CAN A SYNTHESIS CENTER WORK FOR ARCHAEOLOGY?

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Since 1995, scientific funding agencies have invested tens of millions of dollars in synthesis centers in North America, Europe, China, and Australia. Beginning with the National Center for Ecological Analysis and Synthesis (NCEAS), there are now nearly two dozen synthesis centers in fields as varied as biomedical sciences, genomics, mathematics, and earth sciences (see e.g., http://synthesis-consortium.org/). There is even one in archaeology.

Whether measured by academic standards (publications, impact factors, citations, etc.) or practical results (changes in public policy, regulations, or governmental guidelines), NCEAS and other synthesis centers have not only been successful, but transformative for their science. At their core, these centers share a commitment to collaboration. They use small (6-20 participants), self-organized groups, whose participants are drawn from diverse fields, social backgrounds, and professional statuses. Key to success is a deliberative process composed of intense, face-to-face meetings in places insulated from day-to-day noise and stress, followed by long intervals (4-6 months) of individual or small group work assisted by long-distance electronic communication (Hackett et al. 2019:5). Projects are relatively short, between 2 to 3 years, with the goal of answering questions, not simply giving the tired response or "more research is necessary."

A Center of Our Own
Although archaeologists had long been intrigued by advances in collaborative, synthetic research, no institution in archaeology stepped forward to lead the effort (e.g., Kintigh et al. 2015). In 2017, the SRI Foundation (SRIF), a US-based not-for-profit dedicated to historic preservation, together with the University of Arizona, Arizona State University, and the School for Advanced Research (SAR), sponsored a workshop at SAR in Santa Fe, New Mexico, titled "Fostering Synthesis in Archaeology." The outcome of the workshop was a framework for collaborative, synthetic research in archaeology that consisted of two parts: a coalition of partner organizations and individual associates to set the priorities and direction of synthetic research and a university- or foundation-based center that would administer research projects, house informatics and logistical support staff, and be responsible for disseminating results (Altschul et al. 2017; Altschul et al. 2018). As an interim measure, SRIF agreed to provide the administrative support for the center and to house the coalition as a foundation program. The Coalition

for Archeological Synthesis (CfAS) was formally established at the end of 2017 with about 15 partners and 30 associates. Today, less than 2 years later, the Coalition has about 40 partners and 200 associates spread across the globe.

Where to begin?

Although existing synthesis centers provide models for how CfAS should operate, there is one big difference: money. Major synthesis centers, like NCEAS and the National Socio-Environmental Synthesis Center (SESYNC) receive millions of dollars of annual support, largely from the National Science Foundation (NSF) and other governmental agencies supporting academic research. They have the ability to modify and operate buildings that are conducive to collaborative research, hire support staff, and maintain in-house expertise and facilities in cyberinfrastructure. CfAS, in contrast, has few resources. But archaeologists are nothing if not resourceful, and lacking money is a common problem we overcome.

Our strategy to combat the money problem was to solicit partners with capabilities and assets in fields needed to conduct collaborative research. Archaeology has a long history of institutions, such as SAR, the Amerind Foundation, and the Wenner-Gren Foundation for Anthropological Research, that host meetings and workshops. The discipline also has a number of organizations that support data archiving, data integration, and computer modeling, such as Digital Antiquity, Open Context, and the Archaeological Data Service. CfAS targeted organizations that had access to critical resources for collaborative synthesis to become partners. Partners readily made their resources available at reduced rates or for free to CfAS projects, which in turn has allowed the Coalition to support two proof-of-concept collaborative synthetic projects using funds from SRI Foundation's research program. The key objective of the proof-of-concept projects is to demonstrate that a synthesis center can move archaeological synthesis from a lone scholar to a collaborative, team-based study and in so doing transform our understanding of the past in ways that can benefit the future.

If you build it, they will come

Synthesis centers commonly use open call competitions to identify important research problems and collaborative research teams. In response to a request for proposals, one or more individuals develop a proposal for a collaborative, synthetic project to address a particular research problem that has both academic and practical impacts and can be answered in a few years. In the proposal the lead investigator(s) identify a group of between 6 and 20 participants, representing scientific disciplines, government agencies, and other stakeholders with particular and complementary expertise and access to necessary, extant data sets. Particular attention is given not only to scientific qualifications, but also to ensure social diversity in terms of gender, geography, and professional status (student, post-doc, lecturer, professor, applied, etc.). Proposals are evaluated by a review committee and awarded on merit.

For its proof-of-concept projects, CfAS followed this model. Proposals were competitively reviewed using criteria that combined scientific merit and public policy impact. CfAS' review committee was composed of archaeologists from all sectors of the discipline—academic, CRM, and government—as well as members of North American indigenous groups.

The two CfAS projects strive to use science to advance learning and impact public policy on two pressing concerns—biodiversity and fire management. Increasing biodiversity is the stated goal of many

countries. But achieving this goal remains elusive, in part because solutions are based on present conditions or at most those of the last few decades. The ArchaeoEcology project takes a decidedly different approach, developing deep-time network models that synthesize archaeological, ethnographic, ecological, climatic, and geologic data from six cross-cultural cases to understand how humans can best interact with ecosystems in a sustainable manner. During its first meeting in October 2018, the team worked out how best to integrate data from very different cases and determined the databases each team member needed to create at their home institution prior to the second meeting. The second meeting is set for October 2019 at which time the team will determine how to integrate the datasets and develop network models. The actual modeling will be done by the team's modeling experts between the second and third meeting. The third meeting in 2020 will focus on finalizing scientific products and working with the Press Office at the Santa Fe Institute (a CfAS partner) to disseminate the results to the public and policy makers.

The second study emerged from a policy debate over the use of fire to manage forests in the borderlands region of the United States and Canada. Much of this area is designated 'wilderness," with management left largely to nature. In the recent past, forest fires have increased in intensity and duration, leaving many to wonder if this approach to forest management is the best or even "natural." The CfAS Borderlands project emerged not from the academia but from forest managers who wanted evidence-based answers to two questions, "Did people fundamentally alter patterns of fire activity in the past through their intentional use of fire? If so, should wilderness managers consider using prescribed fire to maintain the resilience and ecological integrity of protected areas?" Archaeologists, First Nation community members, land managers, scientists, and those with traditional environmental knowledge are using archaeological, ethnographic, and tree-ring data in the context of traditional histories to understand the long-term relationships among people, landscape, and fire in this region. One outcome of the first workshop was "the illustration of how archaeological records can serve as catalysts for synthesizing data and perspectives in ways that inspire new approaches to addressing important questions and problems faced by society (Larson 2018:4)." As Evan Larson, the leader of the project, stated, "Throughout the workshop, archaeological records served as translators between knowledge systems and enabled conversations that explored the causes of historical patterns in fire activity across the Border Lakes Region, how these fire patterns have changed through centuries of EuroAmerican and settler colonialism, and how restoring fire to the landscape may be a key component of both ecological and cultural revitalization (Larson 2018:4)." The first workshop laid out an ambitious set of goals, including two revised fire management plans, three journal articles, a children's book, a public oriented book, museum materials, and a best management practices document.

The open call approach allows good ideas to bubble up through the discipline. For well-funded synthesis centers, which can allocate substantial resources into "unspecified" projects, it works well. However, CfAS is not such a center. John Yellen, the director of the NSF's Archaeology Program, for example, has told the authors that the Foundation might be interested in funding collaborative, synthetic projects on specific, well-defined themes, but is unlikely to simply hand over money to CfAS to solicit projects on open calls like it did for NCEAS or SESYNC.

Science by Design
Put simply, we need an inexpensive way of figuring out what types of questions to ask and how to fund them. This year we are experimenting with an approach that leverages the knowledge and experience of

the discipline. In late September 2019, CfAS will convene a design workshop that bring together 15 experts to develop one or more proposals for synthetic studies of human migration as understood from a long-term perspective.

The impetus for this workshop emerged from the migration crisis that engulfed both North America and Europe around 2015. The European Association of Archaeologists (EAA) and the Society for American Archaeology (SAA) wanted to combine forces to hold a thematic conference on how archaeological studies could impact and inform the public debate. Due to a variety of issues, however, the conference was never held. Collaborative synthesis as envisioned by CfAS provided a different approach to meet the EAA and the SAA's objective. CfAS proposed to organize and conduct an EAA-SAA sponsored design workshop on the underlying deep time causes and process related to human migration. The goal of the workshop is to develop one or more proposals to fund synthesis working groups focused on developing long-term, understandings of the factors stimulating human migration, the conditions and processes implicated in the success of the incorporation of immigrant groups at their destination, and how these new understandings might inform contemporary public policy.

Just after the boards of the SAA and EAA agreed to sponsor the design workshop, the Society for Historical Archaeology expressed interest in the project. Although it was too late to add SHA as a sponsor, the selection committee was enlarged to incorporate representatives from the three professional societies.

After an open call for information, CfAS received more than 50 applications from 20 countries to participate in the design workshop. The review committee selected 15 participants from 7 countries, ranging from post-doctoral researchers to distinguished senior researchers. The participants research on human migration stretches from the Paleolithic to modern homeless shelters and represents research from 6 continents.

Will they believe us?

All synthesis centers are predicated on some form of the "knowledge deficit" model, which holds that the lack of public support for policies based on science is largely the result of a lack of scientific information. The primary job of a synthesis center is to supply systematic, evidence-based information. It is not to advocate for a position, but instead to put information in the right hands, with faith that decision makers will use that knowledge to make good decisions. In the Upshot column of the New York Times, Aaron Carroll (2019) recently noted that studies not only cast doubt on the deficit knowledge model, but strongly suggest that, "those with the least understanding of science had the most science-opposed views, but thought they know the most." According to this line of reasoning, it will not be enough, for example, to bring scientific evidence of traditional human use of fire to manage forests to bear to convince advocates of "wilderness" as places untrampled by man (as enshrined in the Wilderness Act of 1964) that no such places exist and that modern intervention is warranted. For many conservationists, this is not a knowledge deficit problem; to them, the science is clear, even though they are completely wrong on the science.

No amount of debating is likely to change anyone's mind on this or any other contentious subject. To be taken seriously, scientists must not be perceived as "the smartest people in the room," but as "honest brokers." In cultural heritage management, an honest broker is an individual or organization upon which others rely for information. Often it falls to the consultant to provide information on archaeological and

heritage sites to private developers, government regulators, indigenous and local community leaders, and the public. Consultants should be, but generally are not, perceived to be honest brokers. Consultants are paid by developers or government agencies and hence are thought by indigenous and local communities to have conflict of interests which color their professional opinions. In contrast, developers and agencies view consultants suspiciously because the consultant benefits financially if there is additional work. To overcome these perceptions, consultants (or at least the good ones) engage with stakeholders early and often; first listening to concerns, then developing methods that incorporate concerns, and finally showing why getting the "right" answer is in everyone's best interest.

To be an honest broker requires trust, and trust is not given, but earned. It is paramount that collaborative, synthetic teams have plans from the outset of their project to identify and engage stakeholders in ways that explains the benefits of the scientific research to them, to make the scientific process understandable, and to make a path for the project to incorporate their goals and views. This work is often as difficult and as treacherous as the science itself.

Can it work?

While it is still early, we are encouraged that collaborative synthesis will take hold in archaeology as it has in many other sciences. We are heartened by the interest shown in CfAS, although finding a sustainable funding model remains a challenge. Success within the discipline is necessary, but it is not sufficient. To be successful, we also need to use new understandings of long-term processes to create policies that will make life better for all. To succeed, we need to be good scientists and better citizens.

None of this works without you, the archaeological community. As a discipline, we must step forward and embrace collaborative synthesis. CfAS is a small boat on a rough sea. We need to row in the same direction to move our science in step with other fields, or be left behind as a quaint, but unnecessary discipline. We need your support. Individuals, please join us as Associates; organizations please become partners.

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