

OCHRE DATA SERVICE

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The global pandemic brought profound disruption and change to many, but at the OCHRE Data Service our work continued mostly as normal. As a support center for projects that use the Online Cultural and Historical Research Environment (OCHRE), we have long been used to working remotely with collaborators all over the world. Being available around the clock and accommodating meetings in different time zones was always a normal part of our work. As archaeological projects were canceled due to the pandemic, scholars turned to analysis and publication of their existing data, thus keeping us busier than ever. And as the University of Chicago (UChicago) was shutting down and sending students home, we were able to step up and provide online research opportunities to fill the gap created by the sudden cancellation of in-person student internships. We were pleased to be able to mentor two interns for the [summer lab program](#) of the University's [Center for Data and Computing](#), which was forced to adopt a remote format. We were also delighted to "get things done and discover new talent" by hiring several students who received paid internships through the [College Micro-Metcalf Program](#) and the [College Research Fellows Program](#).

But the OCHRE Data Service, too, is embracing a new normal in the summer of 2021. As we celebrate our tenth anniversary and approach the landmark of ten million database items managed by the OCHRE platform, we are excited to be expanding and broadening our reach. Effective July 1, 2021, the OCHRE Data Service has moved from the OI to the Division of the Humanities in association with the program [Digital Studies of Language, Culture, and History](#), directed by OI professor and archaeologist [David Schloen](#). Sandra Schloen continues to manage the OCHRE Data Service and is now the technology director for digital studies, joining [Miller Prosser](#), who transitioned to the role of associate director of digital studies in September 2020 while continuing to support OCHRE projects. Going forward, we will be better positioned to work with students and faculty in all fields of the humanities: ancient, medieval, and modern. We will provide database services, consultation, and training for students and faculty in all departments, including continued support for research at the OI.

In fact, the staff of the OCHRE Data Service have already been working closely with faculty and students in various departments outside the OI for several years. For example, we have played a key role in the interdisciplinary [initiative](#) Critical Editions for Digital Analysis and Research ([CEDAR](#)), whose principal investigators are in the divinity school (Prof. Jeffrey Stackert) and the English department (Prof. Ellen MacKay). We have also enabled faculty-led digital projects based in the departments of art history (Prof. Niall Atkinson's study of the Florentine Catasto of 1427; see fig. 1) and linguistics (Prof. Alan C. Yu's research on the Washo language and culture), and we expect to engage with many more projects in more departments in the future.

As the OCHRE Data Service transitions to its new home in the Division of the Humanities, it is with great appreciation for its beginnings at the OI, which served as fertile ground in which OCHRE could grow and blossom. Indeed, the unusual types of data and research engaged in by the OI faculty posed a significant computational challenge and served as a spur for OCHRE's technological innovations. Non-alphabetic texts written in Egyptian hieroglyphs and Mesopotamian cuneiform demand a computational approach that goes beyond what is found in ordinary, off-the-shelf software. Like-

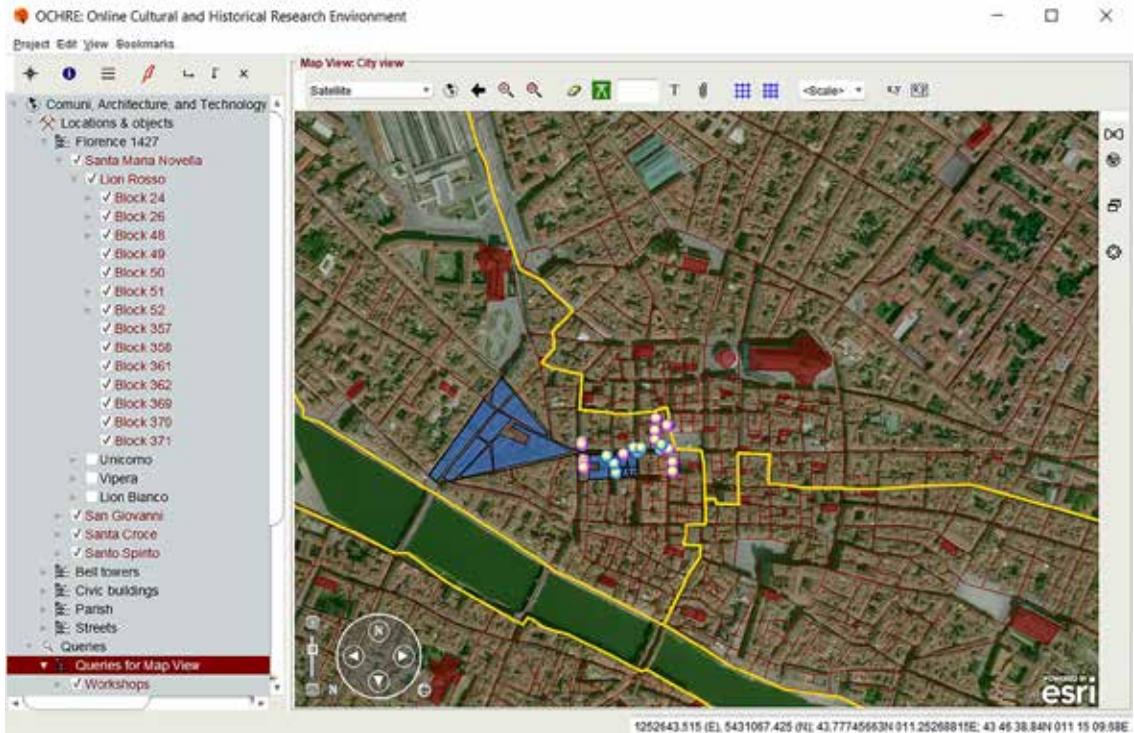


Figure 1. A cluster of workshops listed in the 1427 Catasto, plotted in the Lion Rosso district of Florence.

wise, the great variability and idiosyncratic nature of archaeological data and recording methods do not suit the rigid format of a typical relational database. A more flexible and comprehensive computational approach was needed. As early as 1999, the [Middle Egyptian Textual Environment for Online Research](#) (METEOR; see fig. 2) was developed for Prof. Janet Johnson's Annotated Egyptian Readingbook Project—an interactive and creative presentation of a collection of hieroglyphic texts. In the early 2000s, in response to the vision of the late Prof. Harry Hoffner and former OI director Gene Gragg, OCHRE was adapted to handle complex lexicographical data so it could serve as the platform for the [electronic version of the Chicago Hittite Dictionary](#) (CHD). When Prof. Matthew Stolper needed a data management solution for his [Persepolis Fortification Archive Project](#) to integrate the complex array of information generated by the analysis, transcription, and imaging of tens of thousands of tablets bearing Elamite and Aramaic texts, as well as thousands of seal impressions, OCHRE met the challenge. Prof. David Schloen's archaeology projects at [Ashkelon](#) (Israel) and [Zincirli](#) (Turkey) depended on OCHRE to manage large amounts of data, including thousands of plans, drawings, and photographs.

Since those early days, the results of other OI archaeology projects have been digitized and preserved in the OCHRE platform, including legacy projects such as [Tell Judaidah](#) and [Megiddo](#) from the 1930s and more recent projects at [Tel Yaqush](#) and [Tell Keisan](#) in Israel and the renewed project at [Nippur](#) in Iraq. Beyond the OI, OCHRE is being used to manage and publish data from archaeological excavations at Antioch (Princeton University), Corinth (University of Missouri), Gezer (Hebrew Union College and others), Hippos-Sussita (Zinman Institute of Archaeology), Idalion (Lycoming College), Jaffa (UCLA), Tell Tayinat (University of Toronto), Tel Shimron (Wheaton College), and Tel Zayit (Pittsburgh Theological Seminary). And beyond the Middle East, OCHRE is being used to manage data from archaeological investigations of the Amache Relocation Camp, a World War II Japanese

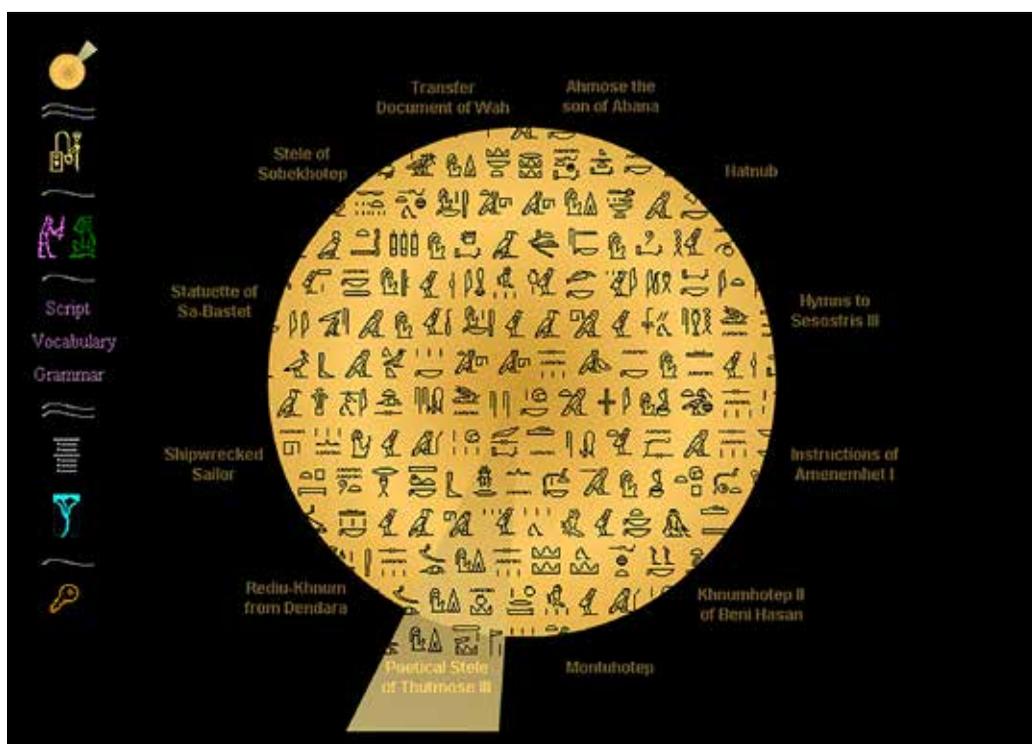


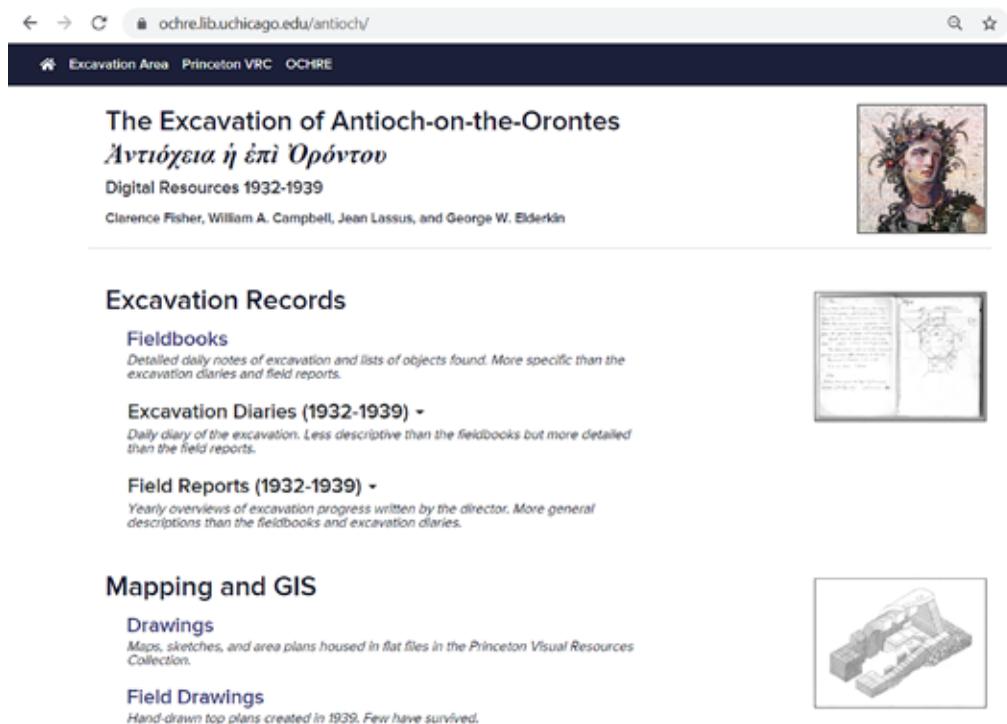
Figure 2. Main menu of METEOR, Sandra Schloen's first digital project at the OI.

internment camp in southeastern Colorado (University of Denver), and from the Corral-Redondo Expedition to Peru, the [Proyecto Wila Jawira](#) investigations in Bolivia, and the [Gobero excavations](#) in Niger (all three being projects of UChicago).

Several textual and lexical projects—such as the [Oriental Institute Demotic Ostraca Online](#) project, led by Foy Scalf (UChicago Egyptology PhD and now head of the OI Research Archives); the [Old Assyrian Research Environment](#) project, led by Edward Stratford (UChicago Assyriology PhD and now a professor at Brigham Young University); and the [Ras Shamra Tablet Inventory](#) project, led by Miller Prosser (UChicago Northwest Semitic Philology PhD and, as noted above, associate director of digital studies) with Prof. Dennis Pardee—have amassed comprehensive data concerning Demotic Egyptian, Old Assyrian, and Ugaritic archives, respectively. Meanwhile, OCHRE has been used for language-learning tools developed at UChicago to teach [Marathi](#) and [Yucatec Mayan](#), thus demonstrating OCHRE's ability to integrate audiovisual materials for pedagogical purposes.

More traditional digital humanities projects, such as the [Peripheral Manuscripts Project](#) at Indiana University, which is digitizing medieval manuscripts housed in institutions throughout the Midwest, are finding OCHRE to be a flexible and full-featured tool. And all this information—archaeological, philological, cultural, linguistic, and historical—in all digital formats, including texts, maps, images, audio, and video, can be easily published from the OCHRE database platform to the World Wide Web via the OCHRE Application Programming Interface (API), which uses open standards to provide free and open access to the data for scholars and students everywhere, while preserving it and keeping it accessible indefinitely on servers maintained by the [University of Chicago Library](#).

Finally, although OCHRE was initially developed to facilitate traditional methods in ancient studies, it is also being used to support cutting-edge research that employs the latest scientific methods. OCHRE is used by the [DeepScribe Project](#), a collaboration that includes OI Assyriologist Susanne



ochre.lib.uchicago.edu/antioch/

Excavation Area Princeton VRC OCHRE

The Excavation of Antioch-on-the-Orontes

Ἀντιόχεια ἡ ἐπὶ Ὀρόντου

Digital Resources 1932-1939

Clarence Fisher, William A. Campbell, Jean Lassus, and George W. Elderkin

Excavation Records

Fieldbooks
Detailed daily notes of excavation and lists of objects found. More specific than the excavation diaries and field reports.

Excavation Diaries (1932-1939) -
Daily diary of the excavation. Less descriptive than the fieldbooks but more detailed than the field reports.

Field Reports (1932-1939) -
Yearly overviews of excavation progress written by the director. More general descriptions than the fieldbooks and excavation diaries.

Mapping and GIS

Drawings
Maps, sketches, and area plans housed in flat files in the Princeton Visual Resources Collection.

Field Drawings
Hand-drawn top plans created in 1939. Few have survived.

Paulus and computer scientist Sanjay Krishnan of the computer science department and is funded by UChicago's [Center for Data and Computing](#). This project has achieved significant progress in *training* computer software automatically to detect and classify ancient cuneiform signs on clay tablets using the latest artificial intelligence (AI) methods of computer vision. A crucial role is played by a *training set* of more than one hundred thousand annotated images of cuneiform signs stored in OCHRE that were extracted from the Persepolis Fortification Archive's digitized photographs. Results to date will be presented at the annual meeting of the American Schools of Oriental Research in Chicago in November 2021.

OCHRE will also be used in a new project on [Genomes, Migrations, and Culture in the Early Civilizations of the Middle East](#), a collaboration between OI archaeologists David Schloen and James Osborne and geneticists John Novembre and Maanasa Raghavan of the human genetics department. This project will extract and analyze DNA from ancient human remains excavated many years ago by the OI and the Field Museum of Natural History at three Bronze Age sites: Alişar in Turkey, Kish in Iraq, and Nahal Tabor in Israel. OCHRE will be used to store and manage the project's archaeological and genetic data and to support a computational workflow suitable for sophisticated and efficient querying and analyzing of ancient genomes in their temporal, spatial, and cultural contexts.

At the OCHRE Data Service, even as we safeguard what is old, we embrace what is new: new projects, new collaborators, new student assistants, new technologies, and new adventures! For us, new is normal. Our website remains the same (ochre.uchicago.edu), but as the University reopens this fall we will have a new home in the center of campus at 5720 South Woodlawn Avenue. We welcome you to visit us there!

Figure 3. Web publication of ancient Antioch, with assistance from [Nicholas Schulte](#), OCHRE technology consultant.