

Legacy documentation: using historical resources in a cultural astronomy project

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Abstract. Legacy documentation, the accumulated historical knowledge about an archaeological site, must be reviewed in order to locate data on the condition of archaeological features and architecture proposed to be related to astronomical observances. This type of documentation can be located in museums, research libraries, colleges or universities, national public institutions and increasingly in digitized collections available on the internet. Locating and using legacy documentation is more than a simple review of literature. It is an integral part of the process of architectural documentation. The method of architectural documentation involves detailed site proveniencing, obtaining summary data for study units, and detailed descriptions of feature conditions (Nordby *et al.* 2002). Case studies present the impact of legacy documentation when evaluating the original condition of astronomically associated architecture or features.

Keywords. cultural astronomy, architectural documentation

1. What is legacy documentation?

Historical resources, also known as legacy documentation, are the accumulated knowledge about an archaeological site from today into the historic past. It includes reports and manuscripts, field notebooks, photographs, maps, archival records and oral histories. These resources, particularly photographs, are of great value in determining the condition of architecture or archaeological features prior to modern intervention such as excavation and stabilization. Reviewing the original condition of architecture or features associated with astronomical observances is important since:

“One must understand an architectural features history in detail, both in terms of its ancient construction, and any modern alterations to the building. This is because too often, features believed to have been emplaced during the ancient period were built by modern stabilizers and connections to points on the horizon are fortuitous.” (Larry V. Nordby 2009)

Using legacy documentation is an important component of any project research design. There is a need to develop this resource early when conducting a project. Even after completion, every project in cultural astronomy based on architectural features should be able to withstand regular review and testing. Legacy documentation is a resource that can be used to conduct this testing.

2. Locating legacy documentation

Even though there are volumes of material available on-line, every project should start with a little good old-fashioned detective work. Most of the archival holdings of many local institutions are not digitized and visits to these facilities are necessary. Museums, research libraries and archives are typically open to the public. An appointment may be necessary so one should contact the institution in advance. They normally feature

internal search engines that will lead you to catalogs and finding aids. A finding aid is a detail itemization and description of the contents of a collection. Each institution has its own regulations regarding the use of laptops and digital cameras. Frequently only paper and pencils are allowed. Be prepared with copies of finding aids and call numbers for photograph, manuscript and other collections you wish to examine. Government and academic resources may restrict access to collections to qualified researchers and projects. Be prepared with letters of introduction, project descriptions and statements of qualifications if necessary.

After you have found the objects of your interest, you may often be able to get photocopies of written material for a small fee. Use of copies is often limited to personal research purposes. Most institutions, even public or government, retain the copyright to materials in their collections. It is very important to review the use and publication regulations of the institution that you are visiting. Digital copies of photographs are also commonly available, usually for a fee. For an additional fee, scanned or digitized images can be used in commercial publications, non-commercial publications, DVDs, television or other public exhibition. These fees are usually reduced or waived if a non-profit or educational institution is producing the publication. Be sure to properly credit the source and photographer, if known, of an image in your publications.

With the advent of the internet and explosion of digital technologies, we now have access to a great deal of legacy documentation on-line. The catalogs of museums, research libraries, state historical archives, colleges, universities and federal archives are, in many cases, now available on-line. Search engines such as google (www.google.com) and ixquick (www.ixquick.com) will lead investigators to available resources on an international scale. World Cat (www.worldcat.org) connects the libraries of the world and gives researchers information on the location of resources both written and digital. A tool gives researchers references available in local libraries around the world.

Digital archiving projects such as Google Books (books.google.com) have contributed the scanned libraries of major institutions. Started in 2004 in association with Microsoft, Google Books initially scanned the complete archival collections of four major universities, Harvard, Stanford, the University of Michigan and Oxford University, as well as the New York Public Library. Contributions to the on-line collection continue to be made by international libraries and archives as funding for digitizing projects becomes available. All of the documents are searchable PDF files. Search results provide a list of all publications, a functional bibliography, containing your search terms often returning numerous pages. Be sure to examine every search result as the older more obscure references buried in the back pages often provide the earliest photographs. Each search result will provide a reference to your search term often with a snippet or abridged view of the text. For items in the public domain, the full text is provided in a freely downloadable PDF file. These files are the most highly sought, as they often are government publications of the early exploration of an area or region. These expeditions traveled to archaeological sites large and small throughout the world. The publications often contain maps and photographs that are most useful when studying the original condition of archaeological features. Of even greater value are the original field notes and photographs from such expeditions. These can often be found in the collections of government intuitions that sponsored the expeditions.

As an example, the National Anthropological Archives (NAA) of the Smithsonian Institution holds the largest collection of anthropological, archaeological and ethnographic data in the United States. They are located at the Smithsonian Museum Support Center in Suitland, Maryland. Their collection principally contains:

1. Manuscript collections (written or printed data)
2. Photograph and artwork collections
3. Sound and film (video) recordings

Located at the NAA are the collections of America's most famous anthropologists, archaeologists and ethnographers. In a visit to the NAA in October 2007, we examined and inventoried the photograph and manuscript collections of Dr. Jesse Walter Fewkes. He was an ethnographer and anthropologist in the mesas of Hopi during the critical period of 1880 to about 1900. He then became one of the southwest's first archaeologists performing excavation and stabilization projects at Casa Grande Ruins National Monument and in the Northern San Juan region including Mesa Verde National Park from 1906 through 1922. He published most of his work in the annual reports of the Bureau of American Ethnology and miscellaneous collections of the Smithsonian Institute. While his work is not without controversy, his notebooks, photos and maps housed at the NAA are an invaluable source of legacy documentation for archaeological sites in the southwestern United States. It is this documentation, in addition to the records of Mesa Verde National Park, that we used to evaluate the following case studies assessing the original condition of architecture and features proposed to be associated with astronomical observances.

3. Case studies

3.1. *Sun Temple*

The astronomical significance of Sun Temple (5MV325) at Mesa Verde National Park, USA has been the subject of discussion from the time of Fewkes' excavation in 1915 to this day. Its size and configuration (Fig. 1) makes it the largest non-residential structure in the Northern San Juan Region (Munson *et. al.* 2008; Munson *et. al.* 2010). It is comprised of a D-shaped perimeter wall enclosing three circular tower-like structures designated Kivas A, B, and C. Malville (1993) suggested that Kivas B and C extended above the D-shaped perimeter wall forming a precise horizon marker for the observation of winter solstice sunset and southern lunar maximum moonset from marked locations in Cliff Palace (5MV625), a large cliff dwelling within line of sight across a small canyon. Legacy documentation located in the Mesa Verde National Park archives consisted of Fewkes' (1916) site report, numerous stabilization photographs, a site card, and a photograph by Gustav Nordenskiöld taken in 1891 (Fig. 2). The Nordenskiöld photo proved significant to assessing the maximum original height of Kiva B and the D-shaped perimeter wall as it is the only available image of the original condition of the interior of Sun Temple. Additional legacy documentation, Fewkes' (1915) field notebook and excavation photographs, were located at the NAA in 2007.

We documented the architectural history and configuration of Sun Temple in a field project in 2006 (Munson *et. al.* 2010). Aside from determining the construction sequence and condition of the site during its excavation, we focused on evaluating the maximum original wall heights to test Malville's hypothesis. Fewkes (1916) provided estimates of rubble volume removed from the entire site. Rubble on the western interior of the site, including Kiva B, is clearly visible in the 1891 Nordenskiöld photo. We could see exposed ground surface and in-situ wall stones, which allowed us to estimate the depth and slope of the rubble fill. Tree roots in the present day walls established that Fewkes did not significantly reconstruct the site.

Using the 1891 photograph, we established a 1m cross section (Fig. 1) through Kiva B and Room 6. From this, we formulated the volume of rubble and calculated the maximum original wall heights (Fig. 3). Accounting for air space, mortar and wall fill volumes, the

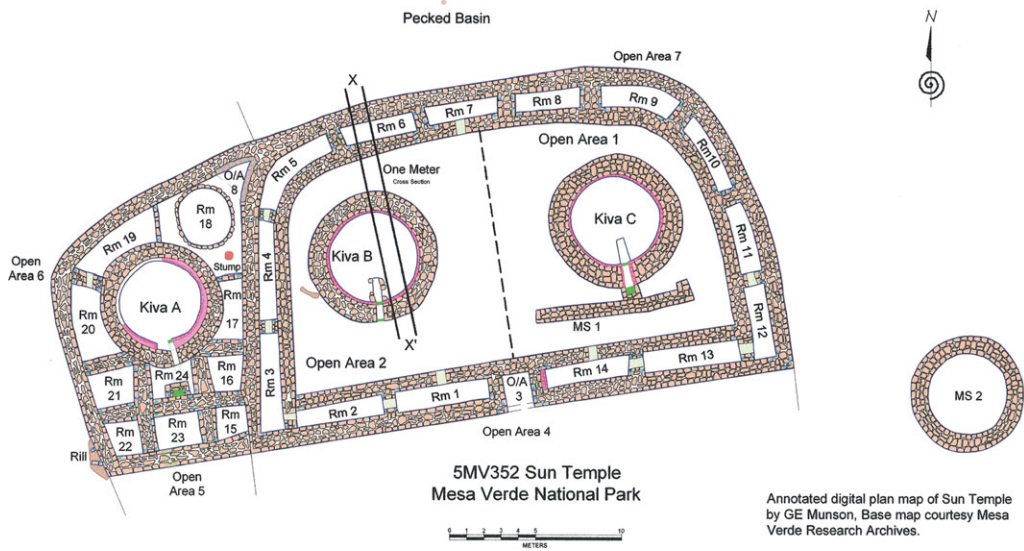


Figure 1. Sun Temple plan map and cross section. Base map courtesy Mesa Verde National Park



Figure 2. Sun Temple c. 1891, Photo by G. Nordenskiöld. Photo courtesy Mesa Verde National Park Archives

walls of Kiva B were likely no higher than 3.57m and the exterior D-shaped perimeter wall was a maximum of 4.17m tall. This led us to the conclusion that the towers of Kivas B and C could not be seen above the D-shaped perimeter wall from hypothesized observation points in Cliff Palace once the construction at Sun Temple was completed. This does not negate the use of Sun Temple as a horizon marker but rather transforms it into a horizon

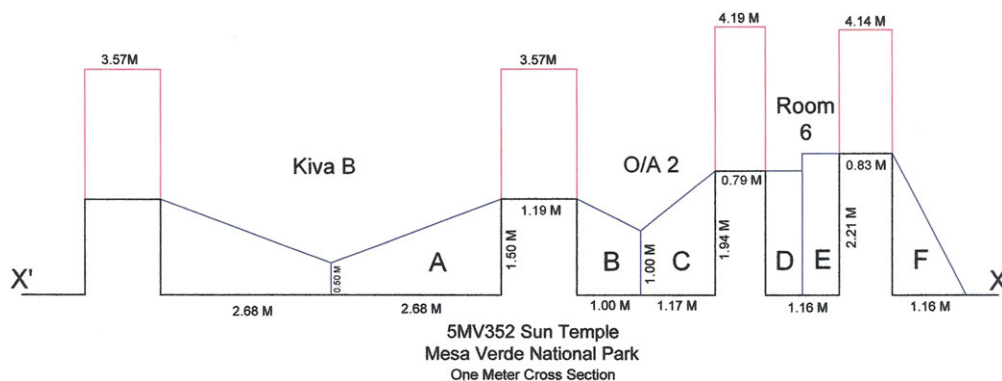


Figure 3. Sun Temple wall height calculations. Illustration by Gregory E. Munson

feature with a long architectural history. Both the research and observations of Malville and Munson support that Sun Temple was used for viewing the setting December solstice sun and the southern maximum moonset. How this was accomplished, the architecture, engineering and feature placement, will be the subject of research and debate well into the future.

$$\begin{aligned}
 A+B &= 3.93\text{m}^3 \times 50\%(\text{air space}) \times 125\%(\text{rubble/mortar fill}) = 2.47\text{m}^3/1.19\text{m}^2 = 2.07\text{m} \\
 C+D &= 2.85\text{m}^3 \times 50\%(\text{air space}) \times 125\%(\text{rubble/mortar fill}) = 1.78\text{m}^3/0.79\text{m}^2 = 2.25\text{m} \\
 E+F &= 2.56\text{m}^3 \times 50\%(\text{air space}) \times 125\%(\text{rubble/mortar fill}) = 1.60\text{m}^3/0.83\text{m}^2 = 1.97\text{m}
 \end{aligned}$$

3.2. Unit-Type House

Williamson (1984) uses the example of Unit-Type House at Hovenweep National Monument as an ancient Pueblo sun building. While surveying the canyon east of Hovenweep Castle, he noted the four ports in its east wall (Fig. 4). A ‘quick but thorough’ compass survey was completed indicating that three of the four ports (A–C) were aligned to summer solstice, equinox and winter solstice sunrise respectively. Williamson later confirmed these alignments through direct observation. He speculated that a fourth port, located in the lower southeast corner of the east room, had a lunar standstill alignment. This was later confirmed by the direct observations of Bryan Bates (pers. comm. 2006). One of the precepts of the scientific method is the ability to confirm a hypothesis with repeated testing. We tested this hypothesis using newly recovered legacy data.

Fewkes traveled extensively in the Hovenweep area and kept detailed field notebooks with maps and annotations about the sites he visited. He was one of the first archaeologists to map and document Unit-Type House. We found his notebooks in MS4408 and his photographs in MS4321 at the National Anthropological Archives of the Smithsonian Institution. The majority of his reports are freely available on the internet through Google Books and include those from the Bureau of American Ethnology (BAE). These reports contain valuable maps, photographs and site descriptions.

A photograph, published in Fewkes’ (1919) report to the BAE, shows the interior of the east wall of the east room at Unit-Type House (Fig. 5). The interior photograph shows three horizontally aligned features that may be ports, vents or beam sockets. The position of Williamson’s Port C in his illustration does not match the photograph.

Fewkes recorded maps and photographs of this site. We located the original plate photos in his 1917 field notebook at the NAA (Fewkes 1917). A plate photo clearly

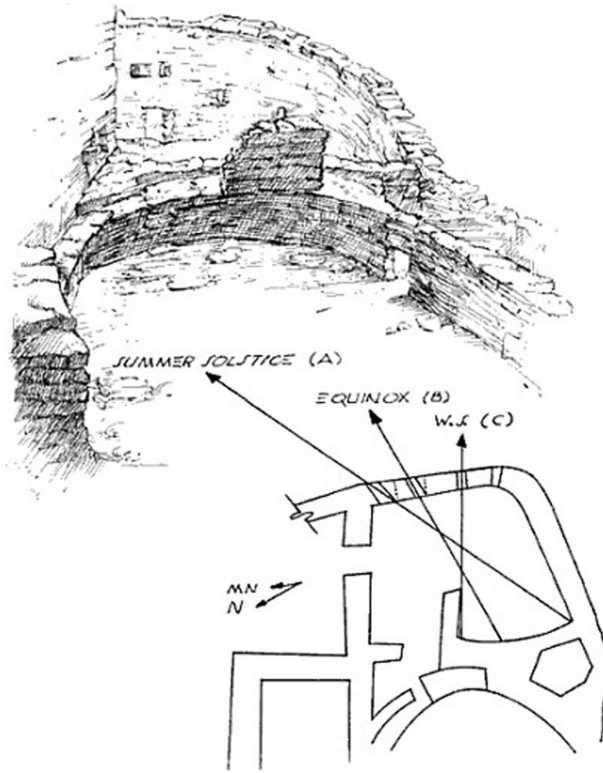


Figure 4. Unit-Type House astronomical alignments. Adapted from and courtesy Ray Williamson. Illustration by Snowden Hodges



Figure 5. Unit-Type House, east room, east interior. Adapted from BAE Bulletin 70, J.W. Fewkes. Photograph by T.G. Lemmon



Figure 6. Unit-Type House, east room, east exterior. Courtesy Smithsonian Institute, MS4321

showed the original configuration of the exterior surface of the east wall of the east room (Fig. 6). It showed a basal wall failure and the ports were not readily identifiable. We obtained a good quality photocopy for reference. When we compared the historical photocopy to modern photos of this wall surface, we noted that the ports are located near areas that have been stabilized since 1917. This is the case for ports B and C. Port A appears to be present. The lunar standstill port cannot be clearly defined. The northern jamb stone of what may be Port B appears to have been historically replaced either creating or enlarging the feature. Port C is located above the basal wall failure and has been stabilized. Its original configuration cannot be clearly seen in the historical photograph.

With the available photography, we cannot unequivocally state if these features are in their original 1917 configuration. We must look for additional evidence in the field notes of Dr. Fewkes. His published map of Unit-Type House (Fewkes 1919) does not show any ports in the eastern wall. Maps in his 1917 field notebook (Fig. 7) also do not show openings in this wall other than the doorway. Did Fewkes show these types of features in his maps and notes? An examination of his legacy documentation for an adjacent site, Ruin 9, clearly show that he recorded features he termed ‘peep holes’ at these sites in his field notes (Fig. 8), published maps and descriptions (Fewkes 1919). This brings the question, if Fewkes recorded these types of features and they were present at Unit-Type House, why did he not record them.

Based solely on the records of Dr. J.W. Fewkes found at the National Anthropological Archives of the Smithsonian Institute, we think there is reason to further test Williamson’s results. What is needed is a thorough review of the legacy documentation held at not only federal institutions but also the records of the excavation and stabilization of this structure over the years from Fewkes’ research until Williamson’s observations. This will fully illuminate the architectural history of these features and lead us to the evidence that will confirm or question their original condition.

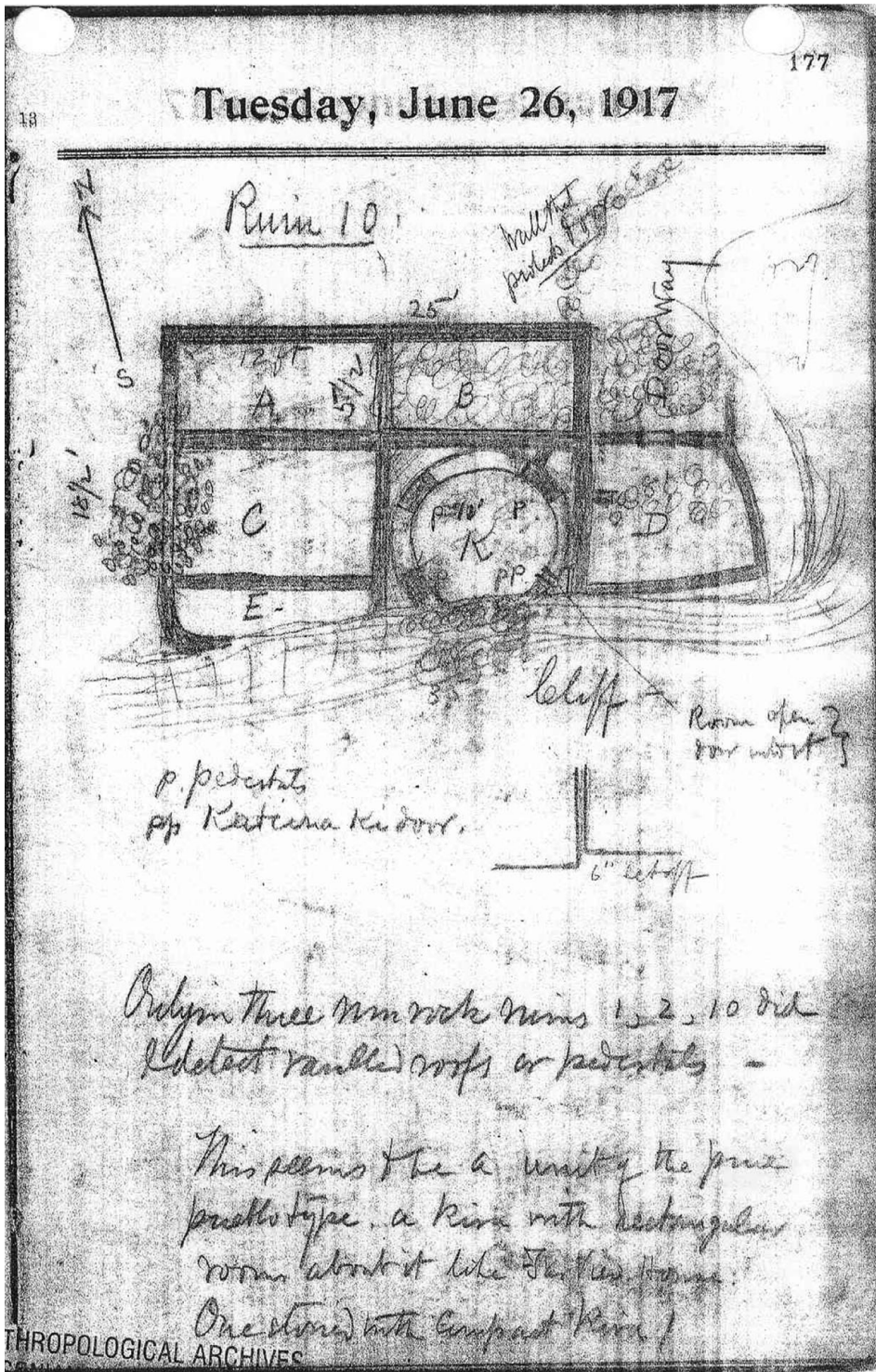


Figure 7. Unit-Type House plan map, Fewkes 1917 notebook. Courtesy Smithsonian Institution, MS4408

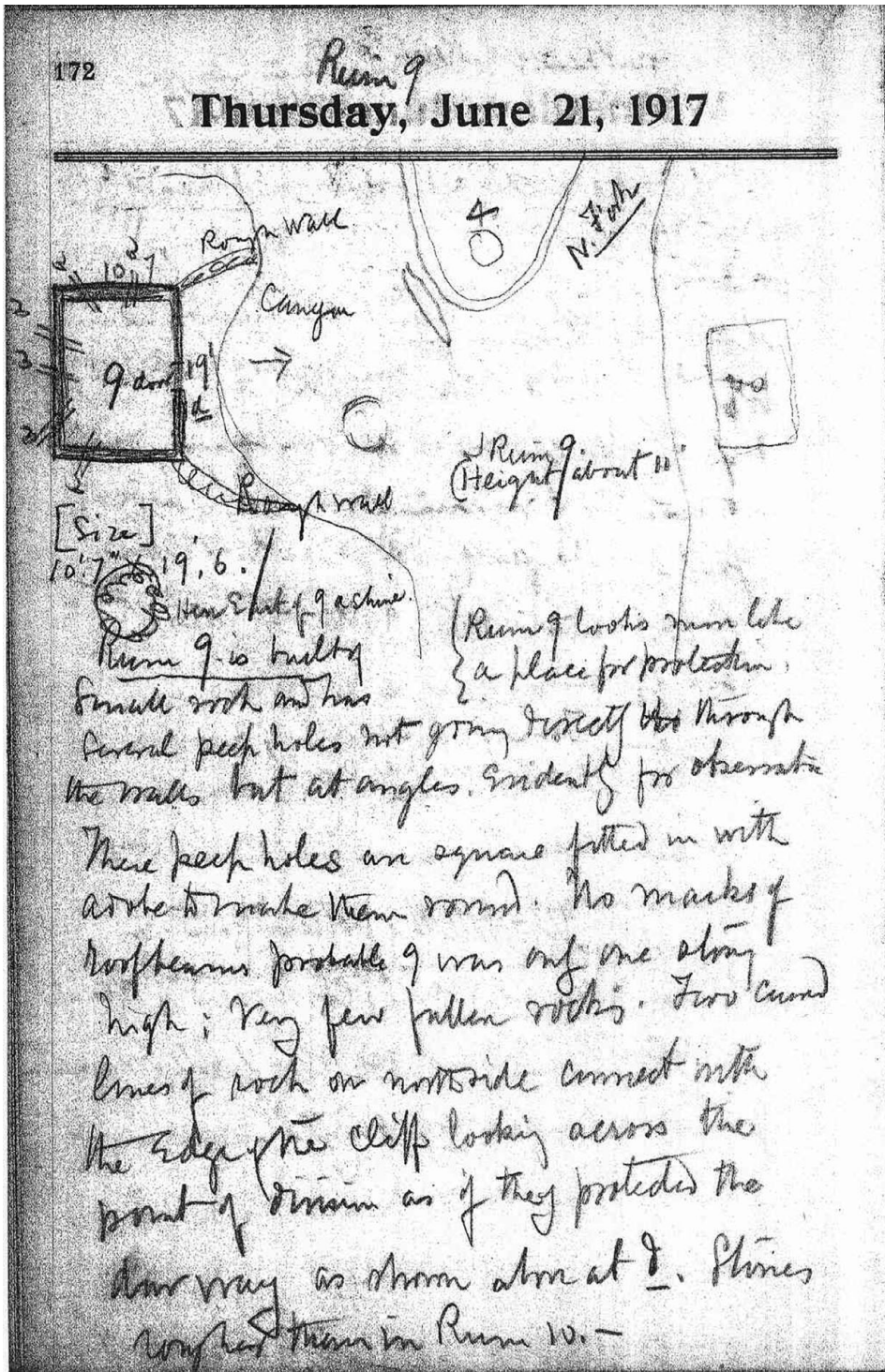


Figure 8. Ruin 9 plan map and notes, Fewkes 1917 notebook.
 Courtesy Smithsonian Institution, MS4408

4. Conclusions

Legacy documentation is critical to establishing the condition of features prior to modern intervention such as excavation and stabilization. It is a vital part of any research design and is a fundamental component of an architectural documentation project. Vast amounts of legacy documentation are now available on the internet but the majority of the written record remains in the collections of museums, universities and libraries. When reporting project results, attribute the source of your images or documentation and obtain proper use permissions before publication.

Two case studies were presented demonstrating how legacy documentation was useful in evaluating the original condition of architecture and features that have been proposed to be associated with astronomical observances. In the case of Sun Temple, an early photograph established the original condition of the western interior space. With this information, we were able to closely estimate and then calculate the original wall heights showing that it is unlikely that the interior structures extended above the exterior wall. In the case of Unit-Type House, the records of Dr. J.W. Fewkes raise the question of the original condition of features recorded by Williamson as astronomically significant. The evidence presented is limited to the records of one of the earliest southwestern ethnographers and archaeologists whose work is not without controversy. What is important is that such records are incorporated into the documentation and evaluation of features and architecture related to astronomical observances. By doing this early in a project, one can be more certain of the original condition of features or architecture, which will provide more confidence in project results.

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