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PASO POR AQUI: A HISTORY OF SITE MANAGEMENT AT EL MORRO NATIONAL MONUMENT, NEW MEXICO, U.S.A.

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Abstract: The subject of this paper is past and present site management and conservation efforts at El Morro National Monument in New Mexico. Interpreting the three distinct cultures of the area has presented a challenge for management. In addition to this interpretation, present site management focuses upon preserving the area's cultural heritage, including engravings and inscriptions found on the sandstone bluff that dominates the landscape. Also emphasised is the importance of comprehensive site documentation and archival storage of materials.

El Morro National Monument is located in the state of New Mexico, between the pueblo villages of Zuni and Acoma, and approximately two hundred kilometres west of Albuquerque. The monument contains varied flora, fauna and archaeological resources; it is, however, best known for Inscription Rock (Plate 1), a sixty-metre-high sandstone outcrop comprising inscriptions, paintings and engravings that chronicle the passage of people through the Southwestern United States over hundreds of years. Nestled at the base of the rock is a natural pool, created by rainfall and melting snow; as one of the only reliable sources of water in the area, it has attracted all who have passed. At the top of the rock are the remains of two villages dating from the late 1200s; the villages were inhabited by the Anasazi people, ancestors of the Zuni who live nearby today.

Since the time of the Anasazi, humans have left evidence of their presence on Inscription Rock. Various styles of paintings and engravings can be found: these include human figures, animals and symbols of American Indians; writings and poems of Spanish explorers from the 1700s, many of which begin with 'paso por aqui' — 'I passed by here'; and finely chiselled names of Anglo settlers, army, and railroad survey expeditions, who were a part of westward expansion in the mid-1800s. There are more than two thousand historic names, prehistoric paintings and engravings on Inscription Rock illustrating the intricate history of New Mexico. Natural and human-induced factors are causing the sandstone to erode, obliterating some of the names.

The Smithsonian Institution brought Inscription Rock's historical importance to the attention of the United States Department of the Interior in 1899. However, the area was not legally protected until 1906, when the National Monument was established by Presidential Proclamation (Anon. 1992: 1).

In 1992, the National Park Service sponsored a project to document and assess the deteriorative processes affecting the historic inscriptions at El Morro and to determine erosion rates (Padgett 1992). A natural clay and water deposit, insect activity, salt efflorescence, spalling, rising damp, microflora and manual abrasion were found to be the major factors contributing to the inscriptions' erosion. Although not mentioned in the scope of the project, rock imagery was examined in relation to deterioration factors because it is an integral part of the cultural heritage of the Monument. One requirement of the project was to gather all available existing site documentation. Background research proved both challenging and rewarding; it brought to light preservation and documentation techniques implemented from the early to mid-1900s. Items that had been missing for several years were discovered, including historic photographs and plaster casts made from latex moulds of some of the inscriptions. The importance of cataloguing and of archival storage for various types of documentation, so that it may be preserved for future research, was highlighted during the project.

Present site management

According to the Statement for Management for El Morro (National Park Service 1992: 6), issues concerning present site management encompass the following: protection and preservation of the inscriptions and other cultural resources, including the prehistoric pueblo villages of Atsinna and North Ruin located at the top of the rock outcrop (Plate 2); management of the El Morro collections; repair of trails and preservation of the natural setting.

Management objectives are: to maintain the integrity and natural setting of the area; to prevent deterioration due to both human and natural processes; to identify and protect the historical and archaeological remains from damage; to acquire land within authorised boundaries; and to encourage continuing research on preservation of cultural and natural features.

Interpretive objectives are: to provide a varied program for visitors that emphasises natural, cultural and historic aspects of the site; and to enhance the understanding of and interest in American Indian, Spanish American and Anglo-American peoples of the south-western United

States and their relationships to the past, present and future (National Park Service 1992: 6).

Additional objectives are: to develop and maintain programs with other agencies and groups for a high-quality environment; and to develop accessible programs and facilities for all types of visitors (National Park Service 1992: 6).

Some of these management objectives were achieved in 1992. For example, an interpretive brochure was published, informing visitors about past Anasazi, Spanish and Anglo use of the site. Within the Monument, there are new interpretive wayside exhibits that emphasise different aspects of the cultural and natural resources of the area. In addition, a Navajo-speaking class constructed a bridge along the main trail, to make it accessible by wheel-chair.

Visitors have a choice of two self-guided trails around the rock and a booklet explains points of interest corresponding to numbered posts along both trails. Guided tours are available for groups. Visitor use is seasonal, with three-quarters visiting between April and October (Anon. 1992: 11). Examination of the visitor book for the year of 1992 shows, for the most part, positive comments from visitors to El Morro.

Strategically-placed signs warn visitors against defacing the rock, and wooden fences serve as a barrier between the trail and the inscriptions (Plate 3). Although there are not enough rangers to patrol the whole trail system, relatively little vandalism occurs; graffiti is promptly removed to prevent further occurrence. The present practice of staff at El Morro, however, is to remove any new graffiti with a wire brush (Sievers 1970: 3; National Park Service 1992: 12). This method can be detrimental when used in close proximity to inscriptions or rock images, especially in areas where the rock surface is unstable. Other more appropriate methods, such as poulticing or disguising graffiti (Thorn 1991a: 74-5, 1991b: 57-61) were discussed with Monument staff.

El Morro collections

The El Morro National Monument archives contain numerous boxes of photographs and negatives from the late 1880s to the present day; these were made by various photographers, including author Charles F. Lummis. While representing a large resource of information about the condition of particular inscriptions and painted and engraved panels in the past, they are neither catalogued nor stored archivally. Also included in this collection is a comprehensive report by Martin (1986) listing all known rock picture sites at El Morro on State of New Mexico site record forms. The most useful set of photographs in the collection was a survey of the inscriptions, compiled in 1955 by Irving McNeil Jr (then Superintendent of El Morro), with assistance from Channing Howell. This survey was the first systematic record of all the inscriptions known at that time. Inscriptions were photographed at intervals and lettered brass markers were driven into the base of the rock to denote sections. Each photograph was numbered and lettered correspondingly, and notes were transcribed onto index cards, numbering over one thousand. The brass markers are still in place and are used today for denoting specific inscriptions. This photographic survey was invaluable as baseline data for comparing the condition of the inscriptions between 1955 and 1992 (Plates 4 and 5).

In 1984, a large-scale photogrammetric project was conducted by the National Park Service, using the 1955 photographic survey as a guideline. Although thirty-six rolls of slides were exposed, because of mechanical failures, the survey yielded only twenty rolls, some of which are over-exposed. Due to the incomplete nature of this survey, only a part of it was used for comparisons.

In the monthly Southwestern Monuments Reports, Robert Budlong, Custodian at El Morro between 1936 and 1942, mentions a complete photographic record of all known inscriptions made during the late 1930s. During the project, however, researchers were not able to find these photographs.

The need for cataloguing and archiving previous documentation became apparent during the project. Mr Budlong's daughter, who was found after the project's end, has over 2000 negatives that her father made during his career with the Park Service (Budlong, personal communication). The negatives are a valuable part of the previous documentation of the site and it is hoped that El Morro National Monument will be able to procure a set of prints. When compared with the condition of the inscriptions today, these 1930s photographs, along with the 1955 survey, could be used to determine the rates of erosion.

Past site management and early documentation

It is important to examine past site management practices, some of which continue to the present, to aid in the construction of a management policy that will assist in preserving the cultural heritage of El Morro for the future. Since the Monument's inception, site custodians have been concerned about preservation of the inscriptions; they noticed them deteriorating further each year. The monthly Southwestern Monument *Reports* of 1934 to 1940 give the first glimpses of early site management, monitoring and preservation attempts. In addition to providing visitation and management information, these reports illustrate the difficulties associated with working in remote areas with no facilities. Custodian Budlong's reports are particularly informative; they describe his attempts to monitor the condition of the inscriptions, to devise methods of preservation and to express his concern for ever-increasing visitation at the Monument.

In 1849, Richard Kern, an artist-topographer who visited the site with Lieutenant James Simpson and others as part of an expedition to Canyon de Chelly, made the first records of the inscriptions and rock paintings and engravings at El Morro. During their survey, Simpson took extensive notes while Kern copied some of the inscriptions, engravings and paintings. Before they left, Kern carved their names into the rock in two places, so becoming the first Anglo to record some of the inscriptions as well as to leave his own.

Paper squeezes, latex moulds and plaster casts

In 1911, Frederick Hodge of the Bureau of Ethnology took twenty impressions — also known as paper squeezes — of select inscriptions. A description of the method for making these squeezes, as found in the El Morro files (Schroeder 1955), is as follows:

The rock with the petroglyphs should be thoroughly soaked with water first. Single sheets of paper of the type used by newspapers in their electrotype process are then laid over the inscriptions and beaten with a heavy brush

and water. Additional layers of this paper, or in its absence newspaper may be used, are applied to build up the thickness of the paper being beaten in. This mass of paper is left to dry in the inscription and may be allowed to fall off onto the ground.

According to Hodge, this method did not remove any particles of rock from the sandstone substrate; however, in order to validate his statement, one would need to examine the casts microscopically and compare them with the rock surface. Eleven of these squeezes and one plaster cast were found recently in a building at El Morro and are now housed at the Western Archaeological Conservation Centre; another nine squeezes, along with three plaster casts, are at the Smithsonian Institution.

In 1938, preliminary experiments for making latex moulds were conducted by Custodian Budlong on a sandstone test fragment. Recording the inscriptions by making moulds and then plaster casts would provide an exact replica of the rock surface; this was thought far superior to photography as a record (Budlong 1938a). Budlong made seven moulds of various inscriptions, and some of these were cast in plaster at the University of New Mexico (Budlong 1940, 1944). After Budlong's departure from the Monument, the location of the moulds and casts became unclear; in the 1960s, one cast was reported in the Park Service Headquarters in Santa Fe (Steen 1966). Until recently, neither the latex moulds and casts nor the documentation and photographs of the processes used could be found.

In July 1992, Kaisa Barthuli of the National Park Service identified four of the missing plaster casts at the Palace of the Governors in Santa Fe. They had been stored in a room with other 'unknown' objects that had no associated documentation. These four casts are framed and have been hand-coloured to resemble the rock surface. The casts are considered an important source of information: they show the rock surface at a particular time and can be compared with the rock surface today to determine rates of erosion.

Darkening of the inscriptions

Two past management practices at El Morro have adversely affected the inscriptions. Early Custodians and employees darkened the inscriptions to make them more easily discernible for visitors and for photography. Prior to 1938, hard graphite pencils were used (Budlong 1938b). It was thought that deepening the groove profiles on the eroding rock surface would help to preserve the inscriptions. Select inscriptions were chosen for this purpose. Unfortunately, experience has shown that individuals undertaking this type of work often use subjective assessment; thus the integrity of the site is changed (Lee 1989: 49, 1990: 1; Lambert 1989: 56).

The most classic and controversial example of penciling at El Morro is the inscription of Don Juan de Oñate, the first Governor of New Mexico (Plate 6). The date appears as 1605 or 1606 on various historic photographs, depending on who darkened the inscription. For many years the inscription read 1606 (Plate 7), until historians pointed out that Oñate had actually passed by El Morro in 1605.

After 1938, inscriptions were painted with 'Rising Sun Stove Polish' using a sable brush; this was considered a less destructive technique (Budlong 1938b). In many places, the graphite and/or stove polish has bonded to the rock surface, particularly on those inscriptions in more protected areas. It is not known exactly when the procedure of darkening the inscriptions ceased; however, as late as 1957, this practice is mentioned in a *National Geographic* article (Park 1957: 237). Some inscriptions have been covered by a water/clay deposit since they were last darkened and are once again difficult to discern.

Erasure of post-1906 inscriptions

The most drastic alteration to the inscriptions was the removal of post-1906 names. In the 1920s, Monument employees were instructed to remove any names inscribed after 1906, the year in which El Morro became a National Monument (Budlong 1938c). At this time, these names were considered graffiti and were removed by scraping with an axe (Dalton 1971a). A mass 'erasure' in the 1920s was poorly supervised and many historic inscriptions were removed. Other erasures came dangerously close to the inscriptions. In many areas with inscriptions, water percolating through the rock has caused formation of case-hardened sandstone. Abrasive pressure against this surface can accelerate erosion by causing unstable rock to exfoliate prematurely thus producing granular disintegration of the sandstone underneath the abraded area. Because of the lack of early complete documentation, we do not know exactly how many inscriptions and/or motifs were lost during the erasures. Custodian Budlong (1938c) noted several examples of pre-1906 inscriptions removed during the mass erasure; these included the names of the first Bishop of New Mexico, Jean Baptiste Lamy, and that of Kit Carson, a prominent figure in American history.

Consolidation treatments

As early as 1925, various consolidants were tested and used on inscriptions at El Morro. A trial area was found during this project and the words carved by Custodian Evon Vogt, 'Colourless coverings save old inscriptions' can still be seen (Plate 8). Five products were brushed onto the rock surface, each covering one of the words. The products used were 'Gar Kem', 'Super Por Seal', 'Glidden's Compound', 'Driwall' and 'Transview'. They were described as equally colourless (El Palacio 1926). 'Driwall', a paraffin solution that was developed by the United States Bureau of Standards, was chosen and used for several years (Vogt 1925). The treatment was described by Vogt (1934):

> it is always somewhat alarming to paint those hallowed old inscriptions with paraffin paint for at first the inscription is so changed-looking. But in a few hours the paraffin preservative sinks into the sandstone and dries so that a natural appearance is given.

Application of this substance to particular inscriptions became an annual procedure prior to each winter. The inscriptions daubed with paraffin were the most well-known and considered to be the most important. These were also darkened with graphite and are easy to identify. In 1937 Budlong decided to apply the coating with a sprayer instead of a brush to prevent smearing of the graphite (Budlong 1937). The paraffin technique was last mentioned in the 1940s Southwestern Monuments *Reports*. Interestingly, the majority of inscriptions that were so treated appear to be in good condition today. This could be due to their location, the paraffin applied over many years, or a combination of the two factors. Most of

these inscriptions were located in areas where the rock surface appears stable.

In the 1960s, consolidation experiments were undertaken at El Morro using two substances, 'Dareweld' and 'Daracone' (El Morro Fact File 1962). They were applied with a brush in adjacent sections of Inscription Rock and monitored for erosion over a period of four years. Those conducting the experiments noted very little difference between the treated and untreated areas. No information could be found regarding the composition of these consolidants.

In 1964, a synthetic resin was tested on an area at the base of Inscription Rock. This area was selected because it represented several conditions found in other places on the rock, because it was in an area not visited by the public, and because there were no inscriptions there. However, there were marks described as 'cuts' that might react to a stabiliser in the same manner as inscriptions (Steen 1966). The 'cuts' mentioned may have been the deeply incised prehistoric engravings that can be seen in this section today. The resin, called 'Pencapsula', was described as an inert viscid petrochemical with an effective life of eighteen to twenty years. The substance does not form a film or membrane, nor does it fill the interstices in the stone. It penetrates and cements individual grains, allowing the stone to 'breathe' naturally while decreasing the possibilities of spalling (Steen 1967: 14-15). In the first test, the bottom portions of two badly faded and eroded pictographs were covered with a mixture of 'Pencapsula' and thinner (Steen 1966). It is interesting that these tests were conducted on surfaces with rock picture motifs before using the consolidants on inscriptions.

In 1965, a mixture of 'Pencapsula', with the proportion of thinner increased, was applied, using a spray gun, to the Don Juan de Oñate inscription and another inscription. One year after these applications no damage or erosion was observed at either location (El Morro Fact File 1962; Steen 1966).

During the current project, the area to which Pencapsula was applied in 1964 (described above) was found. The prehistoric paintings in the treatment area have been affected by micro spalling but it is unclear whether this was due to the consolidation attempts or to natural weathering processes. Infrequent but large doses of moisture and deposits of water/clay affect the entire rock surface in this area. Comprehensive written records and photographic documentation of these consolidation tests are lacking. This information would be valuable as baseline data for future consolidation tests and for monitoring.

Modifications to El Morro's pool

The pool at the base of Inscription Rock has been modified considerably over the years. Carved hand- and toe-holds leading from the pool to the top of the bluff provide evidence that it was originally used by the Anasazi. Various sources report that the pool was ringed with an embankment of sand for most of the year (Greene 1978: 8-12), and there were at least forty-three inscriptions in this area (Slater 1992: 56-8). In the 1920s, the first dam was built, altering the natural state of the pool. The dam was enlarged in subsequent years, and was the main source of water within the Monument and for local people who hauled water from the pool for personal use (Greene 1978: 13-18).

In the late 1930s, the hauling of water was found to be damaging vegetation in the vicinity and was prohibited (Sievers 1970: 11-12). The public was no longer allowed to use water from El Morro's pool, the original reason that people came to the rock. In 1942, a huge sandstone slab from near the top of the rock exfoliated and fell into the pool, totally destroying the dam (Greene 1978: 17). The last modification to the pool was a dam built in 1943 of reinforced steel and concrete. Domestic use of water from the pool at the Monument ended in 1961 when a well was acquired (Greene 1978: 18).

It is possible that the present water level of the pool is affecting the adjacent rock surface. A former seasonal ranger at El Morro visited the site and remarked how much the pool area had changed in forty years, including the fact that many inscriptions were gone. He considered that enlargement of the pool, allowing water to be in direct contact with the sandstone, had undercut the inscriptions in the vicinity, causing them to spall off into the water (Dalton 1971b: 1). Returning the pool to its natural state or historical appearance has been suggested (Greene 1978: 21), but this would require careful examination of past conditions.

Conclusions

Past management practices and preservation attempts at El Morro focused on protection and interpretation of the Spanish and Anglo inscriptions. Current management objectives emphasise identification, protection and interpretation of archaeological and historical heritage of all three cultures associated with the site. To accomplish these objectives, it is essential to obtain a complete record of all inscriptions and rock pictures contained within the Monument as soon as possible; it is known that some are deteriorating rapidly.

Various attempts in the past to record and to preserve the inscriptions and rock pictures illustrate the importance of maintaining comprehensive written and photographic records. Complete documentation of the site would involve systematically photographing all the inscriptions and the rock engravings and paintings. Equally important is cataloguing and the proper storage of all the items in the El Morro archives; some of this information is unobtainable elsewhere (for example, negatives and photographs that show inscriptions prior to exfoliation, weathering or erasures).

Management strategy has changed considerably over the years at El Morro. Visitor management techniques are being developed and methods for preservation of the inscriptions are being examined. These include stone consolidation as well as monitoring of surface water movement, water percolation within the rock and large-scale movement of sections of the rock.

It is important that the Monument's future management develop priorities for the variety of cultural resources contained within the Monument. Should the focus of preservation efforts be on the prehistoric motifs, on the most historically significant inscriptions, or on those found to be in the most danger of exfoliation or rapid deterioration? These questions can only be answered after a complete inventory is made by thorough documentation.

ADDENDUM

Since 1992, when this paper was presented, two inscription assessment projects have been undertaken to document photographically and graphically all known rock images and inscriptions at El Morro. The present condition of each panel has been recorded and potential threats assessed. A monitoring system has been developed based on priority ratings assigned to each inscription or rock picture panel during assessment. A large proportion of the photographs and negatives in the El Morro collection have been catalogued and stored archivally. A project has commenced testing the potential of spot-welding with epoxy and grout injection to stabilise detached rock surfaces. All these projects were undertaken on the basis of recommendations made to management in 1992. The lack of comprehensive site documentation has been addressed, and management can now focus upon interpretation and monitoring while research continues on preservation techniques.

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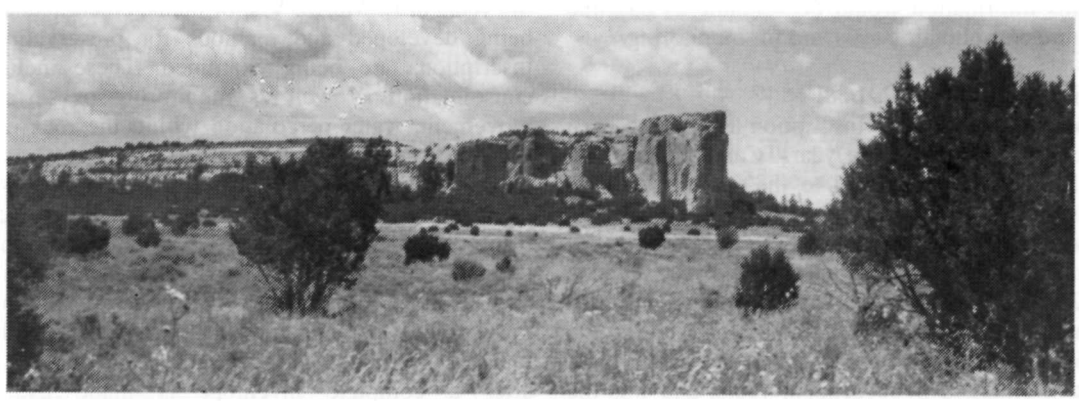

Plate 1. *Inscription Rock, El Morro National Monument. The sandstone outcrop contains paintings and engravings from Anasazi and Zuni people and inscriptions from Spanish explorers and Anglo settlers.*

***Plate 2**. Superintendent Reed Detring of El Morro National Monument and geologists George Austin and Tanya Baker from the New Mexico Bureau of Mines and Mineral Resources examine the prehistoric pueblo village of Atsinna at the top of Inscription Rock.*

***Plate** 3. A wooden barrier fence separates visitors from the inscriptions.*

***Plate** 4. Inscription of Pablo Morales, photographed by Irving McNeil Jr in 1955 (photograph courtesy of El Morro National Monument).*

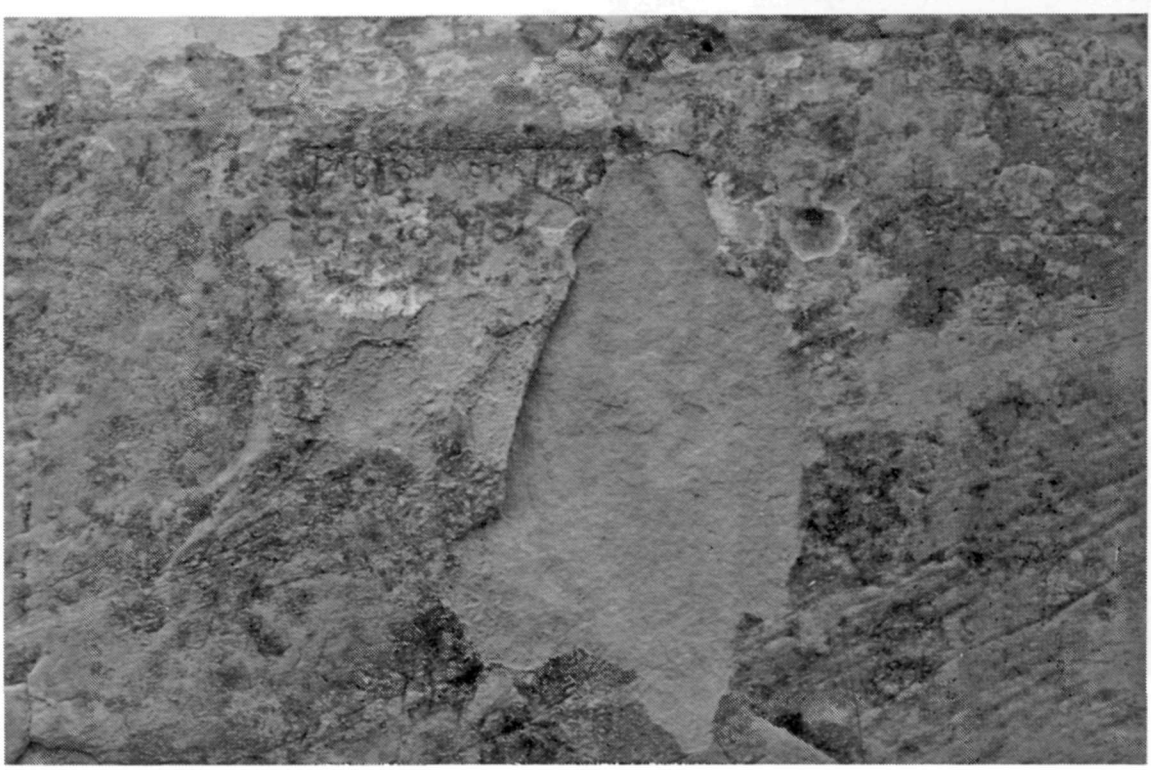

***Plate** 5. Inscription of Pablo Morales, photographed by Kaisa Barthuli in 1992. Note the degree of spalling of the rock surface.*

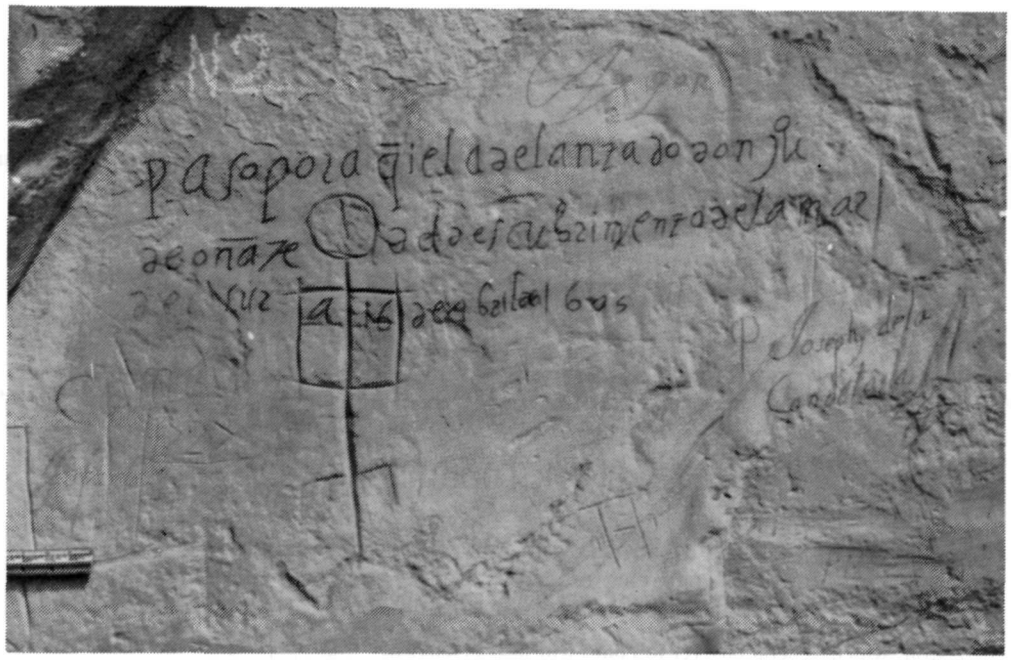

***Plate** 6. Inscription of Juan de Oñate, photographed by Irving McNeil Jr in 1955 (photograph courtesy of El Morro National Monument).*

***Plate** 7. Juan de Oñate inscription in a 1911 photograph by Jesse Nusbaum, showing the date as 1606 due to subjective penciling (photograph courtesy of El Morro National Monument).*

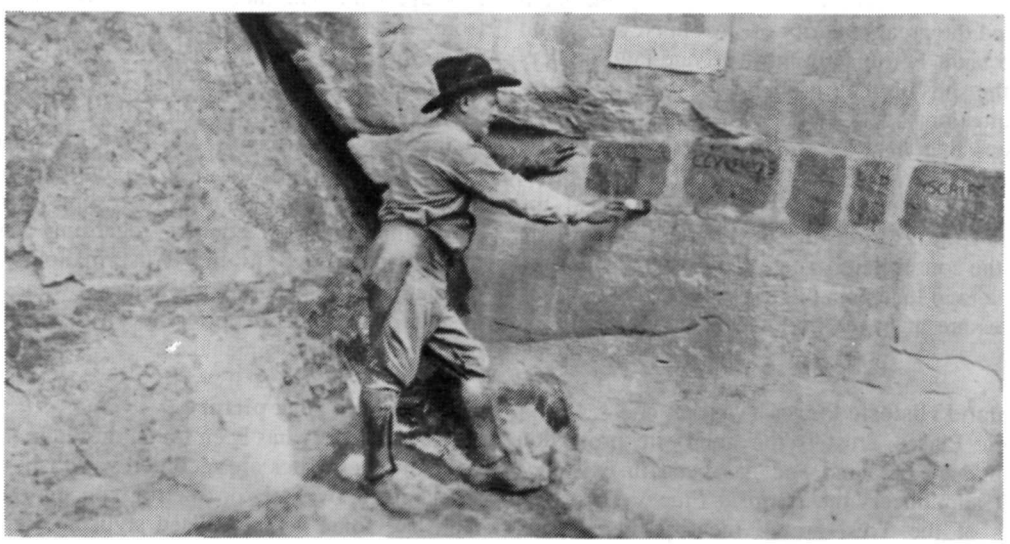

***Plate** 8. El Morro Custodian Evon Z. Vogt shown testing various consolidants in 1925 over the words, 'Colourless coverings save old inscriptions'. These carved words can still be seen today (photographer unknown, photograph courtesy of El Morro National Monument).*