

HISTORY OF RUINS STABILIZATION AT  
CLIFF PALACE AND SPRUCE TREE HOUSE  
MESA VERDE NATIONAL PARK, COLORADO

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## Abstract

In October 1988, Alpine Archaeological Consultants, Inc. conducted an examination of all documentary information at Mesa Verde National Park pertaining to ruins stabilization of Cliff Palace and Spruce Tree House. The project was carried out under the provisions of National Park Service contract CX-1490-8-0006. The following report documents the history of ruins repair and stabilization at Spruce Tree House and Cliff Palace from the initial work of Jesse Walter Fewkes to the present time. The report is broken into two categories. The first is a narrative history of stabilization of the two ruins including a section on philosophy and policy of stabilization at Mesa Verde National Park which puts the repair and stabilization into historical context. The second section is composed of "Stabilization History Forms" for Cliff Palace and Spruce Tree House for every architectural unit for which evidence of stabilization could be determined.

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## INTRODUCTION

In September 1988, Alpine Archaeological Consultants, Inc. of Montrose, Colorado was awarded a National Park Service contract (CX-1490-8-0006) to document the history of stabilization work at Spruce Tree House and Cliff Palace at Mesa Verde National Park. A complete examination of all existing documents was conducted at the Mesa Verde Museum and Research Center by Ms Susan M. Chandler and Mr. Jonathon C. Horn the following month. Thousands of pages of correspondence, reports, and field notes were scrutinized and pertinent information noted or photocopied. An equally large number of photographs were examined and the information therefrom annotated. Poorly identified photographs were taken to the cliff dwellings where they were positively identified. Several historical photographs were replicated in the ruins so that comparisons could be made and previously undocumented modifications detected. Historical photographs before and after the work of Fewkes were copy shot so they could be compared with each other and with the modern reconstructed views. Synthesis of the data collected at Mesa Verde National Park, resulting in the generation of this report and forms on each room, kiva, or other unit of research, was conducted at Alpine's research facility in Montrose.

The following stabilization history of Cliff Palace and Spruce Tree House not only documents activities at those two ruins but puts that work into larger contexts of events and policy at Mesa Verde National Park, as well as regionally and nationally. The narrative portion of this report is followed by Appendices for each ruin composed of "Stabilization History Forms." These provide all photographic and written documentary reference data on a unit-by-unit basis along with a brief historical account.

### INITIAL WORK AT SPRUCE TREE HOUSE AND CLIFF PALACE BY JESSE WALTER FEWKES

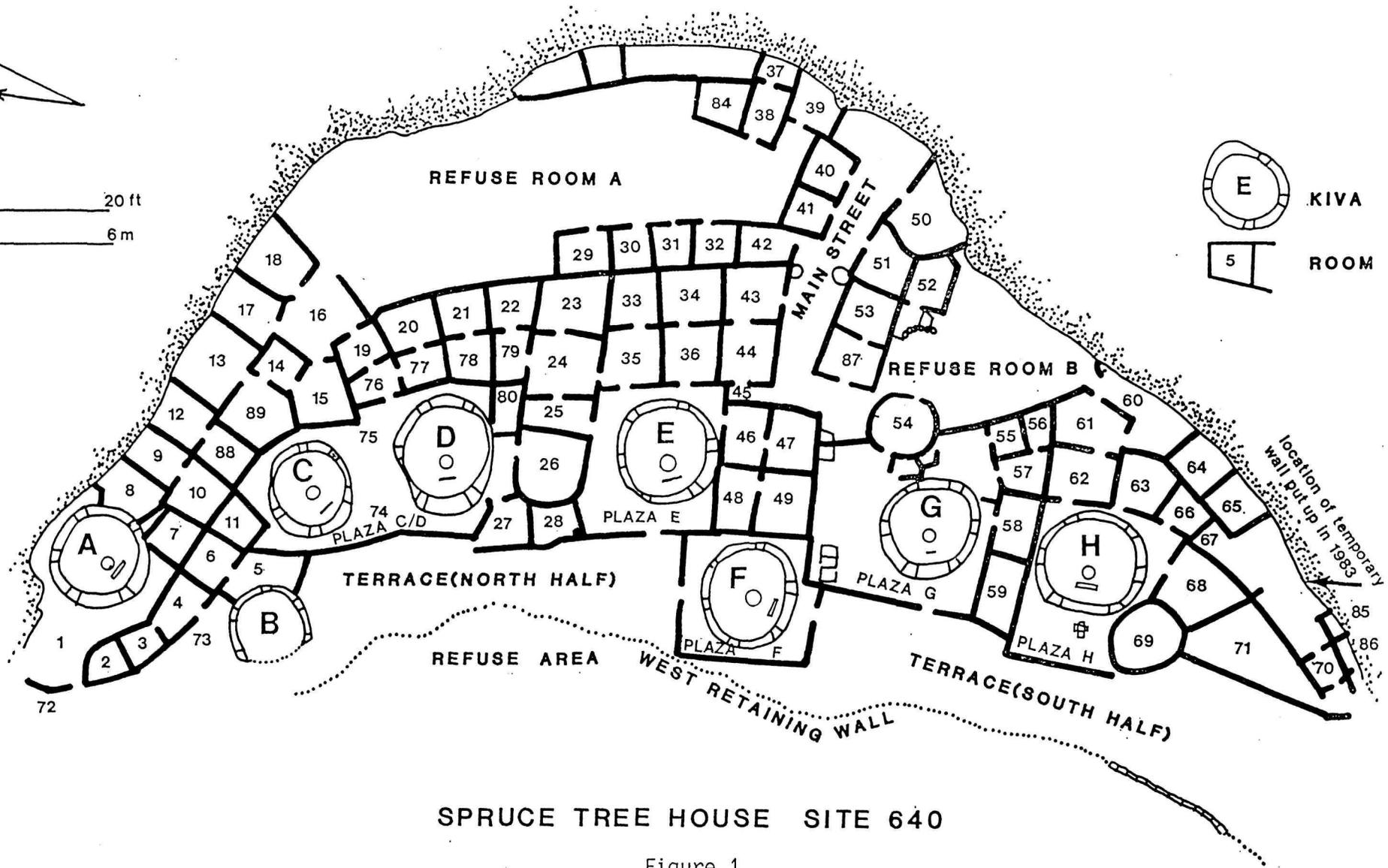
With the establishment of Mesa Verde as a National Park in 1906, the first order of business was to place the ruins into condition suitable for visitation and public interpretation. Dr. Jesse Walter Fewkes of the Smithsonian Institution was sent forth to direct the undertaking of excavating and repairing certain of the ruins.

Fewkes began his work at Spruce Tree House in May and June of 1908 (Figure 1). He duly noted the uniqueness of the endeavor when he stated: "This action marks the entrance of the Interior Department into a new field of activity, the excavation and repair of our prehistoric ruins, and is a step of no small importance viewed from both the educational and the scientific standpoint" (Fewkes 1908a:15). Spruce Tree House was chosen for this initial work for two reasons. First, the appropriation of \$2,000 for the project was anticipated to be sufficient to complete work at a site the size of Spruce Tree House. Second, the ruin was situated in close proximity to where all the visitors to Mesa Verde camped and was the first cliff dwelling they visited. Also of importance, "Spruce Tree House presents all the important architectural features found in other Mesa Verde ruins" (Fewkes 1908a:5).



0 20 ft

0 6 m



### SPRUCE TREE HOUSE SITE 640

Figure 1

Education of the visiting public was the primary goal of Fewkes' early work at Mesa Verde. With this in mind, Fewkes set out to make Spruce Tree House a "type" site by which all of the other ruins in the park could then be understood. Because Spruce Tree House was the first ruin visited by newcomers to the park, he felt it imperative that his work give a clear idea of the general features of cliff dwellings by "show[ing] the meaning of their different parts, the construction and essential features of the rooms, their arrangement and special uses" (Fewkes 1908a:16).

To accomplish this, Fewkes treated Spruce Tree House as a "museum specimen."

A sign board stating dimensions of the ruin, number of rooms, and kivas was placed in a conspicuous position on the large cedar of Kiva B. Other signboards, "Balcony," "Wall Painting," and "Burial Chamber," were set up in appropriate places. Two old stairways consisting of foot holes cut in the wall of the canyon, were also properly labeled. Dwelling rooms were numbered with black paint;... Especial attention was given to labeling Kiva G, its different parts being indicated by numbers which refers to a large label painted in full sight on the Kiva wall.... It was the intention of the authors to answer by these labels questions ordinarily asked by visitors. The numbering and lettering is to facilitate descriptions and references. The name "Spruce Tree House," printed out on a brass plate, is firmly affixed to the outer wall of room 49 [Fewkes 1908a:28].

Kivas C and F were completely restored. The expertise of A.V. Kidder was drawn upon in reconstructing the roofs (Fewkes 1908a:25), with Fewkes following "as a model the roofs of the two kivas of the House with the Square Tower (Peabody House)" (Fewkes 1909a:21). The most complete reconstruction was possible in Kiva C. According to Fewkes (1908a:28), "This is the only attempt to restore the complicated roof of a cliff-house kiva, and it is believed that from the educational standpoint the result is one of most important in the repair work at Spruce Tree House."

In addition to his "educational ideal for visitors," Fewkes sought to use his work at Spruce Tree House "as an object lesson for archaeological students, showing by this means how ruins should be excavated and repaired" (Fewkes 1908a:16). In this, Fewkes saw himself in the vanguard of a "new archaeology," one in which "beginners and those without training or experience should not be allowed to take charge of archaeological work without direction on any of the great ruins of the southwest" (Fewkes 1908a:17).

In this vein, Fewkes (1908a:16-17) explained:

Hitherto, with the exception of the work under the author's direction at Casa Grande, by the Smithsonian Institution, archaeological fieldwork in the Southwest has been devoted mainly to making collections of pottery and small portable

antiques. In the effort to gather these minor antiques the walls of the ruins have been mutilated and left practically without any thought of protection from the elements. Architectural data have been sacrificed to obtain collections of those small objects which have a commercial value or will make an artistic impression when arranged on the shelves of a museum. It is hoped that the work done at Casa Grande Ruin in Arizona and the Spruce Tree House in Mesa Verde National Park the past season may influence archaeologists to even greater care in the treatment of the ruins they are permitted to excavate in the southwest. Our responsibility in this work is very great, for we are dealing with precious data, which belongs to posterity as well as to the present generation. The author believes he has no right to tear down walls and despoil prehistoric cemeteries for any other purpose than the advancement of knowledge.

In hindsight, Fewkes has been criticized for his lack of scientific methods in excavating sites at Mesa Verde. Considering his "educational ideal" in treating Spruce Tree House, the extensive looting which had taken place there over the preceding 25 years, and the state of archaeological method at the time, Fewkes was truly in the vanguard in the development of modern archaeology. Consequently, his techniques should not be judged too harshly.

As for the repair of Spruce Tree House, Fewkes was indeed a pioneer in the field of "ruins stabilization." Even at this early stage, however, Fewkes realized that theoretical questions concerning repair and reconstruction were likely regarding the extent to which work should be legitimately carried out. Fewkes (1908a:16) addressed this problem when he wrote:

Archaeological experts may differ in their judgments regarding the extent of work necessary to repair a ruin as much mutilated as Spruce Tree House. It is difficult to determine a strict line of demarkation between repair and restoration work. The author has sought to avoid any restoration which would involve him in any theoretical questions even when he had good reasons to adopt an obvious interpretation. He has endeavored to preserve the picturesque character of the walls when possible and has not attempted to foist on the observer any theory of construction that was not clearly evident.

The main problem with both the archaeological and repair work conducted by Fewkes at Spruce Tree House and other ruins at Mesa Verde is the level of documentation which he maintained. Except for brief written statements about the nature and location of the work, and a few before and after overview photographs of the ruin, documentation is absent. This is most critical for his repair work because it is frequently impossible to tell the original masonry from that which was added. Therefore, it is not possible to ascertain whether Fewkes was true to his ideals or if inaccurate interpretations may have been incorporated unintentionally. It is certain from photographs and written records that Fewkes conducted work in Rooms 15, 26, 27, 28, 62, 63, and 69 and



Figure 2. Copy of historic photograph of Spruce Tree House looking east across the canyon prior to 1908. (Neg. #4693, Mesa Verde Museum)



Figure 3. Present view of Spruce Tree House looking east across the canyon.

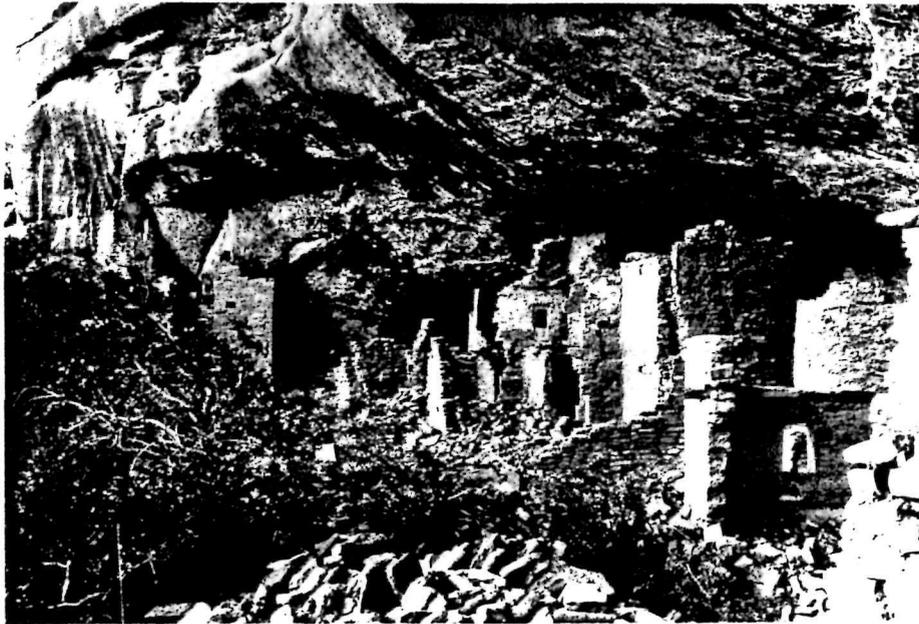


Figure 4. Copy of historic photograph entitled, "Spruce Tree House Before Excavation" looking north across front of the ruin. (Neg. #4915, Mesa Verde Museum).



Figure 5. Present view north across the front of Spruce Tree House from the same vantage point as the historic photo.



Figure 6. Copy of historic photograph entitled, "Spruce Tree Before Excavation" looking south across front of the ruin. (Neg. #4916, Mesa Verde Museum).



Figure 7. Present view south across the front of Spruce Tree House from the same vantage point as the historic photo.



Figure 8. Copy of an historic photograph attributed to Fewkes, ca. 1908, entitled, "Spruce Tree House Before Repair" looking south into the courtyard of Kivas C and D. (Neg. #4153, Mesa Verde Museum).

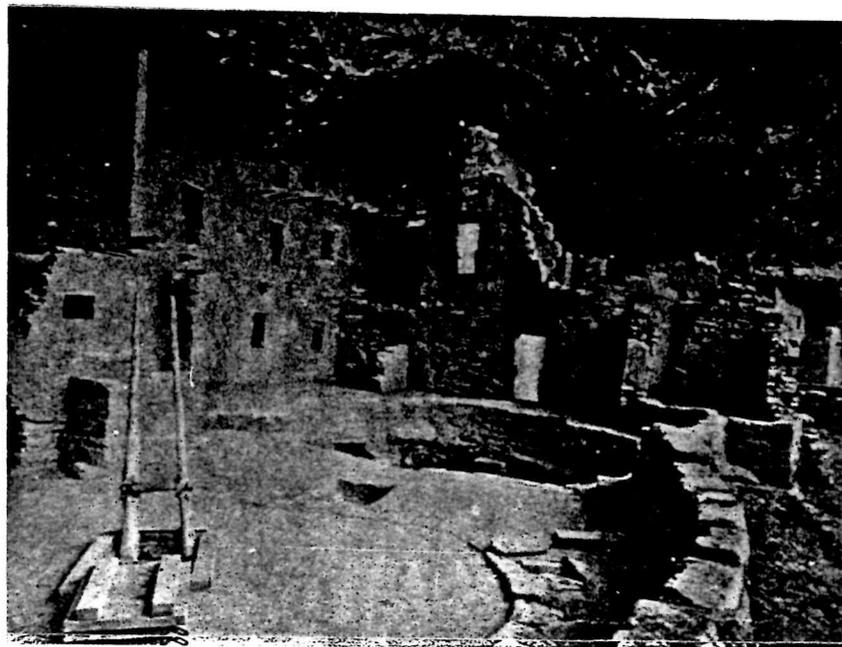


Figure 9. Copy of a photograph attributed to Fewkes, ca. 1908, entitled, "Spruce Tree House After Excavation" looking south into the courtyard of Kivas C and D. (Neg. #4154, Mesa Verde Museum).

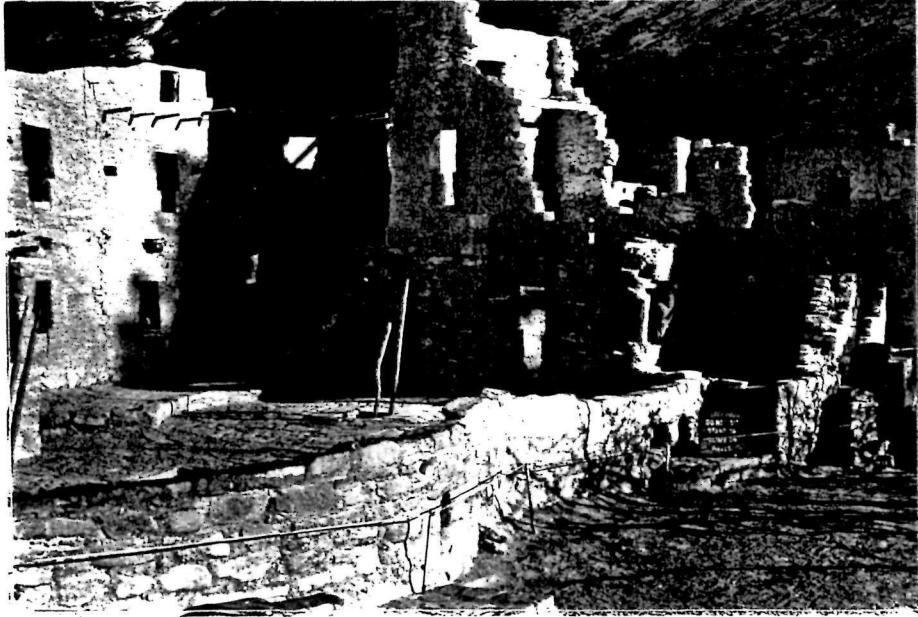


Figure 10. Present view south into the courtyard of Kivas C and D and Spruce Tree House from a similar vantage point as the two previous photographs.

all of the kivas at Spruce Tree House (Fewkes 1908a:18, 24-28; 1908b; 1909a:12-13, 23). Figures 2 through 10 are before and after photographs of Spruce Tree House. The "before" photographs show the ruin before initiation of excavation and repair by Fewkes. The "after" photographs are replications of the historic photographs taken in 1988. In addition, Figure 9 is a photograph taken immediately after the completion of Fewkes' work in 1908. These photographs are the best documentation of Fewkes' work and suggest that he indeed did adhere closely to his ideals.

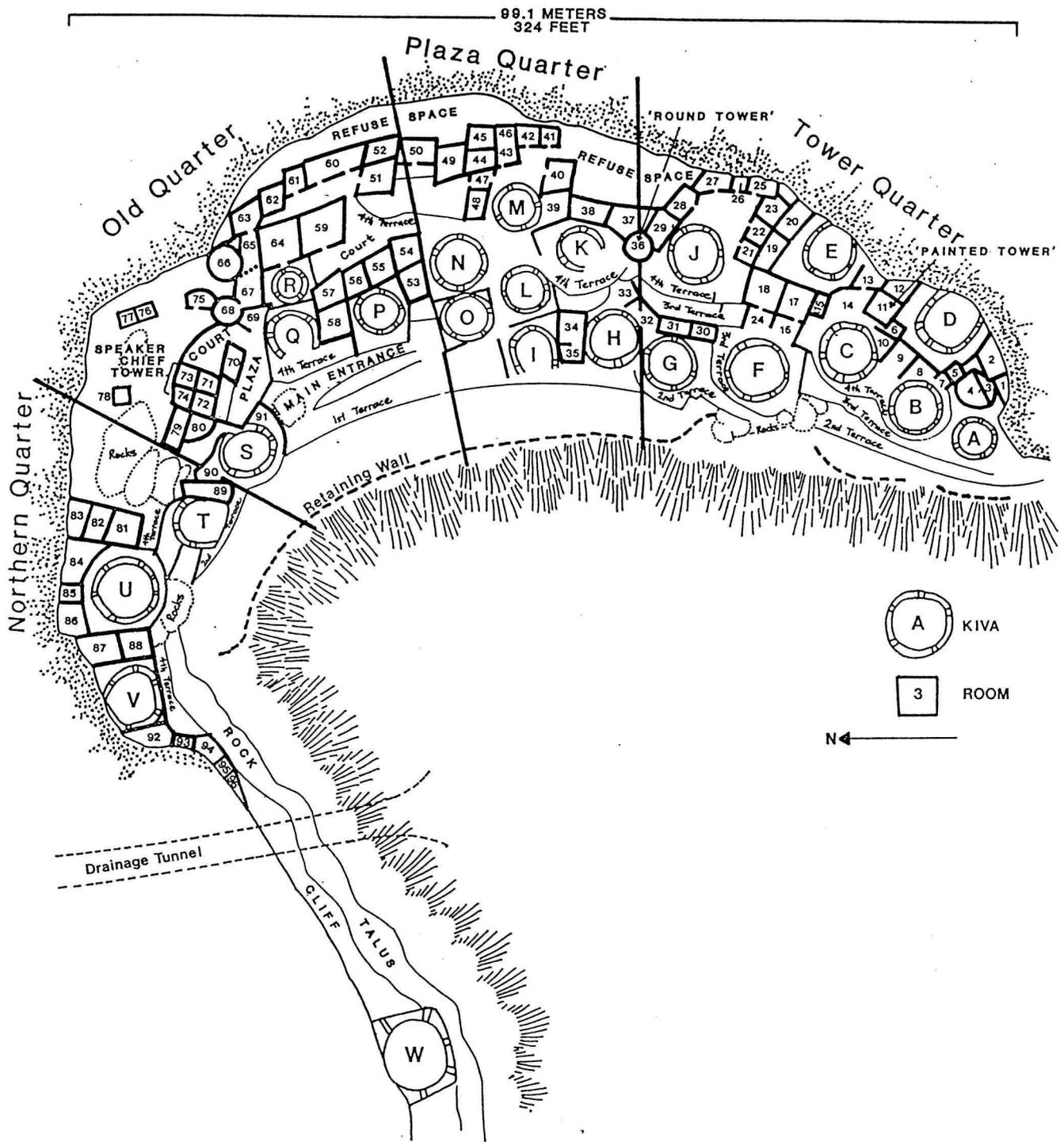
In addition to actual excavation and repair work at Spruce Tree House, Fewkes made several other improvements. For ease of visitation, trails were built through the ruin and the main approaches graded. A 310 foot trail from the head of Spruce Tree Canyon to the north end of the ruin was built replacing a trail that crossed the canyon and entered the south end of the ruin. He also improved an existing trail in the canyon bottom that entered the ruin on the north (Fewkes 1908a:28-29). The most destructive force, water cascading over the alcove rim onto the ruins below, was obviated by "blasting" a trench 254 feet long, two feet deep and three feet wide near the edge of the mesa top, diverting water to either side of the ruin (fewkes 1908a:17).

The following year, 1909, Fewkes returned to Mesa Verde and conducted the excavation and repair of Cliff Palace (Figure 11). The enormity of the task was alluded to by Fewkes (1908a:16) in his report to the Secretary of Interior on Spruce Tree House the previous year: "Before the repair of a magnificent ruin like Cliff Palace could be attempted, work on a small ruin like the Spruce Tree House was almost necessary. No one without some such experience in repair work should be entrusted with the excavation and repair of this important ruin."

A total of \$4,360 was allotted for the project, which was conducted from May through August. Fewkes proceeded with the project as a continuation of his work at Spruce Tree House. In fact, his "educational ideal" was the primary force motivating the project. To this end he wrote:

As far as possible I endeavored to increase the educational value of Cliff Palace and to develop it into a "type ruin." It is well adapted for this purpose, being the largest cliff house known and containing most of the architectural features of this type of prehistoric buildings.... Anyone familiar with the Cliff Palace as now repaired has a type for interpretation of all other cliff ruins in the Mesa Verde National Park, and for comparison with those situated outside this area [Fewkes 1909b:17-18].

"Very little attention was given to labeling rooms, kivas, and their different parts, the feeling being that this experiment has been sufficiently well carried out at Spruce Tree House, an examination of which would logically precede that of Cliff Palace." (Fewkes 1911:26). Since this had already been done at Spruce Tree House, "it would be redundant to carry out the same plan in other ruins" (Fewkes 1911:26).



CLIFF PALACE SITE 625

Figure 11

Following this same logic Fewkes (1911:26) reported:

No attempt was made to restore the roof of any of the Cliff Palace kivas for the reason that one can gain a good idea of how the roof of a circular kiva is constructed from its restoration in Kiva C of Spruce Tree House, and an effort to roof a kiva at Cliff Palace would merely duplicate what has already been accomplished without adding essentially to our knowledge.

Tremendous destruction had taken place at Cliff Palace since its discovery in the 1880s.

Probably no cliff dwelling in the southwest has been more thoroughly dug over in search of pottery and other objects for commercial purposes than Cliff Palace.... In order to secure this valuable archaeological material, walls were broken down with giant powder, often simply to let light into the darker rooms; floors were invariably opened and buried kivas mutilated. To facilitate this work and get rid of the debris, great openings were broken through the fine walls which form the front of the ruin. Beams were used for firewood to so great an extent that not a single roof now remains. This work of destruction, added to that resulting from the erosion due to torrents of rain, left Cliff Palace in a sad condition [Fewkes 1909b:16-17].

The repair of Cliff Palace was conducted in the same manner as Spruce Tree House, only on a grander scale.

No attempt was made to restore buildings, the rooms being merely cleaned out and their broken foundations repaired in order to preserve the original lines as far as possible. Repair work was devoted principally to the walls to prevent their further destruction. In some instances it was found necessary to construct buttresses to hold up tottering walls or strengthen foundations [Fewkes 1909b:17].

The location of the buttress was not documented.

Fewkes described the reconstruction of a large corner section of the square tower but, overall, his documentation of specific work to the ruin was even less detailed than that for Spruce Tree House. Some insight into the stabilization procedure used by Fewkes was provided by Gorham Fuller (1909) in his account of the work:

There was one good feature in the rains, for they showed us where the drip came on the ruins and enabled us to lay Portland cement where it would be most effective. It was the only possible way of saving the walls in many places, and while it was not in keeping, it was decidedly better than allowing things to fall to pieces.

This statement is interesting for several reasons. First, it documents the use of Portland cement at Cliff Palace, possibly the first

such use in ruins stabilization. Second, it indicates that the use of Portland cement was not used indiscriminately, but only in instances where other materials would be ineffective. It further indicates that the work was conducted with much concern that the finished product be "in keeping" with the original workmanship. It is also interesting that there was evidently no attempt made to direct water from the masonry walls by construction of drainage channels above the ruin, as was done at Spruce Tree House.

From Fewkes' two major publications about his work at Cliff Palace (Fewkes 1909b, 1911), it can be stated with certainty that he conducted repair work in Kivas A, B, C, F, G, I, L, M, N, P, Q, S, T, and U and Rooms 11, 16, 29, 35, 36, 39, and 92. Photographic evidence and later documentary references indicate that Fewkes worked on all of the Kivas except perhaps Kiva D, Rooms 5-11, 13, 14, 16-36, 38-41, 43, 44, 46-51, 53-61, 63, 66-70, 79, 82, 83, 85, 88-90, 92, and 93. Stabilization work was also undertaken in Rooms 80 and 81 some time before 1934, possibly by Fewkes (Markley 1934a). Figures 12 through 17 are before and after photographs of Cliff Palace. The "before" photographs show the ruin as it was before excavation and repair by Fewkes. The "after" photographs are replications of the historic photos, taken in 1988. Again, these photographs serve as the best documentation of Fewkes' work and are testimony to his adherence to his ideals.

The impact of Fewkes' work at Cliff Palace and Spruce Tree House was immediate. Superintendent Hans M. Randolph (1909:10) reported in 1909 that "The work of Doctor Fewkes in the excavation and repair of Spruce Tree House and Cliff Palace has greatly increased the interest of the park." As a result, visitation to the park grew rapidly.



Figure 12. View of Cliff Palace before excavation and repair by Fewkes, looking southeast. Photograph taken by an unnamed park visitor, ca. 1908. (Neg. #18558, Mesa Verde Museum).

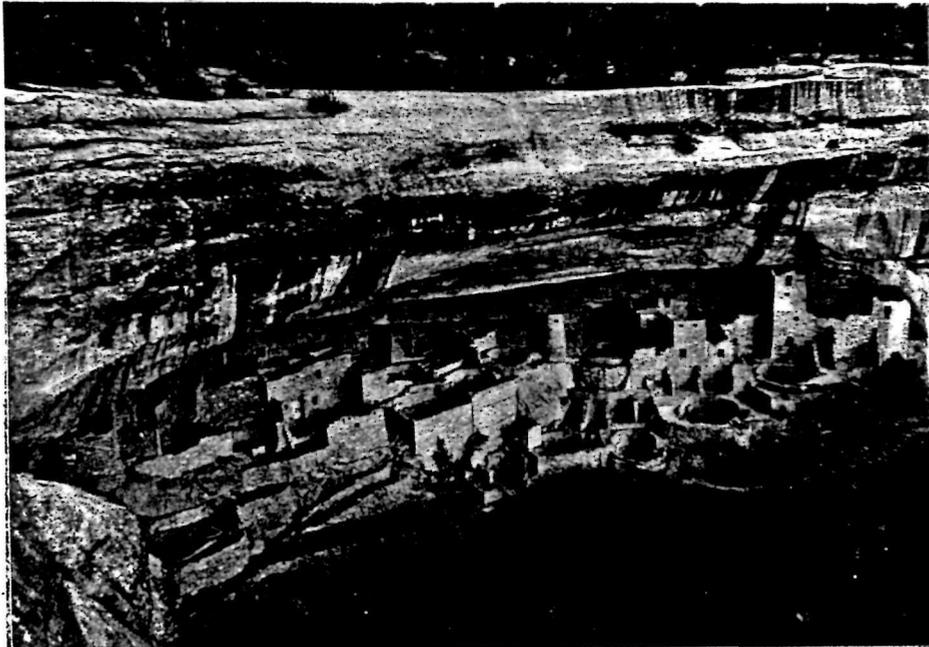


Figure 13. Present view of Cliff Palace looking southeast from the same vantage point as the historic photo.

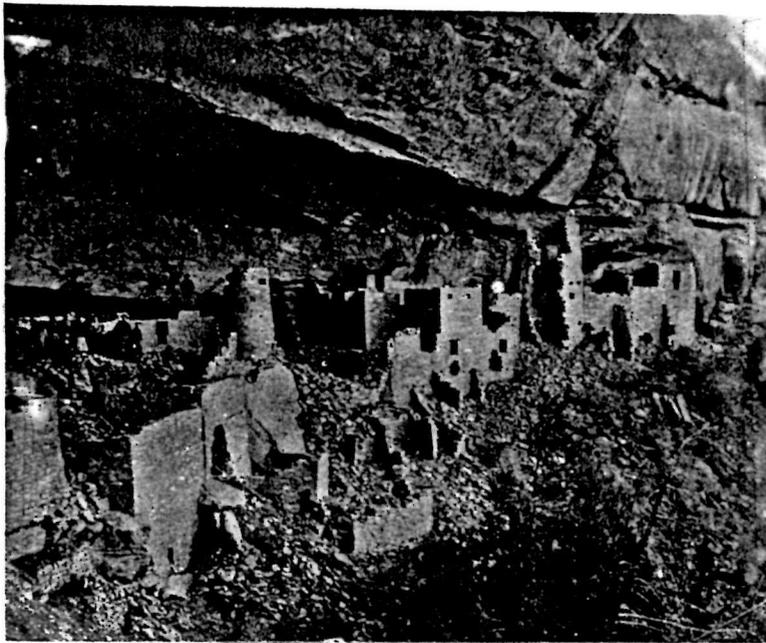


Figure 14. Copy of photograph of southern portion of Cliff Palace taken in 1896 by Rev. F. F. Peterson. (Neg. #3081, Mesa Verde Museum).



Figure 15. Present view of the southern portion of Cliff Palace from the same perspective as the historic photograph.

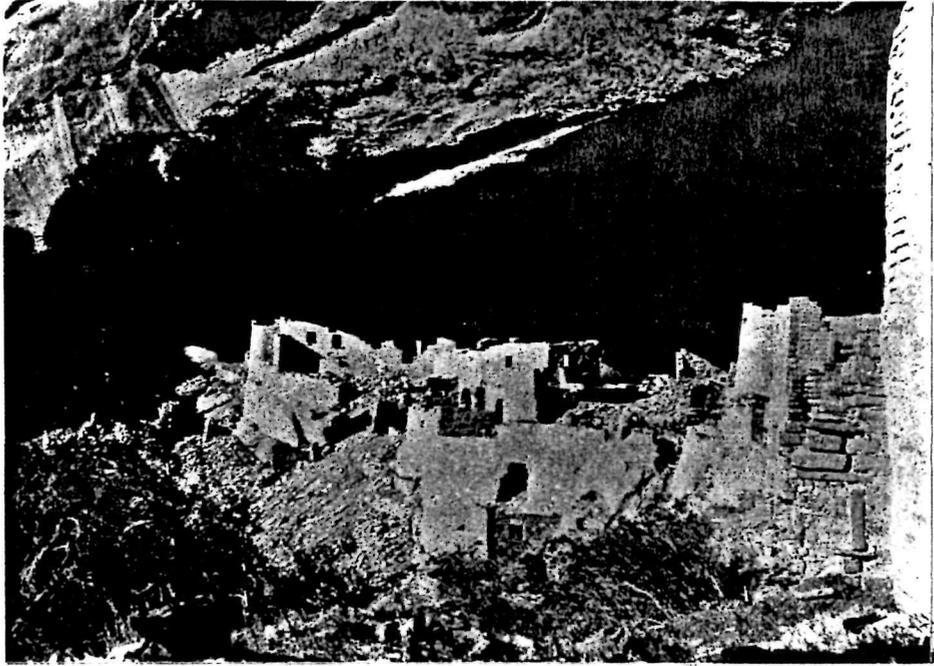


Figure 16. Copy of an historic photograph looking north across the front of the central portion of Cliff Palace prior to excavation and repair by Fewkes. (Neg. #4914, Mesa Verde Museum).



Figure 17. Present view looking north across the front of the central portion of Cliff Palace from the same vantage point as the historic photo.

## SPRUCE TREE HOUSE

### Maintenance and Stabilization After Fewkes

Following the initial work by Fewkes in 1908, stabilization at Spruce Tree House was done strictly on a maintenance or emergency repair basis. The roofs of the reconstructed kivas were regularly in need of repair primarily because of erosion from foot traffic. Rockfall sometime in the 1920s reportedly destroyed the roof and part of the wall of a restored kiva (Nusbaum 1948), probably Kiva F. Kiva F was reroofed by Lancaster in 1934 (Lancaster 1935). In 1936, the sheet metal covering on the "front kivas" became exposed. These were nailed down more securely and covered with a deeper layer of soil (Watson 1936b). More soil was added the following year (Watson 1937) and additional repairs were required in 1938 and 1942 (Faha 1938; Ross 1942a). The roof over Kiva F was strengthened in 1949 (Watson 1949b). In 1950, new hatchways were built on two of the kivas (Watson 1950; Anonymous 1950).

Another ongoing problem was maintaining the walks and courtyard surfaces. Visitor traffic continually wore down the ground surface and created very dusty conditions. Work to remedy these problems was reported frequently beginning in 1939 (Watson 1939a, 1939b, 1940b, 1948a, 1951d, 1951d, 1954c; Lancaster 1950; Rose 1951a, 1952; Carlson 1956; Abel 1957b; Fiero 1986, 1987). Regional Archeologist Erik K. Reed was opposed to covering the surfaces with "cement, bitudope or other durable materials," finding that thorough soaking and tamping of traffic areas was both satisfactory and suitable (Reed 1946). In 1976, a Portland cement and soil mixture was laid in Plazas F, G, and H and Room 59 (Decker and Crawford 1976a). Plaza F was resurfaced in 1987, primarily with dirt (Fiero 1987:28).

The roof of Kiva D, which still retained a few original log supports at the time of Fewkes' work (Fewkes 1909a:21), was reconstructed by Superintendent Finnan in 1932 (Anonymous 1950). A major mapping project was conducted in 1933 by Lyle Bennett (Morse 1934a; Thomas 1962c). The basic mapping techniques were expanded upon the following year for the mapping of Cliff Palace. Some major stabilization was done in 1935 on the north end and high central portions of the ruin (Lancaster, Markley, and Morse 1935). Periodic stabilization and maintenance was conducted after 1935. Table 1 lists the structures at Spruce Tree House for which such repairs have been documented.

In 1940, Al Lancaster reported that two cracks in the sandstone above Spruce Tree House were widening, forming nearly detached arches. Although not directly above the ruin, it was thought that, should the rock fall, it would demolish the visitor trail and anyone on it, and indirectly result in the collapse of several walls. In addition, the appearance of the canyon would be substantially altered (Watson 1940a).

Ross A. Maxwell, Regional Geologist, and William H. Richardson, Assistant Engineer, conducted a preliminary field study of the cracks (Maxwell 1940; Richardson 1940). They recommended that all rock, gravel, soil and vegetation be removed from the crack and some sort of protective covering be placed over it to keep snow and rain out. In addition, they recommended installing gauges so that, should the rock

**Table 1. Maintenance and Stabilization at  
Spruce Tree House after Fewkes**

LOCATION	REFERENCE
Room 1	Decker and Goff 1964
Room 2	Lancaster et al. 1935; Lancaster 1935
Room 4	Decker 1967; Fiero 1987
Room 5	Decker 1967; Fiero 1987
Room 6	Begay 1987a
Room 15	Lancaster et al. 1935; Lancaster 1935, 1940
Room 20	Anonymous [1988]
Room 22	Crawford 1980a, 1980b; Fiero 1986:17
Room 25	Lancaster et al. 1935; Lancaster 1935
Room 26	Lancaster et al. 1935; Lancaster 1935, Carlson 1955
Room 27	Lancaster et al. 1935; Lancaster 1935, Fiero 1987
Room 28	Lancaster et al. 1935; Lancaster 1935, Crawford 1983a
Room 35	Lancaster et al. 1935; Lancaster 1935, Crawford 1983a
Room 48	Lancaster et al. 1935; Lancaster 1935, Fiero 1987:26, 28
Room 54	Fiero 1987:26, 28
Room 59	Decker and Crawford 1976a
Room 71	Crawford 1983a
Room 73	Fiero 1987:27
Room 80	Lancaster et al. 1935; Lancaster 1935
Kiva B	Watson 1955e; Decker 1974
Kivas C	Watson 1936b, 1950; Faha 1938; Lancaster 1939; Ross 1942a, 1943c; Anonymous 1950; Crawford 1982:3; Fiero 1986:16-17, 1987:26
Kiva D	Watson 1936b, 1950; Faha 1938; Lancaster 1939; Ross 1942a, 1943c; Anonymous 1950; Crawford 1982:3; Fiero 1986:16-17, 1987:26
Kiva E	Crawford 1983a, 1984a
Kiva F	Lancaster et al. 1935; Lancaster 1935, 1937, 1939, 1942a; Faha 1938; Ross 1942a, 1942c; Nusbaum 1943a, 1948; Anonymous 1950, 1960b; Watson 1937, 1950; Crawford 1985; Fiero 1986),
Kiva G	Crawford 1984a, 1985; Begay 1987
Kiva H	Anonymous 1960b; Crawford 1984a

begin moving, protective action could be taken to hold the rock in place (Maxwell 1940:4-5).

The crack was cleaned out and filled with emulsified asphalt on the ends where it was narrow. The wider section at the center was roofed over and waterproofed. A framework of steel rods bridged the crack every 12 inches. Metal lath was laid over this and covered with tar paper. The tar paper was tucked into a three inch wide groove cut along the upper edge of the crack, secured with metal lath, and painted with asphalt sprinkled with gravel (Lancaster 1940a, 1940c; Watson 1940d; Williams 1941). The crack was waterproofed again in 1941 by filling it with tar (Watson 1941) and with asphalt and gravel in 1942 (Lancaster 1942a; Ross 1942c; Nusbaum 1943a:2). Leaks in the seal were repaired with a plastic asphalt material in 1943 (Ross 1943c). In 1946, 1948 and 1949, the crack was resealed again (Watson 1946b, 1948d, 1949b). In 1949, the covering over the crack was retarred and given a fresh coating of sand (Watson 1949c). It was retarred again in 1952 and 1960 (Watson 1952c; Anonymous 1960d).

Controversy erupted in 1946 over whether or not some of the large Douglas fir trees in front of Spruce Tree House should be removed to open up the view from across the canyon. Assistant Superintendent W. Ward Yeager began the foray by recommending that nine trees be removed from in front of the ruin (Yeager 1946). He believed the growth of the trees had detracted "from the appreciation of Spruce Tree House" and took a series of photographs to show how they obscured the view of the ruin from various points. Jesse Nusbaum believed strongly that the trees greatly enhanced the ruin (Nusbaum 1946). Park Naturalist Don Watson was also opposed to removing any of the trees and submitted photographs of his own which he believed were a fairer example of what views of the ruin could be had, which were "very different when the photographer does not stand behind trees" (Watson 1946c). A conservative solution of removing or thinning some of the deciduous growth along the approach trail and eventual "limited control of future growth" of some of the younger trees was decided upon by the Regional Director (Tillotson 1947). In comparing Yeager's and Watson's photographs to the present state of vegetation in front of Spruce Tree House, it is clear that several large trees have been removed. However, there is no documentation as to when or by whom the trees were removed.

When Fewkes conducted his excavations and repairs at Spruce Tree House in 1908, he only partially excavated Kiva B. At that time, a large "spruce" (Douglas fir) tree was growing out of the kiva and had done considerable damage to it (Fewkes 1908a). In 1955, the kiva was little more than "a weed-filled hole, interfering with visitor traffic and presenting certain safety hazards" (Watson 1955e:3). As a result, it was excavated, found to be in poor condition, and then backfilled, producing extra space for visitors as well as eliminating the safety hazards (Watson 1955e:3). No photographs of this work exist.

A major rockfall occurred at Spruce Tree House in March 1960. The rock detached from a ledge beneath the overhang on the south end of the ruin and destroyed about 10 feet of the front retaining wall enclosing Kiva H. About 60 feet of the visitors trail in front of the south end of the ruin was demolished as was the front retaining wall (Anonymous

1960a). Later it was found that the shock of the falling rock had caused damage to Kiva F and some of the doorways on the south end of the ruin (Anonymous 1960b). Several of the large boulders were solidly embedded from their fall and were left in place as an exhibit to visitors. The retaining wall in front of Kiva H and the trail were repaired. Several loose spalls and flakes were removed with long poles and a 5-ton slab was winched off (Pinkley 1960a). A year later, water was diverted away from the ledge where the rockfall had broken loose by way of a copper lip installed on the cliff face above the south end of the ruin. At the same time, small drainage channels were chiseled into the mesa top to divert water away from the sealed crack on top to the new copper lip (Anonymous 1961b).

Later in 1960, a very hazardous condition was reported. The lip of the alcove roof had fractured and partially detached a slab of rock about 100 feet long and 16 to 23 feet high supported only by its own arch (Hunt 1960; Dumrud 1964). A contract was awarded to Lee Turzillo Contracting Company of Brecksville, Ohio in November 1961 for anchoring the loose slab with bolts and aggregate grout. During the project a second detached arch was anchored and two large sections of the cliff face that were loose were removed. Work was completed on March 16, 1962 at a cost of just under \$30,000 (Anonymous 1962; Thomas 1962a, 1962b; Fairchild 1962; Pinkley 1962a; Wright 1962a, 1963b, 1962c, 1962d). Extensive photodocumentation of this work is on file under 740-12 in the A-V room of the Mesa Verde Museum.

Following the bolting of the loose arch, a study was conducted by the U.S. Geologic Survey to examine cracks that developed adjacent to the secured slab (Dumrud 1964). Numerous cracks indicating apparent structural instability were noted as were some small, loose slabs and blocks of sandstone (Dumrud 1964:2-3). It was recommended that the loose slabs and blocks of rock be removed immediately, that additional bolts be added in a few locales, that the existing bolts and grout be checked and cracks monitored, and that "the introduction of moisture into the upper 25 feet of the sandstone adjacent to the cliff" be prevented (Dumrud 1964:5-6). Loose rock was apparently removed as a result of these recommendations by Brinkerhoff Construction early in 1965 (Hewitt and Decker 1965).

Soon after the report was completed, another large sandstone slab fell from the alcove roof at the north end of Spruce Tree House (Anonymous n.d.). No damage to the ruin was reported. To prevent further occurrences, the stabilization crew completely cleared the sandstone mesa top above the ruin then cleared the drainage ditches of debris (Decker and Goff 1964). One of the drainage ditches was enlarged. The entire cleaned sandstone mesa top above the cliff dwelling was then sprayed with Pencapsula, a waterproofing solution manufactured by the Texas Refining Company (Decker 1964). The drainage ditches were treated with Troxymite, an epoxy grout. The idea behind the waterproofing was to eliminate entry of water into the sandstone forming the alcove, as recommended by Dumrud (1964:6), thereby preventing spalling of the alcove walls from freezing and thawing (Anonymous 1967a). A hazardous rock study in 1978 revealed no serious rock hazards at Spruce Tree House (Wachter 1978).

A series of crack control points set, measured, described and photographed by Arthur Hewitt and Al Lancaster at Spruce Tree House in 1961 (Pinkley 1961; Hewitt and Lancaster 1961), were remeasured in 1976 (Kuh 1976). No significant changes were detected, indicating that the cliff dwelling itself had remained immobile.

In the 1980s, Jack Smith (n.d.) recommended that, for the safety of visitors and preservation of the ruins, the 1962 work anchoring the detached arch be examined periodically for failures and that other potential rockfall hazards be identified as well.

Dr. William Petuski of Arizona State University built two "test" walls at Spruce Tree House as part of a study to determine the effects of acid rain on the ruins of Mesa Verde. One wall was built under the protective cover of the alcove while the other was built fully exposed to the elements. A weather station was also placed just south of the cliff dwelling by Dr. Donald Dolske of the University of Illinois to gather pertinent weather and aerometric data (Crawford 1983a). The acid rain study is still ongoing.

### Visitor Access and Restrictions

Following the initial trail work by Fewkes in Spruce Tree Canyon, Jesse Nusbaum apparently made some trail improvements in the early 1920s (Nusbaum 1922b:2). Some fairly major trail building apparently took place in the 1930s. Photographs taken by John D. Williams in 1930 and by J.B. Hamilton in 1934 show trail work, apparently below the Chief Ranger's Office on the west side of the canyon (Williams 1930; Hamilton 1934), the latter using heavy equipment.

In 1950, a short return trail was built from the south end of Spruce Tree House across the canyon to the entrance trail switchbacks. This was built in order to lessen traffic problems caused by people moving to and from the ruin on the same trail. Although there is no mention in the records, this trail may have been at least partially built upon the original route to the south end of Spruce Tree House. Also in 1950, the main entrance trail was widened so that two people could walk side by side and 2/3 of the trail was surfaced with a tar and gravel mixture (Pinkley 1950).

Steps placed to facilitate visitors crossing low walls into Spruce Tree House were all widened in 1951 so that larger parties could be accommodated, to speed visitor progress and to keep people from climbing over the walls where there were no steps (Watson 1951b, 1951c; Rose 1951b). In 1955, the area in front of the plaza containing Kivas C and D was built up about 2 feet in order to make it easier for visitors to see over the surrounding retaining wall. Brush was cleared from the north end of the cliff dwelling in 1964 and the trail moved completely under the alcove overhang to protect visitors from falling rock. A wooden fence was also constructed to route traffic away from the edge of the talus slope below the ruin (Decker 1964). Some trail work was carried out in 1972 near the spring at the head of the canyon (Kenoyer 1972). The steps at the south end of the ruin were apparently built

prior to 1977 (Anonymous 1977) and repaired in 1986 and 1987 (Fiero 1986:16, 1987:27). Major repairs were made to the retaining wall below the walkway on the north end of the ruin in 1985 (Crawford 1985) which was finally rebuilt in 1987 (Fiero 1987:27). The trail bridge was rebuilt by the Youth Conservation Corps in 1987. This construction exposed small portions of the midden downslope from the ruin (Smith, personal communication 1989).

In order to prevent visitors from entering Spruce Tree House at times other than visiting hours, it was proposed in 1948 that a barrier and gate be constructed part way down the entrance trail (Bennett 1948). A woven wire barrier and gate was installed soon after it was proposed (Watson 1948c). It was not until 1955 that access to portions of the Spruce Tree House ruin itself was restricted. At that time, the northern half of the ruin was roped off in order to protect visitors from potential collapse of a weakened wall (Watson 1955a). Access to the southern half of Spruce Tree House was limited some time after that date.

## CLIFF PALACE

### Maintenance and Stabilization After Fewkes

In 1932, Superintendent C. Marshall Finnan had Navajo workmen dig a trench along the rim rock above Cliff Palace in order to direct runoff away from the exposed portions of the ruin below. For fear of damaging the ruins, the trench was dug with picks rather than with blasting powder (Nusbaum 1948).

In 1934, Earl Morris conducted major stabilization work at Cliff Palace. The condition of the cliff dwelling had deteriorated to the point where certain areas posed great danger to visitors. At the request of Superintendent Finnan, Public Works Administration funds (P.W.A. Project 496) were allocated in 1933 for site mapping, photodocumentation, and stabilization (Leavitt 1933). The actual stabilization fieldwork was supervised by Al Lancaster, who was assisted by Raymond Dobbins and a crew of Navajo workmen. Judging from Lancaster's field notes (Lancaster 1935), Morris was present at the site less than 50% of the time, apparently commuting to the park from Aztec, New Mexico.

The most critical situation at Cliff Palace was the instability of the Speaker Chief's House near the center of the ruin. Years of visitation had gradually undermined the Speaker Chief Rock, the large boulder on which the Speaker Chief's House was built to the point where its position was very precarious. Through careful engineering, the sediment below the rock was removed and replaced by a steel I-beam and concrete foundation (Morris 1934a). In addition, an entire system of beams was put into Speaker Chief House itself (i.e., Rooms 71-74) to strengthen the walls. Four poles from Balcony House and an unspecified number of cottonwood beams from Aztec Ruin were added (Lancaster 1934, 1935). Other areas of the ruin were also worked on including room walls, retaining walls, and kivas. Stone for the masonry work was obtained from Farview and set in Portland cement. A timber from Balcony House was added to Room 79's wall (Lancaster 1934, 1935). Most notable was replacement of the northwest corner of the Painted Tower (Room 11), which had initially been rebuilt by Fewkes in 1909 (Lancaster 1935). Because of the poor quality of the reconstruction, the masonry was torn out and the corner rebuilt, using faced stone from Sunset House Ruin and adding floor beams on every level (Lancaster 1934, 1935).

Work done by Morris' stabilization crew in 1934 is documented for Kivas F, I, Q, T, and V and Rooms 11, 15, 18, 39-40, 47-48, 52, 57, 58, 60, 66, 71-74, 79, 84, 86-88, and 90-91 (Lancaster 1934, 1935; Anonymous 1934; Markley 1934a, 1934b). It is also likely that they conducted work in Kiva S and Rooms 70, 75, 80-81, 85, and 89 (Markley 1934a). The stabilization forms for Cliff Palace should be referred to for details on this work.

Erosion of the walks and courtyard surfaces by visitor foot traffic was an ongoing problem at Cliff Palace, particularly with regard to dust. Frequent resurfacing of these surfaces was performed, beginning in 1933 (Franke 1933; Watson 1937, 1939a, 1939b, 1940b, 1954c; Carlson 1956; Abel 1957b).

The partially detached flat arch section of the secondary ledge at the rear of the Cliff Palace alcove was perceived as a potential hazard by Superintendent Robert H. Rose in 1948 (Rose 1948a). Ground water seeping onto the ledge was believed to be causing the arch to weaken and separate farther from the surrounding alcove. Further information from Jesse Nusbaum (1948) suggested that, though the arch was indeed separating from the alcove, the situation was no worse than was the case when photographs were taken of the ruin in 1907. He went on to further state that measures taken to reduce or stop the ground water seepage would indeed have the effect of forestalling the eventual collapse of the arch. Two tons of wet sand were removed from the top of the arch in March 1948 in hopes of drying it out (Watson 1948b; Lancaster 1948). In November of that year, more loose rock and debris was removed from the ledge on the arch in order to find the source of the moisture (Lancaster 1948). Two seams were found and it was believed that removal of the debris would eliminate direct contact of the weakened portion of the arch and would allow it to dry out (Watson 1948e).

In December 1956, vandals rolled several large rocks off the canyon rim onto Cliff Palace below. These individuals were not caught and considerable damage was done to the cliff dwelling. A portion of the outer wall of Kiva B was demolished as were two prehistoric retaining walls below (Abel 1957a). Because of cold weather, repairs were not made until March 1957 (Burroughs 1957a).

The sandstone into which steps were cut on the upper portion of the exit trail at Cliff Palace fractured violently in August 1957. This caused concern that rock overhanging the exit trail had become unstable and posed a threat to visitors. The trail was closed and USGS Geologist Alexander A. Wanek was called in to inspect the situation. He concluded that the surrounding rock was in no immediate danger of falling and posed no hazard to visitors of the ruins (Burroughs 1957a; Wanek 1957).

Late in June 1960, a large slab of rock fell from the alcove roof, destroying a portion of Room 17 and the northwest corner of the court surrounding Kiva C (Anonymous 1960c). The damage was examined by Regional Archaeologist Charlie Steen (Pinkley 1960b; Steen 1960). Damage by the rockfall was repaired in October of that year (Anonymous 1960e).

Besides the damage caused by the rockfall, it was clear that the ruin as a whole was in need of extensive repair. Seepage of ground water from the back of the alcove was causing the entire cliff dwelling to gradually move downslope, resulting in progressive destruction. Moisture had been noted as a problem at Cliff Palace periodically through the years. In 1912, Superintendent S. E. Shoemaker requested that money be set aside to repair damage of Balcony House and Cliff Palace caused by rockfall and seepage (Shoemaker 1912). Moisture was blamed for the partial collapse of a wall of an unspecified kiva in 1943 (Ross 1943a). Seepage was reported as a major problem in the "Painted Tower Section" of the ruin in 1946, leading to the suggestion that drains should be installed (Watson 1946a). Two years later, repairs were required to remedy a bulging wall in Kiva W caused by moisture in the rubble core (Watson 1948b). Later in 1948, 35 feet of the lower terrace below the Speaker Chief's section of the cliff dwelling collapsed. The reason was disintegration of stone in the wall due to water

saturation. An 8 foot-deep trench was dug below the terrace level, and 35 feet of perforated drain pipe installed behind the base of the wall (Watson 1948e; Lancaster 1948). Disintegration of stone due to moisture resulted in a considerable amount of work being done "in some of the front kivas of Cliff Palace" in 1952 (Watson 1952a). In 1960, it was reported that one of the front retaining walls was settling because of excessive moisture (Anonymous 1960c).

Park Archaeologist Jean Pinkley recommended that an engineer be consulted on the feasibility of installing drains beneath the ruins to draw off excess moisture. Pinkley also recommended that test trenches be excavated across the front of the cliff dwelling to determine the depth of bedrock so that a walkway could be firmly anchored across the front of the alcove and hold the ruin in place (Pinkley 1960b). Regional Archaeologist Charlie Steen concurred with Pinkley's assessment and was quite definite that the services of a geologist would be obtained and that testing would be carried out (Steen 1960).

Dr. Charlie Hunt, a geologist with the U.S. Geological Survey, assessed the seepage problem at Cliff Palace and recommended that a 250 foot-long tunnel be excavated at the contact of the sandstone and shale along which the ground water flowed. This was intended to intercept the groundwater before it could enter the alcove (Hunt 1960; Thomas 1960).

Mission 66 funds were made available for the drainage tunnel early in 1961 (Thomas 1961a, 1962c). Brinkerhoff Construction Company of Durango, Colorado was awarded the contract and began work in June 1961. Construction of the 300 foot long tunnel was completed by the end of August of that year. The tailings scar and tunnel entrance were then planted with trees and shrubs to make them invisible to visitors (Anonymous 1961a).

In order to monitor movement or slippage of Cliff Palace, Balcony House and Spruce Tree House, descriptions, photographs, and measurements were made of selected cracks at each ruin (Hewitt and Lancaster 1961). These were to be revisited periodically to determine if any movement of the cliff dwellings was occurring so that remedial measures could be undertaken before there were serious consequences (Pinkley 1961).

A. H. Hawkins, a soil stabilization and grouting engineer with considerable experience with prehistoric ruins in the Southwest, visited Cliff Palace to determine what would be required to arrest the slippage of the ruin and if grouting would be feasible (Thomas 1961b). During the fall of 1961, testing was conducted in front of Cliff Palace in order to determine the depth and nature of the fill and bedrock in that location (Anonymous 1961e). Deposits in front of the ruin were found to be surprisingly shallow, averaging less than 6 ft deep. As a result, it was decided that forcing grout into the deposits underlying the cliff dwelling was not the most satisfactory alternative to halting downslope movement. Instead, the best solution was believed to be "toeing in the ruin with wedged, concrete abutments sunk into bed rock across the front of the cave," which would "provide a proper bearing for the fill above" (Thomas 1961d:2). A new walkway would then be built on this foundation, thus lessening the effects of the vibration from tourist traffic on the ruins and provide much easier access for visitation (Thomas 1961d:2).

Using Mission 66 funds, the engineering firm of Dames and Moore was hired to determine the most feasible method of eliminating slippage of the ruin (Thomas 1963a). They recommended installing a combination footpath and retaining wall anchored to the underlying bedrock (Roberts and Javete 1962). Geologist A. A. Wanek recommended that drains be installed along the walkway (Wanek 1963). Plans were finalized in July 1963 (Thomas 1963a; Riddell 1963), with work apparently being completed later that year, though no documentation of the work could be found.

Contributing to the moisture problem in the Cliff Palace alcove and causing instability of the sediments underlying the ruin was percolation of waste water from the comfort station on the mesa top. This problem was first noticed in October 1961 after completion of the drainage tunnel (Thomas 1961d). The tunnel had been successful in drying up the north portion of the ruin, but effluent was saturating the south and central portions (Thomas 1961d; Pinkley 1962b). A drainage trench was built between the parking area and a drain field to the south, which alleviated damage to the parking area but did not stop the seepage into the ruin (Pinkley 1962b). Superintendent Thomas proposed temporarily closing the comfort station, at which time a pipe would be installed to carry effluent from the septic tank to a point 500 feet south of the Cliff Palace alcove and dump it over the edge (Thomas 1962d). This plan was apparently successfully carried out. The Cliff Palace comfort station was closed in 1988 (Fiero, personal communication 1989).

The selected cracks in Cliff Palace, Balcony House, and Spruce Tree House identified and measured in 1961 (Hewitt and Lancaster 1961; Pinkley 1961) were remeasured and photographed in 1976. No substantial changes were noted (Kuh 1976).

Two years later, in 1978, the Park Service conducted a hazardous rock study at certain National Parks (Wachter 1978). Cliff Palace and Spruce Tree House were both included. Both alcoves were observed to be relatively stable. Some precarious overhanging rock was noted above the entrance and exit trails at Cliff Palace and monitoring was recommended (Wachter 1978). A rock fell from the alcove roof, damaging the east wall of Room 88 and Kiva U at the north end of the ruin, during the winter of 1983 (Crawford 1983a).

During the winter of 1981, visitors entered Cliff Palace without authorization. Minor damage requiring stabilization attention in seven locations were the result (Smith 1981). Special PRIPS funding made it possible to conduct stabilization in numerous kivas, rooms and of courts and walkways throughout Cliff Palace. Unfortunately, a report documenting this stabilization was never completed.

From 1935 to the present, work has been conducted in Kivas A-I, P, and T-W and in Rooms 1, 4, 17, 39-40, 44, 48-49, 68, and 92 (Table 2).

**Table 2. Maintenance and Stabilization  
at Cliff Palace since 1935.**

LOCATION	REFERENCE
Room 1	Nelson 1984c, 1984h, 1984r; Anonymous 1984
Room 4	Nelson 1984c, 1984r
Room 17	Anonymous 1960e
Room 39	Nelson 1984l, 1984p; Anonymous 1984
Room 40	Nelson 1984j, 1984l; Anonymous 1984
Room 44	Nelson 1984j, 1984l; Anonymous 1984
Room 48	Lancaster 1942b
Room 49	Lancaster 1942b; Anonymous 1984; Nelson 1984j, 1984k, 1984l
Room 68	Anonymous 1984; Nelson 1984j, 1984k, 1984l
Room 92	Lancaster 1942b; Anonymous 1984; Nelson 1984a, 1984g, 1984i, 1984k
Kiva A	Lancaster 1939; Burroughs 1957c; Nelson 1984i, 1984p
Kiva B	Lancaster 1939; Abel 1957a; Anonymous 1984; Nelson 1984h, 1984n, 1984o, 1984q
Kiva C	Lancaster 1935, 1942b; Franke 1935c; Crawford 1982; Anonymous 1984; Nelson 1984h, 1984p
Kiva D	Crawford 1982; Anonymous 1984
Kiva E	Anonymous 1984
Kiva F	Anonymous 1984; Nelson 1984i, 1984r
Kiva G	Anonymous 1984; Nelson 1984j, 1984q
Kiva H	Anonymous 1984
Kiva I	Anonymous 1984; Nelson 1984q
Kiva P	Lancaster and Decker 1961
Kiva T	Anonymous 1984; Nelson 1984i, 1984k
Kiva U	Decker and Goff 1964; Crawford 1983
Kiva V	Lancaster 1939b; Decker 1965; Anonymous 1984; Nelson 1984g, 1984k
Kiva W	Lancaster 1948; Decker and Goff 1964; Anonymous 1984; Nelson 1984a, 1984b, 1984c, 1984d, 1984e, 1984f, 1984g, 1984h, 1984m

## Visitor Access and Restrictions

Access to and through Cliff Palace was improved by Fewkes as part of his repair work in 1909. He developed the present exit trail at the south end of the ruin by attaching a series of four ladders to the rock on either side of a large crack extending to the mesa top. An existing trail north and west of the ruin, known as "Fat Man's Misery," near the present entrance trail, was also used unchanged. Four ladders and a notched pole were placed at strategic locations through the ruin to facilitate visitation. (Fewkes 1909b:15-16). In 1922, Jesse Nusbaum made additional improvements to the trails.

The most trying parts of the trails, for elderly visitors as well as the very large and heavy ones, have been so treated that no visitor this season will have to give up a trip because of the trail. And now two can walk abreast over the more level stretches of the trail, or pass in comparative comfort and safety [Nusbaum 1922c].

By 1935, it was realized that the quantity of visitors passing through the ruins was becoming a problem. Work by Morris in 1934 and Lancaster in 1935 had put Cliff Palace in a stable condition, and thought was given to ways of preventing new damage by visitors.

Instead of going through and over the ruins as we do at present, it may be necessary to keep visitors out of the ruins, permitting them to travel along a pathway in front of the ruins, where the interesting kivas and towers, etc. may be pointed out to them, and explained.... The time may come, looking ahead many years, when the number of visitors will be so great that most of them will have to content themselves with standing on the cliffs and looking down into the ruins [Leavitt 1935a:4].

Regulations to prevent or discourage damage to the ruins were more strictly enforced in 1935. In 1934, large groups of unsupervised Civilian Conservation Corps (CCC) enrollees overran the ruins, climbing on the walls and collecting artifacts (Watson 1935). To prevent such occurrences the following year, visitation of the ruins by CCC enrollees was highly regulated by permitting visits by guided tour only on specific days at certain times (Leavitt 1935b). During the summer of 1935, visitor Edward Shanley of Pratt, Kansas wrote his name in ink on the wall of Kiva V in Cliff Palace. Efforts to apprehend him in the park failed. The Park Service wrote him and requested \$5 to cover the cost of removing his name, threatening him with criminal prosecution should he not comply. Shanley remitted \$1. The total cost to remove his name was \$1.73 and efforts to collect the remaining 73¢ were unsuccessful (Leavitt 1935c; Shanley 1935; Franke 1935b).

In 1939, a new trail across the front of Cliff Palace was built and completely stabilized. This trail was approximately where the present trail runs. In addition, a cement core was put into all of the low walls that visitors sat or stepped on (Anonymous 1939). Following World War II, visitors to Cliff Palace were restricted to the new trail in front of the ruins and were not permitted inside the Painted Tower at

all (Reed 1946:1; Ross 1981:23). Heavy visitor traffic in conjunction with water seepage from the back of the alcove was causing settling and movement of the ruin, resulting in major damage to walls and terraces (Pinkley 1960b; Ross 1981:23). In order to keep visitors out of the back rooms on the south end of Cliff Palace, a masonry wall was constructed behind Kiva A (Burroughs 1957c). This wall blocked an opening in Kiva A's east wall. It is not known when visitors were excluded from the north end of Cliff Palace, but it was possibly in the early 1960s when slippage of the ruin may have caused concern for visitor safety.

The trail to Cliff Palace was repaired and improved in 1951 with new steps being built and the trail smoothed out and widened in places (Pinkley 1950). Two wooden ramps were built in 1953 to get visitors over difficult places in the trail thereby speeding up the movement of parties (Watson 1955a). In 1955 a short trail was built on the south end of Cliff Palace. This included a short flight of steps allowing visitor access to more of that portion of the ruin than before (Watson 1955b). In 1963, to prevent outward slippage of the ruin, a new walkway and anchoring retaining wall was built across the front of Cliff Palace (Thomas 1963a). An entrance stairway was constructed in the sandstone crack north and west of Kiva W in 1964 (Decker and Goff 1964). This stairway was removed in 1974 (Wenger 1974). In 1984, the steps below Kiva V on the entrance trail were widened and a masonry guardrail added. Also that year, the trail through the rear of the ruin on the north end was repaired, even though it was no longer used by visitors (Anonymous 1984a). A set of narrow steps below Kiva P on this walkway were widened in 1987 (Fiero 1987).

## STABILIZATION PHILOSOPHY AND POLICY AFTER FEWKES

Following Fewkes' initial excavation and repair of Spruce Tree House and Cliff Palace, work in the ruins was strictly on a maintenance level focusing on visitor safety and convenience. The ruins were "swept up" annually and, apparently, small repairs made (Rickner 1914, 1915; Leavitt 1933). The trails were widened and made less strenuous, and perilous rocks removed before they could fall on visitors or the ruins (Nusbaum 1922b). Several loose rock slabs had fallen in front of the ruin on the main trail (Nusbaum 1922a). Removal of dangerous rock at Spruce Tree House was carried out by Superintendent Nusbaum "by using a high powered rifle from the opposite side of the canyon" (Nusbaum 1922c). Nusbaum used a .25 caliber Army rifle and approximately 70 rounds of soft-nosed bullets to remove about half a ton of hanging slabs and rock (Nusbaum 1922c:2; 1948:5). "Only 2 or 3 hanging small flakes required attention at Cliff Palace" (Nusbaum 1948:5). Damage, if any, to the ruins by ricocheting bullets was not reported.

By the early 1920s it was realized that improved methods were needed to combat the natural forces of deterioration that were taking their toll on the prehistoric ruins of the Southwest. The agents of destruction were well understood, but the techniques for dealing with them were fairly unsophisticated and not wholly satisfactory (Hamilton 1933; Anonymous 1940).

A miracle cure for the problem of ruin preservation was actively being sought (Anonymous 1940:13-14). "Ideally, it should be a substance which, sprayed or painted on the walls of the ruin, would make them weather resistant -- if not perpetually, at least for several years" (Hamilton 1933:4). Other requirements for the product were that it could not change the appearance of the wall, should be inexpensive, and should be equally effective on all stone, mud mortar and sticks in the walls (Hamilton 1933:4). Several synthetic products were tried at Mesa Verde and at other ruins in the Southwest with little success (Anonymous 1940:13).

In 1932, Air-Spray Service Co. of Washington, D.C. sprayed portions of Far View Ruin and Pipe Shrine House with a chemical preservative. The results were not satisfactory enough to pursue the process (Albright 1933; Finnan 1932b; Webster 1932). Further studies into chemical stabilization of ruins was conducted by Fredrick T. Martius of Stanford University in 1933. While he reported some positive results with a chemical he had developed, no further progress was apparently made (Kittredge 1933). A chemical was sought to help preserve the plaster paintings at Cliff Palace in 1934, but no substance could be found (Nusbaum 1934). In the middle 1940s, Stabinol, a product of the Hercules Powder Company of Wilmington, Delaware was used to some extent. It was thought to be the best solution found to that point for ground stabilization, waterproofing ruins, and repointing joints and walls (Nusbaum 1944a). This appears to be the first instance where thought was given to using an actual soil or mortar amendment. This line of research was apparently pursued by A.E. Buchenberg who, in 1947, visited several ruins in the Southwest to gather mortar samples for experiments with a soil amendment in order to determine the proper mix to match aboriginal mortars (Scoyen 1947). The pursuit of a chemical preserva-

tive continued into the 1970s. In 1977, Dennis B. Fenn proposed conducting experiments with various soil amendments on a heavy use pathway at Mesa Verde. He also proposed testing certain chemicals which the National Bureau of Standards showed as having promise as stone and mortar preservatives (Fenn 1977). It is not clear whether this work was ever conducted. The search for a suitable mortar amendment has continued to the present time. In recent years Rhoplex, an acrylic polymer manufactured by the Rohm and Haas Co. has been used with fairly good success.

Beginning in the 1890s and continuing into the 1920s and 1930s, America was swept by a period of nostalgia for the vanishing American Indian. Partly out of guilt over the events leading to the removal of Indians to reservations and ignorance of the Indian's way of life, the American populace embraced the Indians as the "noble red man" in an almost mythical way (Nash 1967:143-144). The Boy Scouts, Campfire Girls, and several fraternal organizations for adults focusing on a return to nature based on a romantic and distorted view of Indian culture became very popular during this period (Nash 1967:146-156). Mesa Verde was not immune to this phenomenon.

On July 4, 1922, Mrs. Nusbaum dressed up five groups of young girls, men and children in Indian costume and placed them at various locations throughout Spruce Tree House, lit with red lights to look like firelight. The spectacle was carried out four times that month and set a precedent for pageantry in the ruin. So moved was a visiting opera singer by the show that she returned the favor by giving a singing performance from the ruin herself (Nusbaum 1922b). This set a second precedent of using the ruins as a backdrop for musical or artistic productions out of character with the ruins which has been revived in recent years with filming of a "Lassie" episode for television in 1969 (Anonymous 1969) and, more recently, production of an impressionistic dance in October 1987 and performance of a brass band in the spring of 1988 (Smith, personal communication 1989). Indian pageantry continued into the early 1930s. The wife of Superintendent C. Marshall Finnan was the producer of a play entitled "The Gift of Life" which portrayed the Cliff Dweller's acquisition of corn, life in the ruins, and eventually abandonment of the area. The "Mesa Verde Players" were made up of an all-Navajo cast and performed the play five times in Spruce Tree House during the summers of 1931 and 1932 (Finnan 1932a; Leavitt 1933). In order to facilitate viewing of the play from across the canyon, one of the trees in front of the ruin was cut down (Nusbaum 1946:3).

Use of the ruins for popular entertainment beginning in the 1920s shows a changing philosophy among those directly in charge of the ruins away from the strict "educational ideal" of Fewkes. This departure may be a reflection of the composition of visitors to the park as a whole. The 1920s and 1930s were a period of increased mobility for the American populace as a result of affordable personal automobiles and better roads. Recreational travel was on the upswing, and destinations such as Mesa Verde were increasingly popular. Access and accommodational improvements at Mesa Verde served to draw a wider cross section of travelers whose main pursuit was recreation. In order to satisfy the entertainment requirements of the average visitor, the strict "educational ideal," while still of considerable importance, gradually lost some of

its prominence.

With increased visitation, safety in the ruins became a primary concern. As a result, care for the ruins became a yearly maintenance routine based on visitor safety and comfort (Leavitt 1933). Scientific or archaeological considerations were of little or no account. By 1933, deterioration of Cliff Palace had progressed to a point where visitor safety was of critical concern (Demaray 1933). It was on this basis that long-needed money was appropriated for ruin repairs.

The 1934 repair of Cliff Palace (Public Works Administration Project 496) was conducted under the direction of renowned archaeologist Earl Morris, known to have high archaeological and scientific standards. Actual stabilization work was conducted by James A. "Al" Lancaster, Raymond Dobbins, and a crew of Navajo workmen (Morris 1934b). The use of Indian laborers for the stabilization work was specifically requested by A. E. Demaray (1933). Indians were preferred workmen because of "their native patience and artisanship" (Anonymous 1940:7). In 1932 it was reported that use of Navajo labor for all new construction and maintenance resulted in a considerable savings (Finnan 1932a). Use of Indians, particularly Navajos, has been a tradition carried on to the present time.

During the time the stabilization project was underway, Morris was only on-site periodically, apparently spending most of his time on another project at Aztec Ruin (Lancaster 1935; Morris 1934b; Dowdy, personal communication 1989). Major problems were tackled such as supporting the rock below the Speaker Chief's House and rebuilding the northwest corner of the Square Tower. Unfortunately it appears that some unwarranted reconstruction took place, most notably the uppermost level of the Painted Tower (Room 11) where a window and T-shaped doorway were fabricated with no supporting evidence. In addition, it appears that an attempt was made to make the ruin indestructible through the use of cement. Whereas Fewkes used cement apologetically and only in certain exposed areas (Fewkes 1909b; Fuller 1909) cement was the mortar of choice in Morris' work (Lancaster 1935). While the 1934 stabilization project was successful in solving several major structural instability problems it also introduced unfaithful reconstruction to the ruin and set a standard of using cement as a panacea in future repair and stabilization in the ruins at Mesa Verde.

Thorough documentation of Cliff Palace, under the supervision of Stanley Morse, was undertaken as part of the stabilization project. Morse was a Denver architect who had been involved with CCC architecture in the Rocky Mountains the previous year. He had also apparently worked for Jesse Nusbaum at Mesa Verde previously as well. Morse's work had its origin in a mapping project at Spruce Tree House by Lyle Bennett in 1933 (Morse 1934a; Thomas 1962c). The Cliff Palace project began on January 20, 1934 (Morse 1934a; Leavitt 1934a), and involved detailed mapping of the site and photography of every wall in which all physical characteristics were carefully delineated (Morse 1934a, 1934b, 1934c, 1934d, 1934f) (Figure 18). Morse's chief interest in the ruins was from an architectural point of view. He believed "the chief value of preserving these prehistoric buildings is in providing educational amusement to the tourist public..." (Morse 1934e). He went on to state, "If



Figure 18. An example of the photographs taken as part of the documentation project conducted by Stanley Morse in 1934. Black and white tapes in 6 inch increments are laid plumb or level. Black cord surrounds aboriginal masonry. White cord surrounds rebuilt areas. Rectangular placards give the ruin name. Round placards give the room or kiva number and date of photograph. Placards with arrows indicate survey or traverse points.

these buildings lose their value as antiques then the principal attraction is forfeited. In anticipation of this condition we are assembling data which in the future may be used as authentic source for material in connection with their repair and preservation" (Morse 1934e).

Earl Morris was a staunch supporter of ruins documentation prior to "actual repairs or reconstruction of the unit in question" (Morris 1934b). He also felt that documentation should continue with the stabilization effort so that "there would [not] be any possibility of question as to what work is old and what is new" (Morris 1934b).

The level of documentation undertaken by Morse of prehistoric ruins was unprecedented. As a result, the methodology was largely developed by trial and error and proved to be very time consuming. The cumbersomeness of the project was apparently amplified by Morse's insistence on an extremely detailed level of documentation (Burgh 1934) and his reluctance to modify procedures in the interest of productivity, what Earl Morris saw as "the neverending struggle between the ideal and the expedient" (Morris 1934b).

While it was clear that Morse's technique was in need of modification, Morris believed the project should be carried to completion for Cliff Palace. Unfortunately, funding was not continued and only the field mapping was finished. The final drafting of the site planview map was never completed. The photography was carried out only in the northernmost part of the ruin. Photodocumentation of Morris' stabilization may have been fairly complete, however, as it appears that areas stabilized were photographed as that work progressed. "Record sheets" may have been filled out (Burgh 1934) but the whereabouts of these 1934 forms, if they exist, is unknown. No formal report of the stabilization was prepared. A short article by Morris (1934a) about the Speaker Chief's House and Al Lancaster's field notes (Lancaster 1934, 1935) are the only written documents from this project. Stanley Morse prepared a manual completely delineating the method he used in documenting prehistoric ruins (Morse 1935), and photographs taken during the project were compiled by Chester Markley (1934a, 1934b).

Although the project was not completed, it was clearly understood that documentation was an important element of stabilization work and a procedure which should be practiced at all ruins (Morris 1934b; Leavitt 1934b). In fact, stabilization work done at Spruce Tree House and Cliff Palace in 1935 was well documented through before and after photographs and excellent descriptions on ruin repair record forms (Lancaster, Markley, and Morse 1935; Franke 1935c).

In the years following 1935, documentation of ruins stabilization was virtually nonexistent. This coincides with the October 1935 departure of Superintendent Ernest P. Leavitt, who was deeply interested and involved with overseeing the stabilization efforts at Mesa Verde. The departure of Leavitt was apparently not the only reason for the decline in documentation. Early in 1935 a document entitled "A Proposed Policy for the Supervision of the Archaeological Sites in Mesa Verde National Park, Colorado" (Franke 1935a) was circulated. In this, Franke noted that up to that time care and preservation of the ruins had been the primary duty of the Park Superintendent.

This condition is now undergoing rapid change. The regular appropriations have increased, and the development projects have so multiplied that the Superintendent is no longer able to devote his major attention to the ruins, as heretofore. In view of this condition it would seem that the time has come for the ruins to be assigned to the supervision of some certain department [Franke 1935a].

In short, running the park was becoming more complicated and delegation of duties was becoming increasingly necessary.

Franke proposed that care of the ruins fall to the "Department of Education and Research" at the park. "By training and experience the staff is well grounded in Southwestern Archeology and has the confidence of all the scientific workers in this section of the country.... They are not specialists but by education and training well versed in the sciences and crafts" (Franke 1935a). He was quite certain that "the men placed in charge of the ruins should not be specialists" since "they do not have the ultimate interest of the ruin at heart as much as a desire to put forth their own ideas" (Franke 1935a). Franke's point of view appears to have been reinforced by the documentation project undertaken by Morse, a professional architect, seen as an outsider, with strong ideas about how he wanted to conduct his work. Franke was soon able to put his ideas in practice as Acting Superintendent and Superintendent, putting into place a stabilization program in which no "specialists" were directly involved, except on an emergency basis, until the early 1980s.

Earl Morris, in 1934, recommended that Al Lancaster be placed in charge of ruins repair and reconstruction at Mesa Verde (Morris 1934b). While Morris was technically in charge, the actual repair and reconstruction of Cliff Palace in that year had, in fact, been accomplished by Lancaster and Raymond Dobbins assisted by a crew of Navajo workmen.

Lancaster's career in archaeology began in 1926 when he served as an archaeological foreman for the Field Museum of Chicago. From 1931 through 1933, Lancaster was the assistant director of the Peabody Museum's Southwest Utah Expedition in charge of excavations. While scholastically untrained, Lancaster was recognized as an accomplished archaeologist, one whom J.O. Brew considered "beyond question the most expert excavator in the southwest..." (Brew 1953). Although an extremely proficient archaeologist, the fact that Lancaster had no formal education in the discipline may have made him much more acceptable to the Mesa Verde staff as a "non-specialist." That Morris recommended him to head a ruins stabilization program for the Park Service shows the confidence he had in Lancaster and is further testimony to his skill.

Unfortunately, a full-time ruins stabilization program as envisioned by Morris -- one which would work throughout the Southwest including Mesa Verde, moving with the seasons -- never materialized, though a National Park Service-Bureau of Indian Affairs CCC Indian Mobile Unit was set up in 1937 and conducted work at other major ruins in the Southwest, principally Chaco Canyon (Anonymous 1940:6-7). Lancaster was retained at Mesa Verde, however, to conduct ruins repair on

a seasonal maintenance level. The majority of Lancaster's time at Mesa Verde was not spent doing ruins stabilization but rather directing archaeological excavations with periods of time serving as a fire guard and truck driver. In 1941, he supervised CCC enrollees doing archaeological work, including stabilization work at Spruce Tree House and other major ruins (Crook 1984:64). Lancaster worked full time as a Park Ranger at Aztec Ruin from December 1944 to October 1946 and an Archeologist Aid at Chaco Canyon from October 1946 until October 1947. During that time the personnel at Mesa Verde lamented the gradual deterioration of the ruins and pushed for a full-time repairs foreman (Rose 1946; 1947a; 1947b; Watson 1946b). It was not until after fulfillment of his commitment at Chaco Canyon that Lancaster was hired as a full time Archeologist Aid at Mesa Verde (Rose 1948b). Lancaster worked at Mesa Verde until he reached mandatory retirement age in 1964 (Wenger 1975).

Work conducted in the cliff dwellings was considered to be maintenance with Lancaster as the head technician. This pattern of viewing ruins stabilization at Mesa Verde as maintenance with little consideration of archaeological values, the same pattern of repair engaged in during the 1910s and 1920s (Rickner 1914, 1915; Leavitt 1933), continued from 1936 into the early 1980s and is still manifested out of tradition to the present time (Abel 1957b; Anonymous 1960b, 1960e, 1961b, 1984b; Burroughs 1957d, 1958a, 1958b, 1958c; Carlson 1953, 1954, 1955, 1956, 1958; Lancaster 1950; Nusbaum 1942, 1943a, 1943b, 1944b; Reed 1950; Rose 1947a, 1948b, 1950, 1951b; Ross 1942a, 1942b, 1943c; Watson 1936c, 1936a, 1937, 1938a, 1938b, 1939a, 1939b, 1940b, 1946b, 1946d, 1949c, 1949d, 1951a, 1952b, 1953e, 1953c, 1953b, 1953a, 1954c, 1954e, 1954d, 1954b, 1954a, 1955b, 1955c, 1955d, 1955e, 1956c, 1956d, 1956a).

The term "stabilization" has been applied indiscriminately to any work done in or around the ruins. For the most part, this has amounted to annual sweeping and preparation of the cliff dwellings for visitation and minor repairs of damage of human and natural cause. The present annual maintenance schedule for Cliff Palace and Spruce Tree House consists of inspection, sweeping out of dirt and litter accumulated during the winter, and repair of rodent damage in the spring, and fall cleaning of the drainage ditches above the ruins. Through the years, the various monthly or annual reports, in which mention of work in the ruins has been made, rarely are specific in identifying where work was undertaken within a particular ruin. As a result, many of these references could not be included on the unit specific Stabilization History Forms included in the Appendices of this report. Much of the work in the cliff dwellings actually required no documentation as ruins stabilization because it was, in fact, trail and janitorial work having no effect on the aboriginal fabric of the ruins. However, a great deal of repair has taken place as annual maintenance that has had an effect on the aboriginal fabric of the dwellings. While the individual instances have been small in scale, the cumulative result has been major in scope both in the amount of work done and loss of archaeological integrity through non-documentation.

The tradition of stabilization as maintenance has been long and is fully ingrained. Considering the low budgetary consideration given the ruins and long tenure of the stabilization staff, it is not surprising

that such a tradition has persisted. What is surprising is that the level and nature of stabilization and low level of documentation continued as it did in contrast to progressive development of stabilization policy on a regional and national level. Maintenance and stabilization have yet to be adequately separated in light of existing policy and the advanced state of modern stabilization techniques.

Late in 1940, a National Park Service committee on Ruins Stabilization convened in Santa Fe. The committee assessed stabilization work carried out by the Park Service nationwide, focusing principally on the Southwest, and proposed policies by which stabilization should be conducted (Anonymous 1940). In so doing, the committee attempted to define different levels of stabilization and provide guidelines for compliance. Scientific considerations were very high with documentation of stabilization work at all levels considered imperative (Anonymous 1940:27). It was the intention of the committee to meet at regular intervals and to eventually develop a reference manual for ruins stabilization (Anonymous 1940:36).

Such a document was written in 1949 (Vivian 1949), primarily by R. Gordon Vivian. This was produced along the lines of the stabilization committee's report of 1940 but in a greatly expanded form. Again documentation was highly stressed (Vivian 1949). The success and acceptance of this document may not have been very widespread however. In 1961, when questions arose as to how rodent control should be carried out in cliff dwellings at Mesa Verde, Park Service policy was quoted from the Ruins Stabilization Committee's 1940 report rather than from the 1949 document (Steen 1961; Thomas 1961a; Allen 1961).

The guidelines and policy for ruins stabilization show that the National Park Service was concerned that ruins under their jurisdiction be properly preserved and maintained. However, policy in the upper levels of the Park Service were apparently not being implemented on the ground at Mesa Verde, even though some directives were received (McColm 1946). The reasons for this can only be speculated upon and include inadequate funding (Anonymous 1940:5), a breakdown of the chain of communication because of the increased complexity in running the park as alluded to by Franke (1935a), an anti-specialist mentality (Franke 1935a), a view that maintenance and stabilization were one and the same, lack of enforcement of policy, and long-term employment of stabilization technicians resulting in methodological rigidity. Some of these problems may be persisting to the present time.

One who benefited from the 1940 Director's Committee Report (Anonymous 1940) was Mesa Verde Assistant Park Naturalist Kenneth Ross. Ross oversaw the stabilization effort at the park in 1942 and lamented the inadequacy of previous stabilizers' recordation (Ross 1942c). He implemented the nomenclature used in the committee's report and provided the most detailed (though barely passable) descriptions of stabilization work since 1935. Some photographs were also used. With the hiring of Al Lancaster as a full time Archeologist Aid late in 1947 (Rose 1948b), the more major stabilization activities were periodically documented, primarily through photography.

Stabilization on a maintenance level resulted in another side effect that has seriously affected the quality of the work and instilled a tradition of poor documentation only now beginning to be resolved. Following 1935 it is quite apparent that basic reference material for use in stabilization, such as maps, were not utilized. This is evidenced by the very infrequent use of room numbers in describing where work was carried out. Since room numbers were the key to using other earlier documentary sources, such as the 1934 Morse maps and photographs of Cliff Palace, it is clear that they were not utilized. In fact, in 1961, a search was made for Morse's Cliff Palace map, which could not be found though it was in the park's files (Thomas 1961a). This is both indicative of how long it had been since the map had been last used and the disorganized state of the files. Maintenance stabilization was done strictly on an emergency or reaction-to-damage basis with insufficient funding, never allowing a coherent stabilization program to develop that could implement the policies and guidelines outlined by the Director's Committee on Ruins Stabilization (Anonymous 1940) and by Vivian (1949). These documents and other directives served to improve the level of stabilization documentation at Mesa Verde slightly whenever they came out, but the standards and techniques used in 1934 and 1935 have yet to be equaled. On the positive side, as time has gone on, more and more documentation has taken place beginning with full time employment of Lancaster in the late 1940s. In the late 1970s, routine maintenance stabilization was more frequently documented, with maps to show areas of work coming into vogue. "Ruins Stabilization Record" forms similar to those in use in the 1930s were put into use in the early 1980s. Photography of stabilization activities increased in the 1970s and 80s. Unfortunately the proliferation of photographs was not accompanied with excellent record keeping. Numerous photographs are misidentified. In addition, many of the photographs are poorly executed or are taken of activities of little consequence to stabilization documentation.

By 1961, probably as a result of the major problems at Cliff Palace, it began to be realized that maintenance stabilization was not keeping up with the steady deterioration.

We have reached the point where this type of stabilization and clean-up will not begin to meet our needs and the lack of a full-time, trained stabilization crew to care for the Chapin Mesa ruins is going to require closing the ruins in turn... for major overhaul [Anonymous 1961d].

It was not until 1974 that serious consideration was given to expanding the ruins stabilization program. Superintendent Ronald Switzer (1974) realized that "many of the prehistoric architectural remains here do not receive adequate stabilization and protection" largely because "expansion of our interpretive program on Wetherill Mesa has expanded the need for routine ruin maintenance." His concern was stimulated by the realization that the stabilization foreman was nearing retirement age and two Ute crew members would soon be leaving the program. The solution he proposed was to create a permanent ruin stabilization foreman trainee position which would receive "on-the-job training understudying our present foreman..." (Switzer 1974). He also suggested training another five-man crew and keeping one of the crews "on duty most or all of the year, and the remainder of the men should be salaried

earlier in the spring and later in the fall" (Switzer 1974). Essentially, Switzer proposed continuance of stabilization on a maintenance level. By employing a foreman trainee entering "at less than journeyman level," he was ensuring a smooth transition with no procedure changes or influx of new ideas. In short, expansion and continuation of stabilization at Mesa Verde as maintenance was desired without improvement of technique.

In 1981, Dr. Jack E. Smith, as the Division Chief of Research and Cultural Resource Management, became the first professional archaeologist to oversee the ruins stabilization program at Mesa Verde as a high-level staff person. With the promotion of Kathleen Fiero as supervisor of the stabilization crew in 1986, the potential exists for stabilization at Mesa Verde to be conducted in accordance with the most up to date techniques and philosophies for the discipline. While stabilization is still intermeshed with routine maintenance, it may be possible to break with the established tradition and conduct ruins stabilization as policy stipulates it should be, in a scientific and authentic manner that exhibits planning and long-term goals rather than as a reaction to emergencies. The finest stabilization should be on display at Mesa Verde, for it is because of the magnificent ruins that the park exists at all.