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The Database of Religious History (DRH): ontology, coding strategies and the future of cultural evolutionary analyses

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ABSTRACT
Perhaps the biggest challenge facing designers of large-scale, cross-cultural databases is that of ontology, both in terms of defining the unit of analysis and the construction of an appropriate back-end architecture. These decisions are also impacted by the coding strategies adopted, envisioned users, and funding limitations. This article explores how one particular database project, the Database of Religious History (DRH), has addressed these issues, the advantages and drawbacks of the approaches adopted, and the potential of the DRH as a data resource for exploring the cultural evolution of religion.

Originally created in 2012, as part of a larger grant on the cultural evolution of religion and morality, the Database of Religious History (DRH; religondatabase.org) is an open-access, online resource for the study of religion and cultural evolution. A flexibly-designed temporal and geo-coordinated system, built on a relational database that can also be browsed like an encyclopedia, the DRH has pioneered a distinctive approach to the design, coding strategies, and function of cultural databases, while also slowly building a new form of scholarly community. As of 24 February 2023, the DRH has 1000 entries and 488 expert contributors,[1] and can be browsed and searched in various ways through powerful built-in tools. Thanks to our latest infusion of funding,[2] our coverage is rapidly growing and our technical features expanding.

In this paper we discuss the challenges involved in creating cultural database ontologies, the theoretical and practical rationales behind DRH ontology and design decisions, current and future uses of the DRH, and strategies that we have adopted for mitigating the downsides of pursuing an expert-based coding approach. In the case of the DRH, the evolution of our database ontology and technical features has often been in response to the unique demands of expert-based coding (Slingerland & Sullivan, 2017, Sullivan et al. 2015/2017). We believe that this approach—despite the difficulties involved—is, over the long term, the only sustainable way forward when it comes to converting qualitative knowledge about cultural history into quantitative data, especially when it comes to large-scale societies. We hope here to not only introduce scholars of religion and cultural evolutionary theorists to an important new data resource but also advance the more general conversation concerning cultural database design and coding strategies.

The ontology of cultural databases

As recent methodology papers on large-scale cultural databases (Slingerland et al., 2020a; Watts et al., 2021) have pointed out, perhaps the central challenge designers face is determining the

unit of analysis.[3] In theory, these could range quite widely both geographically and temporally. At one extreme we can imagine a database built around very large units, such as "Western" vs. "Eastern" or "ancient" vs. "modern" cultures, that radically collapse either space or time in the interest of documenting extremely broad trends. At the other, a very fine-grained database might document the cultural beliefs and behaviors of a single individual, or even sub-divide the individual depending on life-stage or activity (e.g., individual X when worshiping at a Shinto shrine as opposed to a Buddhist temple, or pre- and post-child rearing). Apart from scale, there is also the question of whether units of analysis should be artificially imposed upon the evidence or derive from emic distinctions (i.e., standard geographic sample or historically contingent polities; 200-year spans or historical political divisions).

Until recently, the databases employed in cultural evolutionary analyses have, for the most part, been limited to the Human Relations Area Files (HRAF), the Standard Cross-Cultural Sample (SCCS; Murdock & White, 1969, 2006), and the Ethnographic Atlas (EA; Murdock, 1967).[4] These are all derived from ethnographic data, are temporally "flat" (each entry typically codes a single slice of time, or at most two), and focus on the "culture" or "society" as their unit of analysis. As Watts et al., 2021 observe, one problem with this approach is that "people live in communities that change in structure and features over time, contain internal variation, and have fuzzy and layered boundaries," which makes it difficult to define a "culture" or a "society" in such a manner that the resulting units of analysis are "meaningfully comparable" (pp. 65–66). Commonly-used databases, such as the Ethnographic Atlas, do a poor job of responding to this challenge, typically homogenizing different subgroups within a larger unit, or simply choosing a particular subgroup as representative, often without explicitly noting or defending this decision.

> With regard to the EA unit labeled "Sumatra," for instance, "the terms 'society' and 'culture' could conceivably refer to the group of villages that make up a district, the Toba Batak, the Batak peoples, or the broader political state of the Island of Sumatra. In practice, the Ethnographic Atlas identifies the Toba Batak as their unit of analysis, but it remains unclear how and why the authors chose this particular grouping (Watts et al., 2021, p. 67).

More recent databases have tried to be more specific and consistent. The Pulotu Database of Pacific (Watts et al., 2015), for instance, defines their unit of analysis, the "culture," as "a group of people living in a similar physical, social and economic environment that speak mutually intelligible languages and have relatively homogenous supernatural beliefs and practices" (Watts et al., 2015). This represents a great improvement over the traditionally dominant databases, but analysts are still left with a lack of historical depth and a focus mostly on small-scale societies.

Besides the DRH, the only existing database attempting to tackle the challenge of coding large-scale societies with real historical depth is the Seshat Databank project (https://seshatdatabank.info/; Turchin et al., 2015). Using ecologically diverse Natural Geographical Areas (NGAs) as a sampling technique, Seshat then employs as its unit of analysis a particular polity within that NGA, temporally slicing that polity into intervals that can range from 50 to several hundred years. This serves as a good example of how choosing the "right" level of analysis can very much depend on what sorts of research questions one intends to ask, and therefore which particular aspects of culture one wishes to capture. Seshat was originally focused on coding aspects of political organization, technology, warfare, and economics, which means that it found a natural unit of analysis in the administrative district or polity. When it comes to a large geographic region, such as the Middle Yellow River Valley, one can reasonably expect to be able to formulate coherent codes for these sorts of variables over a time period of roughly 200 years.

Such large geographical and temporal units are less helpful, however, when it comes to aspects of culture such as religion, where a geographical and temporal range of this size should be expected to host a myriad of religious groups, places, and circulating written texts, all enjoying various degrees of political support, developing rapidly over time, and perhaps existing in competition with one another. This structure is best suited to capturing those aspects of historical

culture that are associated with clearly-defined and relatively dominant polities, which could include aspects of state cults or officially-sponsored religions, but will inevitably erase the sort of diversity and complexity that typically characterize human religious life in large-scale societies. It was the desire to preserve and represent the messiness of lived religion on the ground that motivated the creation of the DRH.

DRH structure and workflow

In order to better understand the questions of coding strategies and ontology that are the main subject of this paper, it would be helpful to begin with an overview of DRH structure and workflow.[5] DRH data acquisition can proceed along various pathways, in both a bottom-up and top-down manner (Figure 1).

Bottom-up data acquisition begins with an expert deciding they would like to compose an entry. "Experts" are defined as individuals with scholarly knowledge of a given religious tradition, with our rule of thumb being that they are at least an advanced graduate student in a relevant university department. The expert then signs up on the DRH site, requesting approval as an official expert from the DRH editor whose expertise best fits their own. We currently have a team of over 30 editors, each of whom oversees a particular geographic and temporal range or, in some cases, specific religious traditions.[6] The expert then either contacts their editor to discuss an idea for an entry or simply begins an entry, which triggers an automatic notice to the editor. Editors provide guidance to the expert in terms of naming and defining their entry and choosing an appropriate Poll Type: either a Religious Group, Place, or Text[7] (Figure 2).
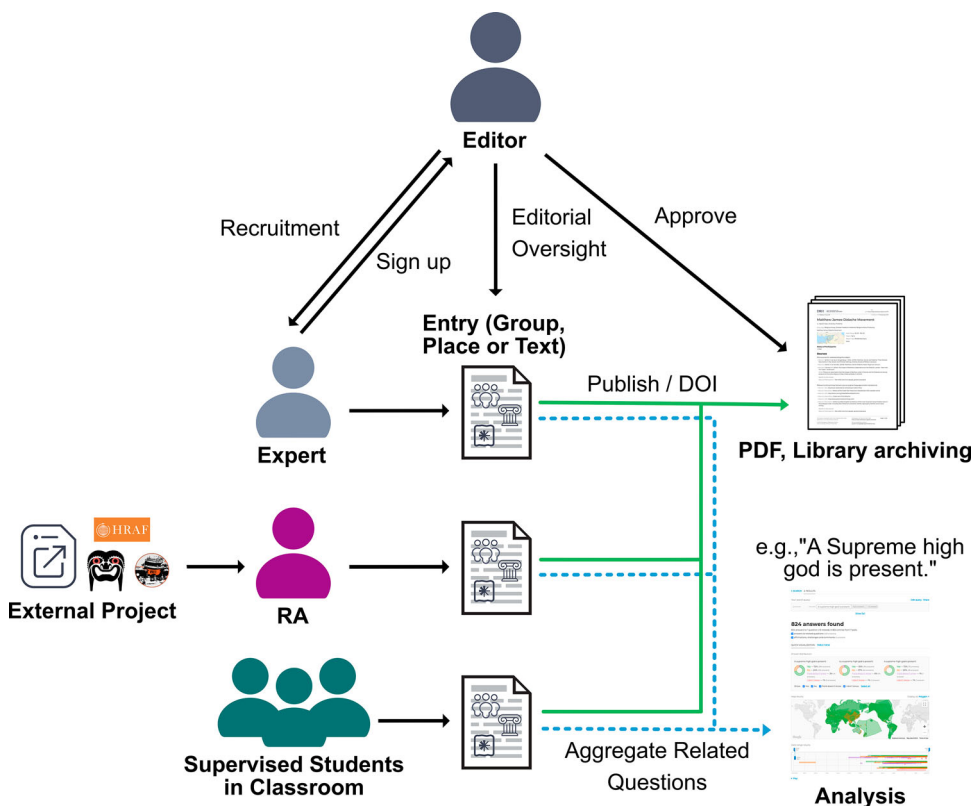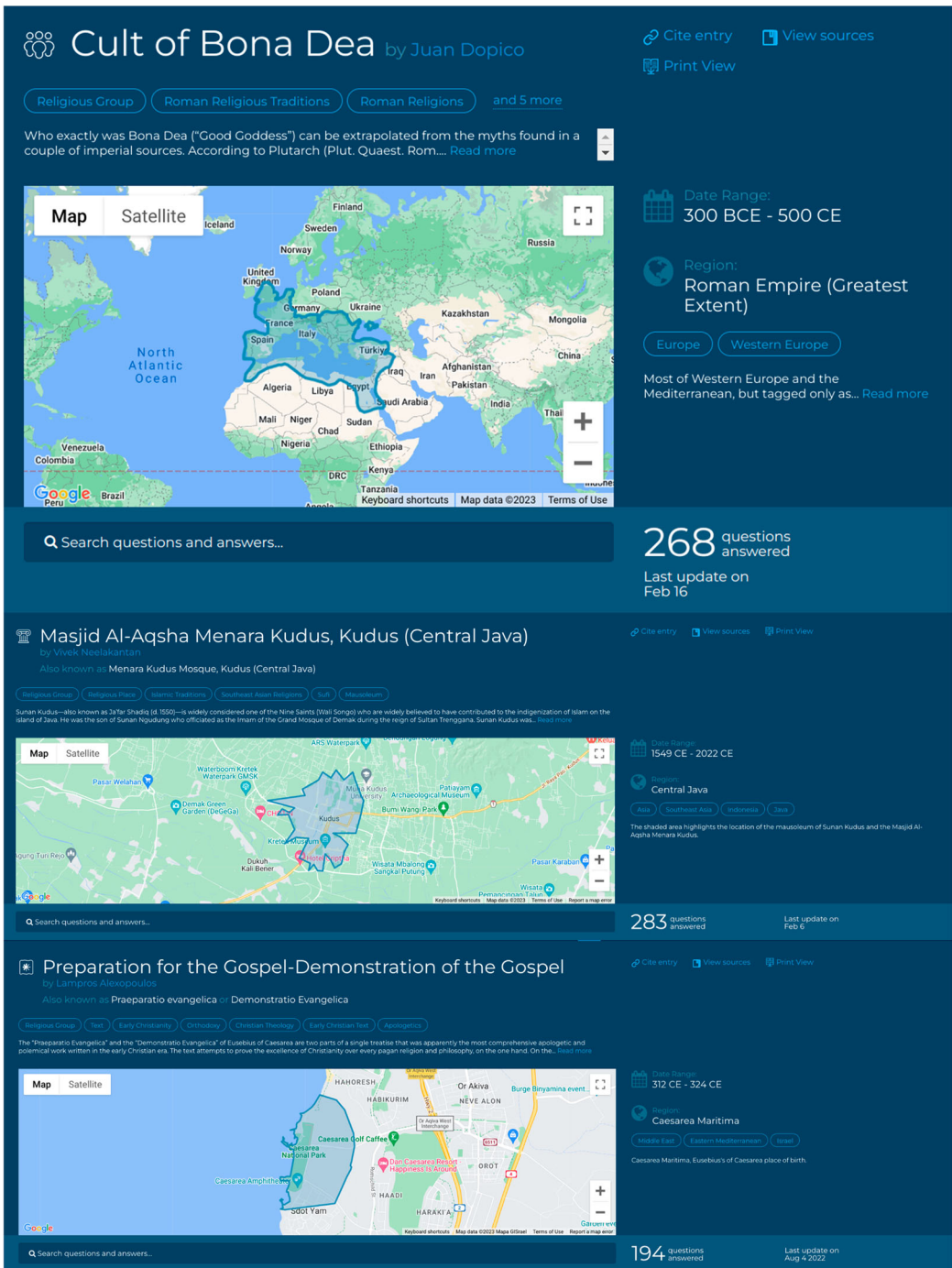

Figure 1. Basic DRH workflow (diagram by Rachel Spicer).

Figure 2. DRH entry structure and poll types, showing a sample header for a Religious Group, Place or Text entry.

A DRH entry consists of a named Group, Place, or Text that is assigned a date range, a GIS map, a set of tags, and then a long set of questions referred to as a "poll."[8] Although individual questions in a given poll can be given unique date ranges or maps, by default they inherit the overall entry values. Individual answers can further be specified as relevant to elites, religious specialists, or

general populace. This gives an enormous amount of flexibility to an expert in terms of splitting or lumping: they can define a temporally and geographically quite broad entry (e.g., "Shang and Western Zhou State Religion") and then change the map or date ranges for answers that vary within that larger rubric, or create multiple, smaller entries ("Shang Religion" or "Anyang") to capture this same diversity. They can create an entry focused, for instance, only on Buddhist monks in a particular temple, or one that focuses on the temple or broader group where the answers will differ for religious specialists and lay adherents.

Poll questions most commonly offer a choice of categorical answer (Yes/No/Field Doesn't Know/I Don't Know), but in some cases require a numerical value (e.g., "number of adherents") or a question-specific categorical choice (e.g., location of iconography) (see Figure 3). They are arranged in nested hierarchies, with broad rubrics (e.g., "General Variables," "Beliefs," "Practices," "Society and Institutions") and nested parent–child questions. Experts answering "no" to a given parent question will never see the nested child questions, which helps to speed progress through the poll. Each entry is also assigned one or more tags from a required "Religion" tagging tree, as well as poll-specific tagging trees. All tagging trees are curated by our editorial team: experts can suggest new tags, but these must be approved by editors before appearing on a published entry or becoming available to other experts. We are also in the process of adding a mandatory "Language" tagging tree in order to facilitate controlling for cultural proximity in cultural evolutionary analyses.

Data acquisition can also be driven in a top-down manner. DRH editors or postdocs may actively recruit particular scholars in order to fill perceived gaps in our coverage. The creation of the Standard Religious Cross-Cultural Sample (SRCCS), explained in more detail below, is primarily driven in this top-down manner, with postdocs either completing their own entries or soliciting entries from colleagues to fill out coverage. In addition to recruitment, top-down data acquisition takes advantage of other entry types in the DRH besides the standard expert entry (Figure 4). The expert entry, our default, is created and completed by the expert themself. As of late December 2022, expert entries currently constitute 75% of 937 DRH entries, and we hope that this proportion will
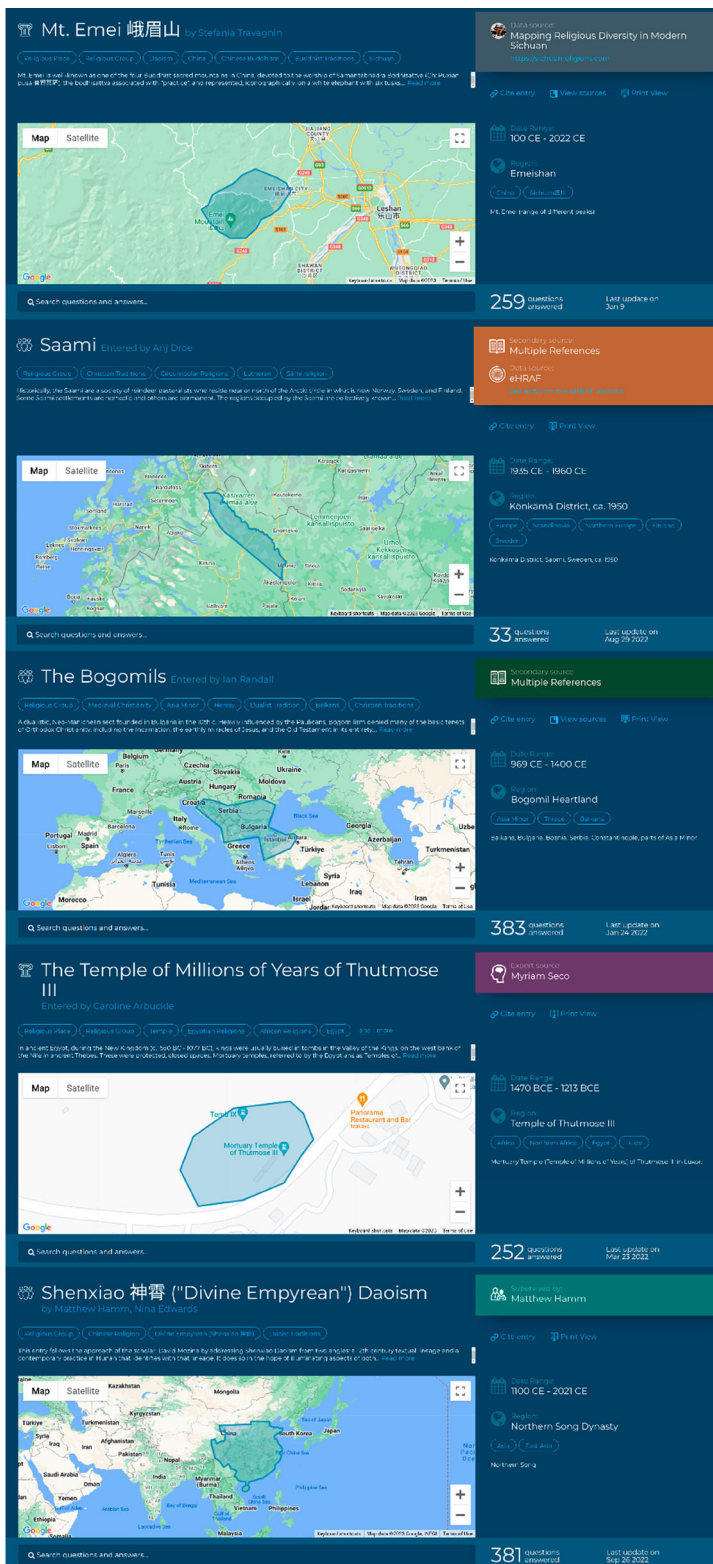
Figure 3. Sample DRH poll question, showing question-specific categorical choices.

Figure 4. Examples of DRH entry types besides standard expert entry (from top): Secondary Source (outside data source), Secondary Source (outside data source), Secondary Source (multiple sources), Expert Source, Supervised Entry.

increase as we rely more and more on bottom-up recruitment. When recruiting scholars (typically senior scholars) who are uncomfortable with digital interfaces, or who lack the time to prepare an entry themselves, we also offer an "Expert Source" entry. Expert Source entries are prepared by a scholar's advanced graduate student, or in some cases a DRH postdoc, using the scholar's own published works. The scholar then reviews, edits where appropriate, and approves the entry before it goes to an editor for final approval. "Secondary Source" entries are prepared by an advanced graduate student working either with a collection of secondary literature or an external database, such as eHRAF or the Pulotu Database of Pacific Religions. Finally, "Supervised Entries" are intended for classroom use, and rely on an instructor supervising one or more undergraduate or early-stage graduate students in completing an entry. Supervised Entries are sometimes top-down driven, but more typically are responses to the pedagogical needs of the relevant instructor.

Any given DRH entry, then, may be composed by an expert who volunteered themselves, an expert who was actively recruited by an editor, an RA in consultation with a given expert, an RA using secondary sources, an RA importing data from an external database, or one or more students under the supervision of an instructor. In all cases, entries are reviewed by an editor and are not published, and issued a DOI, until approved.

In this regard, it might be useful to contrast the DRH with other digital, online resources such as Wikipedia. To begin with, unlike Wikipedia entries, DRH entries are created only by vetted academic experts and subject to editorial peer review. Perhaps more importantly, the DRH preserves scholarly disagreement on the precise outlines and natures of religious groups, places, and texts. For instance, the early Jesus movement associated with the apostle Paul has been traditionally referred to as "Pauline Christianity" in scholarly circles, but more recently some have preferred to emphasize that there was no concept of "Christianity" per se during this historical period, merely followers of a Jewish prophet known as Jesus. Searching for "Paul" in the DRH returns five different Group or Text entries that correspond to what one might think of as "Pauline Christianity," but all with slightly differing names, maps, and date ranges (Figure 5). Each entry documents these scholars' differing opinions on the outlines of the movement and the details of its beliefs and practices. While Wikipedia entries covering the same ground (e.g., "Pauline Christianity" or "Paul the Apostle") do make note of differing scholarly opinion, the specific opinions noted, their precise characteristics, and other potentially crucial details are subject to the editorial judgement of the latest Wikipedia entry editors. The DRH, on the other hand, allows the full spectrum of scholarly diversity to be preserved, with the analyst making their own decisions as to how to weight or filter the resulting data.
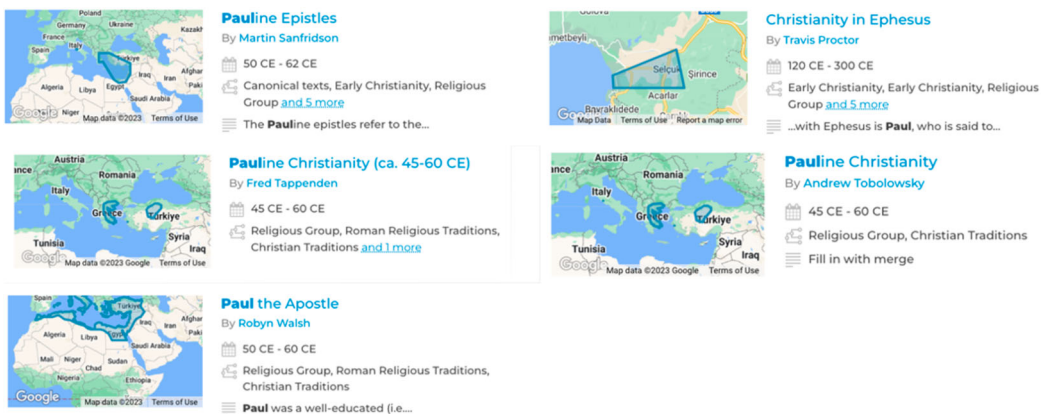
Figure 5. Selected entries returned from a search for the keyword "Paul" that represent differing scholarly approaches to the early Jesus movement sometimes known as "Pauline Christianity."

Armed with this overview of basic DRH structure and workflow, let us now turn to a discussion of the theoretical considerations that drove its design.

DRH coding strategy and ontology: let a hundred flowers bloom

The DRH approach to defining units of analysis was very much influenced by research on cultural evolution, and in particular by models of cultural-group selection (Richerson et al., 2016; Zefferman & Mathew, 2015). Seminal work by David Sloan Wilson (1975) argued for a view of cultural-groups as collections of traits rather than groups of people. For example, models often define a group of those who possess altruistic beliefs and a group of those who possess selfish beliefs. These groups may be structured in a variety of ways, from being fully intermixed within the same geographic location to being structured and separate, maintaining cultural boundaries through geography (e.g., separated by a mountain range) or through differential levels of norm enforcement (punishment for norm violation or rewards for following norms). New advancements in empirical research confirm the value of measuring with a focus on distribution of cultural traits, since people belong to multiple overlapping and embedded groups (Muthukrishna et al., 2020; White et al., 2021). For instance, a person may be Buddhist with animist practices and have cultural traits that are also shared with their fellow Californians. It is important therefore to study the overlapping influence of a variety of cultural (including religious) groups in time and space on historical populations through the detailed and intricate web of traits that make up these groups.

Given this theoretical foundation, the DRH was designed with a focus on flexibly storing answers to questions about specific cultural traits—beliefs, behaviors, practices, and traditions—attached to space–time coordinates rather than traditions or groups of people. The space–time coordinates are defined by a Geographic Information System (GIS) polygon mapping an area and a time range. Of course, even if people can hold multiple traits or change their beliefs, ultimately it is groups of people, defined in various ways, who are seen as the origins of these traits. Since it is more natural to think of groups of people than of groups of traits possessed by people, the DRH began by asking experts to think about religious cultural traits as features of an aggregate unit of analysis, the Religious Group: experts were asked to answer questions about religious beliefs and practices that were characteristic of a particular group of people who could be located in space and time. We have since introduced other units of analysis as alternative lenses through which experts can aggregate and characterize cultural traits, the Religious Place, and Religious Text.

From the perspective of a reader, analyst, or expert contributor, this freedom in defining units of analysis is one of the primary ways in which the flexibility of the underlying database structure is most clearly experienced. The key to this architectural design is that the fundamental unit of data is a trait located in time and space, with the ability to assign these traits to a variety of units of analysis. The design of the DRH's backend database allows for new poll types to be continually introduced while also maintaining discoverability and coherence in our dataset. The centrifugal force of proliferating units of analysis—which could potentially spawn a chaotic or incoherent collection of data —is counterbalanced by the centripetal force of linked questions, named units of analysis, and shared tagging systems grounded in the idea of cultural-groups as groups of cultural-traits.

The balancing of these two forces is a good example of how early design decisions can have significant downstream effects on the flexibility and adaptability of a technical platform, because multiple units of analysis was not at all part of the original conception of the project. The DRH began with its original unit of analysis, the "Religious Group," as the sole poll type. This unit was defined as "a community or network of people (locatable in space and time) who share common practices, beliefs, and/or institutions, but who are not necessarily conscious members of an explicitly recognized group. The group can be an emic (indigenous) name or category or an etic (scholarly attributed) one" (see Tappenden, 2017).

This was sometimes construed by our expert coders quite broadly, especially in the early days of the project. For instance, one early entry by the eminent historian of religion Stanley Stowers, on
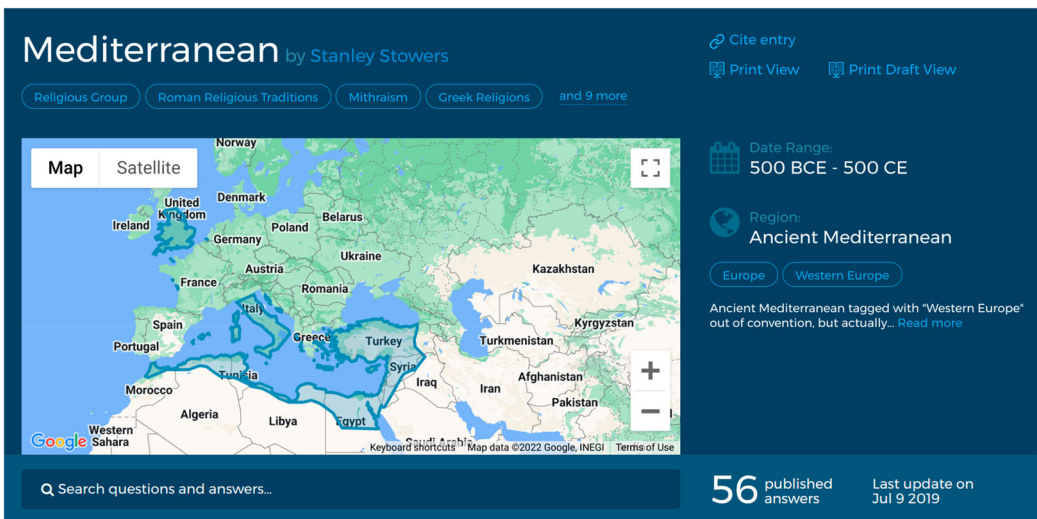
Figure 6. "Mediterranean Religion" by Stanley Stowers.

"Mediterranean Religion" (Stowers, 2019), took as its scope the greatest extent of the Roman Empire and its time range 500 BCE–500 CE (Figure 6).[9]

While such broad-brush entries may, indeed, capture some important shared aspects of religious culture across broad swaths of space and time, we tried to actively steer experts away from such expansive understandings of "groups" and focus, instead, on distinct communities. The mantra that we have encouraged our editorial team to employ when advising new contributors, and that still guides our strategy, is "smaller is better." Rather than coding "Tang Dynasty Buddhism," for instance, editors encourage an expert in this period to focus on a specific Buddhist sect in a specific location over a relatively short time period. The idea is that, as such smaller entries proliferate, an analyst interested in the broader construct of "Tang Dynasty Buddhism" as a unit of analysis can derive it by combining all of the relevant smaller entries, resulting in a more accurate and nuanced generalization.

This bottom-up approach to broader religious categories also allows us to assess the coherence of the categories themselves: does the label "Tang Buddhism" actually capture anything analytically useful, or do we need to revise our categories? We could discover, for instance, that "Tang capital-region religions" or simply "Tang religion" captures more variance in poll questions answers than more traditional labels such as "Buddhism." This focus on small units also directly responds to one of the research desiderata suggested by Watts et al. (2021): by encouraging experts to focus on smaller units of analysis, we "[enable] variation to be studied in its own right" (p. 71). It is impossible to capture this level of granularity with the broad units of analysis employed by Seshat or the various ethnographic cross-cultural databases.

To be sure, broad entries from earlier periods of the project remain in the DRH, and newer ones have been added in cases where RAs or experts have attempted to import data from existing ethnographic or archaeological databases into the DRH. One entry singled out by Watts et al. (2021) in their discussion of the DRH is Central Africa Iron Age (Carleton, 2017), which has a very broad geographical and temporal range compared to a more typical DRH Religious Group entry such as the Oneida Community (Prince, 2020) (Figure 7). However, these broader entries do represent the perspectives of scholars working with historical evidence, and serve as a test for future studies of coherence of regional generalizations.

Watts et al. present the simultaneous presence of groups defined on such different scales as a serious flaw in the DRH design. "This [difference] presents a challenge to systematic cross-cultural
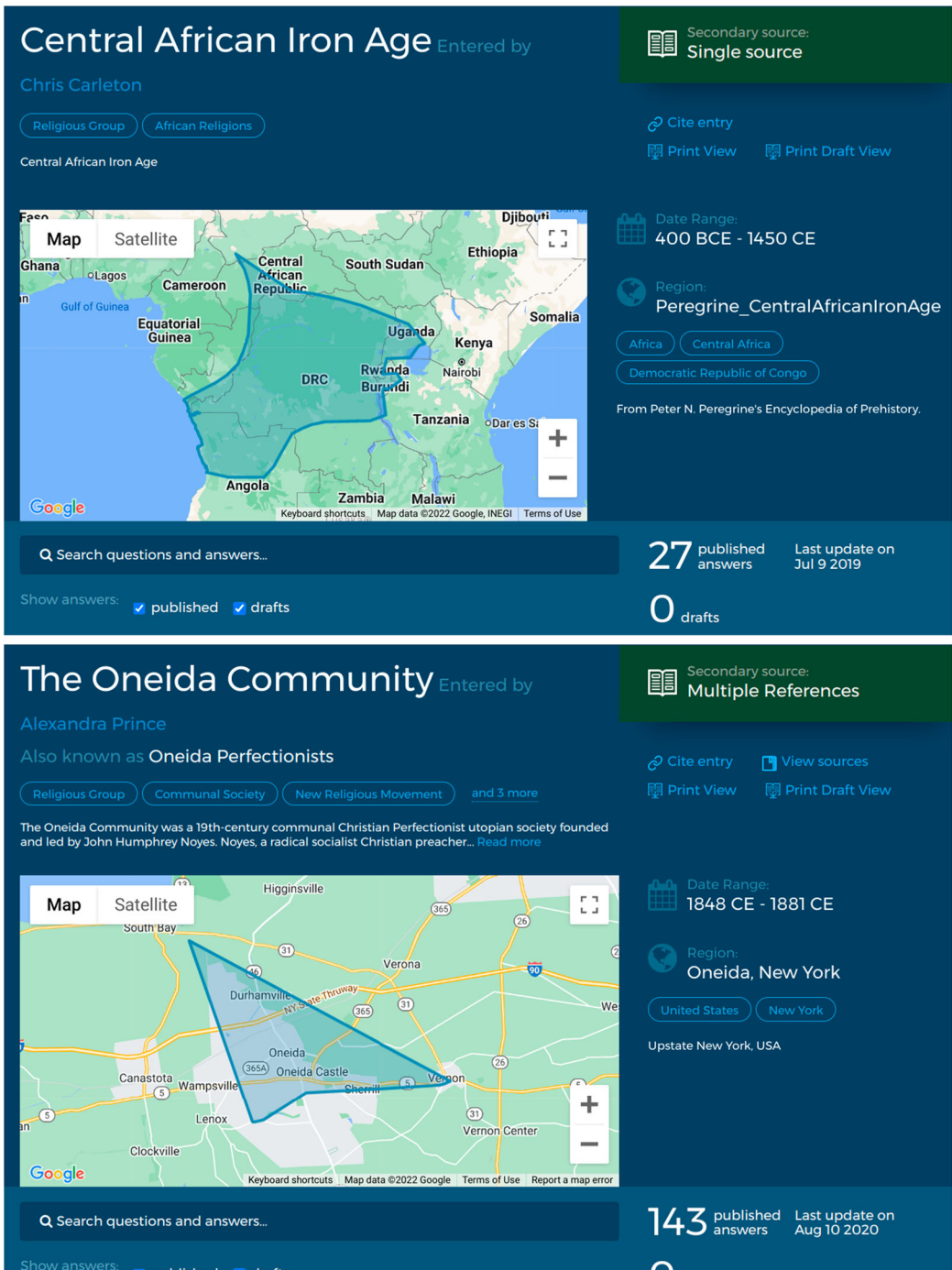
Figure 7. Two religious group entries, Central Africa Iron Age and Oneida Community.

comparisons," they argue, "as researchers must account for differences in scale when comparing the traits of religious groups" (p. 68). We believe that this concern is unwarranted. An analyst wishing to focus solely on more clearly defined Religious Groups could simply exclude from their analysis entries with geographical or temporal ranges above a certain threshold. Broad entries such as

Central Africa Iron Age—which are generally Secondary Source entries pulled from external data sources[10]—currently serve in the DRH as placeholders of a sort, providing sub-optimal coverage of what would otherwise be gaps in the database. The plan is that they will eventually be supplemented (and, if the analyst desires, supplanted) by more narrowly focused entries as our contributor base expands.

A separate concern of Watts et al. concerning DRH structure has to do with the *variety* of our units of analysis, which gets to the heart of the central challenge for database designers. As explained above, the DRH began with a single unit of analysis, the Religious Group. From the very beginning of the project, however, we received feedback from certain experts, primarily archeologists, that they were uncomfortable working with Religious Group as their analytic lens. They might, for instance, work on a temple site in a pre-literate culture, with limited ability to make claims about a purported group that might have used the site. They argued that a different poll would better suit their subject matter, one that dispensed with certain group-specific questions that they found difficult or impossible to answer, and that instead added questions relevant to physical remains that might shed at least indirect light on religious beliefs and practices.

After several workshops on the topic, it was decided to introduce a new unit of analysis to the DRH, the Religious Place, with its own dedicated poll type (https://www.religiondatabase.org/landing/polls/overview-of-polls/2). The Place poll was designed to overlap when possible with the Group poll, often with minor wording changes to better reflect the relevant unit of analysis. In addition, it includes bespoke sections on the built environment and physicality of the site that are not present in the Group poll, allowing an important contingent of our contributors to code aspects of the object of their scholarship that are specific to the concerns of physical archeology. A similar expert-driven process resulted, in 2020, in a third unit of analysis and poll type, that of Religious Text (https://www.religiondatabase.org/landing/polls/overview-of-polls/6). Again, this was a response to experts who had no interest in speculating about the nature of the group that might have produced or used this text, or who study texts used by multiple, incompatible religious groups. Like the Place poll, it was designed to overlap with the original Group poll where possible, again with appropriate wording changes. Also like the Place poll, it contains bespoke sections on, for instance, audience and production, that allow it to capture distinctive aspects of texts, as opposed to groups or places.

A separate driver of poll proliferation in the DRH is collaboration with external research groups. One important function of the DRH is to serve as an open technical platform, one that makes it easier for other teams interested in the cultural dynamics of religion to gather, analyze and publish their data. We are well-positioned to provide this service to the field because we have invested an enormous amount of time and money into our technical stack, and because our home institution, the University of British Columbia, has committed to providing technical support to the DRH in perpetuity. The benefit for external research groups, then, is potentially significant savings in both time and money in not having to build their own, bespoke database, as well as preventing their hard-gathered data from meeting the all-too-common fate of becoming inaccessible—or simply disappearing—once current grant funding is exhausted. The benefit for the DRH is becoming host to new streams of data, albeit typically in the form of new polls tailored to the specific research interests of the scholars in question.

Some collaborations have inspired significant edits to existing polls. A collaboration with the director of the Inform database of New Religious Movements (NRMs) (www.inform.ac), based in the UK, and DRH editors who specialize in NRMs has led to the creation of an entirely new section of the Group poll. The questions in this section—having to do with topics such as funding, founding figures, and legal issues—are tailored for NRMs, and were lacking in a Group poll that was originally envisioned in the context of historical religious groups. Similarly, we are working with the team behind a new, large cross-cultural database of prayer to add a section relating to "Communication with the Divine" to our existing Text poll. Another addition to the Group poll arose out of an August 2022 workshop in Vancouver, where scholars who specialize in East and

South Asian traditions argued that the poll neglects topics related to self-cultivation and self-divination that are common in these traditions, but less so in the Abrahamic faiths that unconsciously motivated earlier versions of the poll. At a scheduled follow-up workshop in Boston in March 2023, we are collaborating with these scholars in composing a new section of the Group poll, which will be incorporated along with the NRM section in an updated version to be released in late 2023. This is a good example of how feedback from experts has forced the DRH to grapple with the sometimes culturally-parochial nature of its etic ontologies, resulting in concrete changes that allow us to better represent the nature of groups, texts, and places across the full spectrum of human experience.

Other collaborations have resulted in the DRH hosting "external polls," religion-relevant polls designed by external research teams in response to their own questions and needs. The first external poll hosted on the DRH, "Practitioners of Mystical Harm" (https://www.religiondatabase.org/landing/polls/49), is a rather small poll created by a single researcher, Manvir Singh, for a particular research project. We are now in the process of developing two more extensive, expandable polls to meet the needs of two larger, ongoing research initiatives focused on religious art and religion and gratitude. These new polls will overlap where appropriate with existing DRH polls, obviate the need for these external research teams to create their own bespoke, expensive platforms, and also ideally allow them to collect opportunistic data from existing DRH experts.

So, in response to both expert feedback and the needs of collaborators, the DRH has ended up employing multiple units of analysis, all containing core areas of overlap, but each containing its own distinct information. These distinct polls provide the project with a method for analyzing religious variables according to different lines of evidence. For instance, we can investigate which questions are more easily answered by experts who specialize in texts rather than archeology. This type of observation is useful for anticipating gaps or areas of missing coverage when the historical record is imperfectly preserved. At the same time, the analytic coherence of the DRH—the centripetal force counteracting the centrifugal forces of continually growing poll types—is ensured through two primary mechanisms: overlap and backend linkage between polls and a single, shared tagging system.

All DRH polls, including external ones, are designed to possess significant areas of overlap, especially with regard to questions that tend to be of interest to those testing hypotheses about cultural evolutionary dynamics. Conceptually identical questions are linked in the database backend and deliver similar results in searches and analyses. For instance, the Group poll question, "Is there special treatment of adherents' corpses?," is linked to a similarly-worded question in both the Place ("Is this a place for treatment of the corpse?") and Text ("Are there special treatments for adherents' corpses dictated in the text?") polls. This means that searching for this question returns results from all three polls, as pictured in Figure 8 below.

An analyst interested in the presence of special treatment of corpses will therefore be able to pull results from across the various polls in the DRH—including subquestions relating to cremation, mummification, exposure to the elements, etc.—that reflect not only the existence of groups that are doctrinally committed to such a practice, but also the presence of physical sites where such practices were carried out or the circulation of texts that advocate such practices. Similarly, the great deal of overlap between new polls created by outside research teams and the DRH Group poll will help to grow a shared, core set of data about the history of religion.

A second type of "glue" that holds together the various DRH units of analysis is the requirement that experts apply to all entries religious tradition tags drawn from a tagging tree that is shared across poll types.[11] An analyst interested, for instance, in "Korean Christianity," can instantly pull all entries relevant to that tag or a parent tag ("Korean religion," "Christianity," "Evangelicalism," "East Asian religions"), whether they are Groups, Places, Texts or external research team polls. External research groups interested in a particular corner of religious cultural space, such as New Religious Movements, also play an important role in expanding and improving our tagging tree.

Finally, the fact that all entry answers are grounded in space and time also creates a different dimension of order in the DRH dataset: any specific question, regardless of poll type, can be queried by an analyst whose main focus is a specific geographic area and time range, or by a researcher

721 answers found

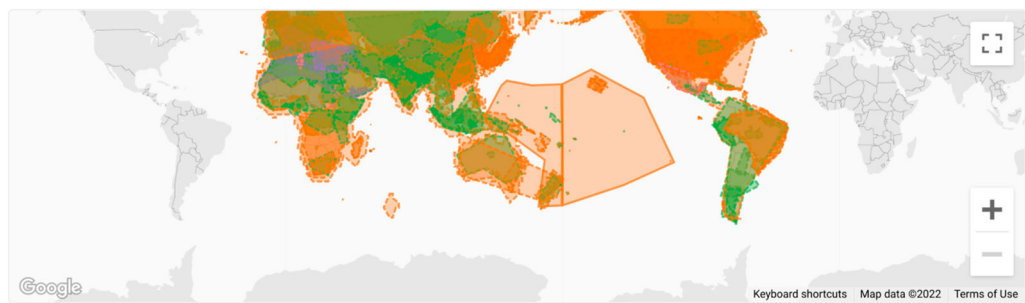721 answers to 1 question (+6 related) in 715 entries from 7 polls.

☑ answers to related questions (613 answers)

☑ affirmations, challenges and comments (2 answers)

QUICK VISUALIZATION   TABLE VIEW

Answer distribution:

Is this a place for treatment of the corpse:

Yes — 5% (6 answers)
No — 83% (99 answers)
Field doesn't know — 6% (7 answers)
I don't know — 6% (7 answers)

Are there special treatments for adherents' corpses:

Yes — 70% (362 answers)
No — 20% (103 answers)
Field doesn't know — 9% (46 answers)
I don't know — 2% (9 answers)

Are there special treatments for adherents' corpses dicated in the text?

Yes — 17% (14 answers)
No — 82% (69 answers)
Field doesn't know — 0% (0 answers)
I don't know — 1% (1 answer)

Show: ☑ Yes ☑ No ☑ Field doesn't know ☑ I don't know Select all

Map results: Display as: Polygon ▾

Keyboard shortcuts Map data ©2022 Terms of Use

Figure 8. Visualization results for the Place poll question, "Are there special treatments for adherents' corpses" (https://religiondatabase.org/visualize/3407/), with related questions from the Group and Text polls.

interested in a particular topic. In other words, although our analytic unit of analysis might be a Religious Group, Place or Text, specific cultural traits—discoverable through keyword searches—can be explored individually, disaggregated from the larger unit of analysis with which they are associated.

In conclusion, while Watts et al. (2021) portray the promiscuity when it comes to allowable units of analysis as a structural flaw in the DRH,[12] it is, in fact, a design feature—albeit one that strikes a balance between the ideal desires of cultural evolutionary analysts and the experts from whom they must get their data. To concede a point to Watts et al., it is fair to say that the proliferation of poll types in the DRH is not what someone solely concerned with cultural evolutionary analysis would desire. The DRH began with the Religious Group as its only unit of analysis, and there is a certain structural elegance and analytic simplicity that would have been gained by forcing scholars interested in particular sites or texts to shoehorn their characterization of these aspects of religious culture into a purported group that could have been said to have used these sites or texts. The problem is simply that scholars of religion *do not like to do this*. Clicking radio buttons to convert their qualitative judgements into data is already extremely jarring and foreign for them. Forcing them to recharacterize their topics of research would create an even greater barrier to recruitment.

This is perhaps the most dramatic way in which the basic structure of the DRH has evolved in response to the desires of our experts, a topic we will return to below. Similarly, requiring external research groups to use one of our own polls to collect their data would be unappealing to them and

ultimately counterproductive. Both external teams and the DRH benefit when we can meet them halfway, providing the control, authorship and specificity they require to pursue their research interests while also ensuring enough overlap that—especially combined with the employment of a shared tagging tree—the expansion of a coherent set of data will be ensured.

The benefit of promiscuity: a comparison of units of analysis across cultural databases

Before moving on to the particular methods and features of the DRH, it would be helpful to add some flesh to the bones of the rather abstract discussion of units of analysis above.

Imagine an analyst interested in religious cultural evolution in the area corresponding to modern Vietnam. HRAF contains an entry on "Vietnam: Vietnamese," covering the full span of Vietnamese history, from prehistoric archeology to the modern state. It provides an excellent short overview of religious history in the region, and notes the co-existence of world religions like Mahayana Buddhism and Christianity with local animist beliefs, but is of little or no help to a scholar interested in coding or tracking the development of religious belief and behavior over time. The SCCS covers two cultures in this region, "Annamese/Vietnamese" (SCCS73) and "Rade" (SCCS74).[13] Both entries are based on ethnographic data gathered in a single time slice from near-contemporary societies, the former in the 1930s and the latter in the 1960s. The entry on Annamese contains a few codes for religion, identifying the local religion as Mayahana Buddhism and also coding "high gods" as absent (Figure 9).

For the Rade, filtering for religion we find two codes, identifying the local religion as "indigenous religion" and high gods as absent (Figure 10). The Ethnographic Atlas code for "high gods" (EA034) is quite specific and culturally particular, including the requirement that the supreme being created the world, which might account for why Mahayana Buddhism is coded as not possessing a high god.

Overall, the data on religious belief and practice is not extensive—not surprising considering that the focus of the SCCS is not religion in particular—and we only have two, temporarily flat slices of "culture" in Vietnam. Two deeper problems with databases such as these are expressed well by Turchin et al. in a recent article:

Showing 1 to 8 of 8 entries (filtered from 1,044 total entries)

← Previous | 1 | Next →

Variable ▲	Datapoint ↕	Details	Focal year ↕	Subcase ↕
religion	Search		Search	Search
Fact_7 Farming & Religion Gossip Scale (sum of Farming And Religious Gossip) [SCCS1805.7]	Absent	more	1930	Red River Delta in Tonkin
Gossip on Religion [SCCS1804]	Absent	more	1930	Red River Delta in Tonkin
(Pre-classical) Religion [SCCS713]	Mixture of classical & preclassical	more	1930	Red River Delta in Tonkin
Religion: 11.1 Changes in Native Religion [SCCS1836]	Present	more	1930	Red River Delta in Tonkin
Religion: 11.2 Introduction of Foreign Religion [SCCS1837]	Present	more	1930	Red River Delta in Tonkin
Religion: 11.3 Changes in Burial Practices or Other Rituals [SCCS1838]	2 additional items present	more	1930	Red River Delta in Tonkin
Religion: high gods [Note, identical to EA034] [SCCS238]	Absent	more	1950	Red River Delta in Tonkin
World Religions (1807) [SCCS2002]	5 (Mahayana Buddhism)	more	1930	Red River Delta in Tonkin

Figure 9. "Religion" variables for the SCCS culture "Annamese/Vietnamese" (https://d-place.org/society/SCCS73 filtering by "religion" in column "Variable").

Figure 10. "Religion" variable for the SCCS culture "Rade" (https://d-place.org/society/SCCS74 filtering by "religion" in column "Variable").

> First, these databases promote a global "ethnographic present" that largely excludes modern European populations and large-scale complex societies of the past. Many entries draw exclusively on dated summaries of contact-era accounts, or ethnographic research conducted with indigenous populations living under colonial rule, strongly influenced by the scholarly discourse of the mid-twentieth century. Second, synchronic or static databases, such as the SCCS and the Ethnographic Atlas, cannot tell us how societies change over time, and thus provide only limited insight into the causal mechanisms at work in cultural evolution. (Turchin et al., 2022, p. 3).

A dataset composed exclusively of single snapshots of the "ethnographic present," however detailed, will be of limited use in discerning dynamics of cultural evolution over long time scales.

Turning to the DRH, filtering current coverage using a map of contemporary Vietnam returns 34 entries,[14] ranging from 700 BCE to the present day (Table 1).

The earliest entries primarily relate to groups and texts from early and imperial China, when the north of Vietnam was firmly part of a broader Chinese cultural sphere, heavily subject to Chinese cultural influence. They also include, however, an early Hindu movement, Pāśupatas (Acri, 2018), that originated in India but spread as well to Southeast Asia. Later entries include broadly circulating texts and widely dispersed groups—Confucian, Daoist, Buddhist and even Christian (Nestorian Christianity)—that influenced Vietnamese culture in the medieval period. We also find two place entries (The Ppo Romé temple-tower complex and Đồng Dương Temple), dating from 500 CE-1400 CE, that give insight into, respectively, local Buddhist and Hindu sects of the Cham people, both of which represent distinctive blends of local and world religious traditions. Finally, a scholar interested in near-contemporary indigenous religion is given two entries, Raglai (Quang, 2019) and Haroi (Quang, 2020), local syncretic sects such as Cham Bani and Cham Ahiér (Noseworthy, 2018, 2021)[15] that combine elements of Islam, Hinduism, and Mahayan Buddhism, as well as specifically local forms of Mahayana Buddhism (Buddhism in the Mekong Valley, Truong, 2020) and Christianity (Hmong Christianity, Rumsby, 2019)—the latter of which has traveled with the Hmong diaspora to North America and Europe. It should also be noted that, although the DRH definition of a supreme high god[16] differs somewhat from "high god" as defined in the EA, the plethora of "Yes" answers in this region should make an analyst nervous about accepting the SCCS coding on this topic.

Not all of these entries will be relevant given the goals of a given study, and can be easily excluded from the analysis. As this eclectic mix suggests, however, religious cultural history is *complicated*, with multiple strands of indigenous and imported religions evolving, competing, blending, and borrowing from one another with bewildering speed (see, for example, Hansen et al., 2020 and Kitiarsa, 2005). Given our still minimal coverage, there are clearly many pieces missing in the DRH portrayal of religion in Vietnam. However, it is difficult to see how one could assemble the full mosaic of these cultural evolutionary processes without something very much like the approach we have adopted: multiple small, focused, detailed accounts of groups, places, and texts, all grounded in space and time, and covering the full course of archeological and recorded history.

The only other large cross-cultural database besides the DRH that addresses the need to provide diachronic coverage is the Seshat Databank. Seshat does not provide coverage of Vietnam, but we can move northward to look at their coverage of the Middle Yellow River Valley (MYRV) to get a

Table 1. DRH entries overlapping with map of modern Vietnam (as of 28 July 2022), with codes for "A supreme high god is present"

Entry name	Entry ID	Date range	Region name	Supreme High God
Shijing 詩經 (Classic of Odes)	1176	700 BCE–1911 CE	Early and early imperial China	Yes
Shangshu 尚書 ("Higher Writings"; also, "Documents")	1062	700 BCE–1911 CE	Early and early imperial China	IDK, Yes
Lunyu 論語, The Analects	1063	500 BCE–1911 CE	Early and early imperial China	No, Yes
*Xing zi ming chu 性自命出, Natural Dispositions Come from Endowment	1067	400 BCE–200 BCE	Early and early imperial China	No
Han Imperial Cult under Emperor Wu	1044	141 BCE–87 BCE	Western Han–202 BCE–9 CE	Yes
Pāśupatas	535	200 CE–1200 CE	South Asia, Southeast Asia	Yes
Ancestral Cult of the Han	178	206 BCE–220 CE	Eastern Han 140 CE	Yes
Han Confucianism	204	206 BCE–220 CE	Eastern Han–140 CE	Yes
Xuanxue 玄學	294	200 CE–600 CE	Southern and Northern Dynasties 440 CE	Yes
Early Medieval Confucianism	1140	220 CE–589 CE	Northern Wei and Liu Song Dynasties	Yes
Dazhidu lun 大智度論	1075	402 CE–406 CE	General range of use for the Dazhidu lun	No
Nestorian Christianity	972	431 CE–1500 CE	Nestorian Christianity	Yes
The Master of the Golden Tower (Jinlouzi 金樓子)	1141	502 CE–557 CE	Liang Dynasty China	No
Mỹ Sơn Sanctuary	831	500 CE–1400 CE	Mỹ Sơn, Vietnam	Yes
Christianity in Tang China	1149	635 CE–845 CE	Tang China (c. 700 CE)	Yes
Late Medieval Chinese State Religion	240	775 CE–960 CE	Tang China (ca. 820)	Yes
Dong Duroing Temple	813	900 CE–1000 CE	Central and Southern Vietnam	Yes
Cham Bani	476	1000 CE–2015 CE	Cham Bani Communities	Yes
Taijitu shuo 太極圖說	1055	1050 CE–2021 CE	Area of Circulation for the Taijitu Shuo and Tongshu (East Asia)	No
Tongshu 通書	1079	1050 CE–2021 CE	Area of Circulation for the Taijitu Shuo and Tongshu (East Asia)	No
Wuzhen pian 悟真篇	1160	1075 CE–1078 CE	Regions that potentially received the Wuzhen pian in the Song dynasty	Yes
Zichiji 資持記	1042	1078 CE–1271 CE	Northern Song Dynasty	Yes
Dalikal Ppo Klaong Garai	1025	1151 CE–2020 CE	Cham Ahiér	No
Raglai	727	1160 CE–2017 CE	South Central Vietnam	Yes
Chongyang Lijiao Shiwu Lun 重陽立教十五論	1170	1200 CE–2021 CE	Area of Quanzhen	No
Haroi	752	1470 CE–2019 CE	Cham H'roi	Yes
The Taizhou Movement	1060	1500 CE–1600 CE	Ming Dynasty	IDK
Cham Ahiér	520	1600 CE–2015 CE	Cham Ahién	Yes
The Ppo Romé temple-tower complex (Bimong Kalan Ppo Romé, Tháp Ppo Romé)	683	1600 CE–2015 CE	Ppo Romé Temple-Tower Devotees	Yes
Chan Buddhists in early Qing period	941	1600 CE–1700 CE	China in the seventeenth century	Yes
Sino-Muslims in Qing China	1038	1644 CE–1911 CE	China proper	Yes
Hmong –Christianity	526	1900 CE–2018 CE	Hmong-Miao speakers in Southern China, Southeast Asia and the US and French diasporas	Yes
Catholics in the People's Republic of China (PRC)	883	1949 CE–2020 CE	Early and early imperial China	Yes
Supreme Master Ching Hai World Society	570	1986 CE–2018 CE	Transnational Cybersect, East/Southeast Asia, California (predominately among Chinese and Vietnamese diasporic communities)	Yes
Buddhism in the Mekong Delta	751	2020 CE–2025 CE	Vietnam	Yes

sense of the difference in granularity of coverage. As mentioned earlier, Seshat slices the polities present in their Natural Geographic Areas (NGAs) into roughly 50–200 years slices. In this region of China, this generally corresponds to distinct dynasties, although longer dynasties are further sub-divided (http://seshatdatabank.info/databrowser/middle-yellow-river-valley.html). For instance, in the early medieval period the MYRV is divided into four polities in Seshat:

25–219 CE Eastern Han

265–317 CE Western Jin

386–557 CE Northern Wei

581–617 CE Sui

For each polity, Seshat provides 16 codes related to "Religion and Normative Ideology," some with justifications. Users are also directed to a backing "Moralizing Supernature Punishment Narratives[17] (hereafter 'Narratives'") to further understand the coding process.

The Narratives for this period (pp. 106–108) do a nice job of briefly characterizing, in qualitative terms, native ways of thought, the introduction of Buddhism, and the interaction of the various traditions. Turning to the Databank itself, however, it is not clear how the Narrative relates to the actual codes assigned. For the codes that have justifications (the first seven, having to do with deification of rulers and normative ideas concerning equity and prosociality), the codes and coding justifications are identical from the Western Jin to Northern Wei, an over 350-year period characterized by great religious innovation and upheaval.[18]

Focusing on one of the sets of codings without justifications, "Moralizing enforcement in afterlife," this is coded in the Eastern Han as "absent," even though the Narratives note that, in the Eastern Han, Buddhism introduced to China the idea of punishments in the afterlife (pp. 106-107). The Narratives also note that Buddhism was not recognized as an official ideology in the Eastern Han, which perhaps explains the "absent" coding—since we are getting only a single code for the period, perhaps by default it is the official ideology. One can see, however, how this overly simplifies the religious cultural reality on the ground. Entering the Western Jin, this variable is still coded as "absent," even though the Narratives identify Mahayana Buddhism, which certainly endorses moralizing enforcement in the afterlife, as an official state ideology (p. 107). The coding then switches to "present" for the Sui and Northern Wei, again without explanation.

Turning to DRH coverage of this same period, Table 2 lists entries from this medieval period that overlap geographically with the Seshat MYRV map. For the sake of simplicity, entries for earlier groups or texts with long date ranges (such as transmitted classics, e.g., the *Book of Documents* or the *Analects* of Confucius) are not included.

Here we find a rich mix of folk, Daoist, Confucian, Buddhist, and even Christian groups or texts. An analogous variable in the DRH to the Seshat "moralizing enforcement in afterlife"[19] returns a variety of answers, including a mixture of "yes" and "no" answers even within what we might think of as monolithic "traditions" like Daoism, Confucianism or Buddhism. This suggests that the actual situation on the ground with regard to these sorts of religious beliefs is considerably more complex than the Seshat unit of analysis or coding strategy is able to reflect.

To be sure, current DRH coverage is merely a fraction of what we anticipate it will become over the next several years. Even these snapshots of two corners of the database, however, give a sense of how utilizing many small units of analysis (groups, places, texts), all grounded in space and time, can allow an analyst to build up a picture of cultural evolutionary processes in a given region of the world in a way that preserves the complexity of history and provides real diachronic depth. This approach also supports the study of historical psychology (Muthukrishna et al., 2021), reconstructing data from dead minds to understand the historical origins of present-day psychology, the psychology of the past, and what causes psychology to change over time. It similarly reconciles high-level, more natural units of analysis with low-level theoretically-grounded groupings of cultural-traits, allowing analysts to apply statistics which have thus far been limited to contemporary data —such as the calculation of cultural fixation (CFst; Muthukrishna, et al. 2020; Obradovich et al., 2022; White et al., 2021)—to historical data.

We acknowledge that our ontological promiscuity deprives one of the neatness and simplicity of comparing oranges to oranges: with no unitary, homogenous "Western Han" religion to compare to a similarly monolithic "Roman Empire" or "Ptolemaic Kingdom" religion, analysts pulling DRH

Table 2. DRH entries from 25 CE to 617 CE with geographical regions touching the Seshat MYRV NGA, as of 3 August 2022, excluding circulating texts from earlier periods, and showing answers to the question, "Supernatural punishments are meted out in the afterlife."

Expert	Entry	Entry type	Dates	Afterlife punishment?
Lu, Zongli	Chen-Wei Texts	Confucian/Daoist text	56–907 CE	Yes
Hendrischke, Barbara	Taiping jing	Daoist text	150–2022 CE	Yes
Lynn, Richard	Xuanxue	Daoist group	200–600 CE	No
Puglia, Francesca	Soushen ji 搜神記	Daoist/folk religion text	100–350 CE	Yes
Kong, Xurong	Fuzi 傅子	Confucian/Legalist text	217–278 CE	No
Knapp, Keith	Medieval Confucianism	Confucian group	220–589 CE	No
Wei, Wu	Early Daoist text-Commands and Admonitions for the Families of the Great Dao	Daoist text	200–500 CE	Yes
Landry, Nelson	Ji shenzhou sanbao gantong lu 集神州三寶感通錄	Buddhist text	266–664 CE	Yes
Greene, Eric	Chinese Buddhism Northern Wei	Buddhist group	386–534 CE	Yes
Orsborn, Matthew	Dazhidu lun 大智度論	Buddhist text	402–406 CE	No
Cha–ng Chaojan (entered by Bingxia Bian)	Lingbao dafa	Daoist text	400–1400 CE	Yes
Hsieh Shuwei (entered by Bingxia Bian)	Duren Jing	Daoist text	400–500 CE	No
Koralija, Srecko	Nestorian Christianity	Christian group	431–1500	Yes
Assandri, Friederike (entered by Matthew Hamm)	Twofold Mystery (Chongxuan 重玄)	Daoist group	500–700 CE	Yes
Toscano, Dominic	The Master of the Golden Tower (Jinlouzi 金樓子)	Folk religious/state religious/imperial Conf	502 - 557 CE	No
Kai Sheng (entered by Fan Wenli)	Shedachenglun 攝大乘論	Yogacara Buddhist text	525 - 650 CE	No

data will have to construct their own sampling strategies, units of analysis, and plans for how to employ Group versus Text versus Place entries. For instance, in a current collaboration with the analysts who produced Poulsen & DeDeo, 2023, we are having to devise ways to deal with oversampling in some regions of space and time and undersampling in others, while also supplementing Group entry answers with data pulled from Place and Text entries in specific ways that respect the logic of how Places and Texts naturally nest under larger Group rubrics. This is not easy, but we believe that the resulting analysis will be based upon much richer, more accurate data than is possible with any other database resource.

Finally—related to the issue of uneven sampling—there are definite costs to an expert-centered approach, not least of which is the extremely slow and unpredictable nature of the data gathering. The payoff, however, is much greater detail and nuance than any other existing architecture of which we are aware. It is our firm belief that there is no way to ensure high-quality and accurate data concerning the cultural historical record without something like this kind of flexibility in units of analysis combined with fine granularity. The difficulty, of course, is getting humanities experts on board. While challenging, this barrier is not impossible to overcome, and there are also ways to mitigate the short-term downsides of the expert-centered approach. We will address both the challenge and mitigation strategies below.

DRH coding strategies and feature development

In previous publications, we have compared expert-based and research assistant (RA)-based data collection strategies when it comes to constructing cross-cultural databases (Slingerland & Sullivan, 2017; Sullivan et al., 2015/2017). Both approaches have their advantages and disadvantages, and

both can produce (in ideal circumstances) high-quality data for later analysis. RA-based coding is usually performed by full-time personnel directly hired by database directors for the express purpose of filling out database coverage. Advantages include predictable, targeted data collection and the ability to impose a clearly-understood and consistently-applied coding rubric (see Turchin et al., 2020, pp. 46–48, for a description of an RA-based coding method). Downsides include the need for significant funding for the RAs, as well as coding quality concerns that arise when RAs are working outside of their domains of expertise (Slingerland et al., 2020b Slingerland & Sullivan, 2017;). This approach is also difficult to scale up, and risks potentially negative reactions from humanities scholars if they feel that their own expertise is not being taken seriously by the scientific community.

Expert-based coding provides the highest levels of expertise and nuance, as the decisions concerning how to convert qualitative judgements into quantitative codes are being made by the people who best understand the relevant material. A potential downside is idiosyncrasies in interpreting coding rubrics. This can be somewhat mitigated by tight editorial control, as well as allowing experts access to discussions of particular coding decisions made by previous experts.[20] The challenges when it comes to expert-gathered data, however, are much more serious than this. Humanities scholars not only have little to no interest in providing quantitative codes for their qualitative knowledge, they are also typically actively and theoretically opposed to doing so, being suspicious of scientific approaches to the study of culture. There is also currently very little agreement on the value of digital humanities or digital-native publications, as opposed to traditional monographs, edited volumes Oxford, or journal articles in issues of hiring and promotion. This means that expert coverage accumulates slowly, and is both hard to target and impossible to accurately predict.

As we will explain below, the principled resistance to coding qualitative data can be at least partially overcome by emphasizing the more traditionally humanistic functions of the DRH platform. The other central drawbacks to the expert-based approach—slowness and unpredictability in data coverage—can, however, not only be surmounted but, ideally, transformed instead into a strength. If one can successfully create a new scholarly culture within which contribution to an online platform such as the DRH becomes normative, one can completely bypass the data-gathering bottleneck inherent to the top-down, RA-based method. Were this cultural shift to take hold, data gathering could potentially ramp up exponentially as contributors attract new contributors through word of mouth, publishing a DRH entry on religious group X comes to be seen as a badge of expertise on that topic, and DRH publications on a CV begin to mean something to hiring and promotion committees.

In order to help this cultural shift to happen, we became aware quite early on that it would be necessary for the DRH to become a useful resource to humanities scholars themselves, for their own purposes. Partly, this involved emphasizing to humanities scholars that the quantitative aspect of the DRH was not only useful to scientists studying cultural evolutionary dynamics, but also to humanities scholars themselves. We have argued (e.g., Slingerland, 2019) that scholarly generalizations in the humanities ("Early Chinese religion did not place a great emphasis on the afterlife") have, up to now, been essentially reports of gut feelings about scholarly consensus in one's field. Such intuitive judgements may have been adequate when fields were small and changed slowly, but our intuitions are no longer able to keep up with the information explosion that every branch of the university has undergone with the advent of online publications, proliferating journals, and increased production of high-quality non-English scholarship. The ability of the DRH to provide an instant overview of scholarly opinion on a given question is thus an invaluable tool for any humanities scholar or classroom instructor.

In addition to explaining the humanistic importance of the central function of the DRH—turning qualitative into quantitative—our recognition that we needed to appeal to fellow humanists has motivated us to create an architecture and technical platform that has, in certain regards, prioritized humanistic desiderata over what might be desirable from the point of view of a scientist interested in performing a cultural evolutionary analysis. For instance, APIs, data download, and analytic

features have taken a back seat to visualization functions that can enhance classroom experiences and bibliographic functions useful to humanities researchers. Below we note some of this more humanities-friendly functionality, as we believe this sort of appeal will be crucial to any successful cultural database.

Rich qualitative data and DOIs

Early attempts to get entries for the DRH emphasized poll completion as simply clicking a radio button for each question and moving on to the next. This resulted in shorter entry completion time, but left both the experts unsatisfied with their experience and the project without relevant contextual data for each answer. More recently, our guidelines for experts have emphasized the desirability of writing qualitative comments to contextualize each answer and including rich-media (images, text, video, audio) alongside their qualitative comments to give the reader (or analyst) a fuller picture and justification for their choice of quantitative answer. This emphasis has two purposes. To begin with, the narrative justification is useful for both analysts and historians interested in understanding the background sources and decision-making process for a particular coding decision. Secondly, it also allows the historian to express their fuller understanding of the particular source material, which in turn contributes to their satisfaction with the entry itself. Additionally, the ability to add rich media allows experts who have personal photographs or otherwise unpublished material a venue for making this material available to the wider scholarly community. Adding qualitative comments throughout means that, when searching the database, the user will get what are essentially mini-encyclopedia articles on the topic by a wide range of experts, which can be extremely useful entirely apart from whatever categorical answers might be attached to them (Figure 11).

Aside from the rich qualitative comments and media added by the expert, they do in the end actually have to come down on a quantitative answer: "Yes," "No," "Field doesn't know," or "I don't know." Early versions of the database included only the first two, while the latter two were added over time. These answer options ("Field doesn't know" and "I don't know") provide two main benefits to the project. The first is purely a psychological benefit for our experts: rather than leave a question unanswered, and therefore the entry incomplete, they can choose one of these two options, which has resulted in a much higher rate of completion. These answer options also provide important data to analysts and future researchers—for instance, a concentration of "Field Doesn't Know" answers might help identify promising lines of scholarly investigation.

Digital projects also have to keep in mind the legacy of their data and design sustainability guidelines for archiving and dissemination. The DRH currently takes completed entries that have passed through editorial oversight and archives a PDF version of the entry with the UBC library in their cIRcle repository (https://open.library.ubc.ca/search?q = contributor:%20%22Database%20of %20Religious%20History%20(DRH)%22). As part of this process, DOIs are minted for the entries as well, which allow for easier citation and discoverability for the material in the DRH. The process of minting DOIs and archiving data is one step in an on-going effort to enroll the DRH in a standard indexing service, a development that will both benefit our experts and increase the appeal of contributing to the DRH.

Bibliography function

Previous versions of the DRH allowed experts to add citations to their entries and individual entries with the rich qualitative comment fields. This was sufficient for capturing the sources and references used by the expert, but lacked integration with standardized citation tools or systematic integration within the database. A recently designed feature now allows experts to add one or more references per answer (and general citations for the entry) through a rich citation interface. This makes it much easier for experts to add citations (and cite previously mentioned material). From an analyst's
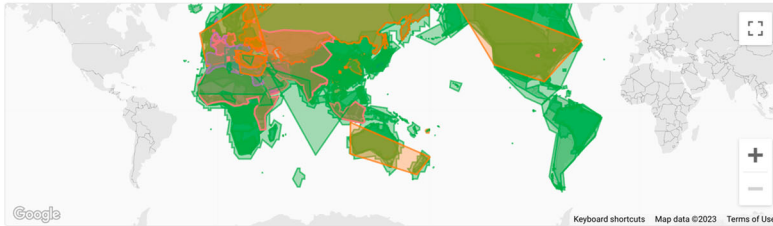
Figure 11. Map view, table view, and zoom into comment on an answer to the query, "Is a spirit-body distinction present?"

perspective, since these citations are integrated within the database and linked to specific answers and entries, they can also be added to existing query methods and serve as an important data-point for meta-analyses.

This citation-querying ability is not merely a benefit to quantitatively-oriented analysts. Humanities researchers can also use it to find relevant citations on a per question basis rather than the traditional top-down search for comporanda (recent encyclopedia entry, secondary sources, relevant primary work). For example, researchers interested in foodways can find citations that directly reflect their discrete questions from neighboring (or even global) perspectives. Similarly, a researcher could look for very recent citations across the database dealing with particular questions. Within the scope of meta-analysis, this type of data opens up a wide range of interesting topics—for example, which fields are relying on publications from a small group of scholars, or which questions lack any recent citations and are therefore likely in need of more study.

Pedagogical uses and supervised entries

The DRH team has also received separate grant funding to create a suite of pedagogical resources, in the form of lesson plans and instructor guides, for use in a variety of classrooms ranging from secondary to post-secondary and graduate-level classes. These lesson plans start by introducing students to the basic concepts at the core of quantifying qualitative information (falling under the popular pedagogical category of "digital literacy"). Later lessons task the students with comparing discrete entries in the DRH, visualizing questions across time and space, and finally using sample data to explore the analytical power of the dataset. All of the lesson plans and instructor guides are available on the website under Creative-Commons licensing (https://religiondatabase.org/landing/about/pedagogy#material).

Additionally, the DRH has created a separate entry type, Supervised Entry, and accompanying documents for instructors. This entry type is intended to facilitate a collaborative student experience wherein a single student (or group) works with their instructor to create an entry based on material relevant to their classroom experience. This introduces the student to crucial research skills—what resources to explore, how long to search before concluding "Field doesn't Know," etc.—and students are encouraged to seek the input of an expert to oversee their work and vet the final product.[21] It is impotant to note that entries created through this process are clearly labeled in the DRH as such and can be omitted from a data sample if desired.

Some members of the project also recently published an article in the journal *Religions* focused on using the DRH for pedagogy. The piece, Danielson et al., 2022, takes core questions from Religious Studies (namely the existence of supreme high gods) as a starting point and demonstrates how to visualize results from the DRH with an eye toward having students investigate these questions in a variety of cultural contexts.

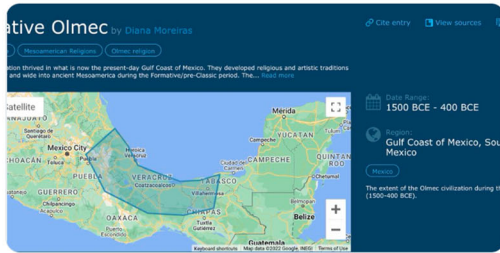### Social media outreach and multilingual access

The DRH twitter feed is quite active, with our postdocs featuring new entries as they are published. They are not only able to reach a broad and discipline-specific audience, but can tailor the thread to feature the sort of information their followers would find interesting. For instance, postdoc Diana Moreiras posted a thread on one of her own entries on the "Formative Olmec" (Moreiras 2022) (Figure 12). Besides garnering multiple likes and re-tweets, and therefore at least indirectly expanding awareness of the DRH, Moreiras was contacted by several experts in her field who had never heard of the DRH, but are now interested in contributing entries of their own.

Dr. Moreiras has also translated DRH recruitment documents into Spanish, and is in the process of translating all of the polls and the interface into Spanish. Spanish will join Chinese, soon to be followed by an updated French version (to be supervised by new postdoc Dr. Julian Weideman) and

future expansions to Arabic, Japanese, and other languages. The ability of experts to interact with the DRH in their language of preference involves a great deal of both technical development—we are currently working on a system to organize the various language versions of the site and the polls—and highly-skilled work. It also entails a certain degree of analytic risk: the possibility that technical terms in other languages might not be perfect analogs for English terms, thereby limiting the inter-usability of data gathered in various languages, is a constant worry. This is one reason we only expand into languages where core team members, such as postdocs, have both native fluency and knowledge of the scholarly literature, to ensure that translations are as accurate as possible and to flag potential translation problems. The payoff is not only the ability to tap into new and extensive

pools of international experts but also potentially to correct any biases that might result from an over-dependence on English-language scholarship.

Dual-use platforms: the only way forward for cultural databases

Turning the DRH into a platform that is intuitive and pleasant to use, useful in the classroom, and that serves the specific needs of humanities scholars as well as cultural evolutionary analysts, has involved an enormous amount of development time and expense. We feel that this sort of investment is not only worth it in the long run but essential for any successful cultural database. Projects which attempt to realize only one of these aims will encounter difficulty succeeding due to lack of funds, audience, and analytic capability. Data-heavy sites can lose the interest of their humanities constituency and co-partners, RA-based data gathering is dependent on regular funding and constant oversight, and projects without pedagogical components lose the important methodological influence of student and classroom-led thinking.

The only viable long-term strategy for breaking out of data-gathering bottlenecks, and to producing a large and continually-growing cultural dataset, is to tap into the expanding community of experts who actually study the cultural historical record. The promise is potentially exponential growth, as experts encourage their colleagues to sign up via social media and word of mouth, and contributing to the platform becomes a new sort of scholarly norm. The DRH is still some way from reaching this breakthrough point, which we believe will ultimately require being listed on a major indexing service (crucial especially to scholars in Europe and Asia) and having our data used in more scholarly publications in the humanities. There are, however, promising signs that we are beginning to hit our stride when it comes to recruitment. As Figure 13 indicates, after a large bump in Fall 2020, caused by a specific targeted recruitment drive, the rate DRH entry publication dipped back to historical norms but then began to grow more steadily in winter of 2021 when the project began relying more on incoming postdocs for expert recruitment.

Continuing on this trajectory will give us a critical mass of entries, all deposited with UBC library and issued DOIs, which in turn should help make the case for our being listed on scholarly indexes.

DRH entries published by month
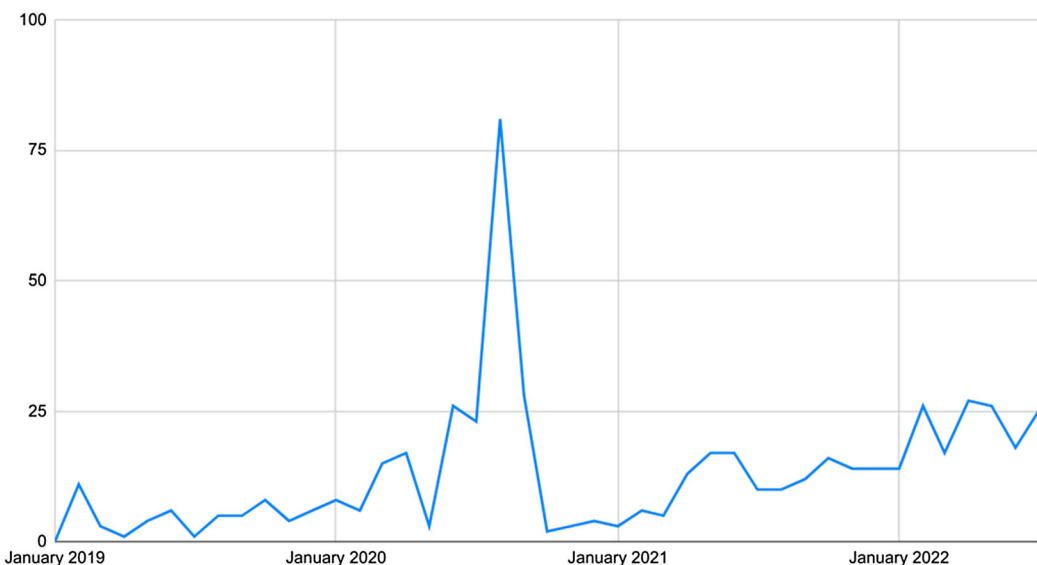
Figure 13. New DRH entries published by month from January 2019 to present.

Once publishing a DRH entry becomes a clear positive on a scholar's CV, useful for both promotion and merit purposes, we anticipate a rapid and continuous increase in our coverage.

Changing scholarly norms—so that contributing to the DRH or serving as a DRH editor becomes a recognized research output or service contribution—is the key to the long-term viability of the DRH strategy. Unlike most other digital database projects, the DRH enjoys the benefit of having a permanent institutional home: the University of British Columbia has committed to support the DRH in perpetuity, pledging to cover hosting costs, technical maintenance and some administrative staff. On the other hand, our ability to pay honoraria to expert contributors, support editors with modest stipends and travel support, and publicize the DRH at conferences is very much dependent on continued grant support. Our hope is that these sort of external grant-funded incentives are a short-term expedient that will grow increasingly unnecessary as contributing to the DRH or serving on the editorial board becomes a clear boon to one's CV. Over time, internal professional imperatives should ideally come to replace the need for external monetary compensation.

Having and eating of the cake: targeted postdoc recruitment and the Standard Religious Cross-Cultural Sample (SRCCS)

In addition to trying to maximize expert recruitment, there are other ways in which the DRH endeavors to continue to enjoy the benefits of an expert-centered coding strategy while also adopting strategies to mitigate the short-term downsides, paramount among them the opportunistic and unpredictable nature of new contributions and the resulting patchy coverage. While dependent upon continued grant funding, these strategies should enable us to fill basic gaps and obtain more representational coverage of the historical record until the DRH becomes a more broadly-known and self-sustaining platform.

Our primary and preferred mode of contribution is the Expert entry, which is completed by the expert themself and reviewed by an editor before publication. As noted above, we have also created other entry types, such as the Secondary Source or Expert Source, to allow us to engage in more targeted data gathering. Secondary Source entries have allowed us to, in collaboration with Carol Ember of HRAF, import to the DRH religion-relevant data from that resource. This process has been on-going over the past several years, with our goal to replicate the SCCS sample of 186 small-scale cultures. A similar, earlier effort focused on replicating some of the coverage of the Peregrine and Ember's *Encyclopedia of Prehistory* (Peregrine & Ember, 2001). In collaboration with the creators of the Pulotu Database of Pacific Religions (https://pulotu.com/), we have also imported some of their entries in the DRH with a mix of standard Expert entries and Secondary Source entries. Expert Source entries similarly allow us to target particular gaps in our coverage by reaching out to specific, usually senior, scholars, and offering honoraria support to their graduate students for completing an entry.

More ambitiously, and more recently, we have been able to pursue a targeted postdoc recruitment strategy. The DRH currently employs six postdocs (https://religiondatabase.org/landing/about/people/team), chosen for their complementary geographic and temporal expertise. Over their two to three years of employment with the project, they first design, in consultation with an external senior scholar in their field, a plan for both "minimum" and "ideal" coverage in their area of expertise. They are then tasked with completing this coverage through a mixture of recruitment of colleagues, production of their own entries, targeting of Expert Source entries, and—as a last resort—creation of Secondary Source entries.

The goal is to, by the end of our current grant funding cycle in 2024, have a diverse set of regions/time periods across the globe completely covered, which together can serve as a standardized sample for cultural evolutionary analysts. Analysts can choose to work with one of what we anticipate will be a series of frozen, time-stamped versions of this sample, or to work with the latest iteration of what we anticipate will be a constantly-growing dataset. This sample, the DRH Standard Religious Cross-Cultural Sample (SRCCS), will essentially represent a new version of the SCCS,

but with diachronic depth, the inclusion of large-scale societies—where much of the cultural evolutionary action is to be found—and infinitely more nuance, detail and geographical and temporal resolution. The current regions of priority include Yellow and Yangzi River Valleys (Dr. Hamm), Ancient Egypt (Dr. Arbuckle), Mesoamerica/South America (Dr. Moreiras), Ancient Greece and Rome (Dr. Canlas), Ancient Near East (Dr. Danielson), Late Antique/Early Medieval East Mediterranean (Dr. Randall), and Islam in the Middle East and North Africa (Dr. Weideman).[22] We hope to devote our remaining postdoc slots to South Asia, Subsaharan Africa, North America, and/or Oceania.

In addition to providing us with some top-down control and predictability of coverage, this postdoc strategy will, over time, help to change the culture around large databases in various circles of the humanities. The postdoc employment calls themselves have greatly enhanced the visibility of the DRH and piqued widespread interest in the project. Being recruited by a trusted colleague in one's field makes it more likely that an expert will get involved. Moreover, as postdocs cycle off the project, they will ideally become assistant professors at institutions around the world, training their own generation of graduate students who will use the DRH in their own research, employ it in the classroom, and create DRH entries themselves. This is one of many ways that we hope our short-term, grant-fund-driven initiatives will help to create more sustainable, norm-driven support for the DRH.

Conclusion

The DRH has existed in some form since 2012—in other words, for roughly a decade. It has only now, in 2022–2023, reached the point where it has enough data coverage for at least preliminary analyses. Our first internal project utilizing DRH data, constructing a bottom-up religious taxonomy from individual DRH entry answers, is forthcoming in the *Journal of the American Academy of Religion* (Monroe et al., forthcoming), and another paper on religion and ecology has been recently published (Spicer et al., 2022). The first paper from an external research group drawing on DRH data has recently been published (Wormley & Cohen, 2022). Another exciting analysis of DRH Religious Group data by cultural evolutionary theorists, arguing for a limited landscape of possible religious trait configurations, has been published as a pilot study (Poulsen & DeDeo, 2023), with a larger follow-up undertaken with the DRH team currently in progress.

Nonetheless, we are still some years away from providing anything like comprehensive coverage of the globe. Coverage in many ways reflects the idiosyncratic expertise of the founding director and earlier project postdocs, and outside of our postdoc-supervised areas is growing in a haphazard and unpredictable manner. Although an expert-based approach has been, on some measures, slow to accumulate data, a decade is barely a blip in the thousands of years of data we are parsing, coding, and making available to modern analysts. We are optimistic about the future, and remain convinced that the database architecture, analytic ontologies, coding strategies, and site features that we have created are the best hope for the future of cultural historical databases.

The main lesson we feel the cultural evolutionary community needs to internalize is that quality cultural data gathering—especially when it comes to complex, large-scale societies—demands time, patience, and flexibility. It also requires buy-in from humanities scholars, who are the only ones able to provide the highest-quality coding. Slowly and consistently building up trust and interest in various branches of the humanities creates a dynamic that benefits both scientists and humanities scholars, and ideally makes collaboration across the science-humanities border more likely.

A decade ago, the DRH technical platform was created by one of us with a shoestring budget and spare time during graduate school. The first two entries—from prominent scholars of early Chinese religion—were solicited in person and recorded on paper by another of us, in one case involving a bribe of specially-selected New York State Riesling. From two people, a tiny amount of money, and a lot of time and favors, the technical platform, contributing experts, editorial team, and budget slowly grew. It is difficult to predict with any certainty where the DRH will be in another decade,

but with our team of postdocs, a growing set of technical features, network of external collaborating teams, and new entries pouring in every day, we hope by then the project will have grown as dramatically and transformatively as it has over the past decade.

Notes

1. A summary of current DRH coverage can be found on our landing page and entries can browsed at https://religiondatabase.org/browse/.
2. The DRH was originally created as part of a Canadian Social Sciences and Humanities Research Council (SSHRC) grant to PI Slingerland in 2012, with further development funded by a grant by Templeton Religious Trust to Slingerland and Muthukrishna in 2017. Current DRH development and operations is funded by a John Templeton Foundation grant to Slingerland and Monroe from 2021 to 2024.
3. See, especially, Slingerland et al. (2020a pp. 4–5) and Watts et al. (2021, pp. 65–68).
4. Exceptions to this trend include studies that have created their own, bespoke databases, such as Sosis & Bressler, 2003.
5. In terms of technical structure, the DRH has a modular, cloud-based architecture built using industry standard open source technologies. The core of the platform is built using Django with a PostgresSQL database. The front-end user-facing pages use ReactJS and communicate with the database via the aforementioned Django application as well as through a GraphQL endpoint using Hasura. The entire project is hosted on Amazon's Web Services (AWS) platform and is fully containerized as Docker images. This architecture ensures stability and maintainability of the platform and data as we improve existing features and implement new functionality. Daily backups are made to multiple endpoints, including AWS and UBC servers, with regular full backups stored on offsite hard drives.
6. For a current list of DRH editors, see https://religiondatabase.org/landing/about/people/editors.
7. The DRH Text poll will soon be expanded into a "Text/Object" Poll in order to encompass religiously relevant object that do not include writing.
8. For current poll types and to browse the sections and individual questions, see Overview of Polls.
9. Religious Groups that are, from our perspective, overly broad, such as Stowers' Mediterranean Religion entry, is one way in which our deference to the preferences of our experts has affected the structure of our data, a topic to which we will return below.
10. Carleton (2017) was the product of an attempt to incorporate data from Peregrine &and Ember (2001). Every entry in the DRH is tagged with its entry type and, in the case of entries drawn from external sources, the name of their source. Entries from external sources often possess their own branding (a distinct color and logo) and link to the original source. Also, analysts dubious about the value of such entries can easily, with the click of a button, exclude either Secondary Source entries or entries based on a particular external source or both.
11. The elements of the current DRH religion tagging tree can be viewed at https://religiondatabase.org/browse/tags-group/3. Experts are allowed, with editor approval, to add new tags, so the tree is always growing, and one editorial challenge faced by the DRH is maintaining consistency and coherence in the tree. This is one of the areas where top-down editorial management is required. Tag hierarchies are represented in entry set-up (during the tagging process), but experts can also pull laterally by simply searching for other relevant tags they might like to apply. Representing the entire tree in a single hierarchy is extremely challenging considering the various ways in which religions could be classified (e.g., a form of Chinese Buddhism might be a sub-tag in a tree headed by "Buddhism," or in a tree headed by "Chinese religion"; "Buddhism" itself might be classed under "Indic religions"). Our response to this problem is allowing a plethora of tagging decision-trees and relying on the search feature of the site to pull all relevant tags in browsing or analyzing. We see the tags as capturing (with editorial oversight) the intuition of scholars about the relationship between their entry and other entries on the site; generally these intuitions are held within and between related disciplines representing top-down forms of categorization.
12. "The variables coded are different across unit categories, limiting the ability to draw comparisons between them" (p. 67). A perhaps related problem is that Watts et al. (2021) seem to conflate DRH tags (which include regions and religious traditions) with poll types ("The predefined categories of units in [the DRH] include regions, religious groups, religious places, places, and polities"; p. 67).
13. Accessed through D-PLACE, https://d-place.org/society/SCCS73 and https://d-place.org/society/SCCS74.
14. Certain extremely broad groups, with worldwide extent, were excluded.
15. For Cham Ahiér, the Group entry is supplemented with a place entry, The Ppo Romé temple-tower complex (Noseworthy, 2019), and a text entry, Dalikal Ppo Klaong Garai (Noseworthy, 2022).
16. "High god" "refers to a supernatural being who is identified by the religious group as qualitatively more important and powerful than any other supernatural being, even if not all-powerful."
17. http://seshatdatabank.info/databrowser/moralizing-supernatural-punishment-narratives.html

18. Snapshots of the relevant variables from the two entries are accessible here (accessed March 3, 2023): https://web.archive.org/web/20230403034740/http://seshatdatabank.info/browser/CnErJin https://web.archive.org/web/20230403034901/http://seshatdatabank.info/browser/CnNWei%2A
19. In the Group poll we have two separate questions for afterlife reward and punishment ("Supernatural punishments are meted out in the afterlife"; "Supernatural rewards are meted out in the afterlife"), with analogous questions in the Text poll. The results in Table 2 refer to the punishment version of the question in the two polls.
20. Inspired by a similar feature in Glottolog (glottolog.org; Kirby et al. 2016), we are planning to introduce a new feature to the DRH where experts can click a button on a particular poll question to see guidelines on coding (clear yes and no examples, borderline cases), as well as any discussion on the topic from previous experts.
21. For an example see the entry on Tel Arad by Kristina Shishkova (2022).
22. Responsible postdocs, external advisors and coverage plans can be viewed at Public Postdoc Progress.

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The first author is Director, the second author Associate Director, and the third author Technical Director of the Database of Religious History.

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Data availability statement

All of the data discussed in this paper can be freely accessed at religiondatabase.org.

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