safavid traditionist Muḥammad Bāqir al-Majlisī (d. 1110/1698), in its printed edition, consists of 110 volumes. In the face of all this, the edition of the Arabic dictionary composed by the Indian lexicographer Murtaḍā Zabīdī (d. 1205/1791) in 20 volumes seems quite modest.

The digitization of this material has certainly opened up epistemic possibilities. With a host of novel analytical tools, from Boolean searching to XML tagging, texts can be read against the grain, in ways never intended or anticipated. Now patterns of text reuse, of copying across the corpus, come into sharp relief, from *ḥadīth* collections with their chains of transmitters to the immense body of historical and belletristic writing long known to have voraciously absorbed pre-existing sources, often without any direct citation. Knowledge networks can be more fully reconstituted in the monumental weight of biographical writings that have preserved such rich prosopographical details on the countless lives of religious authorities. Diachronic analysis of shifts in language and word usage can take on a breadth never seen before. The distribution of texts and titles can shed further light on reading patterns and structures of canonicity. This is not to mention the potential for social history along the lines first developed,

in an analogue form, by Richard Buillet, who sought to track the history of Islamic conversion through onomastic shifts in biographical writings.[20]

Buillet's case is interesting, though, largely because criticism of his prosopographical analysis continues to emphasize the problem of extrapolation. Quantitative data mining has notable limitations, specifically for the corpus at hand. As for social history, the available Arabic and Persian biographical sources focus almost entirely upon a male, urban, religious elite. We must wonder to what extent this rather rarefied group reflects anything other than the routinized maintenance and production of juridical and theological authority. The biographical collections were not designed to function as a census documenting the kind of information on conversion that would be relevant to modern social historians. As much as we may wish to read these writings against the grain of their original design and divide the material into quantitative units for analysis, the primary sources at our disposal do not offer neutral accounts of history; rather, they are involved in a process of shaping reality even as they describe it.[21] This was true before the digitization of our texts, and it remains so now.

As with any form of quantitative statistical analysis, the question at hand is actually that of *data quality*: How reliable is the information at our disposal, and how well suited is it for answering the questions that we pose? Of course the library of Arabic and Persian letters as it emerged in the first five centuries of the Islamic era is anything but homogenous. At the most basic level, however, what unites the public record is the economic and social means necessary to produce and disseminate the written word. While there are notable exceptions in the early expanse of Islamic history, this power of production, as with other pre-modern civilizational complexes, largely excluded women and the unlettered. Furthermore, much of this legacy is united by particular and often competing construc-

20 See Richard Bulliet, "Conversion to Islam and the Emergence of a Muslim Society in Iran," in *Conversion to Islam*, ed. Nehemia Levtzion (New York: Holmes and Meier, 1979), 30–51; idem, *Conversion to Islam in the Medieval Period: An Essay in Quantitative History* (Cambridge, MA: Harvard University Press, 1979). For a digital continuation of this line of analysis, see also John Nawas, "A Profile of the *Mawālī ʿUlamāʾ*," in *Patronate and Patronage in Early and Classical Islam*, ed. Monique Bernards and John Nawas (Leiden: Brill, 2005), 454–80.

21 See Richard Frye, "Comparative Observations on Conversion to Islam in Iran and Central Asia," *Jerusalem Studies in Arabic and Islam* 4 (1984), 82; Jamsheed Choksy, "Zoroastrians in Muslim Iran: Selected Problems of Coexistence and Interaction during the Early Medieval Period," *Iranian Studies* 20 no. 1 (1987), 19; Michael Morony, "The Age of Conversions: A Reassessment," in *Conversion and Continuity: Indigenous Christian Communities in Islamic Lands, Eighth to Eighteenth Centuries*, ed. Michael Gervers and Ramzi Jibran Bikhazi (Toronto: Pontifical Institute of Mediaeval Studies, 1990), 135–50.

tions of religious authority, in theological, juridical, and pietistic terms. This is not to suggest that such stated or unstated ideological frameworks of inclusion and exclusion, which ultimately shape all forms of writing and power, in any way diminish the utility of these materials.

"Ulemalogy" is indeed a fine science, and the digital configuration of our sources today would appear to all but demand it.[22] But the memorialization of religious authority gives us rather narrow insight into the broad array of movements and forces governing social history. This is not to mention the very fragmentary nature of the archive at our disposal. If we were to piece together from the available biographical dictionaries the history of the city of Nishapur in eastern Iran, for instance, during the fourth/tenth and fifth/eleventh centuries from the available biographical dictionaries, the image would be one dominated by traditionalist Shāfiʿī jurists, Ashʿarī theologians, and Sufi saints writing almost entirely in Arabic. This is the picture we would have because the surviving *ṭabaqāt* literature on the region during this period was written almost entirely by Shāfiʿī authorities, who promoted Ashʿarī theology and Sufi piety. While women make an appearance, they would be largely missing, just as the Ḥanafī elite that long dominated the city and the populist Karrāmī movement that stretched throughout Khurasan would be quite diminished. Also overlooked would be the strong currents of Muʿtazila thought, not to mention the various Shiite groups known to have been active in the region. Furthermore, we would have little indication of the immense scope of Persian vernacularization that occurred at this very moment in eastern Iran and Transoxiana. While we can piece some of this together from materials not solely dedicated to memorializing the religious elite, we still know relatively little about the unlettered rural masses or the presence, influence, and status of non-Muslims in and beyond the urban centers of the region.

Digitization does not solve this problem, for it is a legacy of the fragmentary state of the archive. In this regard, it is important to recognize the limits of the sources at our disposal, not only in terms of the questions that can be asked of them, but also with regard to their palpable discontinuities. This incompleteness stands in contrast to the language of the information revolution, which is that of completeness, of unprecedented volume in a sea of ever-expanding points of data. The vast web of interconnected information that makes up the Internet gives off a glow of pulsating encyclopedic comprehensiveness, of a super-

22 For a nuanced critique of 'ulemalogy' for the production of social history, see Roy Mottahedeh, "Review of R.W. Bulliet, *The Patricians of Nishapur*," *Journal of the American Oriental Society* 95 no. 3 (1975), 495.

collective consciousness for all humanity. When confronted with the sheer immensity of it all, it is hard not to feel humbled and entranced. Much of the marketing of the digital libraries of Arabic and Persian letters explicitly promotes this illusion of complete and total universality, in the light (*nūr, tibyān*) that illuminates the past with electronic speed, in a library that encompasses everything (*shāmila*, *jāmiʿ*). As with the traditional publishing industry, it is also a marking of culture (*thaqāfa*, *farhang*) and heritage (*turāth*, *mīrāth*), which, like all normative enunciations of communal identity, is conditioned by curatorial acts of exclusion, of choosing what is worthy to be passed on and what is not.

This illusion of totality is the siren's song that conditions, as it pleases, not to venture far beyond the comfort of the same. Despite the marketing of expansion and boundless information, a good deal of the digital resources at our disposal suffers from this very problem of homophily—birds of a feather flock together. Many of these websites and sharing platforms are designed to reconstitute and enunciate particular forms of normativity. This is not unique to the digitization of information. Indeed, earlier patterns of physical publishing followed similar lines of articulating and demarcating communal boundaries. But the promise of totality telegraphed across the Internet stands in marked contrast to the often-arresting absence of heterogeneity that governs many of these digital materials. Indeed, the all-consuming reach of the encyclopedia can as readily include as it can cover over dissent or difference. What we have now is the fragmentation of resources that in great measure follows modern sectarian divisions and preoccupations.

With regard to the Sunni sources, much of the material posted online is governed by a modern Salafī emphasis on the direct and unmediated return to the Quran and the sunna. One might easily be left with the impression, after engaging with these sites, that the most pivotal figure for all of Islamic history was Ibn Taymiyya (d. 728/1328), with his particular strain of Ḥanbalī reform. Scholars of Salafī traditionalism today suffer an embarrassment of riches; many of the foundational sources of modern Sunni fundamentalism are easily culled from the Internet. The promotion of Arabic is also intimately connected to this phenomenon, as it follows in tandem with the Salafī emphasis on the essential Arabic nature of Islam.[23] This in turn fits into the development of new modes of reading without the intermediaries of religious authorities, in a hermeneutical turn that

23 See Travis Zadeh, "The *Fātiḥa* of Salmān al-Fārisī and the Modern Controversy over Translating the Qurʾān," in *The Meaning of the Word: Lexicology and Tafsir*, ed. Stephen Burge (Oxford: Oxford University Press, 2015), 378, 406–7.

has advanced both the primacy and transparency of Arabic, while textualizing religion as a closed scriptural body of law.[24] The Internet, in many ways, is ideally suited for such personalized modes of promoting the supremacy of the text. Similar observations can be developed with regard to the confluence of Shi'ism, Persian, and modern Iranian nationalism, although the Imāmī resources online are, as to be expected from the very intellectual history of Imāmī Shi'ism, much broader, more inclusive, and heterogeneous.

The conflation of Islam with a body of texts is a reifying process meant not only to affirm orthodoxy, but also to assert particular modes of reading. It also tends to ignore the material and visual cultural productions and social practices historically associated with Islamic devotion. Furthermore, this specific form of textualization often serves to isolate Islamic history as disconnected from the larger civilizational currents that included, notably, Jews, Christians, Zoroastrians, Manichaeans, and Buddhists, to name a few. Perhaps even more arresting, in historical terms, is the way in which the expanse of digitization has noticeably underrepresented what was long the core of Islamic religious authority, namely *taṣawwuf* and its structures of education, power, proselytization, shrine veneration, charitable works, and even militant piety. In the modern period, *taṣawwuf* has often been constituted by both Sunnis and Shiites alike as a separate, heterodox branch of Islam. Such presentations, needless to say, overlook the largely normative status of Sufi piety, as promoted by the religious elite across various regions for centuries.

Other significant portions of Islamic culture and thought are also almost entirely missing from much of this digital archive. The great flourishing of Persian and Arabic learning under the Mughals of the Indian subcontinent is woefully underrepresented, not to mention the textual legacies of other dynasties from the region. This is undoubtedly due in part to the fact that Persian, which for centuries was the official language of Indian Muslim states, has long ceased to be actively cultivated in South Asia. Without a living community invested in digital preservation, many of these materials remain only accessible through archives, which often are not fully catalogued.[25] The case is not as dire with Ottoman Turk-

24 See A. Kevin Reinhart, "Fundamentalism and the Transparency of the Arabic Qur'an," in *Rethinking Islamic Studies, From Orientalism to Cosmopolitanism*, ed. Carl Ernst and Richard Martin (Columbia: University of South Carolina Press, 2010), 98–101.

25 A notable exception is the Digital Library of India (dli.gov), which has scanned and hosts online published books in an array of languages, including Urdu, Persian, and Arabic; the site also includes numerous rare lithographs. The materials available here, however, represent a small fraction of the early modern printed corpus. Similarly, while the National Mission for Manuscripts sponsored by the government of India (http://namami.org) has digitized numerous

ish documents or Persian writing under the Safavids and the Qajars, precisely because Turkish and Persian remain profoundly linked to the modern national identities of Turkey and Iran. Nonetheless, in historical terms, the early modern digital resources pale in comparison to the vast trove of material that focuses on classical Islamic thought as construed largely through the prism of religion and overwhelmingly in Arabic. This stultifying reality serves as a kind of linguistic and historical essentialism that holds that true Islam is rooted in the classical Arabic of the past.

Many of the digital resources under consideration form part, in some fashion, of the modern articulation of religious authority. This is not the neutral mediation of information, nor does it really pretend to be. In very obvious ways, such religious commitments stand in opposition to the field of the digital humanities, which is predicated foremost on the secular constitution of knowledge and information centered on the very coded values of liberal education, independent thought, and freedom of expression. Here religion is largely subsumed into the realm of either history or anthropology and is not promoted in theological, doctrinal, or deontological terms. Needless to say, both frameworks are particular ideological formations governed by preexisting epistemic commitments, which are either largely transparent (and thus unstated and evidently non-existent) or presented as self-evident and thus irrefutable. This situation warrants attention, as the digital corpus of Arabic and Persian letters has been shaped by values and assumptions that overlap with the humanistic enterprise in certain instances, but also in very noticeable ways diverge and stand in contrast to it. Thus the rarefied group of scholars operating within the context of Western academic education easily enters into this digital web of Islamic letters with values, assumptions, commitments, and objectives that often run contrary to the stated goals of the resources themselves. While the same proves true for printed books, the stakes are arguably quite different in terms of scale and magnitude. This is particularly so in light of the imagined completeness that is the currency of the digital archive.

Indian manuscript archives, this material is not available or searchable online and currently can only be obtained with written permission from the relevant regional archives. Also noteworthy for Urdu PDFs and ebooks are: http://besturdubooks.wordpress.com and http://rekhta.org.

4. The Digital Condition

Much of the academic ambivalence directed at the digitalized corpus of Arabic and Persian texts initially focused on the quality and reliability of the resources and the problem of how to cite them. Part of this is shaped by the legacy of textual criticism, which was originally developed at the beginning of the nineteenth century for the critical editions of Greek and Latin classics. The basis of textual criticism is fundamentally taxonomic, predicated on a principle of prior simplicity whereby the proliferation of textual variants, naturally distributed in manuscripts and inherent in the very idiosyncratic nature of manuscript production, all descend from an original common source. A monogenetic origin from a single parent is also generally assumed. Both assumptions prove rather problematic for medieval Arabic and Persian book culture.[26]

This process of textual reconstruction privileges accuracy and authenticity above all, as it attempts to identify the closest codicological witness to the original authorial intention. In contrast, corruptions and contaminations inherent in the universal variation of manuscript culture are exposed and ferreted out as spurious to the authorial original. Based upon a genealogical sequence (*stemma*), a reconstruction of variants is sought. Such a process sets out a hierarchic structure between the various manuscripts (*phyla*, *genera*, etc.), as they proliferated from an invariably lost, authorial archetype. Generally, this method is designed to marginalize or cut away entirely the often rather complicated and messy reception history of a given text in favor of establishing an authentic original that can serve as a foundation for positive historical knowledge.[27]

Many modern printed editions of classical Arabic and Persian texts have followed similar methods; however, the ideal of the critical edition has had mixed results in the region. Yet, even prior to the problem of textual accuracy, there is often a good deal of textual uncertainty, as the piracy of editions is quite common. Books originally printed by one publishing house are often reprinted and repaginated by another with no attribution. With regard to the texts themselves, the authority of the critical apparatus is by no means unknown, but in-

26 See Jan Just Witkam, "Establishing the Stemma: Fact or Fiction?" in *Manuscripts of the Middle East* 3 (1988): 88–101.

27 See David Greetham, "Phylum-Tree-Rhizome," *Huntington Library Quarterly* 58 no. 1 (1995), 99–126; Adam Gacek, *Arabic Manuscripts: A Vademecum for Readers* (Leiden: Brill, 2009), 266–8, s.n. "Textual criticism and editing." These observations are elaborated in greater depth in Travis Zadeh, "Of Mummies, Poets, and Water Nymphs: Tracing the Codicological Limits of Ibn Khurradādhbih's Geography," in *Abbasid Studies IV*, ed. Monique Bernards (Exeter: Short Run Press, 2013), 18.

creasingly the editorial focus, at least for classical Arabic religious material, has been directed toward the production of chains of transmission (*takhrīj*) associated with each appearance of a *ḥadīth*; this is a form of erudition that, needless to say, is much less valuable in a digital field, where such material is easily accessed through the power of search operations.

At times, the choice of which manuscripts to use and collate for a given edition proves to be rather arbitrary. Even with published editions that sport variants in the form of marginal notes, it is often necessary, particularly when working closely on a given text, to check other manuscripts for variant material that has not been included. This is hardly much of a critique, given the vast range of manuscripts that an editor might confront when preparing an edition.[28] Furthermore, the values animating the ideal of the critical edition, while certainly admirable in the positivist recuperation of the past, are by no means universal. In very meaningful ways, the artifact of textual criticism is the product of the secularization of history, specifically the development of skeptical inquiry as a means of assaying authenticity in the face of changing attitudes toward the divine origin of scripture.[29] Despite this, digital forms of presentation, particularly with hyper-textual nodes of interconnection, suggest obvious possibilities for elucidating the kinds of archival problems of radical variance that so many of the classical sources of Arabic and Persian literature exhibit.[30]

Initially, the move from the analogue realm of physical books to the digitization of the corpus magnified many of these problems, particularly with the utter lack of transparency regarding which sources were used in preparing the digital editions and the problem of the reliability and accuracy of the digital texts themselves. The landscape has changed somewhat, with the increasing availability of digitized texts keyed to specific printed materials. Similarly, the move toward scanning and posting entire editions of printed books has obviated this problem

28 For an extreme case, see Abū ʿAlī l-Balʿamī's (d. 363/974) *Tārīkh-nāma*, which has been edited by Muḥammad Rawshan, who, needless to say, does not rely on the roughly 180 manuscripts of the text for his edition, *Tārīkh-nāma-i Ṭabarī*, 5 vols. (Tehran: Surūsh, 1995–9). Missing from his edition is a significant body of material, which may or may not be spurious. On this problem, see Elton Daniel, "Manuscripts and Editions of Balʿamī's *Tarjamah-i Tārīkh-i Ṭabarī*," *Journal of the Royal Asiatic Society of Great Britain and Ireland* 2 (1990): 282–321; Andrew Peacock, *Mediaeval Islamic Historiography and Political Legitimacy, Balʿamī's Tārīkhnāma* (London: Routledge, 2007), 52–4.

29 See Talal Asad, *Formations of the Secular: Christianity, Islam, Modernity* (Stanford, CA: Stanford University Press, 2003), 41–3.

30 See Dino Buzzetti and Jerome McGann, "Critical Editing in a Digital Horizon," in *Electronic Textual Editing*, ed. Lou Burnard, Katherine O'Brien O'Keeffe, and John Unsworth (New York: Modern Language Association, 2006), 67–70.

to some degree; yet with this comes what, by all appearances, is the large-scale piracy of printed materials that in many cases would run afoul of international copyright law. However, here again the values of private capital and commercialization that serve to advance the industrial primacy of content producers stand in opposition to the explicitly religious motivations of propagation that often animate the dissemination of these materials.

With scans of printed books, the problem of citation would appear to be whether or not the editions in question are reliable. Once more, there is a range of quality and selection. The shifting field of citational practice, however, speaks to a deeper set of issues. Foremost is the matter of permanence and diffusion. This problem can be seen in the scholarship of earlier generations. Anyone who tries to track down some of the printed sources cited by Theodor Nöldeke, Ignáz Goldziher, or Joseph Schacht quickly realizes that the editions widely available now are not the same as those cited by earlier generations of scholars. While the printed page gives off a patina of permanence, many of the printed books in our field are often rare or difficult to access. Digitization promises to put an end to the temporal impermanence of the printed world. Yet now, after living through more than twenty years of the digital revolution, we understand that the Internet is a process, not a product, and as such it too is ephemeral. Websites have to be continuously maintained, updated, secured; hyper-textual links must be checked for validity; standards and codes need to be rewritten; it is the plight of the constant gardener, weeding away the inevitable march of entropy. This says nothing of storage and the grids of energy—and thus capital—necessary to maintain it all. While there have emerged scholarly standards for referencing content on the Internet, addresses of webpages (i.e., URLs [uniform resource locators], DOIs [digital object identifiers, etc.]) are notoriously fickle and, in the very architecture of the web, mercurial. Everything exfoliates in a constant state of flux, which entices with the allure of the new, the majestic immensity of innovation and productivity, generally pegged to the cyclical market forces driving information technology and its consumption.

Then there is the practice of citation itself, which today remains the very hallmark of scholarly authority. The textual apparatus of notes and bibliographical references serves many purposes. Ostensibly, these conventions authenticate, inform, and expand, although they also easily divert, malign, and obfuscate.[31] At a comparative level, the diverse practices of textual citation share in common the physical limits of the codex, as well as the textual produc-

31 See Bruce Lincoln, *Theorizing Myth: Narrative, Ideology, and Scholarship* (Chicago: University of Chicago Press, 1999), 207–16, particularly 208–9.

tion of *auctoritas*. The book allows for and even demands specific forms of referencing. Citation has long provided a means for grounding arguments in the power of individual authorities as well as in the authority of particular scriptures. The concordance and the index are outgrowths of these referential practices. The footnote, as a visual form, also descends from the marginal gloss and the peripheral commentary, which in Arabic and Persian manuscript culture are rooted in such diverse practices as scriptural, juridical, theological, and belletristic exegesis. At the edge, the marginal note can easily lure the reader away from the centrality of the text, while also advancing it.

With regard to the field of Islamic studies, the convention of *isnād* citations—of listing the numerous chains of narrators of a particular account, which generally stretch back to a saying or action of the Prophet or Companion—represents one of the more complex citational models, which, while assuring readers of the original oral source, is itself a thoroughly textual practice.[32] It purveys an authority that is both scholarly, in the sense of demonstrating knowledge (*ʿilm*), and religious, as it is rooted in the canonical power of scripture. Yet, regardless of the form, the epistemic value of citation generally advances the primacy of both the original and the verifiable in the ability to trace down and reveal the source.

The Arabic concept of transmission, or *riwāya*, accentuates, in its oral and textual forms, the preeminence of the source. Etymologically, the word relates to drawing, bearing, or conveying water (i.e., *rawā l-māʾ*), as from a well. The metaphor follows that, as with both speaking and writing, water flows out, spreads, irrigates, floods, inundates, quenches, subsumes, purifies, dissolves, hides, and washes over; it can be bottled up and also let loose—this expanse is promised in classical Arabic's titular fascination with the maritime totality.[33] Though compendious, water, once cut from its source, is easily muddied, quickly absorbed, and when left unattended, it evaporates. The *rāwī*—the narrator, the storyteller, the transmitter, the thirst-quencher who draws water—is always a mediator between the source and its transmission, who, while pointing back to the site of the original *logos*, moves forward in a temporal process of conveyance. While such movement is polyvalent, it is also largely unidirectional, not return-

32 See Gregor Schoeler, *The Oral and Written in Early Islam*, ed. James E. Montgomery, trans. Uwe Vagelpohl (London: Routledge, 2006), 28–61.

33 See Ibn Manẓūr, *Lisān al-ʿArab*, 15 vols. (Beirut: Dār al-Ṣādir, s.d.), 14:346, s.v. "r-w-ā," second column; see also Ḥājjī Khalīfa, *Kashf al-ẓunūn ʿan asāmī al-kutub wa-l-funūn*, ed. Muḥammad Sharaf al-Dīn Yāltaqāyā and Rifʿat Bīlga al-Kilīsī, 2 vols. (Istanbul: Maṭābiʿ Wikālat al-Maʿārif al-Jalīla, 1941), 1:220, 223–7, s.v. *biḥār* and *baḥr*, see also variants *majmaʿ al-baḥrayn*, etc., 2:1599–1602.

ing to the source, but rather moving away from it. This is to say nothing of the intermediating forces in the transmission of meaning (*riwāyat al-maʿnā*), which invariably undermine the immutability of the word (*riwāyat al-lafẓ*). Citations today can often function in rather similar terms.

The professed values of modern scholarship predicate the accessibility of information in both its dispersal and its recovery. As a value system, the citation advances transparency, attribution, and ownership. However, it usually remains silent about process. Indeed, our references place relatively little emphasis on the means or methods of acquisition. So while we may lay bare the location from which an idea or reference was obtained, citations do not require any disclosure as to how or by what means. This point deserves mention, as there has been relatively little academic discussion or acknowledgment of the way the digital corpus of Arabic and Persian sources shapes the kinds of queries that we pose, the methods of analysis that we develop, or the means by which we may now retrieve information. Indeed, a scan through recent academic publications in the field can easily leave the impression that our digital corpus does not exist at all, or if it does, it is of relatively little consequence. The reluctance to directly cite or engage these particular resources, widely available online, is certainly understandable. While published in the modern sense of the word, many of these materials are ephemeral, uncritical, or lack any explicit provenance and, as such, do not carry the same authority as the printed page. Furthermore, they often serve as tools, like indexes and concordances, to access the printed source, not ends in and of themselves.

This is by no means a new phenomenon. Generally speaking, the towering European Orientalists of the nineteenth century have left us very little record of the native translators, interpreters, and educators who opened up for them the vast trove of oriental letters. By preferring the authority of immediacy to the filters of mediation, history, as the direct witness of the past, generally effaces the go-between, the translator, and the local informant. And then there is the issue of the actual economic conditions necessary for authorship. It may seem trivial, but ignoring the processes and the capital by which we acquire knowledge effaces the complex means by which knowledge is produced. In our case, it posits information as largely a passive and transparent body that can be accessed and entered at will, to be mined, quantified, and reconfigured. However, digitization has not just transposed our texts into binary code; it has also shaped who we are as readers, how we think, the questions we pose, the concerns we have, our conception of the archive, and our very idea of the past.

Ignoring all this is certainly expedient. Our archive is messy and contingent, the product and labor of others, often with radically different values. Furthermore, however remunerated, access to this material is still the result of asymmet-

rical structures of power.[34] Contrast this to the digital resources housed at the libraries of elite universities and colleges, with revenue streams that are protected behind subscriptions and paywalls. Our citations certainly are not designed to account for such inequities. Footnotes assure expansion, illumination, and the possibility of retrieval, yet they are also wedded to replicating an established transmission and construction of knowledge. The digitization of information invites radically distinct forms of referencing, mapping, and recalling sources and materials. Yet, for our purposes, such a transformation in standards and modes of authority must first acknowledge the very digital condition of our texts.

Any knowledge transformation, whether in interpreting, distributing, or producing, occasions both loss and gain, as new techniques and technologies displace old ones. To use a mercantile metaphor, the adaptation of alternative modes of production, for both intellectual and material capital, results in both surplus and deficit. The idealized discourse of digitization, in the boundless reconfigurations of data, emphasizes above all progress, advancement, productivity, and liberation; it frees information from the physical constraints of the material world. Loss, if discussed at all, is usually couched in terms of outdated and retrograde practices that have historically hindered us. There are passive forms of loss, as the mere byproduct of any transformative process, as well as more active means of forgetting that are cultivated and conditioned. The production of memory, of what is preserved and commemorated communally, is also a curatorial process of leaving out, of ignoring, and even of destroying.[35] As opposed to abundance, gain, and presence—the very features of memory—lack, loss, and absence are all in the business of forgetting, of effacing the past and, with it, knowledge.

At the most basic level, uncertainty is occasioned by a lack of information; that ours is a state of uncertainty is undoubtedly an irony in this information age. Yet there are many sources of uncertainty facing the dispersed, decentralized, and fragmentary archives of digital information. First is the problem of inclusion. We may wonder, "If it is not online, does it really exist?" The question today may sound shrill, hyperbolic, or even disproportionate. Surely, in terms of ontology, much of our lives are lived in spaces beyond the Internet. But this is not so much the stuff of being, but that of knowing. When digitized, the searing abundance of information so quickly eclipses its analogue ancestor, the

34 For further discussion of this problem of access, see Riedel, "Of Making Many Copies There is No End."

35 See Aleida Assmann, "Canon and Archive," in *Cultural Memory Studies: An International and Interdisciplinary Handbook*, ed. Astrid Erll and Ansgar Nünning (Berlin: Walter de Gruyter, 2008), 98–9.

physical written word, that the problems of both displacement and inclusion, in epistemic terms, are certainly quite real. The Internet not only gives off an impression of immediacy, but also bears the mark of completeness. As we rely increasingly on digital means of accessing the archive, the archive that is not digitized risks losing both prominence and presence. Despite this professed ethos of encyclopedic inclusion, there is good reason to remain, in some basic sense, unsettled about the totality of the archive.

Furthermore, despite the vast quantity, there is still the issue of quality—yet another source of uncertainty. Can we rely on the information? Can we trust it? Can it be authenticated? How accurately does it render the analogue source? This is as much a matter of transmission as it is a question of origin. As with any structure of transmission or communication, there are values, assumptions, and motivations invested in the process of digitization. Such commitments, in turn, run directly into the problem of transparency (or the lack thereof), which is often born out of the decentralizing forces of network distribution; just as there are many actors conveying and relying on the same material, so there are many motivations, both stated and unstated (and often conflicting), that animate its distribution.

The process-oriented structures of dispersion, replication, and transmission that underwrite the communal bonds of the Internet would appear to transcend the power structures of center and margin. Nonetheless, such decentralized networks do not portend egalitarian or nonhierarchical economies of exchange. Traveling along the ligaments binding together these disparate points of connectivity, information is easily reproduced, pirated, stored, shared, sold, or repackaged. Here, the question of both the source and its owner are quickly obscured, and this in turn implicates the citational practices of modern scholarship and may occasion even more doubt or suspicion.

At times, such uncertainties may feel intractable. But as impasses, they are also possibilities, as they are the very generative grounds for the further cultivation of knowledge. Indeed, as with any act of communication, the points of rupture and discontinuity that amplify the noise over the signal are precisely the moments where the efficacy of the system and the transparency of the set of values and assumptions undergirding it are the most vulnerable. Such fissures and incongruities are the spaces that most need to be mapped out, for ignoring them means the ideological bases and structural biases shaping the archive remain unexamined.

5. The Production of Territory

As for the problem of mapping, the geographical corpus of letters, at first glance, it would appear to be a particularly rich resource for surveying this digital territory. This is true primarily for two reasons: 1) the body of writing is relatively compact compared to other fields; 2) much of it is freely available online. This is the case for many of the classical Arabic sources; the Persian and then subsequent Turkish and Urdu ventures into the field, which are quite significant in their own right, are far less represented. In a very basic sense, this situation is a product of the focus on the early classical Arabic corpus by the Orientalists of the nineteenth and early twentieth centuries (in general) over later developments, particularly in the diverse fields of science, philosophy, and theology.

A good number of the Arabic geographical texts available to Western scholars were edited before the end of the nineteenth century. Among some of the major works first published according to modern standards of textual criticism were the compendium of Abū l-Fidāʾ (d. 732/1331) and the geographical dictionary of Yāqūt al-Rūmī (d. 626/1229). These editions emphasized the utility of geographical writing for the broader historical understanding of Islamic civilization. During this period, the most important figure in the promotion of classical Arabic geographical and historical texts was the towering Dutch Orientalist Michael Jan de Goeje (d. 1909), whose influence on the field is still felt today. Following the model for editing manuscripts of Greek and Latin classics, de Goeje published with E.J. Brill in Leiden the *Bibliotheca Geographorum Arabicorum* (1870–94), a multivolume set that consisted of critical editions of geographical texts along with notes and indices. The focus of the compendium spanned the administrative to the belletristic and covered Abbasid imperial productions as well as works produced for regional dynasts and other learned patrons. The collection opened up a colorful spectrum of early material and consisted of writings by Ibn Khurdādhbih (fl. 270/884), al-Yaʿqūbī (fl. 278/891), Ibn al-Faqīh (fl. 289/902), Ibn al-Rusta (fl. 300/912), Qudāma b. Jaʿfar (d. 337/948), Abū Isḥāq al-Iṣṭakhrī (fl. 340/951), Abū l-Ḥasan al-Masʿūdī (d. 345/956), and Abū ʿAbdallāh al-Maqdisī (fl. 375/985).

More than half of these works have been re-edited, often following further codicological discoveries. De Goeje issued a second edition of Maqdisī's geography, drawing on new readings from additional codicological material (1906); Johannes Hendrik Kramers used further manuscripts for his edition of Ibn Ḥawqal's geography in two volumes, which notably improved the *editio princeps* (1938–40); Iṣṭakhrī's collection was re-edited by Muḥammad Jābir ʿAbd al-ʿĀl al-Ḥīnī (1961); Muḥammad Ḥusayn al-Zubaydī edited the entire unicum of Qudā-

ma b. Jaʿfar's administrative manual, of which the geographical portions were a mere selection (1981); similarly, the discovery of a new manuscript of Ibn al-Faqīh's geography allowed Yūsuf al-Hādī to expand our knowledge of the work significantly (1996). This pattern is also reflected in Ibn Khurdādhbih's travel book, *al-Masālik wa-l-mamālik* [Routes and Realms], for de Goeje, who had access to a new manuscript, entirely supplanted the original edition of the geography by Charles Barbier de Meynard (1865). This short sketch of publication history highlights the fact that editions of these texts have remained, in some basic sense, a work in progress.

Today, the entirety of the *Bibliotheca Geographorum Arabicorum* is available for download in the form of scanned PDFs on archive.org and on multiple other sites; most are also accessible and can be searched by optical character recognition on Google Books, though its search capacity for the Arabic script still leaves much to be desired. Despite this digital diffusion, or perhaps in the face of it, Brill has recently reprinted the entire series in the analogue form of published books (2013–4). Yet even before digital scanning, de Goeje's library had long circulated in editions of photo-offsets issued by the publishing house Dār al-Ṣādir in Beirut. These high-quality reprints maintained the exact publication information, typesetting, and pagination of the original editions. In the case of Ibn Khurdādhbih's *Masālik*, however, the Beirut edition omits the rather informative French translation of the work that accompanies de Goeje's volume. Unauthorized reprints are not uncommon in the book publishing industry of the region, which historically has not always followed the strictures of international copyright law. For instance, I have a printed copy of *Nuzhat al-mushtāq fī ikhtirāq al-āfāq* [Pleasant Journeys into Faraway Lands] by the great geographer Abū ʿAbdallāh al-Idrīsī (d. 560/1165), originally published by the Istituto Universitario Orientale di Napoli in conjunction with E.J. Brill in a series of fascicules edited by a team of scholars under the direction of Enrico Cerulli (1970–84). My copy, however, makes no mention of this, but rather states that the geography, in two volumes, was published in Cairo by the Maktabat al-Thaqāfa al-Dīniyya (1994). Nonetheless, the text, pagination, notes in the critical apparatus, and the copyright restriction (in English) at the end of both volumes of the Cairo edition all match the European original. In contrast, the text of Kramer's Ibn Ḥawqal, originally printed by E.J. Brill, was reissued by a Beirut publishing house, Dār Maktabat al-Ḥayāt (1992), without any reference to the original; it is now shorn of its critical apparatus of textual variants and entirely repaginated. The only direct evidence that this is a copy of Kramer's text is the inclusion of his meticulously designed maps. Needless to say, both of these pirated works, which lay equal claim to their respective publishing rights, are now freely available for download as scanned documents from multiple websites.

All of these early Arabic geographical texts, including many more, have been digitized as searchable text files. They are available from several of the main online aggregators, including most notably al-Maktaba al-shāmila, through software that can be installed on computers and mobile devices. This website, which houses, as its name suggests, a vast trove of digitized books, follows a growing trend in Arabic and Persian e-books, as it keys the pagination of the text to that of the printed source (i.e., *tarqīm al-kitāb muwāfiq li-l-maṭbūʿ*). In such cases, al-Shāmila offers publication information for the respective editions used as the basis for typing out the e-books and supplies brief biographical notices on the authors. They also note the date when the file was first uploaded to the website, the original editor (if available), and they specify whether or not the text in question corresponds to a printed edition. This move toward greater transparency fits into a larger shift aimed at replicating the physical state of the editions from which the text files are copied. This would appear to be a step toward qualitatively improving the reliability of the texts and thus enhancing their value as reference tools, for the accuracy of the material can be compared easily to the printed page. It has become easier to check the online text against printed originals, as many of the print editions used, in and beyond the narrow field of Arabic descriptive geography, are now widely available online in the form of scanned copies.

However, on closer inspection, there is a good deal of heterogeneity. An example is al-Maqdisī's *Aḥsan al-taqāsīm fī maʿrifat al-aqālīm* [The Best Divisions on Knowledge of the Climes], posted on al-Shāmila. In addition to the name of the author and the title, the bibliographical information notes that the text was uploaded in 2010 and gives a list of how many times it has been viewed. The page lists the publishers in the following order: E.J. Brill, Leiden; Dār al-Ṣādir, Beirut; and Maktabat Madbūlī, Cairo. The only date given is for the Cairo edition (1411/1991), which may well be a copy of a copy. The entry also observes that all of these editions correspond to the same pagination, which is the basis for the digitized text. No mention is made here of the editor, de Goeje, or the fact that the text is based upon the second updated edition of the work published by E.J. Brill in 1906 and not the first edition issued in 1877, the third volume of the *Bibliotheca Geographorum Arabicorum*. As for the text, it follows the exact pagination of the original edition and includes de Goeje's detailed critical apparatus in the form of footnotes, where all the work of recording the significant codicological variants appears. While de Goeje's notes in Latin have been jumbled in the course of laying out the text, the record of divergence is quite clear and follows the printed page of the Leiden edition. This is of note, as Maqdisī's geog-

raphy has survived in two distinct recensions that exhibit significant variations.[36] Any detailed work with the geography has to reckon in some fashion with these distinct recensions.

But al-Shāmila is not the only site to host this particular text file; indeed, the same file can be found on the Iranian-based Kitāb-khāna-i dījītāl-i nūr (Noor). Interestingly, the text files from both sites appear to be identical, with the exception that the Noor text has done a much better job of rendering the Latin in the footnotes. It is uncertain who produced the original text, which for all intents and purposes is the same, a matter that complicates the question of attribution and citation. But as these are copies of copies of copies, the question of origin and source is quickly obscured.

Nonetheless, the Noor site encourages citation with two links to bibliographic information files, keyed to the formats for the software of BibTex and Endnote, respectively, which follow standard bibliographic conventions. Here the name of the publisher appears as Dār al-Ṣādir, but there is no reference to the fact that the Beirut version is a copy of de Goeje's second edition published in Leiden. Included in the bibliographical information is what would appear to be a stable URL, but as al-Shāmila also offers an address for citing the online version, it remains unclear which text should be referenced.[37] However, in addition to a cleaner rendering of the critical apparatus, the obvious advantage of the Noor interface is that, in this particular case, it allows readers to switch seamlessly between the text file, noted as the book (*kitāb*), and the copy of the printed edition, referred to as the image (*taṣwīr*); this, in turn, enables easy verification that the information on a given page from the text file corresponds exactly to the printed book. The extent to which this feature will continue to be meaningful remains to be seen in the face of the growing power of text recognition software. For instance, de Goeje's second edition of Maqdisī's geography is also available on Google Books, which allows users to search through the Arabic text, though at this point with rather limited capability.[38] Both Google Books and the Noor Library have overlaid digital watermarks on every page of their scanned copies, asserting digital ownership of the material.[39] For Google's purposes, the work falls under the category of the public domain and thus can be freely download-

36 See *Bibliotheca Geographorum Arabicorum*, ed. Michael Jan de Goeje, 8 vols. (Leiden: E.J. Brill, 1870–94), 4:6–8.

37 See http://www.noorlib.ir/View/fa/Book/BookView/Image/4351; http://www.shamela.ws/index.php/book/23696.

38 See http://books.google.com/books?id=uQ8YAAAAYAAJ.

39 All Noor Library scans bear the watermark of the Computer Research Center of Islamic Sciences; Google similarly watermarks the books it uploads.

ed; in contrast, Noor only allows sections of the text to be downloaded in a given time interval, although the edition is readily accessible in the form of scans made by other institutions.[40]

Contrast this situation of relative transparency with the text file of the geography available for download on al-Miskhāt; according to the website, this file was uploaded in the spring of 2004. This version gives no indication of the publication history, makes no attempt to collate the work to a printed edition, and does not even have page numbers. The detailed and very important codicological record is missing, as the footnotes have been entirely ignored in the process of digitization. Perhaps the only redeeming feature of the text is that it can be downloaded directly, in a fairly universal word processing DOC file format.

At first glance, this may not appear particularly noteworthy. Yet both the Shāmila and Noor sites, which grew independently from stand-alone software, have embedded each page of the text with HTML markup and JavaScript coding typical of the server-side scripting of current web-based applications. While these two designs most clearly replicate the form of the book, they also force readers to work through individual pages at a time, as the websites retrieve information from their respective servers. This may not appear to be a constraining factor, especially in light of the profound gains that can be obtained through the text search functions. Yet such formats restrict, to a noticeable degree, the ability of individual readers to mark up the text or tag data (e. g., for prosopographical, historical, or geographical information) using the standards developed, for instance, by the Text Encoding Initiative (tei-c.org), among others.

Instead of freeing information and readily enabling its reconfiguration, such server-client transmissions, filtered as they are through the medium of websites, channel readers into preexisting paradigms that are designed for and capable of only certain kinds of interaction. There is a tension here between proprietary frameworks that restrict, limit, and funnel and the free circulation of information that can be easily reconfigured, rearranged, adapted, transformed, and telegraphed. That said, much of the material can be readily obtained through basic scripting applications that enable users to download content off the servers

40 In addition to the Digital Library of India (http://dli.gov.in), see also the Digital Assets Repository (http://dar.biblaex.org), developed with the Bibliotheca Alexandrina, which hosts scans of both the Dār al-Ṣādir and the Maktabat Madbūlī copies of the Leiden edition; the Dār al-Ṣādir copy is categorized as in the public domain, and thus fully accessible; in contrast, the Maktabat Madbūlī edition is marked as under copyright and thus only available in a restricted view, which enables five percent of the book to be accessed online. However, many of the books scanned by the Bibliotheca Alexandrina have been hacked, as it were, and this copy is also freely available on other websites.

of entire websites. Rather, we must emphasize that, just as the physical book privileges and conditions certain modes of ownership and reading, so too digital publishing platforms advance particular sets of expectations that both expand and limit the means by which readers can enter into and manipulate the material at hand.

As for this digital archive of geographical literature, it is by no means uniform. While we have access to a searchable text of Maqdisī's geography that corresponds page for page and note for note to the printed edition, the same is certainly not true for the entire corpus. The case of Ibn Khurdādbhih's geography here is emblematic. The text version on al-Shāmila corresponds to the edition published by Dār al-Ṣādir in Beirut, which is, in turn, based on the Leiden edition published in 1889, which is the sixth volume in de Goeje's series of Arabic geographical literature. The same information is also supplied by the Noor Library, which likewise hosts a text and a scanned copy of the published work. The text is the same on both sites. While it corresponds page for page with the printed edition it has been completely stripped of the detailed notes that accompanied the original. For de Goeje's edition of Ibn Khurdādhbih's geography, this is deeply problematic; the only way to begin to grasp the significant variants between the surviving codicological witnesses is to engage thoroughly and painstakingly with the critical apparatus of the Latin footnotes.[41] It is also of note that de Goeje includes a supplement to his edition: the geographical selection from Qudāma b. Jaʿfar's secretarial manual. The bibliographical information on the websites makes no reference to this, and the reader who merely searches through the text of the file without due diligence could easily assume Qudāma's work is a continuation of Ibn Khurdādhbih's geography. Here, rather than mediation, we have intermediation, distortion, and erasure in the process of translation. While this can be checked against the printed text, such slippage must be constantly borne in mind in an archive increasingly filled with greater uncertainty.

In this age of digital reproduction, such caveats may help to navigate this ever-evolving territory populated by simulacra, illusions, and forgeries. What is missing here is a map to guide us through it all, one that indicates not so much how to get there, but what to expect along the way. For the geographical corpus, this is doubly so, as the colorful legacy of cartography (which is so wedded to the enterprise of descriptive geography) is largely absent from these digital sources. In part, this is a legacy of the editing process of geographical literature, a process that has overwhelmingly privileged the textual over the detailed, if bewildering, cartographic supplements. The vaulting advance of de Goeje's li-

41 For more on this particular text and its reception history, see Zadeh, "Of Mummies."

brary of Arabic geography left behind, in its sheer ambition, almost the entirety of this cartographic enterprise.[42] By the time Cerulli turned to Idrīsī's horizon-traversing adventures, Islamic cartography had been cut loose from its moorings in descriptive geography. This is a profound irony, for Idrīsī's descriptions of far-off regions are dependent on his project to plot the world in its entirety—clime by clime, region by region, sea by sea—through maps that are ingeniously connected to the space of the physical book.[43]

The digital horizon would appear to be well suited for new configurations of text and image and the interplay between the two. Despite the potential of digital media, relatively little has been done in the way of reintegrating maps or images back into their original texts. An early exception in the field of the digital humanities is the multimedia computer program of Idrīsī's cartographic enterprise (published in the year 2000), which was digitized on the basis of a beautifully executed manuscript housed in the Bibliothèque nationale de France (Ms arabe 2221).[44] The interactive program, developed under the direction of Annie Vernay-Nouri, allowed users to navigate Idrīsī's *mappa mundi*, as pieced together from his visual projections of the various regions of the world; the maps themselves were interactive—they could be magnified or minimized, rotated, searched, and scrolled through. Along the way, the toponymic layers of place names and geographic features were linked to descriptions drawn from Idrīsī's text in Arabic and in French translation. This sensory experience was heightened by Andalusian music that could be played in the background. The program sought to transport its users through the power of the multimedia presentation back to the past of medieval learning and sophistication. Yet today the CD is largely obsolete, as it was designed for computer operating systems that have been quickly outpaced in technology's steady parade of the faster, newer, and

42 Notable exceptions are Kramer's edition of Ibn Ḥawqal, *Kitāb Ṣūrat al-arḍ* (Leiden: E.J. Brill, 1938–9) and Muḥammad Jābir ʿAbd al-ʿĀl al-Ḥīnī's edition of Abū Isḥāq al-Iṣṭakhrī, *al-Masālik wa-l-mamālik* (Cairo: Dār al-Qalam, 1961), which include editions of the maps integral to both works.

43 This work of separating the cartographic tradition as a discrete field, for Idrīsī and others, had already been undertaken by Konrad Miller, *Mappae Arabicae: arabische Welt- und Länderkarten des 9.–13. Jahrhunderts in arabischer Urschrift*, 6 vols. (Stuttgart: Selbstverlag des Herausgebers, 1926–31).

44 *La géographie d'Idrisi: un atlas du monde au XIIe siècle*, under the supervision of Annie Vernay-Nouri, CD-ROM (Paris: Bibliothèque nationale de France, Montparnasse multimédia, 2000). Minimum system requirements: 8xCD-ROM drive (i.e., 1.2 Megabytes/sec), Macintosh PowerPC (OS 7.5.3 or higher), 120 MHz processor, 27 megabytes of Random-access memory (RAM), 800 x 600 monitor with millions of colors; or Personal Computer, Pentium 166 MHz processor (Windows 95 or higher), 32MB of RAM, 800 x 600 monitor with millions of colors.

better. The website of the Bibliothèque nationale hosts a much diminished version of the program, largely shorn of the functionality of the original software. This project offers an object lesson in obsolescence and the difficulties of long-term storage and presentation inherent in the digital medium.[45]

A more recent example of using the interactive potential to engage with text and images in the field of Islamic mapmaking is Emilie Savage-Smith and Yossef Rapoport's online edition and translation of the *Kitāb Gharāʾib al-funūn wa-mulaḥ al-ʿuyūn* [The Book of Curiosities of the Sciences and Marvels for the Eyes], published in 2007. The heart of the website is a manuscript that preserves an anonymous copy of a Fatimid cosmography composed around 410/1020, with sections devoted to astronomy, astrology, and geography.[46] The manuscript on which the website is based was acquired in 2002 by the Bodleian Library of Oxford University (MS Arab. c. 90) and consists of several diagrams, maps, and charts.[47] Visitors to the site can make their way through the text of the work and the accompanying illustrations with high-quality reproductions of the manuscript that are tagged, element by element, line by line, to the Arabic text edition and to an English translation and notes. The scholarly edition and translation are accessed through 'hover boxes'—a graphical control script that activates pop-up windows when users scroll over specific areas of the manuscript pages that have been tagged. In addition to an introduction to the project, the site includes an Arabic-English glossary with further onomastic and toponymic notes, bibliographic references, guidelines for teachers wishing to use the website for pedagogical purposes, and a search function. Savage-Smith and Rapoport followed the website with a physical book (Brill, 2014), which presents an updated edition and translation that draws on further manuscripts of the text. Their work reflects a broader trend of offering some form of online presentation that is coupled with the traditional format of a printed book.

With the growing emphasis on digital publishing, we should expect to see more of such presentations of manuscript culture in the future, in and beyond maps and codices. These endeavors, which are collaborative by nature, require

45 See the website that was originally developed for the exhibition at the Bibliothèque nationale de France, entitled: *al-Idrîsî, la Méditerranée au XII^e siècle* (13 October 2001 through 16 January 2002), http://classes.bnf.fr/idrisi.

46 *An Eleventh-Century Egyptian Guide to the Universe: The Book of Curiosities*, ed. Emilie Savage-Smith and Yossef Rapoport (Leiden: Brill, 2014), 32–3.

47 *The Book of Curiosities: A Critical Edition*, ed. Emilie Savage-Smith and Yossef Rapoport, online publication, http://www.bodley.ox.ac.uk/bookofcuriosities (March 2007). See also Jeremy John and Emilie Savage-Smith, "*The Book of Curiosities*: A Newly Discovered Series of Islamic Maps," *Imago Mundi* 55 no. 1 (2003): 7–24.

a good deal of institutional support, funding, and technological capacity. Both examples cited above are proprietary and closed; they allow for certain kinds of interaction and engagement. They are similar in the sense that, while both are hosted on distinct platforms, they have been designed as final products and thus risk varying degrees of ossification. This is not so much a critique as an observation about the limits inherent in the digital medium itself. Yet in very creative and engaging ways, such projects demonstrate the power of digital presentation for opening up and integrating text and image in new ways of imagining and returning to the constraints of the physical book.

These examples, however, are largely the exception that proves the rule. Generally, the resources that Muslim institutions have invested in the digitization of Islamic learning have overwhelmingly focused on textualization. In addition to cartography, this has also largely meant the effacement of the great traditions of illumination and figural arts, which are highly developed in Arabic, Persian, and Turkish book cultures. Such textual emphasis extends beyond just the legacy of Orientalist philology, with its own fetish for the text; rather, it forms part of a wider trend in Islamic reform concerning the nature and history of religious authority. In this regard, we must continue to recognize the very distinct sets of values animating the digital presentation of Islamic material produced in the frameworks of secular Western academic institutions versus those funded by governmental and religious organizations operating in the modern spheres of Islamic piety.

6. Monolingualism and the Self

Given the weight placed on explicitly religious sources, the digitization of the geographical corpus is noteworthy in its own right, particularly because this corpus developed, in great measure, out of the larger absorption of classical Greek and pre-Islamic Persian models of learning and science. In part, this presence in the digital field results from the fact that geography has been so thoroughly sacralized and explicitly transformed into an 'Islamic' science. Yet, in light of the wide sectarian propensities of the geographers, their inclusion in the digital corpus perhaps reflects more than anything their utility as pragmatic sources of information for classical Islamic history writ large.

Contrast this state of abundance with the almost complete absence of digital material from the massive Greco-Arabic translation movement, sponsored largely by the early Abbasid elite. Largely missing from this digital expanse in Arabic letters is the record of translations that span the entire range of classical learning and include works on agriculture, alchemy, algebra, astrology, astronomy, bot-

any, geometry, literary theory, fables and romances, magic, mathematics, medicine, pharmacology, meteorology, military manuals, mineralogy, music, optics, philosophy, veterinary science, and zoology.[48] Many of these titles, which were often translated via Syriac intermediaries, can be found quickly in the searchable versions of Ibn al-Nadīm's *Fihrist*, which in its catholicity reaches far beyond the narrowly defined genres of our modern digital platforms. Yet the texts themselves are almost nowhere to be seen. It is true that not all of these translations survive, and of those that do, many remain only in manuscript form, unedited; yet the last century has seen a steady increase in the publication of Greco-Arabica, which is, for the most part, unaccounted for in the massive expanse of the digital corpus.[49] The digital field produced outside of Western scholarship has also largely overlooked classical Arabic and Persian writings from the diverse fields of scientific learning that developed and expanded beyond the legacy of the scholastic movement of late antiquity, though many of these works are available in modern editions.

In part, this situation is a result of the modern hollowing out of Islamic civilization, which generally excludes the 'foreign' sciences from the purview of religious authority and authenticity. As so much of this classical learning no longer proves 'valid', having withered under the glare of secular empiricism, its immediate relevance to the projects of modernist scientific discourses in Islamic reform is by no means apparent.[50] After all, the teleological and wrongheaded narrative of the Western *translatio imperii et studii*, which claims that the 'Arabs' preserved the learning of Greek antiquity only so that the West could then inherit it, is not particularly meaningful in the diverse contexts of Islamic modernity—other than perhaps to nostalgically bemoan the great achievements of the past. Yet ignoring the legacy of science and learning that extended both in and beyond the frameworks of classical religious education risks a further reification of Islamic knowledge as the sole domain of jurists, *ḥadīth* scholars, and exegetes,

48 This list is drawn from Dimitri Gutas, who supplies bibliographical references in *Greek Thought, Arabic Culture. The Graeco-Arabic Translation Movement in Baghdad and Early ʿAbbāsid Society (2nd–4th/8th–10th centuries)* (London: Routledge, 1998), 193–6, cf. 1–2.

49 A notable exception, produced within the framework of Western scholarship, can be seen in the database *Glossarium Græco-Arabicum* (telota.bbaw.de/glossga), which is currently a research unit of "Greek into Arabic – Philosophical Concepts and Linguistic Bridges" (http://www.greekintoarabic.eu). A growing body of materials is also hosted as "A Digital Corpus for Greco-Arabic Studies" (http://alpheios.net/content/grecoarabic), part of the Alpheios Project, an open source initiative.

50 See Behrooz Ghamari-Tabrizi, "Is Islamic Science Possible?" *Social Epistemology* 10 no. 2/3 (1996): 323–7.

who use such ancillary fields as grammar, rhetoric, history, and geography purely for utilitarian ends.

The introduction, absorption, and naturalization of classical scholarship, which helped to transform Arabic into a cosmopolitan language of power, was itself predicated on acts of translation.[51] This is to say nothing of the expansive history of vernacularization and, with it, ultimately the eastward spread of Islamic learning and piety, which drew from and also transcended the idiom of Arabic religious vocabulary. Yet so many of our digital platforms promote, in monogenetic singularity, the primacy of Arabic writing as the sole emblem of Islamic authenticity.

In this essay I have emphasized that the classical corpus consists of sources in both Arabic and Persian. The two bodies of writing are by no means equal in size or range of fields, nor in the historical or geographical areas covered. This is also true, though in very different ways and for quite distinct ends, of the digital corpus, which places comparatively less weight on source material written in Persian. Yet, with its emergence in the fourth century of the Islamic era, early New Persian writing came to occupy areas of learning once reserved exclusively for Arabic. This process of vernacularization was fundamentally an activity of translation, as written Persian moved from a language associated with non-Muslims to a language of learning, piety, and authority promoted by the Muslim elite. The rise of Persian also laid the groundwork for subsequent vernacular expansions in Turkish, Urdu, Malay, and a host of other languages. This history is the reason many Muslims around the world refer to prayer with the Persian word *namāz* rather than the Arabic *ṣalāt*, a simple example that could easily be multiplied.

Today, the vocabularies of Islam inhabit staggeringly diverse fields linguistically and culturally. To be sure, as the language of scripture and learning, Arabic plays a central and one might say even transcendental role, but contrary to the suggestion of some, it is by no means the sole badge of Muslim identity.[52] Rather, today's plurality of experiences and conditions gives the lie to the myth of ethnolinguistic singularity and homogeneity. Although many of our digital resources of classical Arabic might suggest the opposite, this was also true of the classical pe-

51 In addition to Gutas, *Greek Thought*, see Hayrettın Yücesoy, "Translation as Self-Consciousness: Ancient Sciences, Antediluvian Wisdom, and the ʿAbbāsid Translation Movement," *Journal of World History* 20 no. 4 (2009): 523–57; Abdelhamid I. Sabra, "The Appropriation and Subsequent Naturalization of Greek Science in Medieval Islam: A Preliminary Statement," *History of Science* 25 no. 3 (1987): 223–43.

52 Cf. Ibn Taymiyya, *Iqtiḍāʾ al-ṣirāṭ al-mustaqīm li-mukhālafat aṣḥāb al-jaḥīm*, ed. Nāṣir b. ʿAbd al-Karīm al-ʿAql, 2 vols. (Riyadh: Dār al-ʿĀṣima, 1998) 1:468–9; for further context, see also Reinhart, "Fundamentalism," 101–2.

riod. It is likewise why we do not talk about 'Arab' learning or 'Arab' science when we mean an ethnic designation, as the majority of intellectuals writing in Arabic were not ethnically Arabs—indeed, this is a great testament to the early hegemonic force of the language. As the historian Marshall Hodgson highlighted in his study of Islamic civilization, a good many of the thinkers and authorities writing in Arabic were not even Muslim. In fact, some might argue that the term 'Islamic science' at times obfuscates more than it illuminates.[53]

From the Balkans to South Asia, Persian was cultivated as a sophisticated language of high culture. The modern period, however, has been marked by an ever-shrinking sphere of Persian linguistic activity. Scholars and administrators working within the often-competing gunpowder states of the Ottoman, Safavid, and Mughal dynasties could communicate with each other through the medium of Persian, a language of the educated elite. Yet by the end of the twentieth century, the linguistic and cultural reach of Persian had drastically narrowed. In terms of intellectual activity, this shrinkage has come to signify an identification of Persian with the Shi'i religious history of Iran during the last century, despite the fact that Imāmī Shi'ism only truly gained hold in Iran as a state religion relatively late, under the Safavid dynasty.

Persian continues to be spoken and written in a variety of regions, particularly in Afghanistan and Tajikistan. Yet Iran has been the leading force behind the promotion of scholarship on Persian history, literature, and culture; as a language, it is profoundly tied to Iranian nationalism.[54] This modern national identification of Persian with Iran—and increasingly, after the Iranian Revolution, with Imāmī Shi'ism—has in part reduced Persian to a national and sectarian identity. Against this backdrop, there is little reason to wonder why the digital material that circulates on Salafī websites, largely in the Gulf, has taken no interest in the Persian corpus at hand, despite the fact that the overwhelming majority of the classical writings in Persian were produced by Sunni authorities. This, of course, says nothing of the basic problem of linguistic competency necessary to extend beyond the singular domain of Arabic learning. The digitization of early New Persian writing has largely fallen within the purview of modern Iranian institutions, as noticeably evinced by the work of the Computer Research Center of Islamic Sciences, which is closely tied to the Iranian state and to semi-

53 Marshall Hodgson, *The Venture of Islam*, 3 vols. (Chicago: University of Chicago Press, 1974), 1:45–8.

54 See Mehrdad Kia, "Persian Nationalism and the Campaign for Language Purification," *Middle Eastern Studies* 34 no. 2 (1998): 9–36; Mohamad Tavakoli-Targhi, "Refashioning Iran: Language and Culture during the Constitutional Revolution," *Iranian Studies* 23 no. 1/4 (1990): 77–101.

nary education. While no less impressive, the selection is relatively narrow and reflects a particular set of commitments and paradigms on the place and significance of classical Persian literature in the context of modern Iran. This linguistic division has further fragmented the fields of knowledge along the lines of national and sectarian identities, boundaries produced in great measure by the diverse forces of modernity. Thus, rather than offering a counterpoint to the often-stultifying divisions of the modern age, this vast body of writing that covers distinct regions and languages is easily put to the service of reaffirming the historical permanency of these very divides.

Many of the religious authorities from the period, however, straddled multiple divisions and inhabited diverse spheres of learning and modes of being. Take, for instance, the famed Ashʿarī theologian, Shāfiʿī jurist, and *ḥadīth* transmitter Abū l-Manṣūr ʿAbd al-Qāhir al-Baghdādī (d. 429/1037) from the city of Nishapur, who is best known today for his work on heresiography. In his own day, he was renowned as a *dhū l-funūn*, a master of arts, including Arabic grammar, poetics, letters, mathematics, and geometry; according to the biographical record, he taught some seventeen different branches of learning (*darrasa fī sabʿata ʿashara nawʿan min al-ʿulūm*), in the context of madrasa education.[55] We know that a wide range of scientific and philosophical material was featured in madrasas of the period, which, in turn, built upon the classical heritage of Greek learning.[56] While ʿAbd al-Qāhir's theological works on heresiography and creed are easily accessible online, both as scanned PDFs and as digitized text files, the modern editions of his writings on mathematics and geometry are currently not available online.

This whittling down of religious authority also forms part of the fragmentation of Islamic intellectual and cultural history. This can be seen in the work of ʿAbd al-Qāhir's son-in-law, Abū l-Muẓaffar al-Isfarāʾīnī (d. 471/1079), also an Ashʿarī theologian and Shāfiʿī jurist. He too wrote an Arabic work of heresiography, which is easily obtained online. Yet, if we relied only upon online Arabic

55 See ʿAbd al-Ghāfir al-Fārisī (d. 529/1134), *Tārīkh Nīshābūr, al-ḥalqa al-ūlā min al-Muntakhab min al-siyāq*, ed. Muḥammad Kāẓim al-Maḥmūdī (Qom: Jamāʿat al-Mudarrisīn, 1403/1983), 545–6, §1190; Ibn ʿAsākir (d. 571/1176), *Tabyīn kadhib al-muftarī fī-mā nusiba ilā l-imām Abī l-Ḥasan al-Ashʿarī* (Damascus: Maṭbaʿat al-Tawfīq, 1347/1928–9), 253–4; ʿAbd al-Wahhāb al-Subkī (d. 771/1370), *Ṭabaqāt al-shāfiʿiyya al-kubrā*, ed. Maḥmūd Muḥammad al-Ṭanāḥī and ʿAbd al-Fattāḥ Muḥammad al-Ḥilw, 10 vols. (Cairo: ʿĪsā al-Bābī al-Ḥalabī, 1964–76), 5:136–48, §467. For more, on ʿAbd al-Qāhir in the context of Nishapuri education, see Zadeh, *The Vernacular Qur'an: Translation and the Rise of Persian Exegesis* (Oxford: Oxford University Press, 2012), 338–42.

56 See Sabra, "Appropriation," 233–5.

resources, we would have very little inkling that Isfarāʾīnī produced a multivolume Persian translation and commentary of the Quran that for many years has been available in a partial edition and now, through the power of digitization, is searchable, though still incomplete, on the Noor Library website.[57] Many of the scholars from the period and the region were *dhawū l-lisānayn*, masters of both Arabic and Persian. This expression, emphasizing bilingualism, is repeated as an epithet for various authorities by the historian Abū l-Ḥasan Ibn Funduq al-Bayhaqī (d. 565/1169–70), who also wrote in both Arabic and Persian and took a strong interest in philosophy, science, and religious learning. His writings are also divided across the digital landscape, split between Arabic and Persian digital resources.

Part of the challenge is that of assemblage, of reconstituting and reuniting what has been broken into parts and cordoned off into separate pieces in this process of transmission. This still remains fundamentally an archival activity of scouring through documents, records, material traces, and physical remains, regardless of venue or form. Much of this body of writing, of representing and refashioning the world, has been documented through editions and photographs, though a good deal of it continues undisturbed, as it were, in the rough form of unedited manuscripts and uncatalogued objects. But even here, through the force of digitization, what was accessible only in physical libraries and museums is increasingly available in digital forms, often online. As for the codicological record, there is a growing (if unequal) number of digitized manuscripts. In this regard, while a good deal of the digital sources for Islamic intellectual and cultural history are fragmented along linguistic and sectarian divisions, the sheer number of resources opens up—for the diligent—new possibilities of collation, aggregation, and synthesis.

A noteworthy example is the case of Abū Naṣr al-Ḥaddādī (fl. 400/1010), a Ḥanafī religious authority from Samarqand trained in Arabic grammar, poetry, and the diverse fields of Quranic learning, whose full significance as an exegetical authority is only now coming to light. If we were to rely on the very meager Arabic biographical record, we would only know that he was an expert in variant readings of the Quran. In addition, we would have the Arabic primer by Ḥaddādī on Quranic grammar, lexicography, semantics, and rhetoric that Ṣafwān ʿAdnān Dāwūdī published in 1988 (based upon a single manuscript housed in the Ches-

57 Abū l-Muẓaffar Shāhfūr b. Ṭāhir al-Isfarāʾīnī, *Tāj al-tarājim fī tafsīr al-Qurʾān li-l-aʿājim,* ed. Najīb Māyil Harawī and ʿAlī Akbar Ilāhī Khurāsānī, partial edition, 3 vols. (Tehran: Shirkat-i Intishārāt-i ʿIlmī wa-Farhangī, 1375 Sh./1996). See http://www.noorlib.ir/View/fa/Book/BookView/Image/19966.

ter Beatty Library).[58] Today, references to other manuscripts of the work can be found easily through online searches, just as a PDF copy of Dāwūdī's edition is widely available.

Yet an important piece of information can also be uncovered by turning to Yazmlar (yazmlar.gov.tr), a Turkish website run under the auspices of the Ministry of Culture and Tourism. The website provides for purchase direct digital access to images of countless Arabic, Persian, and Turkish manuscripts held in various archives in Turkey and also catalogue references to many more. From this website we learn that the public library of Kastamonu in northern Anatolia houses two manuscripts on Quranic exegesis by Ḥaddādī. The cataloguing is not entirely accurate in this particular case (as it gives the impression that these are separate works), nor are the images of the manuscript directly accessible online. However, the library officials in Kastamonu are more than happy to supply, via email, digital copies of manuscripts upon written request and after the standard transfer of funds to purchase the images. As with many of these smaller archives, there is no published catalogue of the full manuscript holdings in the Kastamonu Library. In this specific instance, the Yazmlar website opens a window onto material that otherwise would be forgotten. It turns out that the two Kastamonu manuscripts are of the same Arabic Quranic commentary; one is the complete work in a single volume (MS 3659), the other is an acephalous first volume from a set of two or three volumes (MS 306). This concise commentary, entitled *al-Itqān fī l-maʿānī l-Qurʾān*, is otherwise unknown and completely absent from the modern scholarly discussion on Arabic exegesis of the period. As with his Arabic primer for the study of the Quran, Ḥaddādī took great interest in poetry, grammar, variant readings, law, theology, and basic questions of comprehension —all matters particularly well suited for madrasa education and instruction.

However, what makes all of this so intriguing is that Ḥaddādī is also remembered for a major commentary and paraphrase of the Quran in Persian. No mention of this is made in the surviving Arabic materials. However, references to Ḥaddādī's *Tafsīr-i munīr*, as it is generally known, are scattered throughout later Persian exegetical writing. At least two manuscripts from sections of his Persian commentary have survived. However, only one copy gives the name of the author and the title of the work: *Maʿānī kitāb Allāh taʿāla wa-tafsīrihi l-*

58 See Abū l-Naṣr al-Ḥaddādī, *al-Madkhal li-ʿilm tafsīr Kitāb Allāh taʿālā,* ed. Ṣafwān ʿAdnān Dāwūdī (Damascus: Dār al-Qalam, 1988). For a critique of Dāwūdī's ascription of the anonymous fragment in Chester Beatty MS 3883 (fols. 228b–44a), which he published as the *Muwaḍḍiḥ* of Ḥaddādī, see Muḥammad Ajmal Ayyūb al-Iṣlāḥī, "A-hādhā *Kitāb al-Muwaḍḍiḥ li-ʿilm al-Qurʾān* li'l-Ḥaddādī?" in *Buḥūth wa-maqālāt fī l-lugha wa-l-adab wa-taqwīm al-nuṣūṣ* (Beirut: Dār al-Gharb al-Islāmī, 2007), 359–69.

munīr [The Meanings of the Book of God Almighty and Its Splendid Commentary]. This particular manuscript, the eighth volume of the commentary, is now housed in the Topkapı Palace Museum of Istanbul (E.H. 209). The lavish use of gold, the rich color palette, the extensive rubrics, the varying scripts, and the magisterial artistry of the calligraphy and decoration all point to the courtly provenance of the manuscript and highlight its value as a precious object. The colophon states that the volume was copied and gilded by the master calligrapher Abū ʿAmr ʿUthmān al-Warrāq, whose telling faith in the lasting power of the written word I introduced at the beginning of this essay. The finispiece, in turn, explains that the work was commissioned on the orders of the Ghaznavid sultan, Ibrāhīm b. Masʿūd (r. 451–92/1059–99). This royal provenance speaks volumes to the question of reception. Foremost, it suggests that Ḥaddādī's Persian commentary bore a prestige that for many centuries has been largely forgotten.[59]

The Topkapı Palace has placed much of its catalogue online, though currently no citations of Ḥaddādī's commentary can be found there. Until the recent work on the manuscript by the Iranian scholar Muḥammad ʿImādī Ḥāʾirī, there were only scattered references to the Topkapı copy; these references did not, in their own right, fully appreciate its significance for the field of Persian exegesis.[60] In addition to Ḥāʾirī's printed color facsimile, published in a limited run, the manuscript (or rather digital images of it) can be viewed at the Topkapı Palace, by appointment.

While fragments of Ḥaddādī's Persian *Tafsīr-i munīr* have now been brought to light, his Arabic commentary and its relation to his work in Persian have not been examined. This is not so much a case of negligence as it is a problem of amassing such diverse and scattered points of information in what is, by its very nature, an incomplete process of reassembly. It turns out, upon close inspection, that these are two distinct works that share many features and areas of emphasis but diverge in important and noticeable ways. This is unlike the case of Isfarāʾīnī's Persian commentary, which is, for all intents and purposes, an unacknowledged translation of *al-Kashf wa-l-bayān ʿan tafsīr al-Qurʾān* [The Unveiling and Elucidation in Quranic Interpretation] by the famed exegete of

59 For more on this, see Alya Karame and Travis Zadeh, "The Art of Translation: An Early Persian Commentary of the Qur'an," *Journal of Abbasid Studies* 2 no. 2 (2015): 119–95.

60 See Muḥammad ʿImādī Ḥāʾirī, "Muqaddima," in *al-Mujallad al-thāmin min maʿānī kitāb Allāh taʿālā wa-tafsīruhu al-munīr*, ed. Muḥammad ʿImādī Ḥāʾirī, facsimile edition of EH 209 held in the Topkapı Sarayı Müzesi Kütüphane (Tehran: Kitābkhāna, Mūzih wa-Markaz-i Asnād-i Majlis-i Shūrā-yi Islāmī, 1390/2011) 9–41; idem, *Kuhantarīn nuskha-i mutarjam-i Qurʾān: taḥlīl-i matn, bar rasī-i dastniwisht, zībāyī-shināsī-i hunar-i qudsī* (Tehran: Mīrāth-i Maktūb, 1389/2010).

Nishapur, Abū Isḥāq al-Thaʿlabī (d. 427/1035).[61] Rather, Ḥaddādī—or perhaps students working after him and in his name—produced two distinct works of Quranic exegesis: one for an audience interested in the fine points of Arabic grammar, poetry, and lexicography, and another that focuses on the meaning of the Quran through the filter of Persian paraphrases, stories, and translations of Arabic exegetical authorities.

In this particular example, Internet resources take us only so far before we must venture into the analogue archive. Yet even here, manuscripts are often tendered through the filter of digital reproductions. Certainly this is a vast improvement over the splotchy and often blurry uncertainty of the microfilm reader. The digital reproduction has increasingly replaced access to the primary codicological witness—a growing archival practice across a variety of fields and disciplines. Promised here is the fidelity of a digital transparency that mediates and transmits and also frees, as it protects the original from further handling. Yet in any process of translation from one medium to the next, there is always some form of intermediation that changes both the object of study and the experience at hand. Beyond the finer points of codicology, of the paper and binding, of the physical history of the book, or of legibility and decipherment, the question of the digital manuscript remains that of the actual weight of the corpus, of the tome, of the materiality of the object, and the very charismatic trace of the past—this is all largely sacrificed in the process of digital conversion.

But, to be sure, much is gained by the speed of transmission and the amount of information that can be quickly recovered. And it is precisely this potential of reassembling that should be most pursued along the divergent digital horizons. For the likes of Ḥaddādī and many others, this means reconstituting a fragmented body of writing that survives in the detritus of past generations, spread unevenly across a vast trove of documents. Even when partially reconstituted and reconnected, the corpus shows competencies and networks that extend beyond the modern concerns and expectations that often shape our entrance into and understanding of the past. One of the great possibilities of the digital arena is its potential to highlight the multilingual, transregional, and truly global areas of interconnectivity. Our sources for the history of Islamic civilization are certainly all of this and much more.

61 See Zadeh, *Vernacular Qur'an*, 382–418.

7. The Alchemy of Uncertainty

As a process of retrieving and telegraphing information, the digital field is fundamentally the product of translation. We see this most obviously in the translation from the analogue to the digital: books are keyed and scanned, transposed into binary sequences of information that can be rearranged and reconnected in new and unseen ways. This transformative process, in the sleight of hand that transforms from the physical into the ephemeral and the disembodied, is, one might say, basically alchemical.

In contrast to the public canons of writing, alchemy represents the other largely obscured side of the written word. Ibn al-Nadīm begins his bibliographic encyclopedia with a section (*maqāla*) on writing and scripture, only to end it with a detailed account of alchemy, the last of the ten sections that make up the *Fihrist*. As with anyone devoted to the art of cataloguing, throughout his survey Ibn al-Nadīm pays keen attention to various organizational principles, and his choice to bookend the catalogue with writing and alchemy is quite telling.[62] The structure comes full circle, as the two sections treat the very global and even divine expanse of the written word and its diverse scripts—one outward and manifest, the other hidden and esoteric. Ibn al-Nadīm ends with Hermes, the sage from Babylon, transplanted to Egypt; the messenger god of the Greek pantheon, the god of writing known to the ancient Egyptians as Thoth, the clever intermediary, the scribe, and the weigher of dead souls, known to Ibn al-Nadīm as Ṭāṭ.[63] Alchemy's first line of inquiry takes us deep into the pyramids of Egypt, the monumental temples (*barābī*) widely believed to have been built by Hermes as storehouses for divinely revealed esoteric knowledge.[64] We read

62 On the organizational principles of the *Fihrist*, see Devin Stewart, "The Structure of the *Fihrist:* Ibn al-Nadim as Historian of Islamic Legal and Theological Schools," *International Journal of Middle East Studies* 39 no. 3 (2007): 369–87; Shawkat Toorawa, "Proximity, Resemblance, Sidebars and Clusters: Ibn al-Nadīm's Organizational Principles in *Fihrist* 3.3," *Oriens* 38 (2010): 217–47.

63 Ibn al-Nadīm, *Fihrist*, 2:441–2, 443. See Johann Fück, "The Arabic Literature on Alchemy According to an-Nadīm (A.D. 987). A Translation of the Tenth Discourse of *The Book of the Catalogue* (*al-Fihrist*) with Introduction and Commentary," *Ambix* 4 no. 3/4 (1951): 112, §9. See also Jacques Derrida, *Dissemination*, trans. Barbara Johnson (London: Athlone Press, 1981), 84–94.

64 Ibn al-Nadīm, *Fihrist*, 2:443–4. On the Hermetic connection to the pyramids, see Alexander Fodor, "The Origins of the Arabic Legends of the Pyramids," *Acta orientalia academiae scientiarum hungaricae* 23 no. 3 (1970): 335–63; Michael Cook, "Pharaonic History in Medieval Egypt," *Studia Islamica* 57 (1983): 67–103; Mark Fraser Pettigrew, "The Wonders of the Ancients: Arab-Islamic Representations of Ancient Egypt" (Ph.D. diss., University of California, Berkeley, 2004), 93–101; also more broadly, Garth Fowden, *The Egyptian Hermes: A Historical Approach to the*

that the pyramids were designed for practicing the art of alchemy, for housing undeciphered inscriptions and writings in Chaldean and Coptic.[65] Ibn al-Nadīm, the ever-diligent bookman, relates that he read in the very handwriting of the famed occultist Ibn Waḥshiyya (d. 318/930–1) a transcription of the scripts (*aqlām*) in which the books of alchemy, magic, and incantations were written. The *Fihrist* even promises to provide the keys to decipher these various alphabets, including the very one used to write the ancient sciences in the Egyptian temples. Unfortunately, these mysterious letters have been lost in the course of the manuscript transmission of the *Fihrist*. In any case, Ibn al-Nadīm tellingly notes that only a master (*ʿārif*) of the discipline can truly understand the meaning of such cyphers.[66]

According to Ibn al-Nadīm, the alchemical art first and foremost seeks to produce the transmutation of gold and silver from other nonprecious metals. Yet a careful reading of his catalogue of alchemical writings reveals that the science, described by the philosopher-physician Abū Bakr al-Rāzī (d. 313/925) as the very pinnacle of philosophy, is much more ambitious, for it attempts to explain the hidden, interconnected nature of creation itself through the transmutation of inorganic matter.[67] A central figure in Ibn al-Nadīm's account is Jābir b. Ḥayyān (d. c. 200/815), whose life and teachings are shrouded in mystery. Ibn al-Nadīm notes that many groups—including not only alchemists, Sufis, and philosophers, but also importantly the Shia—claimed him as one of their own. This affiliation, given Ibn al-Nadīm's background as an Imāmī Shiʿi, sheds light on his spirited defense of Jābir's corpus.[68] Much of the material associated with Jābir in the alchemical and natural sciences reflects the absorption and reinscription of learn-

Late Pagan Mind, 2d ed. (Princeton: Princeton University Press, 1993); Kevin van Bladel, *The Arabic Hermes, From Pagan Sage to Prophet of Science* (Oxford: Oxford University Press, 2009).

65 Ibn al-Nadīm, *Fihrist*, 2:445.

66 Ibn al-Nadīm, *Fihrist*, 2:460–1, 461 n. 2. See Fück, "Arabic Literature," 139–40 nn. 64–7. For an example of this field of cryptology, see the study on ancient scripts and hieroglyphs, *Shawq al-mustahām fī maʿrifat rumūz al-aqlām*, ascribed to Ibn Waḥshiyya, edition and partial translation, *Ancient Alphabets and Hieroglyphic Characters Explained*, ed. and trans. Joseph Hammer-Purgstall (London: W. Bulmer and Co., 1806). However, on the question of authorship, see Jaakko Hämeen-Anttila, *The Last Pagans of Iraq, Ibn Waḥshiyya and his Nabatean Agriculture* (Leiden: Brill, 2006) 21 n. 45, 43 n. 112.

67 See Jamal Elias, *Aisha's Cushion: Religious Art, Perception, and Practice in Islam* (Cambridge, MA: Harvard University Press, 2012), 175–88.

68 Ibn al-Nadīm, *Fihrist*, 2:450–1. Ibn al-Nadīm appears to be much more sanguine on the matter of alchemy than Fück would have us believe; see "Arabic Literature," 84, §3. On the Shiʿi reception of Jābirian cosmology, see Mohammad Ali Amir-Moezzi, *The Spirituality of Shiʿi Islam, Beliefs and Practices* (London: I.B. Tauris, 2011), 108–9 n. 14, 115–6 n. 36, 165–6 n. 64.

ing from classical antiquity in Arabic letters, which draws together Hellenistic philosophy and Hermeticism, Mesopotamian astrology, and Indic astronomic traditions. Ibn al-Nadīm concludes the section (and with it the entire catalogue) with an observation on the origins of the alchemic corpus, which he notes is as innumerable as it is transnational: some claim it originated in Egypt, others claim it comes from the Persians, from the Greeks, from India, or even from China.[69]

The very global character of the field suggested here reflects, above all, the status of alchemy, not as a fringe discipline, but as an authoritative branch of scientific learning pursued by people the world over. Like astronomy and astrology, which during this period were integrated into Islamic scientific discourse largely through the absorption of Neoplatonic thought, alchemy represents a system of learning very much preoccupied with understanding the deep and hidden interconnections that bind together the cosmos. Today, as with most branches of occult learning so actively cultivated and developed throughout Islamic history, the alchemical arts, the basis for modern chemistry itself, are in great measure absent from the digitized corpus of Arabic and Persian letters. The pursuit of occult knowledge, however, was not restricted to a particular sectarian group. There is much evidence that a broad spectrum of the religious elite not only circulated occult learning, but also sought to harness it.

In this regard, the example of Abū l-Faḍl Muḥammad al-Ṭabasī (d. 482/1089), who lived much of his life in Nishapur, is illuminating. Referred to by the honorific title the "pride of the imams," Ṭabasī was known to be a reliable *ḥadīth* transmitter and a pious ascetic who composed numerous works. He delivered lectures in the Niẓāmiyya Madrasa, established by the powerful Seljuk vizier Niẓām al-Mulk (d. 485/1092) in the city of Nishapur. His scholarly pursuits fit into the normative network of the region's Shāfiʿī jurists and Ashʿarī theologians, who professed an outward expression of Sufi piety. However, of the writings associated with Ṭabasī, the only work that appears to have been disseminated widely in manuscript form is his *al-Shāmil fī l-baḥr al-kāmil* [The Comprehensive Compendium of the Entire Sea], a treatise on subjugating various occult forces through talismans and incantations.

The collection of spells focuses particularly on commanding angels and *jinn*. The incantations also showcase an underworld of forces that can be harnessed for various ends, from the benevolent to the nefarious. Over the course of Ṭabasī's grimoire, the sum total of spells conjures an entire demonology through the power of subjugation. Despite the avowedly monotheistic supremacy of God,

69 Ibn al-Nadīm, *Fihrist*, 2:466.

affirmed repeatedly in the course of the work, the pantheon of powers showcased suggests a world that is certainly dualistic. It reflects deep currents in autochthonous Persian religious and philosophical traditions, expressed notably in the competing structures of Mazdaean and Manichaean dualism. In Ṭabasī's work we read how to perform incantations summoning the "Lady Queen" (*al-sayyida al-malika*), the daughter of the devil, or the Indian demon King Mahākal (i.e., from Sanskrit *mahākāla,* meaning 'great time', one of the epithets for the god Śiva, the Destroyer). Ṭabasī justifies the inclusion of this material by his choice of title, *al-Shāmil*, as his work is meant to be inclusive and all-encompassing.[70]

Needless to say, Ṭabasī's collection of spells does not feature on the website of al-Shāmila, whose name also purports to represent encyclopedic comprehensiveness. As with a good many of the Arabic and Persian writings on magic, alchemy, and astrology, Ṭabasī's book of spells has never even made it to print. Multiple copies of the work are known to exist: notably, a complete manuscript housed in the Staatsbibliothek of Berlin (MS Or. fol. 52) and a fragmentary version located in Princeton University (MS Islamic NS 160). As with other holdings, Berlin can quickly dispatch a digital copy of the manuscript of Ṭabasī's book of spells, or it can be freely downloaded directly from Princeton Library's website of Islamic manuscripts.

All of these sundry examples of exclusion and dispersion point to the intractable difficulties of the digital archive and the serendipitous potential for discovery and reassembly. The abundance is daunting and requires new types of reading. Today, for instance, thousands of manuscripts housed in various archives around Istanbul can be searched and examined through computer terminals in the Süleymaniyye Library. In minutes, reading patterns within Ottoman madrasa education can be brought into view, with a power of cataloguing and indexing that in a previous era would have taken significantly more labor. Readily purchased, these manuscripts can, in turn, be transmitted, duplicated, and shared with a speed unimagined in the age of mechanical reproduction.

Entire manuscript collections are now stored on servers, diligently kept offline, under lock and key, in a replication of the very structures of access and exclusion that historically formed the physical domain of the archive. And like all

70 For more on Ṭabasī, see Travis Zadeh, "Commanding Demons and Jinn: The Sorcerer in Early Islamic Thought," in *No Tapping around Philology: A Festschrift in Honor of Wheeler McIntosh Thackston Jr.'s 70th Birthday*, ed. Alireza Korangy and Daniel Sheffield (Wiesbaden: Harrassowitz Verlag, 2014), 144–50; idem, "Magic, Marvel, and Miracle in Early Islamic Thought," in *Cambridge History of Magic and Witchcraft in the West, from Antiquity to the Present*, ed. David Collins (Cambridge: Cambridge University Press, 2015), 251–5.

digital information, such proprietary archives readily await further dissemination, escaping the centripetal forces of centralization that belie the assurance of singular totality. Such quicksilver transmutations from the physical page to the digital replica are all but magical—making something into nothing into everything, nowhere and everywhere. The mercurial fluctuations of the digital condition are what make observing it, in all of its uncertainty, and fixing it in writing so vexing, and yet so promising. As with the kinetic energy of quarks and other subatomic particles that produce their own uncertainty at the very basis of physical matter, these digital sparks and points of confluence can be missing one moment, only to suddenly reappear unannounced, recharged, and transformed the next.

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