HISTORIC RESOURCE STUDY

for the

CARRIAGE ROAD SYSTEM

ACADIA NATIONAL PARK

MOUNT DESERT ISLAND, MAINE

Prepared for:

U. S. Department of the Interior
National Park Service
North Atlantic Regional Office
15 State Street
Boston, Massachusetts

Contract Number: CX1600-6-0047

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May, 1989



Figure 1. Asticou-Jordan Pond Road
Approach to Cliffside Bridge

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ACKNOWLEDGMENTS

There are many we would like to acknowledge for their help with the research undertaken for this report, as well as with the editing and production of it. We are particularly indebted to Dwight Pitcaithley, Regional Historian in the North Atlantic Regional Office, for his guidance and careful editing. In addition, Ed Bearss in the Washington office of the Park Service was generous with his time and counsel. Also helpful at Acadia National Park Headquarters were Isabel Mancinelli, Michael Furnari, Lois Winter, Meg Fernald, Ed King, Curt Mossestad, and Superintendent Jack Hauptman. Charles E. Peterson, Charles W. Eliot, II, and John Stilgoe all reviewed the report in its early stages. Their comments have been incorporated and the report is better for it.

Those who contributed their time to complete the necessary research include Timothy Marshall, Chief of Construction and Preservation for Central Park; Paula A. C. Spero, architectural historian; and graduate students in landscape architecture, Deborah Tobin, Ann Roberts and Sharon Runner. Sharon Runner also worked on the report's graphics.

Ken McNichols, Executive Director of the Iowa Limestone Producers Association and Ron Thillen, engineer for Linn County, Iowa, provided valuable knowledge of broken-stone road construction. We are grateful, too, to the citizens of Mount Desert Island for their time and contributions to this report. Among them are: Mrs. C. A. Marinke, daughter of Walters G. Hill (an engineer for the carriage road construction); Joe Minutolo of The Bar Harbor Bike Shop; Debbie Burch of the Seal Harbor Library; Deborah Dyer; Tom Lawrence; and Ed Winterberg who manages the carriage concession at Wildwood stables. We are most especially grateful to Mr. and Mrs. Charles P. Simpson. Mr. Simpson's father, grandfather and uncle were involved with the construction of the carriage roads and their collection of letters, photographs and drawings added immeasurably to this report.

The research institutions where we found much assistance include the library of the National Fine Arts Commission, the National Archives, and the Maine State Archives where Jeffrey Brown and Patty Lincoln pointed us in the right direction. Most valuable has been the Rockefeller Archive Center. A wealth of primary source material is readily available there and easily accessible. We are indebted to Tom Rosenbaum for his guidance and enthusiasm.

T & N Printing, Michael Rieley, Gretchen Edwards, Libbey Kelso, and Jeff Broughton aided us in production of the report. We thank, too, Ralph Gabriner for his excellent photographs of the Central Park bridges, and Libby Rieley for her editing assistance.

PREFACE

The purpose of this report is to document the design and construction history of the carriage roads of Mount Desert Island, Maine, and their appurtenant structures and to analyze their place in American social history. This documentation is based on research and analysis of information available at the Rockefeller Archives in Pocantico Hills, the National Archives, the Maine State Library and Archives, the library at Park Headquarters in Acadia National Park, and various repositories on Mount Desert Island, Maine, including the Bar Harbor Historical Museum and the Seal Harbor Library. (See Appendix XXV for a complete list of sources.)

In addition, a very important source has been the personal collection of letters, drawings and photographs belonging to Mr. and Mrs. Charles P. Simpson of Seal Harbor. This research was supplemented by personal interviews, a field study of the roads, and a review of the literature on the early development of roads in this country, the early history of the National Park Service, and American social history in the first half of the twentieth century. The narrative and illustrations in this report describe the context in which the carriage roads were developed, the cast of characters involved in their design and construction, and how the roads were designed, built and maintained. Also included is a discussion of their current use and maintenance.

INTRODUCTION

The carriage road system on Mount Desert Island was conceived, planned, and funded by John D. Rockefeller, Jr., between 1913 and 1940. From its inception, this road-building effort reflected the ethic of using private wealth for public enjoyment and conservation. These roads are also a tangible record of Rockefeller's conviction that access to a natural setting may be provided without spoiling the resource. They reveal, too, his delight in both the grandeur of nature and the artistry of man. This balance appears in his correspondence with his road builders. To one he writes, ". . . [t]he view of Jordan Pond and the ocean . . . is beautiful beyond description"[1]; to the other, he writes of the alignment of one of the carriage roads, ". . . [w]hat a magnificent line that is."[2] That access and conservation were linked in Rockefeller's plans is clearly shown in his own account of his involvement in the development of the Park:

> When Acadia National Park was established, it consisted only of mountain tops bought earlier by interested summer and winter residents of Mount Desert Island as a protection against exploitation for cheap amusement purposes and held in a corporation known as the Hancock County Trustees of Public Reservations until they were turned over to the Government. Thus the Park area at the outset was not accessible to any highway and was traversed only by foot trails. Believing that it should ultimately extend to the ocean on one side and to Frenchman's Bay on the other and that access to it would be desirable not only for pedestrians but, in carefully chosen areas, for lovers of horses as well as automobilists, I began years ago buying lands on the Island having in mind to make possible the rounding out of the Park boundaries and its extension and development as above mentioned.[3]

To a remarkable degree, the history of the carriage roads is the history of the development of Acadia National Park. For many years, the carriage roads, bridges and gate lodges were the primary physical development in the Park. The early motor roads were associated and funded simultaneously with the carriage roads. The carriage road development, then, largely established the architectural and landscape architectural character of the Park.

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[1]John D. Rockefeller, Jr., to A. E. Clement, May 6, 1926. (This and all letters cited hereafter are located in the Rockefeller Archive Center, unless noted otherwise.)

[2]John D. Rockefeller, Jr., to C. D. Joy, July 17, 1925.

[3]John D. Rockefeller, Jr., to Harold L. Ickes, March 14, 1935. Acadia National Park files.

The remarkable cast of characters who contributed to the development of the carriage roads lends another intriguing element to their history. The cooperation and occasional friction between Rockefeller and George B. Dorr, the "Father of Acadia National Park," were an underlying factor throughout the construction of the carriage road system. In addition, Rockefeller assembled an able group of designers and craftsmen to execute his vision of an extended network of quiet, beautiful carriage drives through the magnificent landscape of Mount Desert Island.

Local Maine engineers Charles P. Simpson, Paul D. Simpson, and Walters G. Hill surveyed the ground, studied alignment, prepared construction documents, did the field layout, and supervised construction. Rockefeller hired Charles Simpson to engineer his early road construction. In this capacity, Simpson set the standards of engineering and design which would remain essentially unchanged over 27 years. When he became ill in 1921 his son Paul continued his father's work as Rockefeller's engineer on-site. In this position, he worked on every aspect of the development of the carriage roads, including the bridges and gate lodges. Mr. Hill began working on the Park motor roads but had a substantial hand also in the development of the later carriage roads. The early roads and bridges were constructed by local contractors including A. E. Clement, C. D. Joy, and S. W. Candage; the later ones by crews overseen by Rockefeller's superintendent at The Eyrie, S. F. Ralston.

Noted architects William Welles Bosworth and Charles Stoughton designed most of the bridges. Before designing several of the early bridges on Mount Desert Island, Bosworth had previously designed the gardens at Rockefeller's Pocantico Hills estate in the Hudson River Valley and his house in New York City. After his work at Acadia, he moved to France to supervise the restoration of monuments including the cathedrals of Chartres and Reims, and the palaces of Fontainebleau and Versailles. Rockefeller in large part financed these restoration efforts.[4] Bosworth studied architecture at the Massachusetts Institute of Technology under Professor William Rotch Ware. The year Bosworth graduated, Stoughton, already in possession of an engineering degree from Columbia, continued his education in architecture under the same professor. He became well known as the designer of the Jacob Riis Bathing Pavilion, bridges, and other structures associated with the Bronx River Parkway.[5]

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[4]Adolf K. Placzek. *Macmillan Encyclopedia of Architecture* (New York: The Free Press Division of MacMillan Publishing Company, 1982), 261.

[5]Henry F. and Elsie R. Withey. *Biographical Dictionary of American Architects* (Los Angeles: New Age Publishing Company, 1956), 577.

Rockefeller hired the architect Grosvenor Atterbury to design several buildings for the Park. Of these, only the gate lodges were built. Atterbury was known as ". . . a designer of conservative, large-scale residential architecture for the rich."[6] He had designed a complex of brick and stone barns for Rockefeller at his Pocantico Hills estate. He is also well remembered as the architect of Forest Hills Gardens, a planned community in Queens, New York.

Beatrix Farrand was a highly regarded landscape architect who, like Grosvenor Atterbury, was best known for her work on large-scale private estates. She, in fact, had worked with Mrs. Rockefeller in developing the Eyrie's gardens and herself owned an estate on Mount Desert Island. In her almost 15 years of work with Rockefeller on the carriage roads, her primary role was to develop the planting design for the roads, bridges and gate lodges, and to frame vistas. She did not hesitate, however, to offer her advice on other issues such as the construction of the bridges and the proper grading of the roads' side slopes. Charles Miller, a local nurseryman, assisted Farrand with the planting along the roads.

Landscape architect Frederick Law Olmsted, Jr., the son of the landscape architect of Central Park and an accomplished road designer in his own right, consulted with Rockefeller during the later stages of development. He worked primarily on the motor roads, although he did make a report on the carriage roads and offered advice on some carriage roads which were planned but never built.

Several key figures in the early history of the National Park Service also played key roles in the development of Acadia National Park (Appendix II). The first three directors, Stephen T. Mather, Horace M. Albright, and Arno B. Cammerer visited the Park and corresponded with Dorr and/or Rockefeller about the carriage roads.[7]

The carriage road system is also significant as an important element in the history of road building in this country. When Rockefeller began these roads, the art of road design for automobiles was in its infancy. Proper alignment (e.g., turning radii and

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[6]Placzek, 113.

[7]Stephen T. Mather served as Director of the National Park Service from 1917 until 1929. From 1917 until 1919, Horace M. Albright served as his only assistant. From 1919 to 1929, Albright served as Field Assistant to the Director and Superintendent of Yellowstone National Park. Arno B. Cammerer during those years was also an Assistant Director. Throughout those years, when Mather was occasionally incapacitated by illness, both Albright and Cammerer served as Acting Directors. It was Albright who succeeded Mather in 1929 and served as Director until 1933. Cammerer was Associate Director under Albright until he became Director from 1933 to 1940.

slopes negotiable by cars) and new paving materials were the subjects of much discussion, as was the issue of how roads were appropriately designed in the landscape. State-of-the art technology was applied as these roads were constructed. The horizontal and vertical alignment were carefully studied, the drainage system expertly done, and the construction of the roads was an excellent example of "broken-stone" construction. Their design also clearly reflected that they were meant to blend into the landscape. Since most roads of this period and construction have been paved and realigned as motor roads, the carriage road system on Mount Desert Island presents a rare opportunity to study the technology and design principles of the era without the overlay of modern roads.

At the conclusion of this major road-building effort, the system was 57 miles long and included 17 bridges and two gate lodges. Two additional buildings and two carriage roads were designed but never built. Rockefeller's agreement with the federal government included the provision that, with a few exceptions, motorized vehicles would not be allowed on the carriage roads. He maintained them until his death in 1960, when maintenance for the majority of them became the responsibility of the National Park Service. Currently, 51 miles are within the bounds of Acadia National Park; seven miles are in private hands but open to public use. Motor vehicles are still restricted and some segments of the roads are designated specifically for bicycle use. A concessionaire uses the Day Mountain loop to offer wagon and buckboard rides to visitors.

Other carriage road systems do still exist. Roads built by Rockefeller in much the same fashion are found on his Pocantico Hills estate (still in private ownership) and in the adjacent Rockefeller State Park Preserve which he donated to the state of New York. The National Park Service also manages carriage roads on the Moses Cone estate, in North Carolina, which is now part of the Blue Ridge Parkway.[8] The system on Mount Desert, however, is unique in its extent and in its extravagance. While all of the elements of the carriage road system were not built as envisioned, the gate lodges, the variety and number of bridges, the fine detail of its construction, and its scenic location combine to make it an enormously important public landscape. Properly restored and maintained, this remarkable resource will offer an appealing and effective means for thousands of Park visitors to enjoy the beauty of Acadia National Park.

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[8]Freeman Tilden wrote that ". . . [w]hen Rockefeller was in the southern Appalachians he saw the roads so built by Moses H. Cone, and delightedly discussed surreys and other horse-drawn vehicles with the men who drove him through the Cone Memorial Park." (Freeman Tilden, "A Park of Land and Sea," Acadia National Park File, 9.)

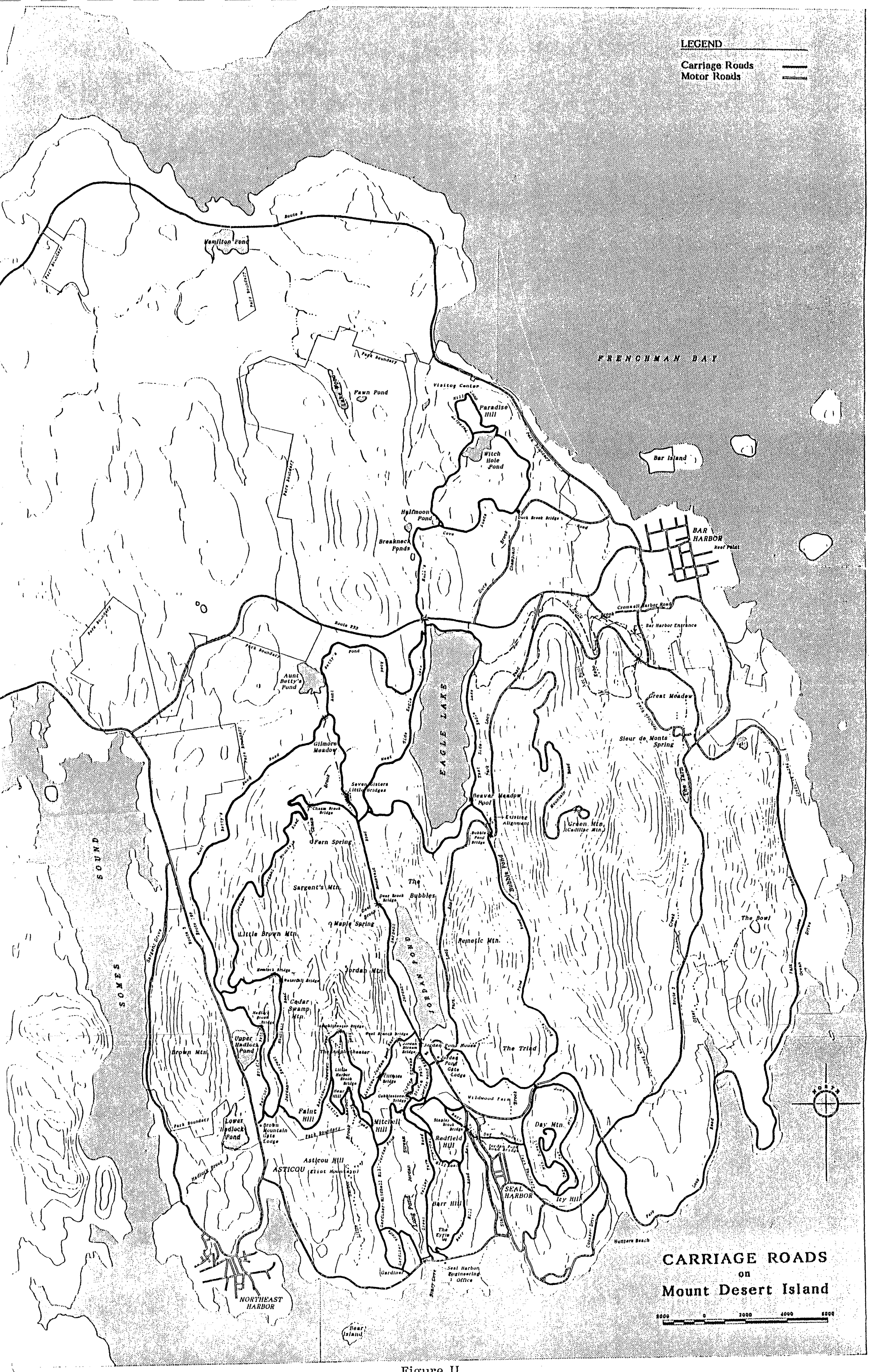

LEGEND
Carriage Roads
Motor Roads
FRENCHMAN BAY
Route 3
Hamilton Pond
Park Boundary
Pond Boundary
Pawn Pond
Visitor Center
Paradise Hill
Witch Hole Pond
Bar Island
Halfmoon Pond
Breakneck Ponds
Cove
Brook
Champlain
Duck Brook Bridge
Road
BAR HARBOR
Reef Point
Cromwell Harbor Road
Bar Harbor Entrance
Route 233
Aunt Betty's Pond
Eagle Lake
Great Meadow
Sieur de Monts Spring
Gilmore Meadow
Seven Sisters Little Bridges
Beaver Meadow Road
Existing Alignment
Green Mtn. (Cadillac Mtn.)
Cheam Brook Bridge
Fern Spring
Bubble Pond Bridge
Bubble Pond
The Bubbles
Sargent's Mtn.
Maple Spring
Deer Brook Bridge
Little Brown Mtn.
Penobscot Mtn.
Jordan Mtn.
Hadlock Brook Bridge
Waterfall Bridge
Cedar Swamp Mtn.
Jordan Pond House
The Triad
Jordan Pond Gate Lodge
Wildwood Farm
Upper Hadlock Pond
Brown Mtn.
Little Harbor Brook Bridge
Cliffside Bridge
Cobblestone Bridge
Faint Hill
Mitchell Hill
Brown Mountain Gate Lodge
Lower Hadlock Pond
Asticou Hill
ASTICOU
Stanley Brook Bridge
Redfield Hill
Day Mtn.
Barr Hill
The Eyrie
SEAL HARBOR
Icy Hill
Hunters Beach
Seal Harbor Engineering Office
Gardiner
NORTHEAST HARBOR
Bear Island
SOMES SOUND
JORDAN POND
Park Boundary
Pond
Brook
Road
Drive
Loop
Trail
The Tarn
The Bowl
Mountain
Ridge
Valley
Cove
Creek
Stream
Bridge
Lodge
Gate
Farm
House
NORTH
CARRIAGE ROADS
on
Mount Desert Island
5000 0 2000 4000 6000

Figure II

CONTEXT

The carriage roads were built on Mount Desert Island over a period of 27 years--the first built on the property surrounding Rockefeller's Seal Harbor home in 1913, the last completed on Day Mountain in 1940. Their construction, then, began during the end of the industrial revolution and continued through World War I, the Depression, and the beginning of World War II. The discussion which follows includes general information on the social history of this period relevant to the development of the carriage roads, how these general characteristics are reflected in the development of national parks and in the local history of Bar Harbor and Mount Desert Island, and how these same characteristics influenced Rockefeller as he formulated his plans for Mount Desert Island and Acadia National Park.

Social/Historical Context

During the years between the end of the Civil War in 1865 and the beginning of World War I in 1914, great wealth was amassed by those who applied new industrial technologies to the abundant natural resources of the American continent. A wealthy social class developed which established for itself rigid standards of fashion and taste adapted from European models encountered on extensive travels abroad. The ramifications of the industrial revolution and the society it engendered explain much of the development of the carriage road system. First, the new technology available not only improved the carriage itself, but resulted in the conveyance (the automobile) which would outdate it. Second, the machine age inspired a philosophy which looked to nature as an antidote to technology and led to the development of country places and "nature parks" as an escape from the hustle and bustle of modern life. Third, although many of the wealthy spent considerable sums in meeting the standards they set for themselves, an ethic of philanthropy led some to spend their money not extravagantly, but for the public good.

Carriages and Automobiles

As to the first point, it was technology which made carriages affordable to the general public. Improved suspension lessened ". . . the jolts caused by poor roads and permitted lighter, more tastefully designed carriages to be made."[9] As a result, there was an increasing variety of styles from which to choose and an increasing number of carriage owners. At first, these owners were quite wealthy, for ". . . private ownership

[9]*Encyclopedia Americana*, "Carriages," 709.

of carriages was still a mark of affluence and position."[10] The mechanization of carriage manufacturing made carriages (or "buggies" as they were often called in America) available for many more people.

The history of the automobile followed the same pattern. The horseless carriage was first patented in 1895, and the carriage industry coexisted for a time with the manufacture of automobiles. By the turn of the century, when most Americans were now able to purchase buggies, wealthy families owned most of the 8,000 automobiles in the United States. Through the next decade, however, more than 50 companies began producing automobiles. By the 1920s, due to increasing wealth and mass production, the number of registered automobiles increased to 23 million,[11] while the demand for carriages rapidly declined.

The availability of carriages and later of automobiles in combination with the new road surfacing techniques resulted in the development of a new sport. Pleasure driving became a new form of recreation for the American public in general and for the society crowd in particular.[12]

Pleasure driving as a sport had captivated England from 1784 to 1837, the "golden age of coaching." To drive a coach, which was larger than a carriage and pulled by a four-horse team, required a great degree of skill. Thus the sport of coaching attracted young aristocrats interested in testing their abilities. Just mastering the reins was a significant accomplishment; the left hand was used to handle all four pairs of reins while the right held the whip and set the direction. This period became the model for a coaching revival after the industrial revolution when ". . . the same urge to drive a coach-and-four caught many a gentleman looking for a way to escape the ennui of daily living. . . . New wealth, generated by high industrial profits, was creating a new society in America, one which looked to England to provide a model for manners and mores. Naturally sports in the English mode became very fashionable and coaching fell into that category. The fine art of driving a four-in-hand was very

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[10]Kenneth Edward Wheeling. *Horse Drawn Vehicles at the Shelburne Museum* (Shelburne, Vermont: The Shelburne Museum, 1974), 21.

[11]Wade and Wilder, 662.

[12]Even after automobiles had become common, some continued to argue for carriages for pleasure use. A committee on Mount Desert Island, which included John D. Rockefeller, Jr., wrote: "It is not yet proved that automobiles are going to survive as pleasure vehicles in a proper sense. Since automobiles became so largely vehicles for traffic and business, there is a return to horse-carriages for pleasure purposes." (Circular: Joint Committee from Northeast Harbor, Seal Harbor and Somesville, *An Auto-Less Summer Resort* [1913], 3.)



Figure III. Road Coach on trip from New York to Philadelphia.

appealing to the nouveau riche and the opportunity to display one's affluence by driving in the park before an admiring group of strollers made it even more desirable".[13]

So, the need for roads to accommodate automobiles had a direct impact on the development of all national parks, and particularly on development in Acadia. Thomas C. Vint, the Chief Landscape Architect for the National Park Service until 1961, wrote: "Until 1925 most visitors came by train . . . . by 1930 most visitors came by private auto. In one instance, the visitor was conducted through the park by stage on a fixed schedule. In the other, he became his own navigator and made his own schedule."[14] Roads, therefore, became critical factors as plans for parks were developed.

"Nature Parks"

For financial reasons, most wealthy businessmen made New York, Boston, or Philadelphia their primary residences. These new millionaires, however, also built seasonal residences or "country places" in resort areas like Bar Harbor. These early country places reflected the English or natural style of landscape gardening. A reaction against mechanization made all that was "natural" (or appeared to be) desirable. The setting for the house became a romantic landscape or park. Grounds developed in this style exhibited curved walks and roads, undulating topography, clumps of trees, vistas planned to "landscape scenes," and gate lodges. During the later years of the country place era, some other European styles, particularly the Italian, influenced the estate garden. The natural style, however, developed into the preferred style of park design.

Frank Waugh in his book, *The Natural Style of Landscape Gardening*, described this style as informal, characterized by its resemblance to nature, and animated by the spirit of the landscape.[15] The advocates of its use in park design (Frederick Law Olmsted and his Central Park being the supreme example) believed this style exerted a positive influence on mankind by providing exposure to both the beauty and sublimity of nature. Thus, parks were not to exhibit the work of man, but rather enhance the

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[13]Wheeling, 42.

[14]Thomas C. Vint, "National Park Service Master Plans," *Planning and Civic Comment* (Washington, D.C.: American Planning and Civic Association and the National Conference on State Parks, 1946), 3.

[15]Frank Waugh, *The Natural Style of Landscape Gardening* (Boston: The Gorham Press, 1917), 11.

experience of nature. Henry V. Hubbard and Theodora Kimball described the implication of this philosophy for park roads: The roads and paths in a landscape park by means of which people on foot or in carriages or automobiles may go through the park, enjoying its beauties on the way and being conveniently conducted to particular points of interest and beauty, are usually, from the point of view of naturalistic character, a necessary evil."[16]

In order to lessen the negative impact, the primary rule for designing roads in a park was to fit them into the landscape. Careful study of the topography led to roads designed with gentle curvature and grades. Park roads, if so designed, flowed unobtrusively through the landscape. Designing the roads to fit the topography offered another important advantage: a sequence of scenic views for those who chose pleasure driving as a form of recreation. Hubbard and Kimball continue:

> The various scenes which are to be displayed to the visitor by automobile should be revealed to him to good advantage and in pleasing succession, that their characters may enhance one another. . . . It is of course desirable in almost every park, from the point of view of the service of the park to all the public, that some of the roads at least should be open to pleasure traffic by automobile, and these roads should be so designed that this traffic under proper speed regulations shall be pleasurable, that is, that the gradients shall be easy, the turns ample and safe, and the views obtained from the road interesting.[17]

Philanthropy

A final topic from this period relevant to the development of the carriage roads is the role of philanthropy in society at this time. The Sixteenth Amendment to the Constitution, authorizing the government to tax personal income, did not go into effect until 1913. The graduated tax required persons with incomes of $3,000 or more to pay one percent, while those with incomes of $500,000 or more paid six percent. These rates were increased in order to finance World War I. In addition, profits in excess of those during the pre-war years were subject to tax. After the war, however, the excess profits tax was repealed, and the rates on high incomes lowered. World War II caused

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[16]Henry V. Hubbard and Theodora Kimball, *An Introduction to the Study of Landscape Design* (New York: The Macmillan Company, 1927), 309.

[17]Hubbard and Kimball, 311.

the next major increase in personal income tax. The number of those paying taxes rose from four million in 1939 to 42 million in 1945.[18]

Social welfare needs, prior to Franklin D. Roosevelt's New Deal programs, were not addressed at a national level.[19] Many who had earned great wealth and were not subject to substantial taxation felt an obligation to fill this need. Andrew Carnegie, for example, lived quietly and took little interest in fashion because he felt that the rich should set an example of modest living. He believed that, as a wealthy man, he had been blessed with the opportunity to provide funding for projects which would prove of lasting value to society. He and others like him therefore advocated managing money as a trust fund for the benefit of the community.[20]

Bar Harbor and Mount Desert Island

A brief description of the natural and cultural setting of Mount Desert Island, more extensively documented elsewhere,[21] will aid in an understanding of the carriage road system that was eventually built in this spectacular setting.

Mount Desert Island, over one hundred square miles in size,[22] is located off the coast of Maine, approximately 50 miles east of Bangor. The complex geology of Mount Desert Island results from successive depositions over millions of years of volcanic material, sedimentation, and metamorphism, then intrusions of igneous rocks into this intricate mass. Below this complex mass, a huge dome of magma, or molten rock, formed and slowly cooled, resulting in the basic core rock of the island--a course-

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[18]Wade and Wilder, 738.

[19]F. D. R.'s Civilian Conservation Corps contributed enormously to the building of state and national park facilities in the United States, but played a very minor role in the Acadia carriage roads. C. C. C. workers installed the road signs but did not work on the roads themselves.

[20]Wade and Wilder, 459.

[21]See bibliography for titles by Butcher, Chapman, Collier, Morison, Rothe, and Street.

[22]At 107.7 square miles, Mount Desert is the third largest island on the coast of continental United States. It is smaller than Long Island, very slightly smaller than Martha's Vineyard, and nearly twice as big as Staten Island and Catalina. (Sargent F. Collier, *Mt. Desert and Acadia National Park: An Informal History* [Camden, Maine: Down East Books, 1978], 1).

grained, pinkish granite.[23] Great compression and upheaval over millions of years created the Appalachian chain of mountains, once as tall as the Rocky Mountains, with the mountains of present Mount Desert Island near its northeastern end. Slow erosion gradually exposed the dome of granite which forms the greater part of the island.

In relatively recent geologic times, this weathered mass of rock was further transformed by the grinding action of glaciers which rounded the mountains and scoured out valleys as they passed across the region in a generally north-south direction. These valleys filled with water to form fresh-water lakes and ponds. Somes Sound, carved deeper than the others, became what many geologists regard as the only fjord on the Atlantic coast in the United States.[24] While greatly eroded from their earlier size, the mountains of Mount Desert remain the highest elevation along the eastern coast of the United States.[25] As William W. Vaughan has written: "So here this happy cluster of granite hills stands, the only mountainous bit of shore on our whole Atlantic Coast."[26]

This great diversity of landscape form--seashore, mountains, lakes, marshes, hills and valleys--naturally supports an enormously varied flora and fauna. Deciduous and evergreen trees, tremendously diverse wildflowers, and both fresh-water and salt-water wetland plants abound, giving habitat to a great variety of wildlife. Hundreds of species of birds, land and sea mammals, amphibians and reptiles thrive, with one fortunate exception--there are no poisonous snakes.

Indians named the island Pemetic (meaning "sloping land") and fished its protected harbors. Samuel de Champlain made the first European discovery of the island in 1604 and named it *l'Isle des Monts-deserts.* A French Jesuit settlement was later established at the head of Somes Sound, but was shortly eliminated by the English.

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[23]Considerable quantities of this pinkish granite were quarried on the island in the late nineteenth century, but the high cost of cut stone and substitution of cheaper materials reduced this amount greatly by the first decade of the twentieth century. (Circular: *An Auto-less Summer Resort* [1915].)

[24]Russell D. Butcher, *Field Guide to Acadia National Park* (New York: Thomas Y. Crowell Company, 1977), 28-37.

[25]Cadillac Mountain, at 1530 feet above sea level, is the highest mountain on the Atlantic coast north of Brazil. (Grant W. Sharp, *Acadia National Park and the Nearby Coast of Maine* [New York: Golden Press, 1968], 4.)

[26]William W. Vaughan, *Northeast Harbor Reminiscences* (Hallowell Maine: White & Horne Company, 1930), 11.

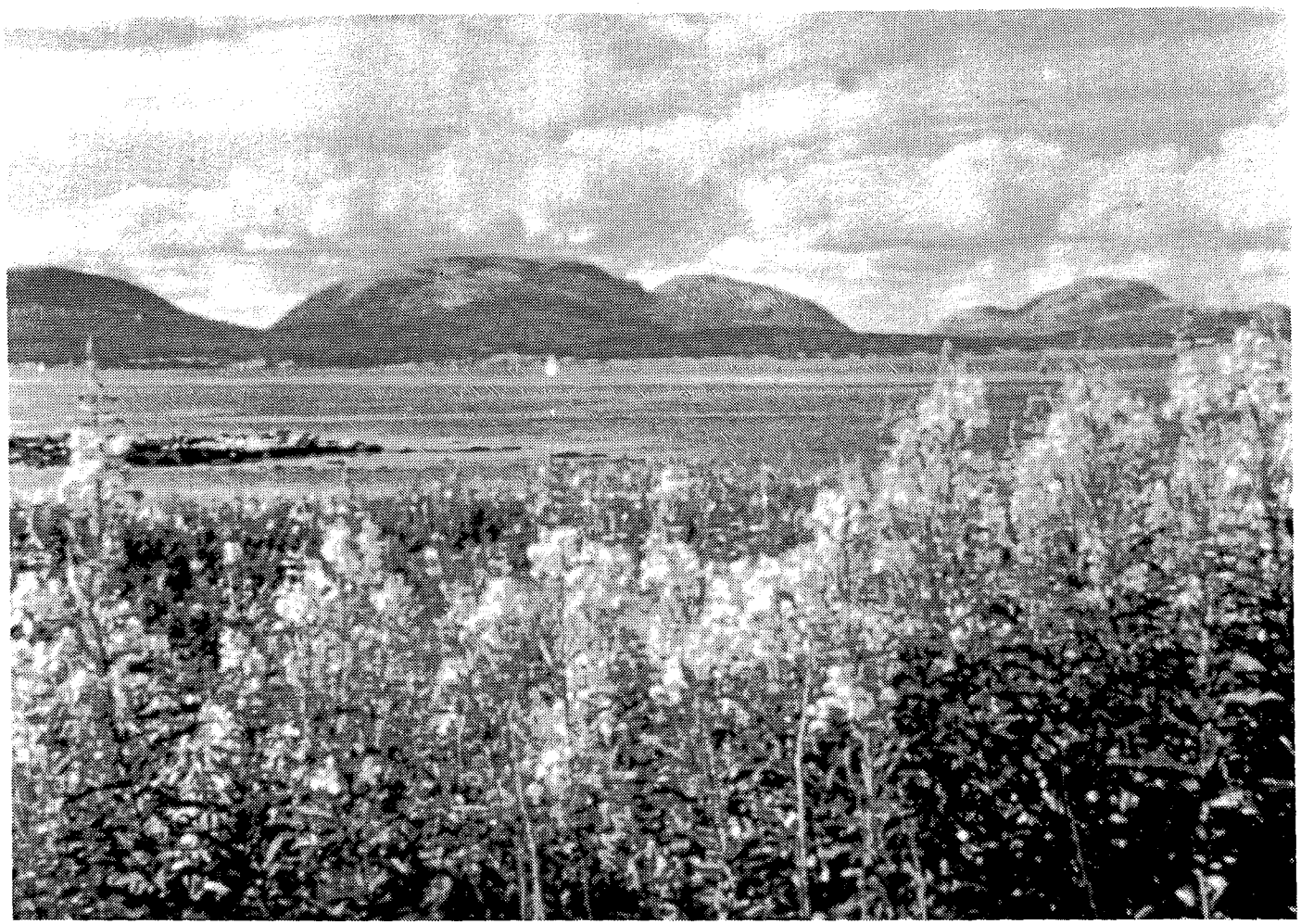


Figure IV. View of Mount Desert Island from Baker Island.

" So here this happy cluster of granite hills stands, the only mountainous bit of shore on our whole Atlantic Coast."
W. Vaughan

It was a hundred and fifty years after Champlain had discovered it that permanent settlers first occupied the island. The early settlers endured a difficult pioneer life of subsistence farming, fishing, and later logging and granite quarrying.

It was to this spectacular but harsh setting that visitors began to come for its picturesque scenery in the mid 1800s. This movement would transform Mount Desert Island, over the next few decades, from an austere rural region to a gracious resort community. In his book, *The Last Resorts,* Cleveland Amory puts forward this theory of the evolution of resort towns:

> . . . [T]he following groups have come to the social resorts in this order: First, artists and writers in search of good scenery and solitude; second, professors and clergymen and other so-called solid people with long vacations in search of the simple life; third, "nice millionaires" in search of a good place for their children to lead the simple life (as lived by the "solid people"); fourth, "naughty millionaires" who wished to associate socially with "nice millionaires" but who built million dollar cottages and million dollar clubs, dressed up for dinner, gave balls and utterly destroyed the simple life; and fifth, trouble.[27]

Mount Desert fits this pattern, although it remains a matter of opinion whether the ultimate result of its development as a resort was trouble. During the mid-1800s, artists such as Thomas Cole and Frederick Church appeared on Mount Desert Island to paint the dramatic scenery; clergymen and educators such as Bishop William Lawrence and Charles W. Eliot followed; and then both nice and naughty millionaires arrived. By the turn of the century, Bar Harbor was booming.

Some of the early summer residents (or "rusticators", as they were called) regretted the turn of events. In 1932, Bishop Lawrence reminisced in a letter to L. B. Deasy:

> Since I came here [Bar Harbor] over 60 years ago [1872] and found only a fishing and farming village, a few boarding houses and 3 cottages just built in the Field, there have come changes and more changes. In those days, the whole island was ours to roam over. We climbed the pathless mountains, we had the summits of Green, Newport, and Sargent to ourselves, and felt the thrill of exploration. As to vehicles, we started with mountain wagons; then came buckboards, beach wagons, cut-unders, and to our horror some New York swells brought Victorias and broughams.[28]

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[27]Cleveland Amory, *The Last Resorts* (New York: Harper & Brothers, 1952), 23.

[28]William Lawrence to L. B. Deasy, August 19, 1932.



Figure V. A Victoria.

"... to our horror some New York swells brought Victorias and broughams." William Lawrence

Amory relates the following anecdote about a European swell taking tea at the Jordan Pond House:

> In the days when the standard vehicle of the resort was the "cut-under," a Bar Harbor version of the surrey without the fringe on top and with the wheels cut directly under the front seat, the story is told of a European countess who drove over from Bar Harbor to Jordan Pond and left a lasting impression on the place, if not on herself. "I can never remember," she said, "whether I drove over in a cut-under for a popover or in a popover for a cut-under."[29]

Buckboards and cut-unders were popular utility vehicles of the period. They resulted from the experiments of American carriagemakers who capitalized on the strength, durability, and lightness of American wood to make carriages less bulky than their English counterparts. These buckboards or surreys were light, maneuverable, and comfortable for a long trip. Because they had no superfluous parts, they were also easy to maintain. They also proved to be ". . . an ideal hotel vehicle" and became ". . . familiar sight-seeing conveyances in the mountains and resort areas of New England."[30] Early brochures for Acadia National Park include information about the buckboards leaving every afternoon from the Malvern Hotel and the Jordan Pond House on tours of the park:

> Connected with the town road system and leading into and through the park is an excellent system of roads for use with horses, some 30 miles in extent. Stables at Bar Harbor, Jordan Pond, and Northeast Harbor furnish horses, saddle and driving, for trips over these roads, entrances to which are provided near Bar Harbor, Seal Harbor, and Northeast Harbor. Buckboards, Bar Harbor's own contribution to the horse-drawn vehicle class, leave the Malvern Hotel in Bar Harbor and the Jordan Pond House at two o' clock daily for trips over the park's carriage roads.[31]

In his informal history of the island, Sargent Collier writes that at the turn of the century many Bar Harbor residents were also unhappy with the transition from

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[29]Amory, 286.

[30]Wheeling, 21.

[31]*Circular of General Information Regarding Acadia National Park*, (U. S. Department of the Interior, ca. 1930), Acadia National Park files, 10.



Figure VI. A "Cut-Under" Phaeton.

Owner-driven "buggies" such as this phaeton were popular park and pleasure vehicles. Rockefeller owned such a phaeton which he drove on the carriage roads.

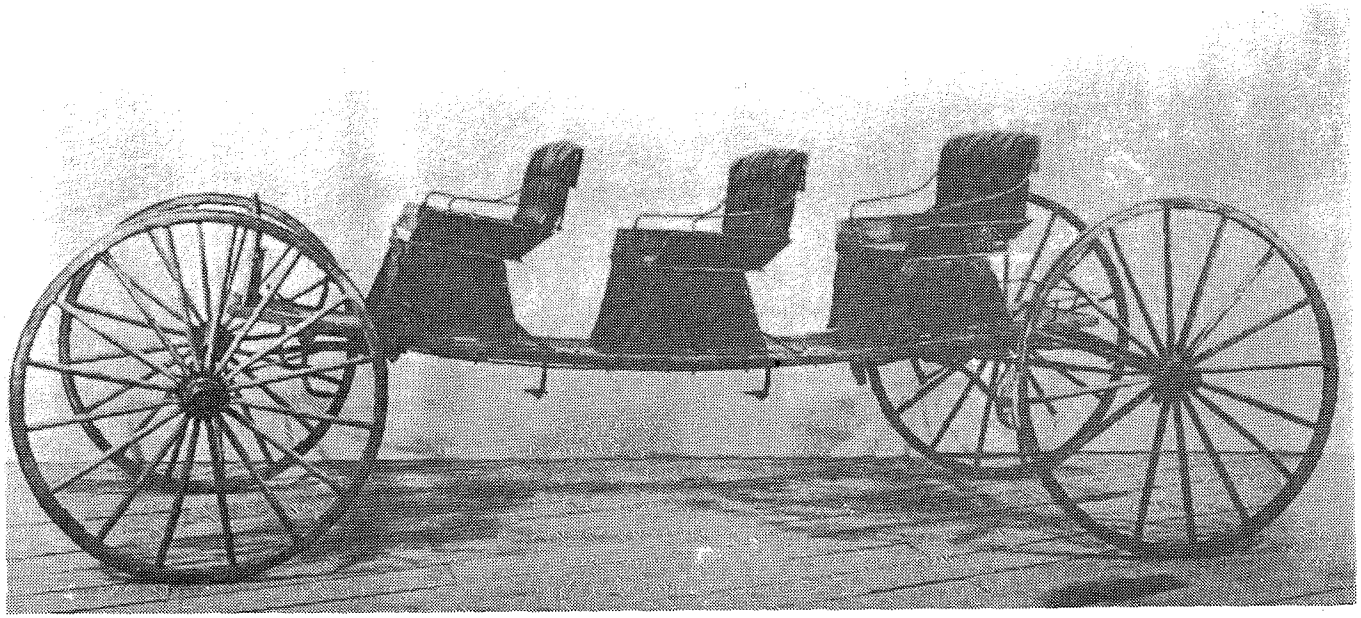


Figure VII. A Triple Buckboard.

This triple buckboard is unusual. As a rule, buckboards had one or two seats.

". . .'rocking' and mountain climbing to musicales and lawn parties."[32] Committees were formed ". . . to keep the beauty of the island inviolate."[33]

In 1901, Charles W. Eliot, president of Harvard and summer resident of Northeast Harbor, formed the Hancock County Trustees of Public Reservations, an organization patterned after one of a similar name founded by his son, landscape architect Charles W. Eliot, Jr., in Massachusetts in 1891. The Massachusetts Board of Trustees of Public Reservations worked to preserve areas of scenic beauty in that state for public use. The Hancock County Trustees set as their goal the preservation of Mount Desert's natural assets for public use and enjoyment. Under the leadership of George B. Dorr, the Trustees were able to offer 5,000 acres to the federal government. This acreage was first accepted as a national monument in 1916, and three years later became the first national park east of the Mississippi and the first national park completely the result of private donations.[34]

Because Mount Desert Island was both a resort community and an island, it was relatively late in admitting automobiles. There are four towns on the island: Eden, which includes the Village of Bar Harbor, in the northeast; Tremont and Southwest Harbor in the southwestern portion; and between these, stretching southeast to northwest, the town of Mount Desert, which includes the villages of Somesville, Northeast Harbor, and Seal Harbor. In 1907, a state law was enacted which allowed the separate towns of the island to admit or bar automobiles as they saw fit. George L. Stebbins, Executive Secretary, reported to the Seal Harbor Village Improvement Society the passage of the law "giving the Town [of Mount Desert] authority to so restrict the use of automobiles as to protect us from all danger of them".[35] For a short time autos were banned from the entire island.[36] Shortly, however, the towns of Tremont and

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[32]Sargent Collier. *Mount Desert Island: An Informal History* (Camden Maine: Down East Books), 51.

[33]Amory, 284.

[34]An engaging account of the origins and political maneuvering necessary to secure the holdings for conservation and public enjoyment is presented by George B. Dorr in his books, *Acadia National Park: Its Origin and Background* and *Acadia National Park: Its Growth and Development* (Bar Harbor, Me.: Acadia Publishing Company, 1985).

[35]Edward K Dunham, "Early Years of the Seal Harbor Village Improvement Society," August 20, 1980. Seal Harbor Library Collection.

[36]This period of legal banishment of automobiles from the island, which lasted for only two years, is exaggerated in many accounts. This may stem from a confusion between the *Island* of

Southwest Harbor admitted them. Four years later, in 1913, the town of Eden, where Bar Harbor is located, permitted them.[37] In July of that same year, a meeting of the town of Mount Desert was called to consider the issue of admitting automobiles to the town.

Many prominent summer residents spoke at the meeting, including President Eliot, Joseph H. Curtis,[38] Ernest B. Dane,[39] George L. Stebbins,[40] and relative newcomer John D. Rockefeller, Jr. After arguments were made on both sides of the issue, the summer residents (who had no vote) were asked to leave, and a vote was taken. By a margin of 292 to 18 the article favoring admittance of automobiles failed.[41] The event was immortalized in a poem by summer resident Herbert Weir Smythe (Appendix III).

The issue was not dead, however. Two years later initiatives were undertaken at the state level to require the town of Mount Desert to admit automobiles. This resulted from pressure from both the state automobile lobby and the other towns on the island. Tremont, Southwest Harbor and Eden had admitted automobiles, but it was still impossible to travel from Bar Harbor to Southwest Harbor by car because they were separated by the town of Mount Desert. In 1915, two bills were entered in the state legislature. One would admit automobiles to only the western portion of the town, allowing connection between Eden on the northeast with Tremont and Southwest Harbor on the southwest. The other bill, more sweeping, would admit automobiles to

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Mount Desert, where autos were legal by 1909, and the *Town* of Mount Desert in which they were banned until 1915. In addition, it is unlikely that the island would have been overrun with automobiles between 1907 and 1909 even if they had been legal--there were less than half a million automobiles registered in the entire country by 1910.

[37]"Mt. Desert Bars the Auto" in *New York Evening Post*, September 29, 1913.

[38]Curtis was a landscape architect and one of the first summer residents of Northeast Harbor. He laid out roads in the Paradise Hill area for a private development which were later incorporated into the carriage road system.

[39]Owner of Wildwood Farm.

[40]Stebbins was a Seal Harbor summer resident who dealt in real estate on the island, and became an advisor to Rockefeller.

[41]Circular: Joint Committee of Seal Harbor, Northeast Harbor, and Somesville, *An Auto-less Summer Resort* (1913), printed in its entirety in Appendix IV.

the entire town of Mount Desert, which had consistently and overwhelmingly voted to ban them.

Unlike the controversy which would develop a decade later over the carriage roads, there was broad agreement in the Seal Harbor-Northeast Harbor area about the admission of automobiles: both the summer and permanent residents were opposed to it. The summer residents wished to preserve the rustic and natural charms which had first attracted them to the island. As for the permanent residents, most of them earned their livings from the summer people, the subsistence farming and fishing occupations having largely given way to support services by the first decade of the twentieth century.

Petitions presented to the legislature were signed by many permanent residents who would later play important roles in the development of the carriage road system, including A. E. Clement, B. W. Candage, S. W. Candage, Gregory Eddy, and S. W. Smallidge (Appendix V). A contingent of summer and permanent residents led by President Eliot went to Augusta to lobby against the bill. This effort was in vain. The bill which went into law read:

> All acts or parts thereof prohibiting or restricting the use of automobiles or motor vehicles in the town of Mount Desert, on the island of Mount Desert, in the county of Hancock, are hereby repealed.
>
> All by-laws and ordinances of said town of Mount Desert prohibiting or restricting the use of automobiles or motor vehicles on the town ways, streets or highways of said town are hereby declared void and of no effect.[42]

Automobiles were now admitted to all parts of Mount Desert Island. This was not the result of local democratic rule, however. The residents of the town of Mount Desert never voted in favor of the admittance of automobiles. It is not a coincidence that in the same year John D. Rockefeller, Jr., made a petition to the Hancock County Trustees of Public Reservations to allow him to construct an expanded system of motor-free roads through Reservation lands.

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[42]*Act of the Seventy-Seventh Legislature [Maine], Senate, No. 319*, March 11, 1915. Maine State Law Library.

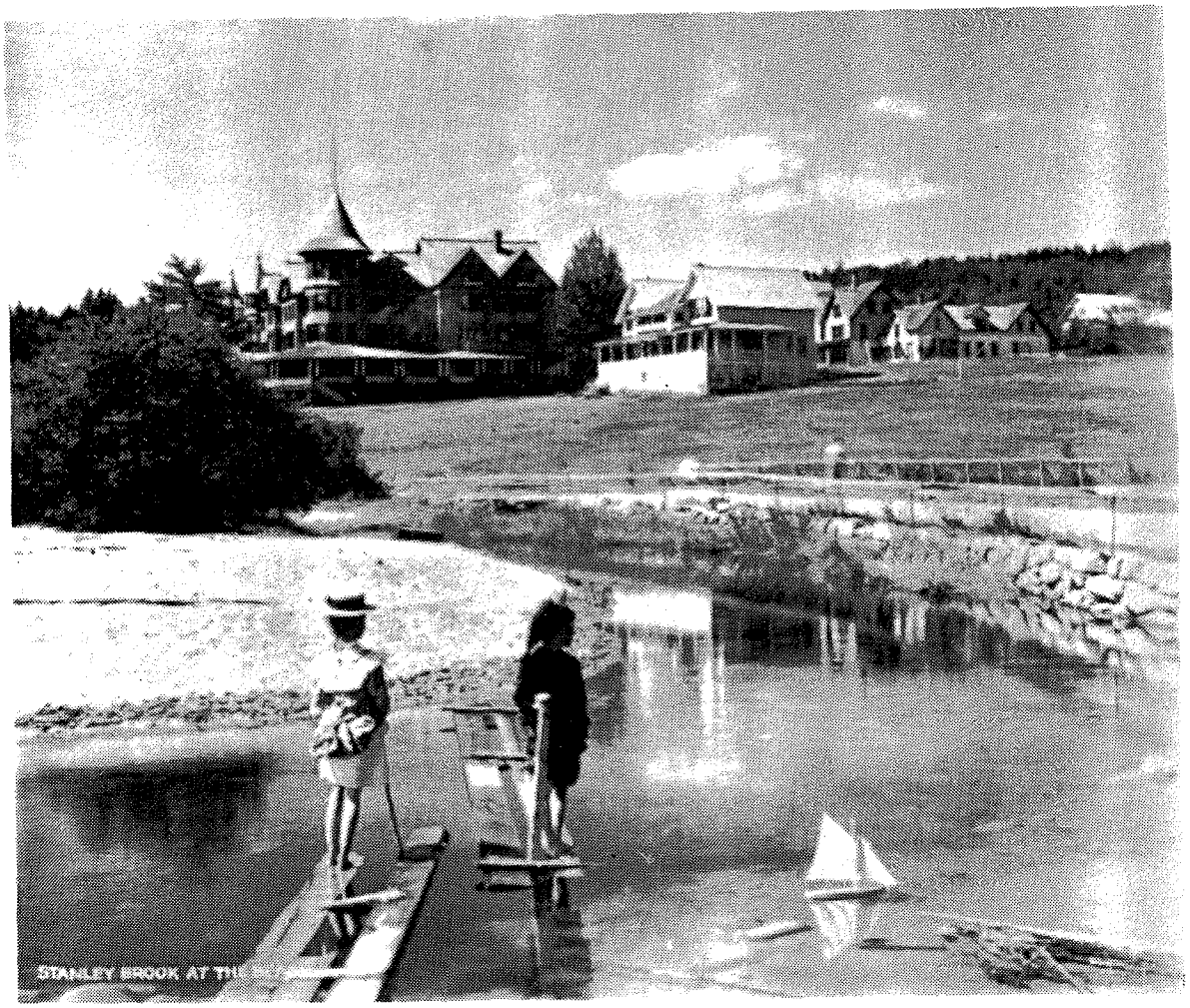


Figure VIII. Stanley Brook at the Beach, Seal Harbor.

"The roads and trails are safe for women and children without escort." An Auto-Less Summer Resort.

John D. Rockefeller, Jr.

As a student at Brown University in Providence, Rhode Island, Rockefeller had visited Bar Harbor the summer before his junior year (1895).[43] In 1901, he married Abby Aldrich and they took up residence in New York City. Two newspaper articles described his use of carriages while in residence there. One began by reporting: "Behind a pair of spanking black horses which require a steady hand and a cool mind to guide them along the thoroughfares of the city, every morning in all sorts of weather there may be seen leaving a house on East Fifty-Fourth street, John D. Rockefeller, Jr., the son and heir of the oil king of America." It ended by recording that, "Young Mr. Rockefeller believes in the out-of-door existence and advocates it at every opportunity, not only by speech, but by action."[44] The other noted that, "Automobiles appeal to the son of the richest man in the world when it comes to practical use, but for exercise and recreation he prefers horses."[45]

Although Rockefeller did not participate in the social rituals of the coaching clubs, he owned a fleet of carriages, including a Stanhope phaeton, which he would transport by train from the Rockefeller estate at Pocantico (in the Hudson River Valley) to Seal Harbor when he was in residence there. For him, however, carriage driving was more of a sporting exercise than a social one, and he was often described as an excellent horseman who loved the out-of-doors. Tom Pyle, a Pocantico Hills employee, wrote that John D. Rockefeller, Jr., ". . . like his father before him, was an expert driver of either a pair or a four-in-hand. With a four-in-hand he was actually better than either the estate coachman or the head of the stable. . . ."[46]

During the early 1900s, park driving accounted for the greatest use of a coach-and-four. Two letters from Rockefeller to Paul D. Simpson indicate that Rockefeller anticipated that this type of carriage would be used on the roads on Mount Desert Island. In a letter dated November 8, 1926, he wrote, "If there is any possibility of the 13'6" clearance not giving entirely adequate head room for people on a coach, I would

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[43]Raymond B. Fosdick, *John D. Rockefeller, Jr.: A Portrait* (New York: Harper & Brothers, 1956), 63.

[44]Undated newspaper articles. Scrapbook Collection at Rockefeller Archive Center.

[45]Ibid.

[46]Tom Pyle, *Pocantico: Fifty Years on the Rockefeller Domain* (New York: Duell, Sloan and Pearce, 1964), 3.

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prefer to err on the safe side and use the 16' clearance."[47] He also wrote in a letter dated September 15, 1932: "Apparently 12 feet would be the minimum overhead clearance for a horse road under a bridge. My impression is you had planned at least that height and perhaps something more for the Jordan Pond Road bridge. This information is based on actual measurements of a coach."[48] One of Rockefeller's intentions in building the carriage roads was to provide access to all parts of the island to the general public. He did expect, however, that they would largely be used by such private carriages and coaches.

Despite his great wealth and the resulting opportunity to indulge his affinity for such diversions as carriage driving, the first decade of the twentieth century was not an easy period for John D. Rockefeller, Jr. It was a period during which his father was the target of ferocious attacks in the press. John D. Rockefeller, Sr., as a matter of principle, did not answer the charges made against him. As a result of these attacks ". . . Senior emerged as the single greatest villain in all that was wrong with the prevailing economic system."[49] The public denunciations of his father were especially trying for the younger Rockefeller, who ". . . saw his father as a warm and loving family man . . . who remained calm and cheerful at the worst of times."[50] In addition, Rockefeller, Jr., was clearly struggling with the direction his own career and life would take.

At the end of 1904, according to Rockefeller family biographers Harr and Johnson, he suffered a nervous breakdown. Whether this breakdown was caused by the public attacks on his father, or by an identity crisis regarding how he was to devote his life, the cure he prescribed for himself is telling in his eventual activity on Mount Desert Island. He took his wife and baby daughter to the south of France for six months, ". . . with Junior wandering through country towns of Languedoc or staring at

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[47]John D. Rockefeller, Jr., to Paul D. Simpson, November 8, 1926, personal collection of Mr. and Mrs. Charles P. Simpson.

[48]John D. Rockefeller, Jr., to Paul D. Simpson, September 15, 1931, personal collection of Mr. and Mrs. Charles P. Simpson. Perhaps Rockefeller's concern for accommodating coaches resulted from the knowledge that Mrs. Browning, a Philadelphia grande dame who summered in Bar Harbor, had spent five weeks "coaching up" to the resort in a four-in-hand in 1907 (Amory, 267).

[49]John Ensor Harr and Peter J. Johnson, *The Rockefeller Century* (New York: Charles Scribner's Sons, 1988), 58.

[50]Harr and Johnson, 60.

the blue Mediterranean from the balustrades of the Promenade des Anglais in Nice."[51] After returning from his convalescent trip to France, he remained absent from work for many more months. To rebuild his health ". . . [h]e continued a regimen of diet, frequent rest, and long horseback outings with his cousins William and Percy . . . . It was years before he felt himself fully recovered."[52] When Rockefeller, a few years later, chose a location for his summer home, he settled on one on the coast of Maine with many of the landscape features he had sought during his recuperation--a view of the ocean, idyllic villages, and automobile-free roads for horse-back riding and carriage driving.[53]

It was in 1910 that the Rockefellers purchased their summer home in Seal Harbor. A few years after this purchase, they supported the Hancock County Trustees of Public Reservations in their efforts ". . . to preserve at least part of the island from exploitation."[54] Rockefeller's program of land acquisition eventually led to the donation of nearly ten thousand acres (all of his land except the property surrounding his own house at Seal Harbor, and almost one-third of the total acreage of the Park on Mount Desert Island.) His initial involvement with Acadia National Park also led to several major undertakings over the course of 45 years in which he aided the National Park Service in its role as steward of the country's natural and historic resources.[55]

Rockefeller's generosity to the National Park Service during his lifetime is an extraordinary example of the philanthropy practiced by many men who had earned great wealth. Raymond Fosdick, Rockefeller's biographer, attributes his generosity and philanthropic attitude to his religious upbringing and his desire to lead his life according

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[51]Harr and Johnson, 85.

[52]Harr and Johnson, 112.

[53]While the younger Rockefeller and his family had a house on the Pocantico estate and Rockefeller, Jr., oversaw much of the construction and reconstruction of the place, during his father's life-time he always referred to Pocantico as "my father's country place at Tarrytown." The Seal Harbor estate, in contrast, was wholly Rockefeller, Jr.'s enterprise.

[54]Amory, 303.

[55]Other significant contributions to the National Park Service include funding for Yosemite, Yellowstone, Sequoia, Grand Teton, Great Smoky Mountains and Shenandoah National Parks, as well as the Blue Ridge Parkway. His role in establishing Grand Teton National Park was so great, that the Park Service has named the 82-mile parkway which connects the West Thumb in Yellowstone to the South Entrance of Grant Teton National Park the John D. Rockefeller, Jr., Memorial Parkway.

to his ideals: "Thus, the younger Rockefeller in his thirty-sixth year came to the conclusion that thereafter his interests would be largely confined to a single focus: the social purposes to which a great fortune could be dedicated."[56]

[56]Fosdick, 142.

DESIGN

When John D. Rockefeller, Jr., became convinced at 36 years of age that the course of his life should be devoted to disposing of wealth to advance the public good, it was 1910, the year he purchased The Eyrie in Seal Harbor. In Mount Desert Island and in the development of Acadia National Park he found a project suited to his talents and goals, and he lost no time in developing a plan and finding the right people to implement it.

The Hancock County Trustees of Public Reservations began the process of acquiring land shortly after the turn of the century to protect the summits of the island's mountains. Although Rockefeller never became a member of the Trustees, he worked with them towards that end, but also expanded that effort:

> After the park had been officially created, he began to purchase additional land in order to enlarge its boundaries and join the mountain summits to one another so that ultimately a park road might extend from the ocean on one side to Frenchman's Bay on the other. . . . Land acquisition was but one phase of Mr. Rockefeller's participation. There was, in fact, no aspect of the park's development which did not interest him--from the architecture of park buildings to landscaping, forestry, roads, or the destruction caused by beavers and deer. Through his long years of association with Acadia he would come to know and love the island almost inch by inch, and his total expenditures for land acquisition, buildings, roads, bridges, forestry, and planting would reach large sums.[57]

Raymond B. Fosdick cites three reasons for Rockefeller's lifelong involvement with Acadia:

> . . . [H]e was a member of the Mount Desert community and was personally concerned that the natural beauty of the island be preserved. Acadia was furthermore the kind of project which appealed to him strongly. It was a virgin enterprise, and to a perfectionist like himself this meant that the work would not be hampered by the precedent of inferior standards nor would the scope of the project be limited by a preconceived plan. . . . Finally, Acadia needed roads, and Mr. Rockefeller, who shared his father's passion for road-building, was only too anxious to help meet this requirement.[58]

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[57]Fosdick, 304.

[58]Fosdick, 304.

In his book, *Random Reminiscences of Men and Events*, the senior Rockefeller discussed this passion for road-building and landscape architecture which he passed on to his son. He described the delight he took in laying out the roads and siting the house at Pocantico Hills in New York's Hudson River Valley: "In a few days I had worked out a plan so devised that the roads caught just the best views at just the angles where in driving up the hill you came upon impressive outlooks, and at the ending was the final burst of river, hill, cloud, and great sweep of country to crown the whole; and here I fixed my stakes to show where I suggested that the roads should run, and finally the exact place where the house should be." He went on to add, "How many miles of road I have laid out in my time I can hardly compute, but I have often kept at it until I was exhausted. While surveying roads, I have run the lines until darkness made it impossible to see the little stakes and flags."[59]

His interest in landscape architecture grew with the purchase of his Forest Hill estate in Cleveland, Ohio, in 1873. The property was carefully developed as a country estate. By the time its grounds were donated to the cities of Cleveland Heights and East Cleveland in 1938, there existed an extensive network of carriage roads and bridle paths, some of which became park roads. Figure IX is a photograph of one such road. Judging from its design, including the vine-covered coping stones, it could just as easily be on Mount Desert Island.

A. D. Taylor, the landscape architect hired to transform the estate into a park for the cities of Cleveland Heights and East Cleveland, noted several characteristics which would be transplanted to the future Rockefeller estates in Pocantico and Seal Harbor:

- Traversing the ravines, and carrying the roads and paths across the north and south branches of Dugway Brook, a number of distinctive and well-constructed bridges were built, using the native stone procured from the quarry on the property.[60]

- The large quarry which was opened on the property is located in the south portion of the property immediately west of Lee Boulevard. The area occupied by this quarry is approximately 4,400 square yards, and the depth of exposed surface of stone gives evidence that a large quantity of stone has been taken from

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[59]John D. Rockefeller, Sr., *Random Reminiscences of Men and Events* (Tarrytown, N. Y: Sleepy Hollow Press, 1984), 37.

[60]A. D. Taylor, *Forest Hill Park: A Report on the Proposed Landscape Development.* (Cleveland, Ohio, 1938), 20.



Figure IX. Carriage Road at John D. Rockefeller, Sr.'s,
Forest Hill Estate in Ohio.

> this quarry through a period of many years, and a quantity of valuable building stone remains in this quarry.[61]
>
> - There are on this property approximately six and one-half miles of gravel roads approximately ten feet in width. . . . These roads were well-graded, unusually well constructed, and excellently located to meet the requirements in the use of this property as a private estate.[62]

When the Rockefellers purchased their 2,500-acre estate in Pocantico Hills, Rockefeller, Jr., oversaw much of its development for his father. The carriage road system begun by John D. Rockefeller, Sr., and completed by John D. Rockefeller, Jr., eventually included approximately 50 miles of road and several bridges of both stone and wood construction. One particular stretch of road which paralleled Gory Brook included 16 bridges designed to Abby Aldrich Rockefeller's specifications. They were made of wide planks, ". . . so that the echo of the horses' hooves reverberated through the woods. It was a sound she loved."[63]

Most of the work on the Pocantico carriage road system occurred during the Depression and concurrent with the work on the carriage roads on Mount Desert Island (Figure XI). These roads, like those at Seal Harbor, remain open for public use.

Besides their love of road-building, the Rockefellers shared another characteristic--a penchant for details--which would prove useful as they undertook the construction of roads. Literature and correspondence are rife with anecdotes about their careful attention to minute details. Rockefeller, Sr.'s, business partner described his preparation of a telegram:

> Let us watch him at work. He had, let us say, a telegram to dictate. I have seen him wrestle with a telegram for twenty minutes. To my impatience it seemed hours. He would try one form of words, then another, then correct here and there. Then when rewritten he would change a word and so on. Never would the telegram leave his hand until it was neatly packed in the smallest possible compass, expressed the precise meaning he wished to convey, and was so

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[61]Taylor, 34.

[62]Taylor, 29.

[63]Pyle, 100.

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> worded that no other meaning by any process could be extracted from it--no less but also no more.[64]

As for Rockefeller, Jr., his friend and biographer, Raymond B. Fosdick, noted that he carried a four-foot rule in his back pocket for most of his life because he liked to measure for himself. For instance, Rockefeller contributed not only his time but his expertise to the development of the Palisades Parkway in New York:

> Plans for the first mile of the Palisades Parkway were brought to Mr. Rockefeller, Jr., who was anxious that the road not disturb the natural beauty of the heights. Inquiring the scale, he took out a carpenter's rule and began measuring the distance. The road, he felt, was too far from the rim; people should be able to look down as well as across. The engineers explained that where talus slopes buttressed the Palisades, they were safe; on steep cliff faces, a road too close would hasten the age-long fracturing. From this necessity sprang the idea of overlooks which gathered trailheads and picnic groves around them.[65]

Rockefeller, himself, addressed his eye for detail. He wrote that he was as interested as his father in details and he regretted that his associates and assistants were always trying to relieve him of the very thing which interested him.[66] He also inherited a complementary attribute which served him well. Fosdick wrote:

> The younger Rockefeller was proving himself a master of detail and it must be admitted that he loved it. He was a perfectionist, with an abhorrence of anything that was shoddy or second-rate, whether it was a pledge to a university or a road to be built at Forest Hill. Neither could the pledge be well drawn nor the road well built without a thorough understanding of all the factors involved. He had his father's meticulousness and preciseness. . . . But he never seemed to lose his way. The difference between woods and trees was always clear in his mind. He had his father's gift for the long view, the far-off objective; and while he often seemed to allow himself too willingly to be harassed by details, he never permitted them to obscure his vision.[67]

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[64]Fosdick, 96.

[65]Nancy Newhall, *The Heritage of Every American: The Conservation Activities of John D. Rockefeller, Jr.* (New York: Alfred A. Knopf, 1959), 27.

[66]Freeman Tilden, "Park of Land and Sea", n.d., Acadia Park Files, 11.

[67]Fosdick, 108.

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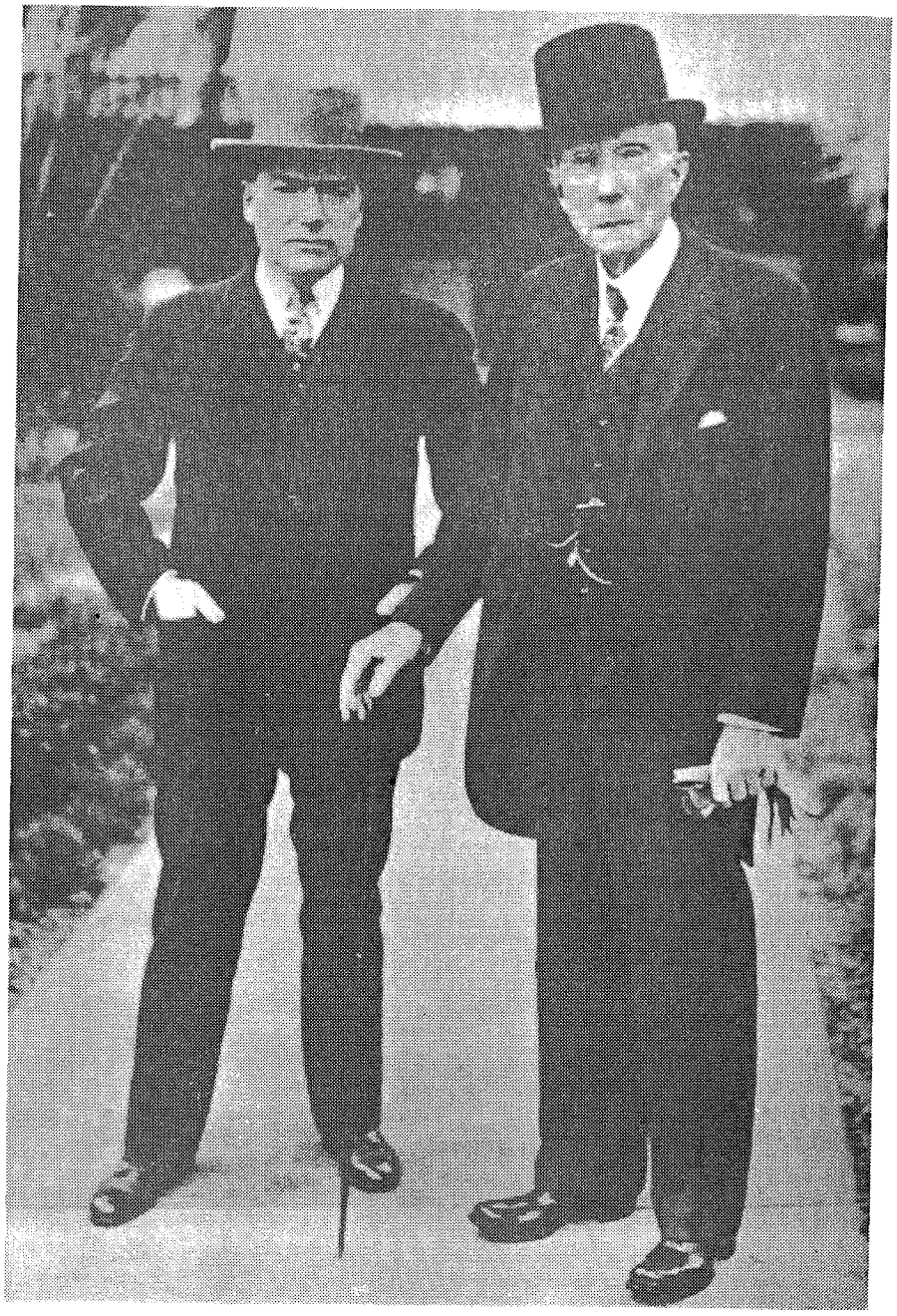


Figure X. The John D. Rockefellers, Junior and Senior

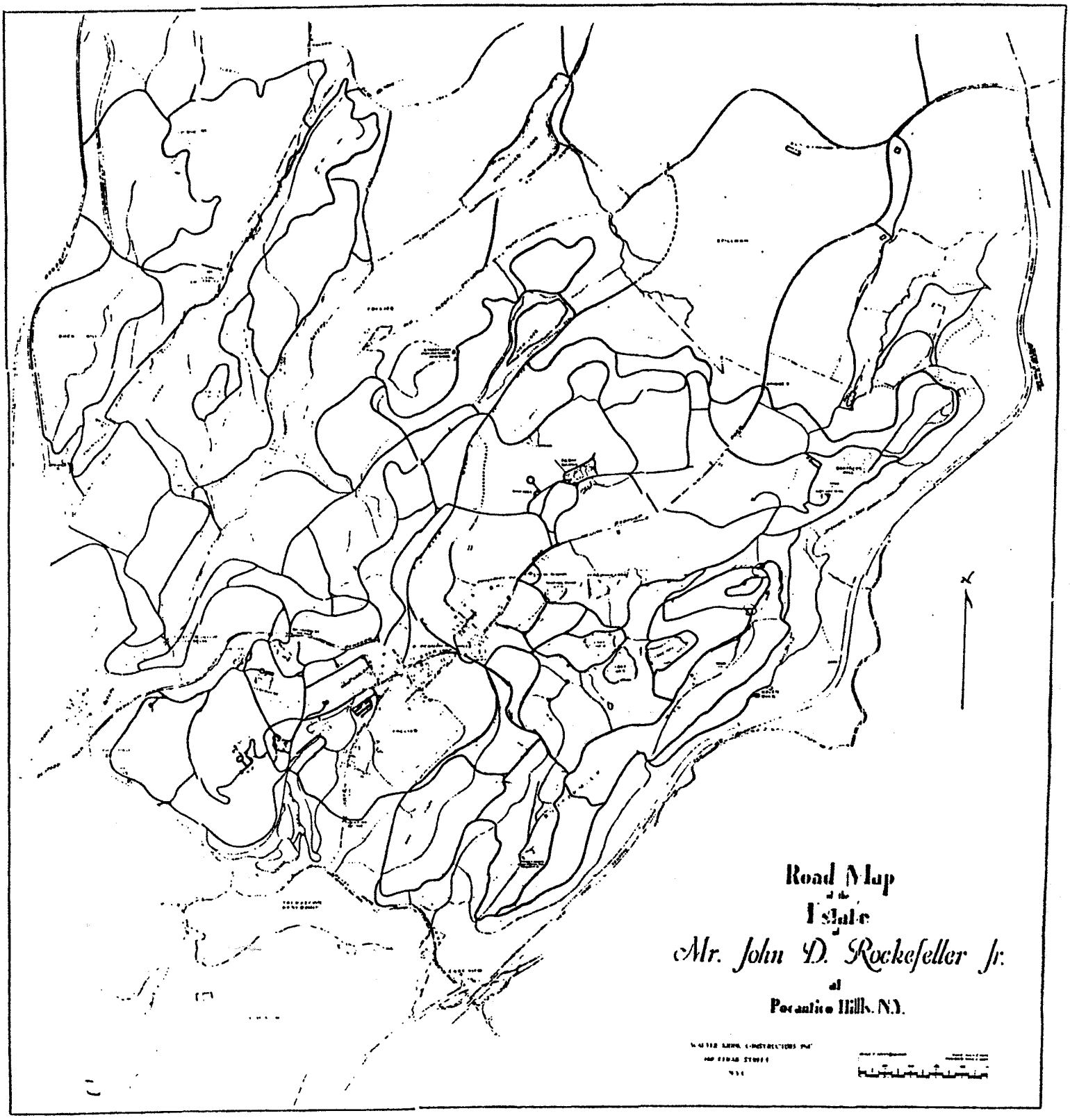


Figure XI. Pocantico Hills Carriage Road System

What this meant for Mount Desert Island was that Rockefeller started with clear, large-scale intentions which he held in focus and worked to implement over decades. Meanwhile, he kept a close eye on the design and construction not only of the carriage road system, but also the motor roads, trails, and many other park-related issues. Thomas C. Vint, a Park Service landscape architect much involved at Acadia, said in an interview about Rockefeller's work on Mount Desert Island:

> Many people know how much Mr. Rockefeller has done for the Park in acquiring land and building roads, and bridges and structures for it. But I think there are few who realize the amount of personal time and study he had given to it. He actually developed the general plan for the present Park. His land acquisition was pointed toward definite objectives--a workable unit at a time, in which the boundaries were studied from the viewpoint that the need for land was to be established and then acquisition carried out to meet the objective. This often meant the inclusion of a number of expensive highly-developed properties as well as the large wooded areas that are the more obvious type of park acquisition. It might be more nearly correct to say that Mr. Rockefeller developed a plan for Mount Desert Island, for he gave as much thought to the appropriate limits of the towns as he did to the limits of the park lands. He was as earnest about keeping the Park from including undeveloped land that should be held for town purposes as he was willing to pay the price and have the patience to acquire and remove an expensive home that was an encroachment on the Park side of a well-studied boundary.[68]

Rockefeller also showed patience and political acumen in the way he set about accomplishing his goals. In a letter to Horace Albright, the second Director of the National Park Service, in October, 1931, he wrote about a western park controversy:

> It was our hope that the establishing of these contacts might help to soften the feeling which has developed on the part of some of the citizens of the valley toward the conservation scheme. I came away increasingly convinced of the far-reaching importance of the scheme and confident that nothing short of the most comprehensive and complete program should be followed, fully believing that whether the program is carried out now or ten years later, it will ultimately be carried out, and for myself, quite willing to wait and let time do its work of adjusting and mollifying, rather than to seek an early settlement of the question through unwise compromise that would for all time mean a less ideal and worth-while program.[69]

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[68]Tilden, 3.

[69]John D. Rockefeller, Jr., to Horace Albright, October 17, 1931.

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And in a letter to Arno B. Cammerer, Associate Director of the National Park Service, in September, 1932:

> People are interested in blocking something which they think I have my heart set on doing. If they know I am indifferent, then the proposal begins to be considered on its merits; and when . . . the merits are found to be very considerable, like all other blessings they brighten as they take their flight. This does not mean that I am not deeply interested in and sympathetic with whatever the National Park Service is doing, whether in this road matter or the other projects which it has on hand.[70]

Given his love for road-building, his ability for attending to details, and his ability to see the far-off objective, it is not surprising that Rockefeller reserved for himself the role of the landscape architect of the carriage road system. While it is true that he engaged Beatrix Farrand to advise on plantings and later, Frederick Law Olmsted, Jr., to help with motor roads and offer advice on a short stretch of carriage roads which was never built, the task of overall master planning of the system, oversight of the location, choice of which features and views to connect, collaboration with engineers in the fit of the road to the landscape, and consultation with architects and engineers in the bridge and building design--this role he retained for himself.[71]

Philosophy/Intended Use

Rockefeller envisioned the carriage roads as a complement to, not a substitute for, Mount Desert's motor road system. He worked with island residents and the Park Service to develop three separate systems--the town road systems, the Park motor roads, and the carriage roads, all separated by grade crossings. With his carriage road system, he planned access to what he regarded as some of the most beautiful views in the world[72] and also to several of the island's important natural features (Figure XII). Mr. Vint related the following information:

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[70]John D. Rockefeller, Jr., to Arno B. Cammerer, September 24, 1932.

[71]In 1938, the American Society of Landscape Architects conferred honorary membership on John D. Rockefeller, Jr., ". . . a lover of order and excellence, who has rendered great and enduring service in preserving for future generations at home and abroad the inspiration of outstanding examples of human artistry and of landscape character and beauty."
("John D. Rockefeller, Junior, Lover of Order and Excellence," in *Landscape Architecture*, Vol. XXVIII, No. 3, April, 1938.)

[72]Newhall, 49.

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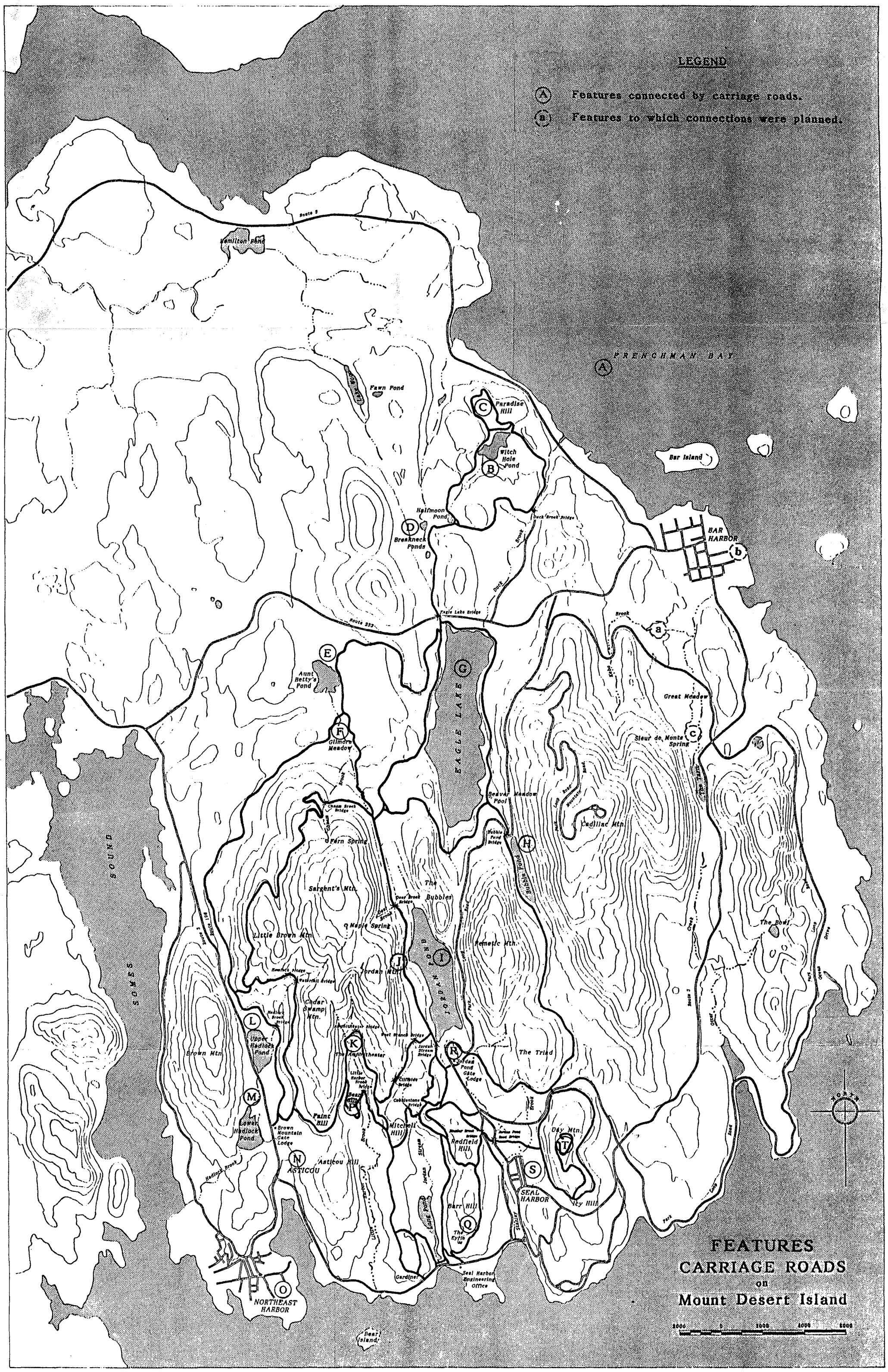

LEGEND
A Features connected by carriage roads.
B Features to which connections were planned.
Route 3
Hamilton Pond
Fawn Pond
FRENCHMAN BAY
Paradise Hill
Witch Hole Pond
Bar Island
Halfmoon Pond
D Breakneck Ponds
Duck Brook Bridge
BAR HARBOR
Eagle Lake Bridge
Route 233
Aunt Betty's Pond
E
G
EAGLE LAKE
Great Meadow
Gilmore Meadow
Fern Spring
Sieur de Monts Spring
Beaver Meadow Pool
Cadillac Mtn.
Cham Brook Bridge
Bubble Pond Bridge
Sargent's Mtn.
The Bubbles
Deer Brook Bridge
Maple Spring
Little Brown Mtn.
Kebo Mtn.
Jordan Mtn.
Cedar Swamp Mtn.
Hadlock Brook Bridge
Amphitheater Bridge
West Branch Bridge
Brown Mtn.
The Amphitheater
Jordan Stream Bridge
The Triad
Jordan Pond Gate Lodge
Little Harbor Brook Bridge
Cobblestone Bridge
Bear Mtn.
Paint Hill
Mitchell Hill
Brown Mountain Gate Lodge
Lower Hadlock Pond
Upper Hadlock Pond
Hadlock Brook
ASTICOU
Asticou Hill
Redfield Hill
Day Mtn.
SEAL HARBOR
Sargent Drive
Barr Hill
Icy Hill
The Eyrie
Seal Harbor Engineering Office
Gardiner Lane
NORTHEAST HARBOR
Bear Island
SOUTH
NORTH
FEATURES
CARRIAGE ROADS
on
Mount Desert Island
2000 0 2000 4000 6000

Figure XII

KEY TO FEATURES MAP

A	Frenchman Bay
B	Witch Hole Pond
C	Paradise Hill
D	Breakneck Ponds
E	Aunt Betty's Pond
F	Gilmore Meadow
G	Eagle Lake
H	Bubble Pond
I	Jordan Pond
J	Rock Slide on Jordan Mountain
K	The Amphitheater
L	Upper Hadlock Pond
M	Lower Hadlock Pond
N	Asticou
O	Northeast Harbor
P	Bear Hill
Q	The Eyrie
R	Jordan Pond House
S	Seal Harbor
T	Day Mountain Summit
a	Kebo Valley
b	Bar Harbor
c	Sieur de Monts Spring

> Mr. Rockefeller's knowledge of the Island was impressive. He seemed to know every contour, every tree and rock outcrop, and had a high regard for each item or natural bit of landscape peculiarity. He had been building roads for some years with his own road crews, giving seasonal employment to local people; expanding his program during years of unemployment and decreasing it during years of high employment. He used methods that required hand labor and less machinery, which permitted a tailor-made job, foot by foot adjustments being made as he went along. But he was patient with our Service methods. He understood perfectly that, using public funds, we had to work to plans and specifications on contracts awarded to the lowest bidder, and thus we could make few adjustments as we proceeded. And, too, few of our contractors had ever built park roads. I think he feels that under the circumstances we have accomplished acceptable results.[73]

The proper utilization of park land was, and is, a matter of debate between those who favor development of parks for public use and enjoyment, and those who favor preservation of the resource in its natural state. This dichotomy is explicit in the dual charge of the National Park Service to ". . . conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."[74] Harr and Johnson discuss Rockefeller's position in the conservation movement of the time:

> Then, as now, the conservation movement covered many shades of opinion. The mainstream, led by Theodore Roosevelt and Gifford Pinchot, was concerned with protecting virgin lands from wasteful exploitation through a "best use" policy, frequently requiring a delicate balancing of interests. . . . Over on the other side, the mainstream view was opposed by such purists as John Muir, who wanted to preserve virgin lands in a pristine state. . . . [Rockefeller] clearly belonged to the "best use" school. In aiding the development of tourist facilities and carriage roads at Acadia, his purpose was to bring the public in to enjoy the park under proper conditions that would preserve its beauty. . . . [75]

These categories, of course, were far from absolute. Muir, for example organized the Sierra Club to "explore, enjoy, and *make accessible* the mountain regions of

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[73]Tilden, 13.

[74]1916 Act establishing the National Park Service.

[75]Harr and Johnson, 200.

the Pacific Coast" (authors' emphasis).[76] While Pinchot advocated management of timber areas through carefully controlled logging operations, Rockefeller bought large tracts of land on Mount Desert to keep them from being cut at all.[77] Rockefeller was not a sentimentalist regarding nature, however. He once advocated, for example, the extermination of all the beavers on the island.[78]

Regarding the specific configuration of roads in a park setting, Rockefeller subscribed to the philosophy that roads should be sited unobtrusively in the landscape. He worked with his engineers to align the roads with the topography. Therefore, although the clearing and construction initially had a great impact, as Figure XIII illustrates, eventually the carriage roads became virtually invisible. Typically, roads around the mountains were sited on the slopes to take advantage of the view. Except for the Day Mountain loop, however, the roads never occupied the summits. This was in keeping with the initial wishes of the Hancock County Trustees of Public Reservations that the summits remain unexploited. The practice was also in accordance with accepted standards of road design in landscape parks--nature was to be experienced unspoiled. Such obvious manmade interventions as roads were to be as unobtrusive as possible. Hubbard and Kimball elaborate:

> Theoretically at least the only wheeled traffic . . . which should be allowed upon park roads is pleasure traffic, people proceeding at a leisurely rate to enjoy the fresh air and the beauties of the park. . . . Such regulations will allow park roads to be made somewhat narrower and with somewhat sharper curves than they otherwise might be, thus materially lessening their conspicuousness and the damage which their grading may do to the natural ground surface.[79]

While Rockefeller's love of carriage driving and his belief in cultivated and refined access to natural areas were at the heart of the creation of the carriage road system, it must be said that another indispensable component of their creation was his love of building. Rockefeller loved construction--particularly road construction. John S. McLaughlin, former Superintendent of Grand Teton National Park, related the following account of Rockefeller's visit to a road construction project at that park:

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[76]Joseph M. Petulla, *American Environmental History* (San Francisco: Boyd and Frazier Publishing, 1977), 232.

[77]George L. Stebbins, *Random notes on the early history and development as a summer resort of Mount Desert Island and particularly Seal Harbor* (Unpublished Manuscript, August 1938), 8.

[78]John D. Rockefeller, Jr., to S. F. Ralston, October 26, 1932.

[79]Hubbard and Kimball, 309.

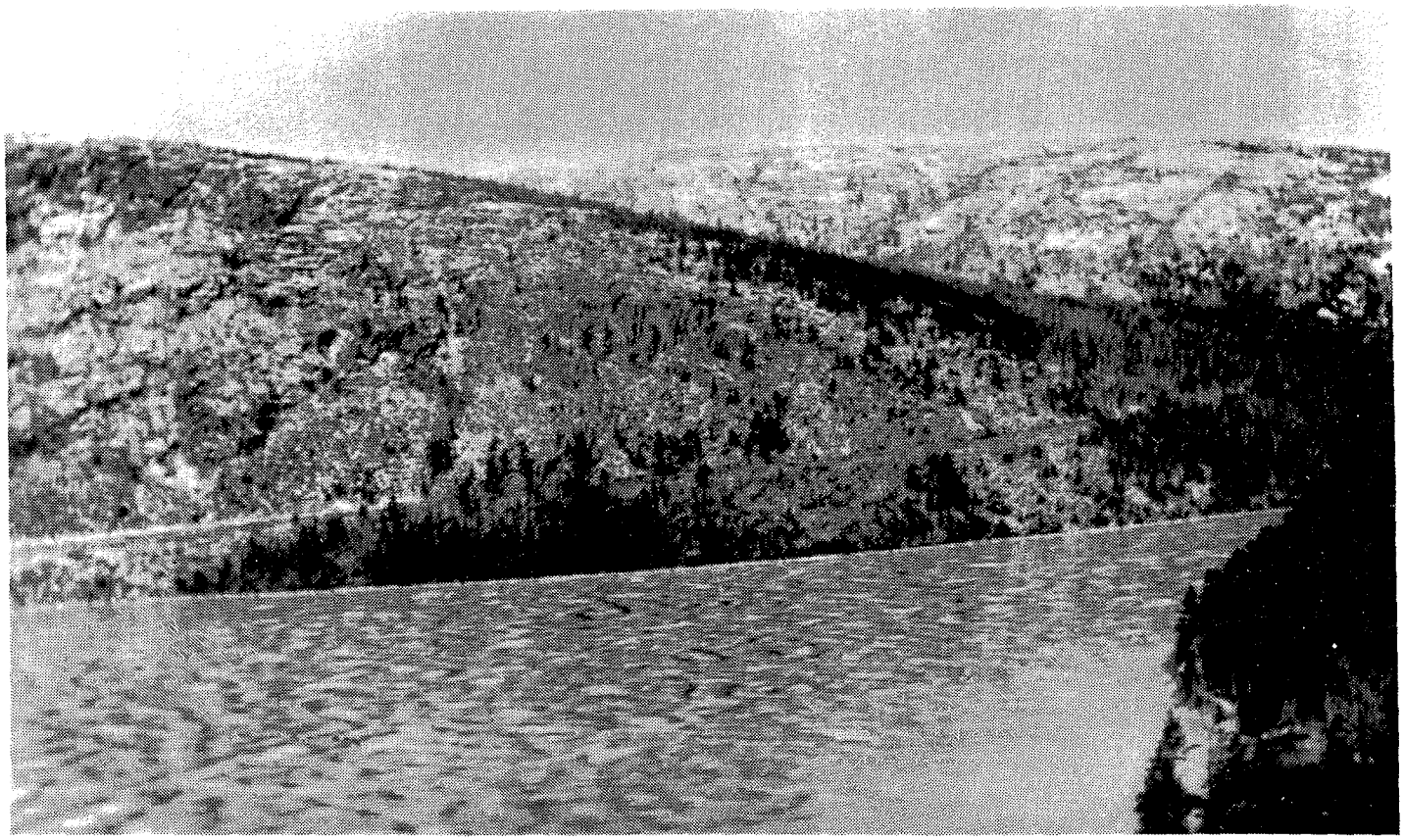


Figure XIII. Jordan-Sargent Mountain Carriage Road, ca. 1930

> Portions of the road had been graded by heavy construction equipment, and the surface, such as it was, was terribly rough. I had a jeep available, but I suggested that the going would be uncomfortable in the extreme. Mr. Rockefeller took one look at the jeep and said he certainly wanted to go and see the construction. We took several hours negotiating the roughest kind of terrain, fording streams, and barely getting through. The dust was blinding. I waited to see if Mr. Rockefeller would change his mind. He didn't. The farther we went, the more he became interested in the construction, the equipment and all the problems of road location. He would have been the last of the group to quit, I now realize.[80]

In addition to enjoying the actual construction, Rockefeller enjoyed the time he spent with his "field people." Mrs. C. A. Marinke of Bar Harbor related that Rockefeller was on a construction site visit with her father, engineer Walters G. Hill, as lunch time approached. When it became apparent to Hill that Rockefeller had not brought a lunch with him, he offered him part of his own, and introduced him to the art of toasting sandwiches over an open fire. Thereafter, Rockefeller's site visits with Hill usually included a toasted sandwich lunch.

On one such visit, Rockefeller and Hill were investigating possible sources of gravel for the carriage roads. When Hill described a gravel bank near the head of Somes Sound, owned by a particularly independent local man, Rockefeller suggested that it be purchased. Hill, knowing that the owner would not sell, told the richest man in the world, "You can't afford it." When Hill left Rockefeller's employ at the end of his major road construction work on Mount Desert, he asked Rockefeller for a letter of recommendation. Rockefeller wrote what is surely one of the most concise and compelling letters of recommendation ever composed: "Mr. Hill can do anything he says he can."[81]

The closest personal friend among all of Rockefeller's Mount Desert road-building associates, was clearly his first engineer, Charles P. Simpson. Their extensive correspondence reveals genuine and mutual respect and admiration between the two men. When Simpson died in 1928, Rockefeller wrote to his son, Paul D. Simpson:

> On returning to New York this morning I find awaiting me your telegram advising me of your father's death. Please know how deeply I sympathize with you in your great loss. No finer, more upright man ever lived. He was my warm

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[80]Tilden, 14.

[81]Irene Hill Marinke, Conversation with the author, October 16, 1988.

65 66



Figure XIV. Walters G. Hill

67 684

> friend. I deeply mourn with you his going. He leaves a spotless record and a proud heritage.[82]

Rockefeller was not given to hollow gestures in such matters. His expression of sympathy and admiration was unquestionably sincere.

Carriage Road Design

Rockefeller, in concert with his engineers, established procedures for design which remained virtually unchanged during the construction of the roads. Their general application will be discussed here.[83] Because a complete set of construction documents is available for Aunt Betty's Pond road, a discussion of its development is used as a prototype.

As noted, Rockefeller planned to make accessible to visitors the dramatic views and prominent features of the island. One such feature was Aunt Betty's Pond. The carriage road to it was not built until the early 1930s. By this time the design process had been in place for nearly 20 years, and the development of the construction documents proceeded routinely. Rockefeller decided to build the road to connect a point near the Brown Mountain Gate Lodge to the Eagle Lake road. Its route followed a lower elevation than that of the Jordan Pond-Sargent Mountain road, located nearby. After the establishment of the initial route, Paul Simpson made a reconnaissance survey (Figure XVI) which served several purposes. First, it allowed Simpson to study the lay of the land. He studied it carefully as the survey was done and noted such points as where culverts would be necessary, where rock would need to be removed, or where fill material would be available. In addition to recording this on paper, he set survey points in the field, some of which are still visible, to which he could return to set centerline during the final layout. Based on this survey, he determined the horizontal alignment and vertical profile of the road. In other words, he located the road in plan (horizontal dimensions) so that it fit the topography as necessary aesthetically with proper circular curvature, and he studied it in profile (vertical dimensions) to make certain that the grades were not too steep or too sharp for carriages. He calculated the latitudes and departures (numbers which allow for accurate location by grid coordinates) in preparation for the final layout (Figures XVII). He next plotted these coordinates and prepared plans showing the road on a topographic survey.

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[82]John D. Rockefeller, Jr., to Paul D. Simpson, personal collection of Mr. and Mrs. Charles P. Simpson.

[83]Specific design details will be discussed in the section, "Sequence of Development."

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Figure XV. Engineer Paul D. Simpson and Son

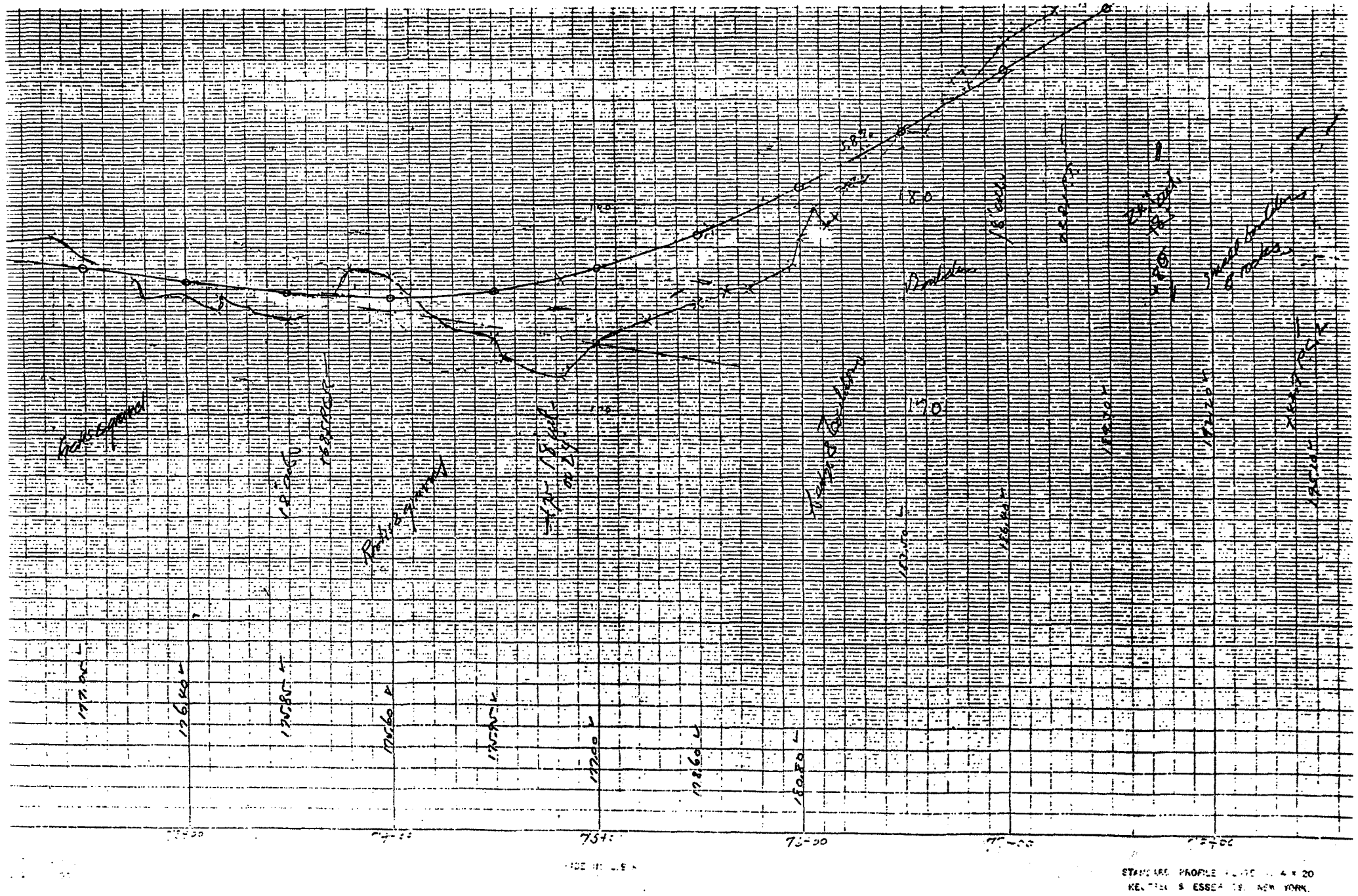


Figure XVI. Reconnaissance Survey for Aunt Betty's Pond Carriage Road

Line	Bearing	Length	Latitude		Departure		Sta.	Total from 4	
			North	South	East	West		Latitude	Departure
4-3	[illegible]	163.5		161.0	28.2		3	-161.0	28.2
3-2	[illegible]	155.8		146.5	53.1		2	-307.5	81.3
2-1	[illegible]	255.0		254.4	169.7		1	-561.9	251.0
1-0	[illegible]	93.4		93.4	34.0		0	-655.3	175.0
4-5	N45°15'E	130.1	94.0		89.9		5	+94.0	89.9
5-6	N20°19'E	105.1	99.0		34.0		6	+172.0	183.7
6-7	N60°47'E	155.8	76.1		136.0		7	+248.1	319.9
7-8	N29°01'E	462.1	404.1		224.2		8	+652.2	544.1
8-9	N9°55'E	229.3	225.9		22.9		9	+878.1	567.0
9-10	N50°31'W	193.1	168.2			69.7	10	+1046.3	497.3
10-11	N10°45'E	351.3	345.1		65.5		11	+1391.4	562.8
11-12	N38°55'W	548.8	212.5			117.4	12	+1603.9	445.4
12-13	N 8°25'E	480.3	475.1		70.3		13	2079.0	515.7
13-14	N25°21'W	289.0	264.3			116.9	14	2343.3	398.8
14-15	N 9°25'W	302.3	298.7			49.5	15	2641.5	349.3
15-16	N11°31'E	220.2	215.5		45.2		16	2857.0	349.5
16-17	N 9°17'E	490.1	483.7		79.1		17	3340.7	473.6
17-18	N 3°03'W	359.8	355.3			56.6	18	3696.0	417.0
18-19	N4°31'E	126.9	126.5		10.7		19	3822.5	427.7
19-20	N 7°51'E	429.9	423.6		73.5		20	4246.1	501.2
20-21	N2°51'E	231.6	231.4		9.5		21	4477.5	510.7
21-22	N1°23'W	342.7	342.5			10.1	22	4821.1	500.6
22-23	N35°21'E	562.9	301.7		214.0		23	5116.8	714.6
23-24	N67°55'E	377.8	142.0		350.1		24	5258.8	1064.7
24-25	N59°57'E	237.3	122.2		205.2		25	5378.9	1269.9
25-26	N30°09'E	395.4	342.9		198.6		26	5721.9	1468.5
26-27	N37°24'E	511.3	406.2		310.5		27	6176.1	1778.9
27-28	N52°44'E	206.5	126.5		163.5		28	6252.6	1938.4
28-29	S51°32'E	302.0		446	238.7		29	6208.1	2237.1
29-30	N61°48'E	309.3	146.4		273.0		30	6354.5	2509.8
30-31	S76°12'E	289.6		69.9	281.0		31	6284.6	2790.8
31-32	N58°02'E	277.6	147.0		235.5		32	6431.6	3026.3
32-33	N39°00'E	156.1	117.6		95.2		33	6549.2	3121.5
33-34	N 5°56'E	331.5	327.5		51.5		34	6876.7	3173.0
34-35	N 2°40'W	332.9	332.5			15.5	35	7209.2	3157.5
35-36	N11°54'E	175.7	172.6		33.2		36	7381.8	3190.7
36-37	N48°02'E	316.3	211.5		235.2		37	7593.3	3425.9
37-38	N25°30'E	282.9	255.3		121.8		38	7848.6	3547.7
38-39	N51°18'E	221.6	138.6		172.9		39	7987.2	3720.6
39-40	N69°26'E	245.6	86.2		229.9		40	8073.4	3950.5
40-41	S56°52'E	278.6		16.5	278.1		41	8056.6	4228.6
41-42	N50°01'E	610.2	392.1		467.5		42	8448.7	4696.1
42-43	N67°13'E	177.9	68.9		164.0		43	8517.6	4860.1
43-44	S72°05'E	217.4		70.5	205.7		44	8447.1	5065.8

Figure XVII. Aunt Betty's Pond Carriage Road
Latitude and Departure Calculations

If the work was to be executed within the boundary of the Park, the next stage of production involved communication with the National Park Service. Drawings were sent for review which included notations on the roads already built and the lengths of segments planned (Figures XVIII and XIX). Simpson then staked the planned alignment and Rockefeller "walked it" on his next trip. With the road plans thus approved, Simpson prepared construction plan and profile drawings for every segment of road. For Aunt Betty's Pond, twenty of the dozens drawn are still in existence. With the completion of the specifications, the road was ready for construction.

The design process as described remained virtually unchanged from beginning to end of the carriage road construction. It was an efficient and precise method of designing and engineering the roads. The standards for horizontal and vertical alignment and road surfacing were state-of-the art during the early years of construction; however, refinements in road design which were developed during this period (largely in automobile parkway design through the collaboration of landscape architects and engineers) were not incorporated.

The specific details of construction will be discussed in "Sequence of Development." There are two details, however, which are included here as part of the design discussion because they apply to the entire carriage road system. They are coping stones, and roadside grading and cleaning.

The coping stones functioned as guard rails. Specifications for the carriage roads described their installation. They were to be used for safety wherever necessary and placed about one foot apart, depending on the shape of the stone. They were also not to be set in a line, but at irregular angles to create a rustic appearance. Figure IX is a photograph of this type of coping at Forest Hill. The same technique was implemented on the Pocantico Hills carriage roads as well. Prior to Rockefeller's involvement in road construction on Mount Desert, the preferred guard-rail treatment had been a fence of round cedar poles (Figure XXIV on page 69).

An important element of all of Rockefeller's road-building, and one of his lasting contributions to the National Park Service, involved roadside grading and cleaning. Early road builders typically showed little concern for the roadside appearance, often leaving steep, uneven cut and fill sections adjacent to the road bed. Trees cut and damaged in the construction process were left to decay at the margins of the road. Rockefeller felt strongly that the roadsides and adjacent woodland should be groomed to a clean and manicured appearance (Figure LVI on page 169). During a trip to the west with his three oldest sons in 1924, Rockefeller visited Yellowstone National Park. There he observed road projects in which the debris of construction had been allowed to remain on the roadsides. The superintendent of the Park, Horace Albright (soon to

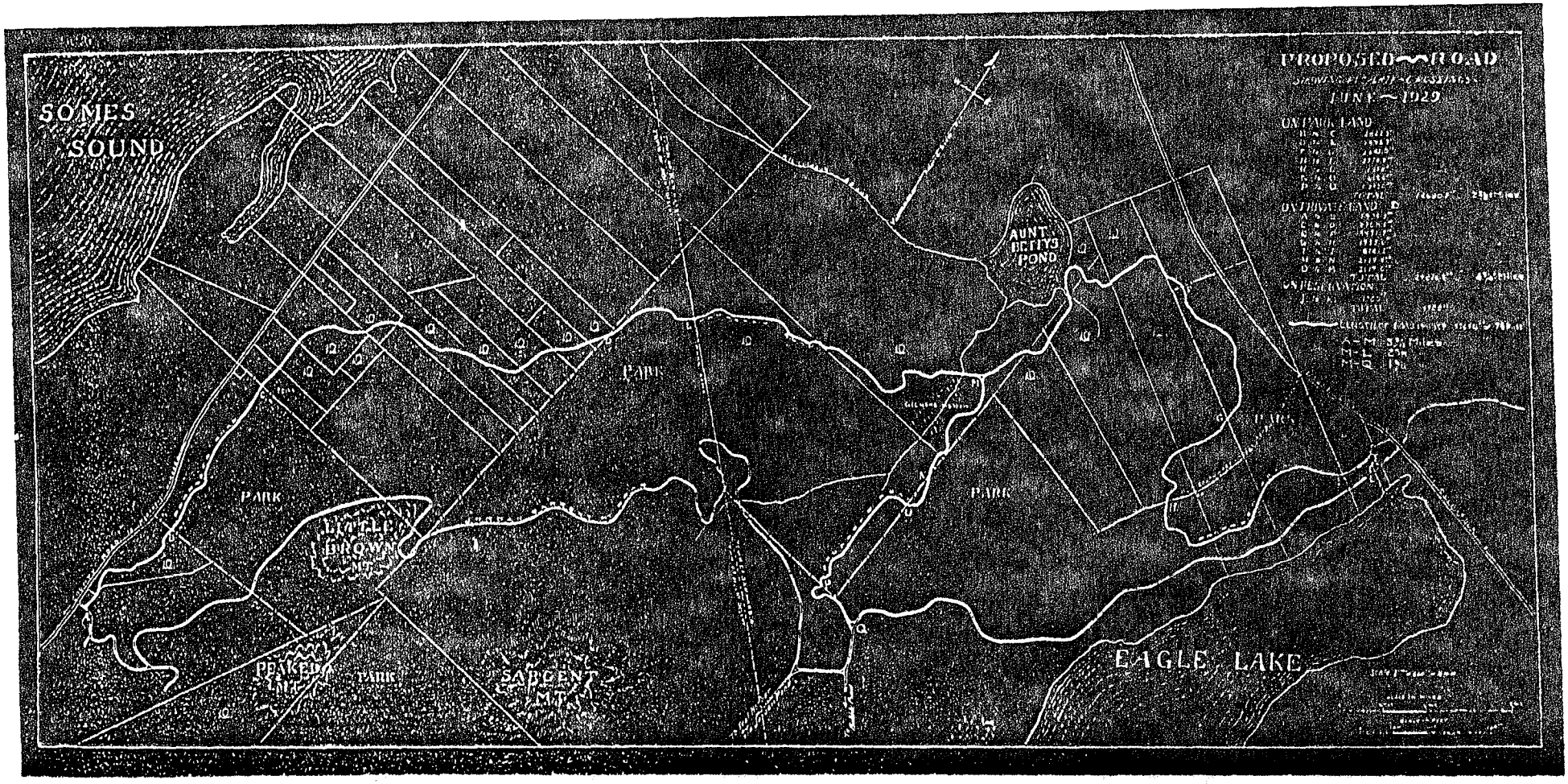


Figure XVIII. Plan for Aunt Betty's Pond Carriage Road

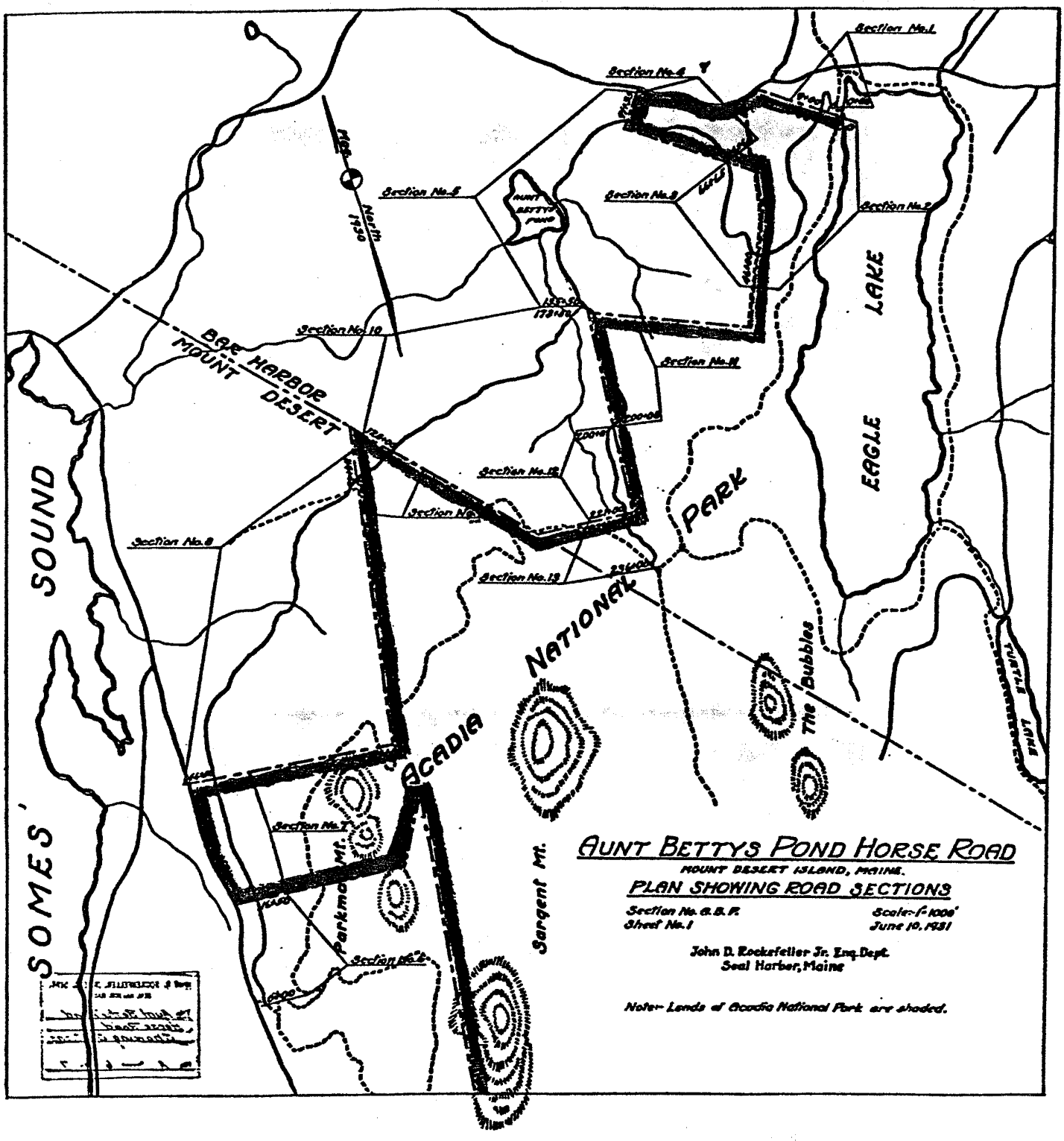


Figure XIX. Aunt Betty's Pond Carriage Road
Key to Plan and Profile Drawings

be the second director of the National Park Service), explained that the fiscal limitations of the Park Service did not allow the cleaning of the roadsides and that Congress had repeatedly denied requests for such funds.[84]

Rockefeller offered to pay for a demonstration project on several miles of Yellowstone road. Albright undertook this and accomplished the work for very close to the original estimate, which pleased Rockefeller. He wrote to Albright:

> . . . The interest which your office and your employees are taking in this road-cleaning work only goes to show that even the untrained eye likes the beautiful and the orderly better than the ugly and the untidy, when an opportunity to compare the two is given.[85]

This was consistent with Rockefeller's aesthetic judgment and his personal demeanor. Charles E. Peterson remembered Rockefeller's reputation among Acadia Park personnel during the early 1930s:

> . . . He was a very neat person. They said he had a whole team of German foresters, and that after a storm they would rush out and pick up every stick.[86]

Rockefeller spent many thousands of dollars over a period of fifty years cleaning the woodlands adjacent to his roads of fallen or decaying trees ". . . as far back as the eye can see into the woods. . . ."[87]

Another roadside management issue was the treatment of slopes in a woodland setting. When a road is built on a hillside, it is typical to create the relatively level cross-section of the road by cutting soil (or rock) away on the uphill side, and filling on the downhill side. The side slopes necessary to meet the original grade would require the removal of trees for some distance on both the uphill and downhill side of the road. This was typically avoided on the carriage roads by installing breast walls on the uphill side of the road and retaining walls on the downhill side. (The distinction between the

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[84]Fosdick, 308.

[85]John D. Rockefeller, Jr., to Horace M. Albright, November 11, 1924.

[86]Charles E. Peterson first came to the Park as a young landscape architect in the winter of 1931. His Park Service career went on to include parkway design, architectural restoration and preservation. Mr. Peterson directed the restoration of Independence Hall in Philadelphia and founded the Historic American Building Survey. Interview with the author: April 15, 1988.

[87]John D. Rockefeller, Jr., to George B. Dorr, November 19, 1919.

two is that breast walls hold the original grade of the ground where a cut has been made below; a retaining wall retains new fill material.) By the use of these walls (Figure XX), the roads could be built with a much narrower path of disturbance.

Bridge Design

The designs of the carriage road bridges reflect the prevailing philosophies of bridge design during this period. An influential text in the early 1900s was Henry G. Tyrell's *Artistic Bridge Design*. In this book, Tyrell set forth his five criteria for beautiful bridges appropriate to their settings. His first rule was that bridges should conform with their environments: "In a wild mountain gorge large spans of bold design without applied ornament are the most appropriate, while in wooded parks a rustic bridge fits better into the landscape."[88] He was such an advocate of this point of view that he recommended photographing the site and design separately but at the same scale, and then superimposing one photograph on the other to determine the appropriateness of the design for the site.

His second "standard of excellence" was the economic use of material:

> . . . Beauty exists in every structure which is designed according to the principles of economy, with the greatest simplicity, the fewest members and the most pleasing outline consistent with construction. . . . Strength and economy are the controlling motives, but art, though secondary, must not be neglected.[89]

Third, he recommended that the construction of the bridge be revealed in its appearance. In other words, girders should not be bent to form arches, and " . . . false members in trusses should be avoided or used with caution."

The fourth criterion is that to be beautiful, the primary form or outline of a bridge and its relative proportions are " . . . well and properly chosen. A spectator is more impressed by the general form than by an endless wealth of detail, and when the outline is correct, little detail ornament is needed." He adds later, however, that small bridges need finer outlines and more detail than larger ones.[90] Last, he recommends

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[88]Henry G. Tyrell, *Artistic Bridge Design: A Systematic Treatise on the Design of Modern Bridges According to Aesthetic Principles* (Chicago: The Myron C. Clark Publishing Co., 1912), 20.

[89]Tyrell, 21.

[90]Tyrell, 23.

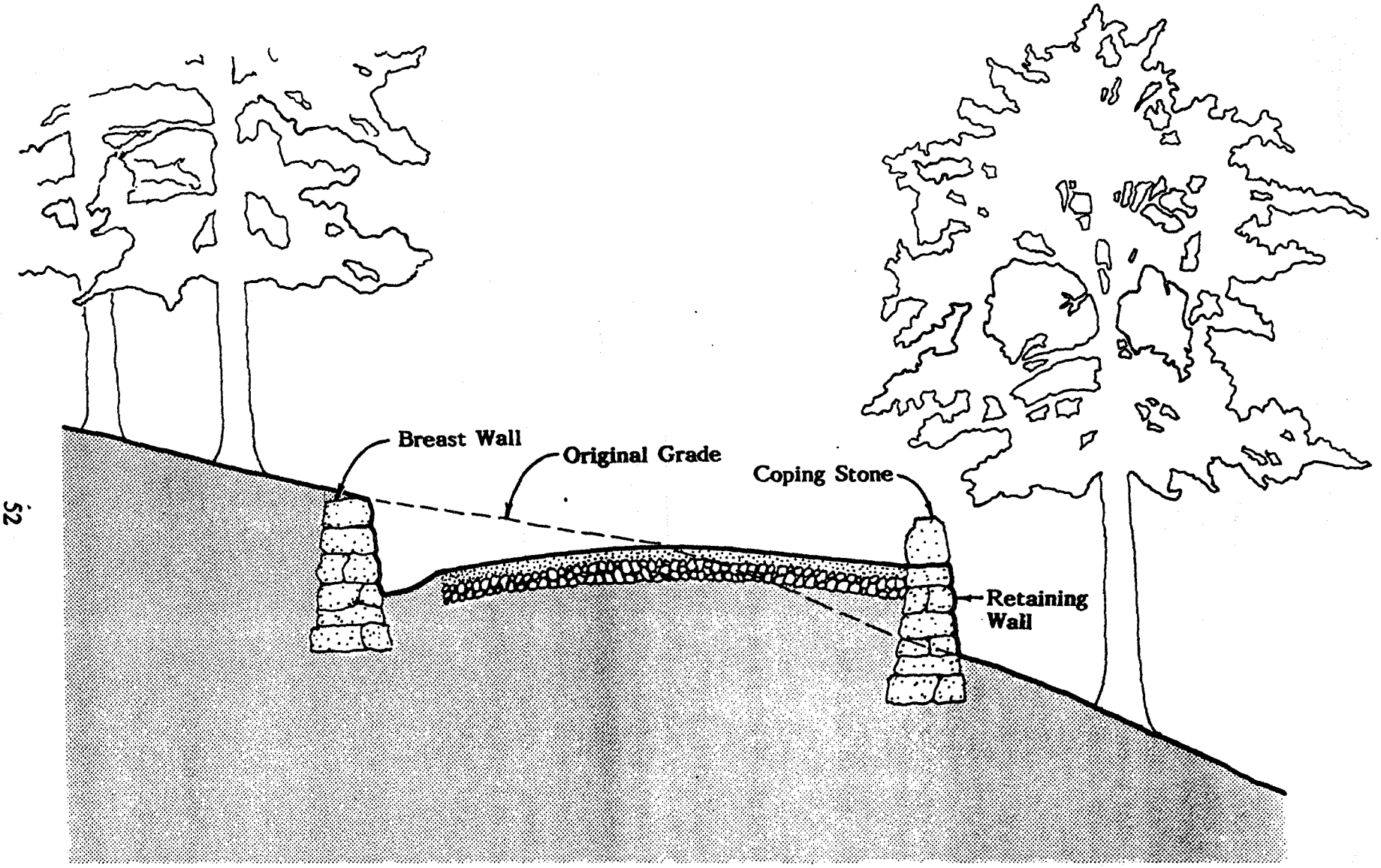


Figure XX. Typical Section at Breast and Retaining Walls

that bridges be ornamented, but not overly so, stating that " . . . superfluous decoration has a minifying effect and is sometimes ridiculous."[91]

Hubbard and Kimball elaborated on these principles, citing Tyrell as a reference thirteen years later when they wrote their textbook on landscape design. They agreed that bridges should conform to their environment and added that they should also reflect their use:

> . . . A bridge, therefore, should be in scale both with the road or path which it carries and with the water, or possibly a ravine or another road, which it crosses. . . . A very elaborate triumphal bridge carrying an unimportant footpath is likely to appear as absurd as a great stone arch carrying a highway over an insignificant rivulet.[92]

They also agreed that, despite the strength of the concrete and steel construction, the forms of bridges, " . . . should not only be actually sufficient for structural stability, but should appear to be so. . . . A proportion should be preserved between the apparent strength of the parts and the work which they are doing."[93]

Eleven years later, in 1938, a Park Service publication reflects the evolution of these principles as they were applied to national parks. The author, Albert Good, reiterated that overemphasizing a bridge's structural elements was important in maintaining a good scale relationship with the surroundings, particularly in the " . . . more or less rugged landscapes widely prevailing in park areas."[94]

The materials of choice for bridges in national parks were not concrete or steel, which were seen as more appropriate in urban settings, but stone and wood. It was important, too, that the stone or wood be native to the area:

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[91]Tyrell, 23.

[92]Hubbard and Kimball, 216.

[93]Hubbard and Kimball, 217.

[94]Albert H. Good, *Park and Recreation Structures* (United States Department of the Interior, National Park Service, 1938) 175.

88

> . . . it is particularly important to stone bridges, which in their most happily successful expressions seem almost to spring from the stream or river bank when truly related in color, texture, and scale to adjacent rock outcrops.[95]

Even the style of stone masonry construction selected for bridges was to reflect the area's natural formations. Good recommended avoiding "slickness" of masonry, stating "Rugged and informal simplicity in use is the indisputable specification for their proper enjoyment." Nevertheless, he didn't recommend complete abandon in stone masonry construction:

> . . . Shapeless stones laid up in the manner of mosaic are abhorrent in the extreme, having no precedent in Nature or in the traditions of sound masonry. In bridges particularly is there merit in pronounced horizontal coursing, breaking of vertical joints, variety of size in stones--all the principles of sound construction and pleasing appearance in any use of masonry.[96]

Since most national parks comprise hundreds of acres with numerous opportunities for bridge construction, the Park Service guidelines contain a new twist:

> . . . The ranges of use, span, and height, and the broad fields of materials, arch and truss forms, local practices (to name a few variety-making possibilities) promise endless combinations and cross combinations making for much individuality among bridges.[97]

Variety in bridge design, within reason, became a goal in national park bridge design.

Although Rockefeller had already built eight of the carriage road system's 17 bridges when Hubbard and Kimball's book was published and had finished building bridges when the Park Service's guidelines were complete, many of these principles are reflected in the bridges as they were designed and built. For example, all of the bridges are built with native stone and most in the pattern of stone masonry style described by Good. Many also spring from the bedrock around them, even at times incorporating the rock into the abutment walls. In addition, all but one are constructed of concrete and steel and faced with stone. As Good recommended, they are ". . . functionally adequate with the exact knowledge of the engineer . . . " while also

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[95]Good, 175.

[96]Good, 176.

[97]Good, 175.

looking structurally stable to the " . . . inexact instincts of the layman."[98,99] One of the bridges, the Bubble Pond, inspired a debate between Rockefeller and Park Service officials about the style of bridges in national parks. This debate preceded by ten years the guidelines just discussed but clearly illustrates early discussion about the rustic nature of bridges in national parks and the need for a variety of bridges within each park.

What was the process by which Rockefeller developed the designs for these bridges? In conjunction with his engineer-on-site, he first determined where bridges would be necessary or desirable along the roads. Once that determination was made, the engineer prepared a topographic survey and forwarded it to the architect working on the bridge. Rockefeller then worked with his architect to set the style and details of the bridge construction. The architect followed through with plans and specifications which included the necessary structural engineering. With plans in hand, the engineer laid out the bridge and supervised the construction. The architect also made periodic inspections of the work as it was underway, as did Rockefeller.

The Gate Lodges

Historically the gate lodge served two purposes. First, located at entrances to estates, it functioned to welcome visitors to the grounds or "park". In the eighteenth century, the idea of the outdoors as threatening gave way to a more romantic view of nature. This led to a shift from small, formal gardens nestled closed to the house to a park of larger proportions and informal naturalistic beauty surrounding the house. As this view developed, landscape design extended into the whole park area beyond the country house. "Taking on" the park became a necessary part of a visitors stay at the house, thus entrances and gate lodges were placed at remote ends of the park so that approaching guests could take in the views. Second, the gate lodge served as working class housing for the gate keeper and his family. It was a pretentious building with a humble function. In other words, it housed a working class family in a structure that also served as a symbol of the owner's wealth, power, and taste.

Just as park design reflected the English landscape or natural style of landscape gardening popular for country estates, the gate lodge was adapted to serve as park entrances. The Brown Mountain and Jordan Pond gate lodges are 1930s examples of

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[98]Good, 175.

[99]Where the undersides of these bridges were visible to carriage passengers, the concrete barrels were faced with stone.

gate lodge architecture, built during the declining years of the "golden age" of the gate lodge when it functioned as an independent, ornamental structure. By the 1940s, even the construction of these ornamental gate lodges was very rare. Like their estate counterparts, the Brown Mountain and Jordan Pond gate lodges served the dual purposes of providing entrances to the carriage roads while also providing housing for the gatekeepers.

When Rockefeller began thinking about a style of architecture for Acadia National Park, he funded Grosvenor Atterbury's tour of the western parks to find an appropriate building type. Since Acadia was still the only national park east of the Mississippi, the western parks (e.g., Yellowstone, Yosemite, etc.) were their only source of models. Atterbury, who eventually designed both of Acadia's gate lodges, set down his findings in a report which includes valuable information about the early history of these western parks and also a clear statement of principles regarding architectural styles appropriate in a park setting. He subscribed to the view that man's intervention should not intrude on the experience of nature:

> However you derive it theoretically and stylistically, any Architecture in our National Parks is bound to be, in fact, the physical point of contact, comparison and contrast between the latest handiwork of human civilization and the oldest untouched monuments of Nature. The handiwork of man in the face of the work of God.[100]

He encountered on his journey several architectural characteristics which he included in the design of both gate lodges. He recommended, for instance, the use of high-pitched roofs because they are picturesque and because they function to keep snow off the roofs. He also advocated that the color of the buildings harmonize, not contrast, with their surroundings:

> In the case of a single building placed in such an environment as this, where the prime requisite is that it harmonize and fit in with its surroundings, color is probably even more important than design. Its power of camouflage is almost as great in buildings as in the case of animals.[101]

He promoted, too, the use of shutters:

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[100]Grosvenor Atterbury, *Notes on the Architectural and Other Esthetic Problems Involved in the Development of Our Great National Parks* (1929), 1.

[101]Atterbury, 12.

> One thing that makes all the Park buildings unlivable in appearance is the absence of shutters or blinds--enhanced too frequently by window trim in startling contrast to the walls and roofs--giving them the hard quality of parrots' eyes.[102]

He concluded his report by citing four ways to handle the problem of inappropriate architecture in national parks:

- First, by avoidance, where the structures are kept so small that they need not involve any question of architectural style. While this is begging the question, it is better than a poor solution along definite and conventional lines.

- Second, and somewhat similarly, by keeping the buildings entirely outside the picture, placing them where the surroundings and background permit of normal treatment as to size and style: where there is no direct comparison or competition with the scenic marvels that have justified the establishment of the Park area. (He points to Yosemite's architecture as a good example of this technique.)

- Third, by going back to ancient local traditions, where such exist--as, for example, in Mesa Verde and other places in the Pueblo region--and developing a style from these historic precedents that will also satisfy the modern practical requirements.

- Fourth, in cases where no such local precedents exist, by adopting and acclimatizing some foreign style that has been produced under similar climatic and scenic conditions and which can be properly expressed in local materials.[103]

Upon returning from this tour, and before he began study drawings for Acadia's buildings, Atterbury travelled to Mount Desert Island. He later wrote Rockefeller:

> . . . Although I thought I knew Mount Desert Island pretty well, I was astonished at the great beauty and variety that your work in the parks has brought out and made available for every one to rejoice in. It is absolutely sui generis

[102]Atterbury, 13.

[103]Atterbury, 51.

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and is not comparable in any way with the other National Parks but, of its kind, equally beautiful.[104]

In this spirit and after discussions with Atterbury and with Albright and Cammerer of the Park Service, Rockefeller decided to build both gate lodges in a revival style inspired by the architecture of the French Romanesque period, particularly the local style found in the Le Puis district of France. Rockefeller and Atterbury chose this style for its picturesque quality and to be in keeping with the French heritage of the area. George Dorr found it particularly appropriate because it was the region from which Sieur de Monts (who commissioned Champlain's voyage which discovered *l'Isle des Monts-deserts*) had come. Charles E. Peterson, in a 1931 memorandum to the Director of the National Park Service, cites that Atterbury ". . . felt that a very good type of architecture for use in Acadia Park would be this French type which originated in the Romanesque period and which is found in picturesque abundance in certain parts of France" and also " . . . that the French tradition seemed particularly fitting to be carried out in this area because of its early French Colonial association."[105]

The design process for the lodges was much the same as that for the bridges. Rockefeller worked with Atterbury to develop the design and with Paul Simpson to establish the location. Simpson then prepared topographic surveys and mapped utility locations for Atterbury. Throughout the design and construction, the two worked closely on modifications related to the utilities. Simpson supervised the construction, and Atterbury made periodic inspections.

Beatrix Farrand/Planting Design

In planning the carriage roads and vistas along them on Mount Desert Island, Rockefeller skillfully applied his inherited interest in framing favorable views. Rockefeller and the Simpsons carefully studied the topography and vegetation and aligned the roads to provide important distant views, views of the Island's features which the roads were meant to connect, and views of structures such as the bridges which they were in the process of building. It was Beatrix Farrand, however, who refined their vision as she travelled again and again over the carriage roads making notes on planting recommendations.

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[104]Grosvenor Atterbury to John D. Rockefeller, Jr., May 15, 1930.

[105]Charles E. Peterson to Horace Albright, October 17, 1931, 4.

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Figure XXI. Beatrix Farrand

The niece of Edith Wharton and the wife of educator Max Farrand, Beatrix Farrand was a longtime resident of Mount Desert Island, her estate "Reef Point" being located in Bar Harbor. When she worked as a consultant for the carriage roads, she was already a well-established and respected professional landscape architect. She began working with the Rockefellers, primarily Mrs. Rockefeller, on their gardens at The Eyrie. From that association grew a working relationship with Rockefeller which generated correspondence spanning a period of 13 years (1928-1941). Throughout that time, he sought her advice regarding planting, vista clearing, grading, and drainage along the whole length of the carriage road system; the construction of the bridges; and the grading and planting design for both the gate lodges. For this work she refused to charge a fee until Mr. Rockefeller pressed her in 1934 to accept a modest payment to at least defray her expenses. That he was grateful for her help is evident in his letters to her. A typical one included:

> I have driven and ridden a number of times since reaching Seal Harbor. This is just a note to tell you how pleased I am with the planting in so far as I have seen it. You cannot know what a relief it is to me to have you giving attention to these matters for it had become quite a burden to me to try to keep up with them on all the roads. Then, too, what you do is so much better done than anything I could do. Please accept this renewed assurance of my deep gratitude to you for the very real service you are rendering to the National Park and also to me.[106]

It was from 1928 through 1935 that she worked most intensely on the carriage roads. She would travel with Charles Miller (the Rockefellers' nurseryman) over the roads, discussing plans with him and making notes on her recommendations. These notes, which were transcribed and delivered to Rockefeller for his review and approval, are valuable in two major respects. First, they describe in detail her planting design, particularly important because most of this planting was destroyed in the 1947 fire. Second, they include information about views, drainage patterns, the grading of the banks along the road--really, anything that struck her fancy. For example, her notes of November 4, 1930[107], include a reference to the fact that the area north of Eagle Lake cannot be planted with trees because it is a winter landing place for airplanes; and, in November of 1934[108] she noted that, "Five deer were noticed in the course of the drive."

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[106]John D. Rockefeller, Jr., to Beatrix Farrand, July 21, 1931.

[107]Beatrix Farrand to John D. Rockefeller, Jr., November 4, 1930.

[108]Beatrix Farrand to John D. Rockefeller, Jr., November 11, 1934.

Though her correspondence with Rockefeller continued until 1941, she wrote in a letter dated April, 1935,[109] that she was returning her "work car" sign and her keys to the gate--an indication that she considered her work substantially completed. An example of her detailed recommendations is included in the appendix;[110] what follows is a discussion of her approach.

She used plants along the carriage roads in five different ways:

1) to enhance and frame distant views of the mountains or sea, and near views of the bridges or features such as the Witch Hole or Gilmore Meadow;

2) to enhance the roadsides and the experience of travelling the carriage roads;

3) to screen objectionable views such as quarry sites or adjacent motor roads;

4) to reforest denuded slopes or scars made by road construction, or block access to old roadways;

5) to create natural plant associations appropriate to their landscape setting.

Mrs. Farrand's planting recommendations were carefully designed to develop the sequence of views planned for those travelling the roads. In her work to enhance distant views, she was primarily interested in removing vegetation which was currently or could eventually be an obstruction. For example, on one excursion with Miller in 1934 she noted ". . . a good many places where a very small amount of cutting would keep open certain vistas created one or two years ago." She was particularly concerned about the "admirably cut vistas" looking over Frenchman's Bay from Paradise Hill and recommended that they not be impeded by any high planting. Specifically, she noted that poplar sprouts needed to be removed from the southeast bay view as seen from Paradise Hill; oaks and birches (with the exception of a good young oak) should be taken out of the northeast view from Paradise Hill; and she advocated the removal of

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[109]Beatrix Farrand to John D. Rockefeller, Jr., April 15, 1935.

[110]Copies of Mrs. Farrand's "Road Notes" are housed in the Rockefeller Archive Center. As a supplement to this report, they have also been put on file in the library at Acadia National Park.

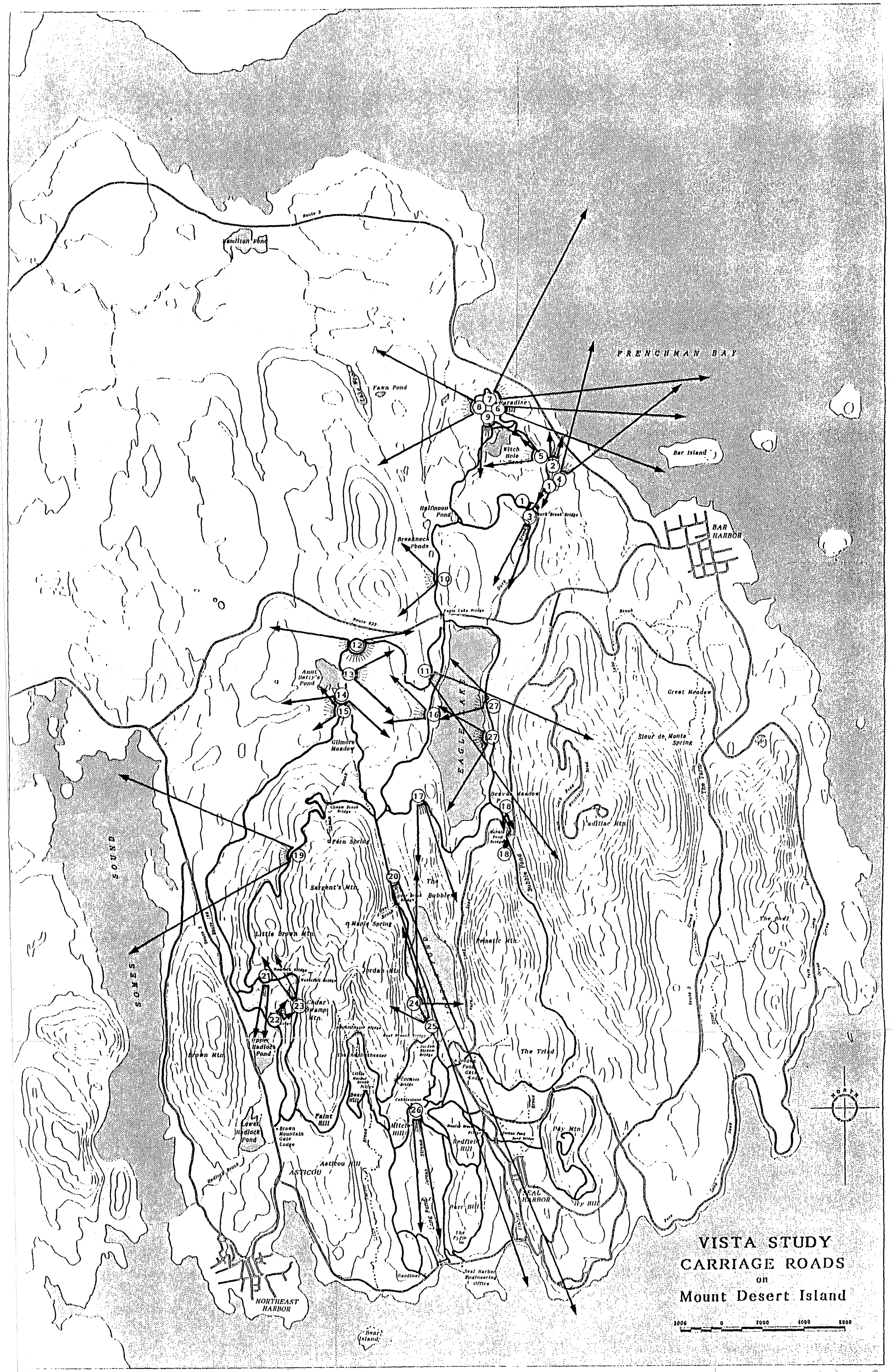

FRENCHMAN BAY
Route 3
Hamilton Pond
Fawn Pond
Paradise Hill
Witch Hole Pond
Bar Island
BAR HARBOR
Hadlock Pond
Duck Brook Bridge
Duck Brook
Breakneck Ponds
Eagle Lake Bridge
Route 233
Brook
Great Meadow
Aunt Betty's Pond
Gilmore Meadow
EAGLE LAKE
Sieur de Monts Spring
Beaver Dam Meadow
Cadillac Mtn.
Chasm Brook Bridge
Fern Spring
Sargent's Mtn.
Maple Spring
Little Brown Mtn.
Penobscot Mtn.
Jordan Mtn.
Cedar Swamp Mtn.
Upper Hadlock Pond
Brown Mtn.
The Triad
Jordan Pond Gate Lodge
Cobblestone Bridge
Little Harbor Brook Bridge
Beech Hill
Paint Hill
Mitchell Hill
Redfield Hill
Day Mtn.
Lower Hadlock Pond
Brown Mountain Gate Lodge
Asticou Hill
ASTICOU
SEAL HARBOR
Parr Hill
Ivy Hill
The Firth
Gardiner
Seal Harbor Engineering Office
NORTHEAST HARBOR
Bear Island
SOMES SOUND
NORTH
1000 0 2000 4000 6000
VISTA STUDY
CARRIAGE ROADS
on
Mount Desert Island

Figure XXII

KEY TO VISTA STUDY

1 **Farrand's Road Notes, November 4, 1930**
View of the triple arches of Duck Brook Bridge from the approach roads.

2 **Farrand's Road Notes, November 4, 1930**
View down Duck Brook Stream.

3 **From Rockefeller to Farrand, November 11, 1934**
Marsh view.

4 **From Rockefeller to Farrand, November 11, 1934**
Vista looking northeast over Frenchman Bay.

5 **From Rockefeller to Farrand, November 11, 1934**
Witch Hole Pond as seen from the road as one approaches it from the southeast.

6 **From Rockefeller to Farrand, November 11, 1934**
Southeast view of the bay from Paradise Hill.

7 **From Rockefeller to Farrand, November 11, 1934**
Northeast view of the bay from Paradise Hill.

8 **From Rockefeller to Farrand, November 11, 1934**
Paradise Hill vistas as seen from the west side of the loop.

9 **From Rockefeller to Farrand, November 11, 1934**
Views of Witch Hole Pond preserved through cutting.

10 **Farrand's Road Notes, October 19, 1931**
View of mountains, south of Breakneck Ponds.

11 **Farrand's Road Notes, October 5, 1931**
Vistas along the upper road toward the mountain.

12 **From Rockefeller to Farrand, November 11, 1934**
From the hilltop looking south to the mountains.
Eastern vista enhanced through cutting.
Small trees removed from west vista.

13 **From Rockefeller to Farrand, November 11, 1934**
View looking out over the marsh.

14 **From Rockefeller to Farrand, November 11, 1934**
Vistas at south end of Aunt Betty's Pond.

15 **Farrand's Road Notes, October 5, 1931**
View of old swamp south of Aunt Betty's Pond.

16 **From Rockefeller to Farrand, November 11, 1934**
View of the marsh.

17 **Farrand's Road Notes, July 31, 1931**
Vista of the Bubbles between the west Eagle Lake Road and the Lake.

18 **Farrand's Road Notes, August 23, 1931**
Vistas of the Bubble Pond Bridge.

19 **From Rockefeller to Farrand, November 11, 1934**
Views from Sargent Drive out over Somes Sound.

20 **From Rockefeller to Clement, May 6, 1926**
View of Jordan Pond and the ocean.

21 **From Rockefeller to Farrand, November 11, 1934**
Occasional openings from the Southwest side of Little Brown Mountain towards Hadlock Pond.

22 **Farrand's Road Notes, July 31, 1931**
Open view of ledges north of bridge.

23 **Farrand's Road Notes, July 31, 1931**
Southeast side of Little Brown Mountain as seen from the east.

24 ***The Boston Sunday Globe*, June 2, 1929**
View across Jordan Pond of The Bubbles.

25 **Farrand's Road Notes, April/May, 1931**
View of the shrub plants on the west bank of Jordan Pond.

26 **Farrand's Road Notes, April/May, 1931**
View of north end of Long Pond as seen from the road.

27 **From Rockefeller to Cammerer, December 15, 1927**
View of Eagle Lake.

birch sprouts around the north loop and sprouts obstructing the vistas as seen from the west side of the loop.[111]

In addition to removing obstructions, she took care to plan the foreground of her views, much as Atterbury described in his report on his Western trip. Her notes also include this recommendation: "As a good foreground to the bay view, use heavy groups of wild roses and Diervilla and Sweet Fern. These will never grow high enough to interfere with the prospect but will make an attractive and clean foreground."[112]

Standards of design for the period emphatically advocated providing appropriate settings for a bridge in the landscape. An important rule was to make the bridge more striking than its surroundings, drawing the traveller's attention. That Mrs. Farrand tried to build on that principle is evident from this recommendation: "Add one or two pines to the north end of Duck Brook bridge (Figure XXIII) and a mass of Viburnum cassanoides. Plant trees on each side of bridge abutments leaving a view of the arches free. Perhaps later on Diervilla, wild roses and Sweet Fern may replace the untidy grass patches."[113]

As well as providing views of the new bridges, the sequence included views to the Island's natural features. Mrs. Farrand took care to ensure that nothing of interest would escape the attention of those enjoying a ride in a carriage. On another outing, she determined that sprouts were obscuring the first view of Witch Hole pond as seen from the road on the approach from the southeast and therefore recommended their removal. She added that much cutting needed to be done on the northeast side of Witch Hole to preserve some pond views. A little farther down the road, she noted that sprouts needed to be removed to open up views of the marsh in at least two places.[114]

Where the views were limited and there was no bridge or natural feature to attract attention, Mrs. Farrand used plants to create interest. For example, she notes on November 4, 1930:

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[111]Beatrix Farrand to John D. Rockefeller, Jr., November 4, 1930.

[112]Ibid.

[113]Ibid.

[114]Beatrix Farrand to John D. Rockefeller, Jr., November 11, 1934.



Figure XXIII. View of Duck Brook Bridge showing Beatrix Farrand's Planting Design

> Instead of keeping the edges of the roads fairly evenly planted with continuous lines of trees, keep occasional spots open in which clumps of shrubs may be set out. This suggestion is made in order to try to vary the road planting in height and quality and type of material . . .[115]

Her notes also include reference to planting done by Miller which was purely ornamental in nature. He planted white boneset in meadows, blue pickerel weed in ponds, scarlet lobelia on pond edges, and white elders at the forest edge. She records:

> It was thought that these, with Witchhazel, would make a fine display and would be likely to thrive in this soil and exposures and that the Witchhazels with their late autumn blossoms would be an attractive feature.[116]

The necessity of screening, particularly of quarry sites and adjacent roadways, also played an important role in the planting design. Similarly, old roads and construction roads needed to be closed by planting, and areas denuded by construction needed to be reforested. Mrs. Farrand spoke of this as "healing with plants", and in general recommended that ". . . the more thickly the old roads and scars of roads are planted . . . the better the effect will be."[117] A landscape architect visiting the Park in 1926 approved of her recommendations as implemented by Mr. Miller. He wrote, " . . . The work of reforesting the scarred slopes is being carried out under Mr. Miller's guidance, and it is not difficult to see that only a short time will be required to remove such scars as have resulted from the construction work."[118]

In all of her planting work, including plans for the gate lodges, Mrs. Farrand worked with primarily native plants. Although she did use some exotic species, she consistently worked to develop natural plant associations. In other words, she planted shrubs in masses or clumps if that was the way they naturally grew, and she planted them in environments (e.g., wet areas, banks, etc.) where they would thrive. She was fortunate in her work on Mount Desert Island to have a large selection of plants from which to choose. Despite its northern location, its situation off the coast puts the island in a climate zone similar to that of southern Pennsylvania.

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[115]Beatrix Farrand to John D. Rockefeller, Jr., November 4, 1930.

[116]Beatrix Farrand to John D. Rockefeller, Jr., April, 1931.

[117]Beatrix Farrand to John D. Rockefeller, Jr., November 4, 1930.

[118]Daniel Hull to Arno B. Cammerer, December 3, 1926.

SEQUENCE OF DEVELOPMENT

Part I -- The Inception

In 1910 John D. Rockefeller, Jr. and his wife, Abby Aldrich Rockefeller, bought a house and fifteen acres of property just west of Seal Harbor, Maine, on a lovely knoll overlooking the ocean. For two years previously, they had rented a cottage in Seal Harbor. Then they purchased the property of Professor Samuel F. Clarke, who had built a large rambling house known as "The Eyrie" ten years earlier.[119] The construction of the carriage road system, which they greatly expanded over the ensuing years, began around this estate. The first roads were very similar to the kind of estate drives which Rockefeller and his father had built at Forest Hill and at Pocantico.

Of course, these were not the first scenic driving roads on Mount Desert Island. Sea Cliff Drive (Cooksey Drive) had been built in 1892,[120] and Sargent Drive, on Somes Sound shortly thereafter. Both of these roads were designed by James T. Gardiner who was an engineer, a summer resident, and the son-in-law of Bishop Doane, one of the pioneers of the summer colony in Northeast Harbor.[121] Figure XXIV illustrates that both of these roads had much the same character as the current carriage roads, although both have since been paved for automobile use.[122] "The Arch" on the Sea Cliff Drive (Figure XXV) predated by more than twenty years the first of the Rockefeller stone bridges. The influence of the Sea Cliff Drive (later called the Cooksey Drive for George B. Cooksey, who had it built and through whose lands it passed) was described in 1930 by William W. Vaughan:

> This road was a revelation to the dwellers on the Island, for up till this time the roads had been built in the usual country fashion, up hill and down, as the general course might run, and "repaired" by annual scrapings of the dirt from

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[119]George L. Stebbins, *Random notes on the early history and development as a summer resort of Mount Desert Island and particularly Seal Harbor*, August 1938, Seal Harbor Library Collection, 8.

[120]George E. Street, *Mount Desert: A History*, (New York: Houghton Mifflin), 1926.

[121]William W. Vaughan, *Northeast Harbor Reminiscences*, (Hallowell, Maine: White & Horne Company, 1930), 40.

[122]Rockefeller acquired the right-of-way along the shore of the Cooksey property in 1912 for a price of $185.00. Eyrie Construction Accounts.

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Figure XXIV. Sea Cliff Drive ca. 1900



Figure XXV. The Arch on Sea Cliff (Cooksey) Drive

> the gutters into the middle. But people were quick to learn, and every road built since has profited by this lesson.[123]

The first element of what we today consider the carriage road system was a section constructed around the east side of Barr Hill. A memorandum from Robert W. Gumbel[124] to Rockefeller indicates that this road was contracted for construction with Messrs. A. E. Clement and C. D. Joy in 1913. The road was built for a flat price , including 25 culverts. Extra culverts were charged at the rate of: ". . . [s]tone $1 per foot; metal, 8" 70¢ and 10" 85¢ per foot." The memo goes on the say that ". . . [y]ou also reimbursed these gentlemen for loss on construction which they suffered."[125] The total cost for this road was $14,321.40[126] (equivalent to $176,440.00 in 1988[127]). An extension was added to the Barr Hill Road by Mr. Clement at a cost of an additional $10,000.00.[128] Alanson E. Clement and Chauncey D. Joy, who continued to build roads and bridges for Rockefeller for years on his private land, on Reservation land, and in the Park, were both experienced road builders when Rockefeller engaged them.[129] The 1900 census lists the occupation of both Clement and Joy as "road builder" ten years before Rockefeller purchased "The Eyrie".[130] Because of this fact,

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[123]Ibid.

[124]Robert W. Gumbel and Charles O. Heydt were the two Rockefeller staff members most involved with the carriage roads. Gumbel was the staff property manager and Heydt was Rockefeller's personal secretary who graduated to become the office real estate expert. (Harr and Johnson, 159).

[125]Memorandum: RWG to MR R JR, August 8, 1921.

[126]Charles O. Heydt to John D. Rockefeller, Jr., July 31, 1919.

[127]Bureau of Labor Statistics, Appendix XI.

[128]Ibid.

[129]Road-building at the turn of the century was accomplished by horse power. Both Clement and Joy were involved with horse transportation prior to entering the road-building business. Clement ran a boarding stable. Joy was a carriage driver. The *Mount Desert Herald* reported that a highway robbery occurred on Green Mountain Road: ". . . a carriage driven by Chauncy [sic] Joy, and hired by John and Isaac How of Boston, was held up. The robber took all the men's money, plus their expensive watches, which he called 'keepers,' but refused to take anything from the three ladies who were guests of the Hows." (Lyda B. Carter, *Early History of Seal Harbor*, January 1959, 12.)

[130]*Twelfth Census of the United States, June 1900*, (Maine State Archives), Vol. 9, ED 46, Sheet 3, Line 44, and Sheet 6, Line 34.

and because Alanson Clement was a close friend of George B. Cooksey and had been an associate of James T. Gardiner, it is probable that Clement and Joy had constructed the Sea Cliff (Cooksey) Drive and Sargent Drive.[131]

Clement was a Charter Member of the Seal Harbor Village Improvement Society and served on its Road and Path Committee from 1900 until 1921. Rockefeller served on this same committee from 1917 until after 1929.[132] Clement, like many of the other contractors who worked for Rockefeller during the early years of his involvement with Mount Desert, was a neighbor. Figure XXVI shows that A. E. Clement's property was adjacent to The Eyrie. The Green Valley Farm, on the east side of Long Pond and also adjacent to the original Rockefeller purchase, was bought by Rockefeller from Clement's wife, Vesta. Clement continued to rent this farm from Rockefeller for many years.

The years between 1913 and 1919 were active ones in the development of The Eyrie grounds and in expanding the driving roads. Before automobiles were allowed on in the Town of Mount Desert, no distinction was necessary between horse and automobile roads. After 1915, when automobiles were admitted to all parts of the island, designations for drives constructed by Rockefeller were usually of "bridle paths" or "saddle paths" (broken-stone roads, 10' to 12' wide); "horse roads," "driving roads" or "carriage roads" (typically 16' wide broken-stone roads); and "motor roads." Sometimes the bridle paths and carriage roads were lumped together under the term "road-trails". For consistency, we will refer to the three as "bridle paths," "carriage roads," and "motor roads." As will be shown, the distinction between carriage roads and bridle paths was an important one.

By 1915, Rockefeller had conceived of a plan of carriage roads and bridle paths which was far more extensive and public than anything undertaken at Forest Hill or Pocantico Hills. He planned the beginnings of a road system which would be built, not only on private land, but also on land owned by the Hancock County Trustees of Public Reservations, who intended to deed the land to the Federal Government. A resolution was passed on September 4, 1915, which read:

> At a meeting of the Executive Committee of the Hancock County Trustees of Public Reservations, held this day, the following action was taken:

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[131]Stebbins, page 6.

[132]*Annual Reports: Seal Harbor Village Improvement Society* (1901-29), Seal Harbor Library Collection.

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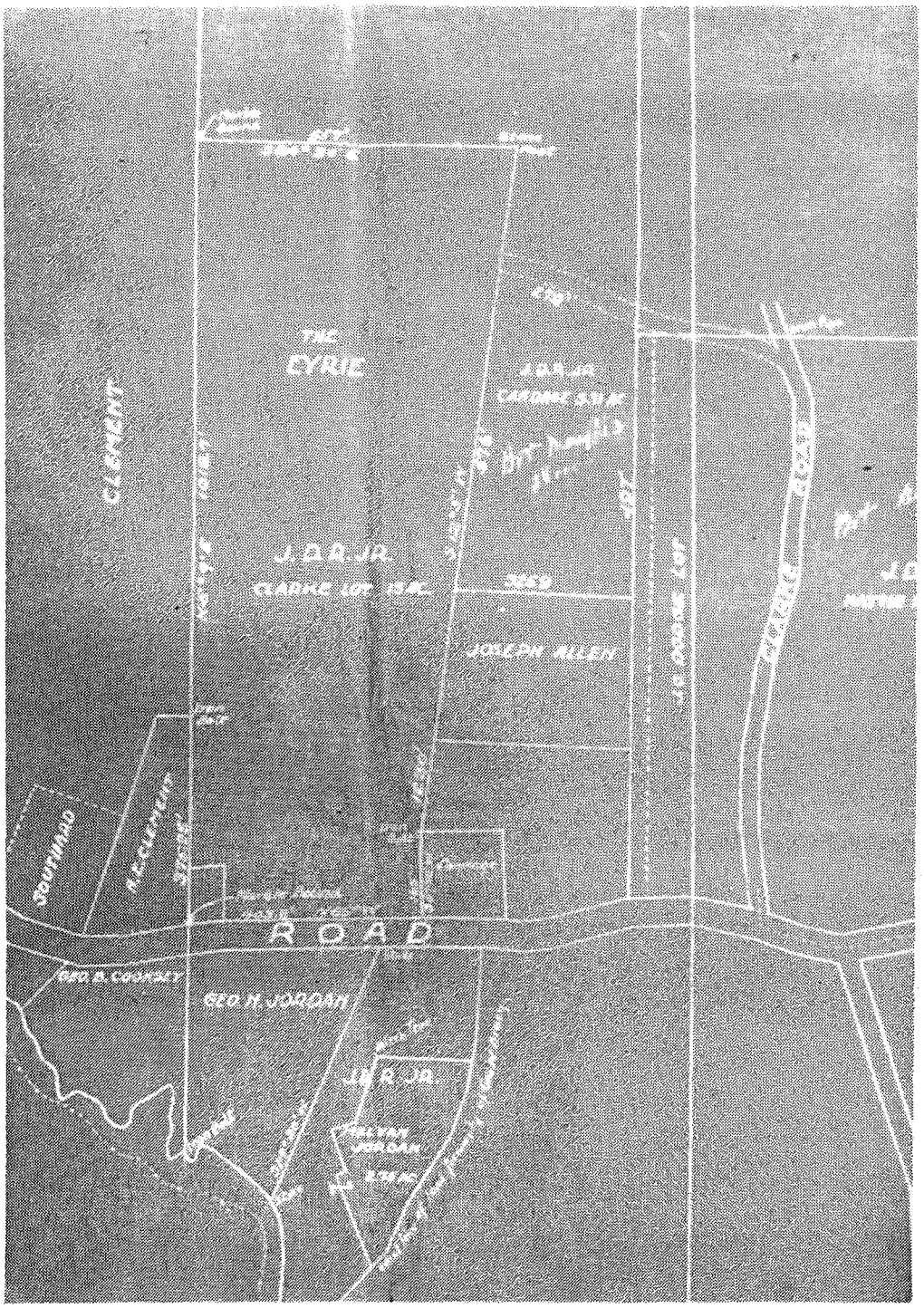


Figure XXVI. Boundary Survey of The Eyrie and Adjacent Properties

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Figure XXVII. The Eyrie, the Rockefeller Estate
in Seal Harbor, Maine

> VOTED that the Executive Committee of the Trustees of Public Reservations will be glad to have Mr. Rockefeller build a road partially on lands belonging to the Trustees, substantially according to the design or plan which has been set before them on maps shown by Mr. George L. Stebbins, but they do not feel at liberty to give Mr. Rockefeller any legal rights which might restrict in the future the rights of the public in the lands owned by the Trustees.
>
> (Signed) A.H. Lynam [133]

The maps are described in a letter from Mr. Stebbins to Mr. Rockefeller, dated August 8, 1916:

> Enclosed are copies of two maps on file with the Trustees of Public Reservations, which were submitted by me in connection with the vote of the Trustees, giving their consent to your building roads substantially according to the plans suggested on these maps. The vote was passed in such a manner as not to bind you down to these exact locations, but gave the permission in such a way that in the judgement of the Trustees variations could be made as long as the general objects shown were affected.[134]

In relating this information to George Dorr, two years later, Rockefeller wrote:

> The two maps to which Stebbins refers and of which he enclosed copies to me, were--(1) a path map marked substantially like the marking in solid black in the map which I sent you the other day [Figure XXVIII]; (2) a blueprint showing the Jordan purchase, giving the boundary lines of the reservation holdings and setting forth the same roads marked on the Path map, so that it is clearly seen where they are on reservation property, where on private property.[135]

These two maps show roads and segments of roads referred to as the Gardiner-Mitchell Hill-Jordan Stream Road, the Redfield Hill Road, the Jordan Stream Bridle Path, and the Asticou-Jordan Stream Road (which was not completed until almost twenty years later).

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[133]John D. Rockefeller, Jr., to George Dorr, February 8, 1918.

[134]George L. Stebbins to John D. Rockefeller, Jr., August 8, 1916.

[135]John D. Rockefeller, Jr., to George Dorr, March 14, 1918.

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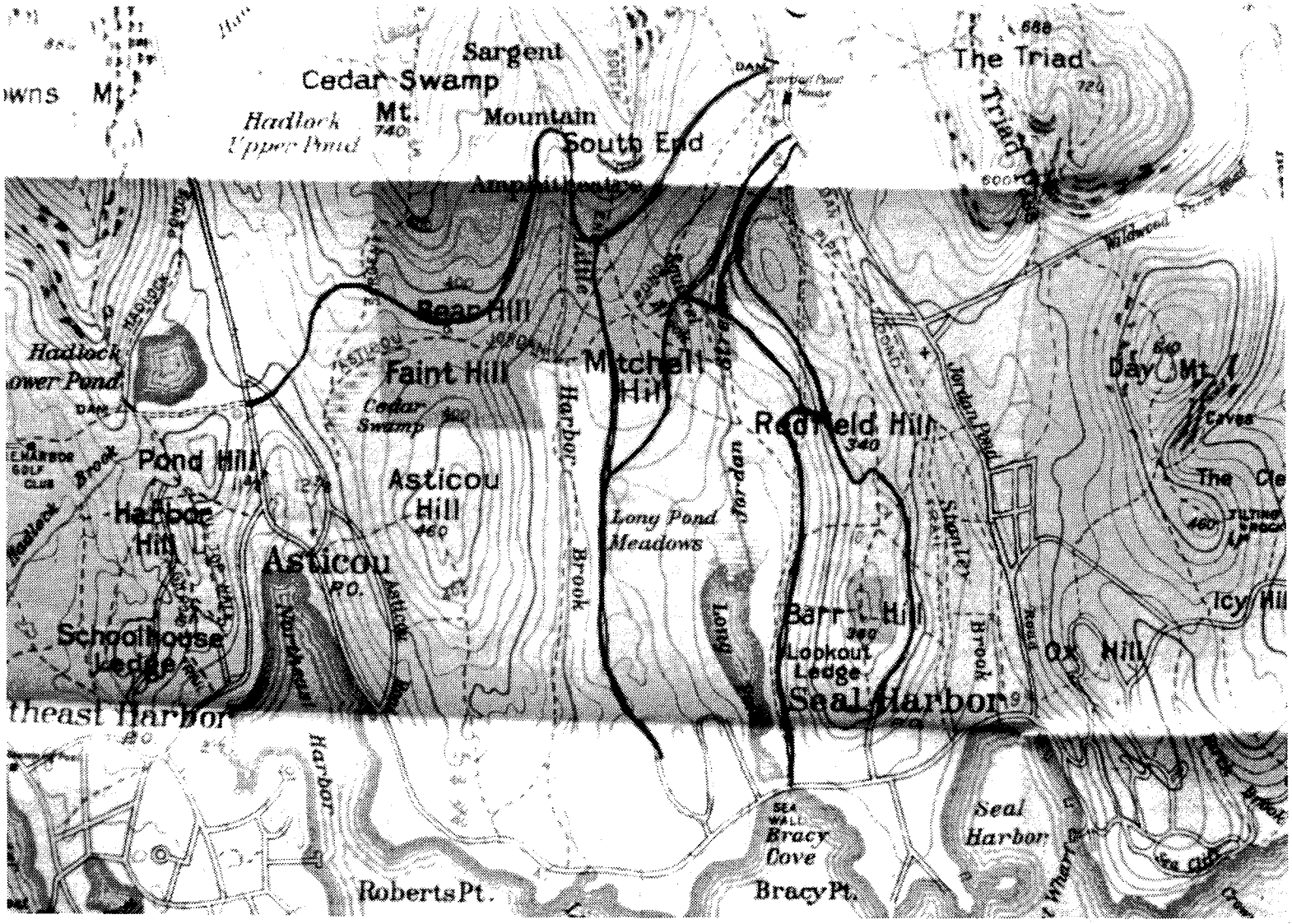


Figure XXVIII. Map Showing Proposed Roads
Through Reservation Land in 1916

In the years between 1916 and 1922, Rockefeller's plans and construction of the carriage roads grew increasingly ambitious. It is probably not a coincidence that it was during this same period that John D. Rockefeller, Sr., disposed of most of his vast fortune, transferring about half to philanthropic trusts and half to his son. During this period, John D. Rockefeller, Jr.'s, wealth increased from about $5 million in early 1916 to about half a billion dollars in 1922.[136]

While Rockefeller had obtained permission to build on Reservation land, most of his ensuing work continued to be on his own property. In early 1916, he contracted, on a cost-plus-10% basis, with A. E. Clement to rebuild some of the old farm roads on the tract of land across Long Pond from The Eyrie known as Gardiner (named for James T. Gardiner, the former owner). These roads had been laid out by Gardiner and were present on the property before Rockefeller purchased it). Rockefeller consulted with his friend and real estate agent George L. Stebbins about the advisability of working with Clement on this basis. Stebbins advised that ". . . Clement has his faults in that he is slack about organization and details but for that job I think he is as good as anyone to be had in that vicinity and his judgement is good on the details of the work. . . ."[137] Rockefeller took Stebbins's advice, and found his assessment to be accurate on both counts.

Rockefeller's great attention to detail has been discussed in a previous section. This, along with his intense interest in the development of his carriage roads, is revealed in his letter to Clement in the fall of 1916 questioning Clement's method of billing:

> Referring again to your bill of October 5th:
>
> The first section from July 15th to 22nd--there is a charge for 60 yards of gravel at 15 cents a yard, which I assume is the gravel from the Jordan Pond Road pit. There is also a charge for 9 days teaming at $5.00 a day, which I assume is a two horse team; and 3 days, 7 hours for the motor truck, at $12 a day. I presume that the motor truck hauls at least 2-2/5 times as many yards as the team of horses, else it would be cheaper to use the horses. On this basis the 3 days and 7 hours of motor trucking would be equivalent to 2-2/5 times the hauling by a two horse team, or 9.3 days, which added to the 9 days of the horse team's work, makes 18.3 days for a two horse team during this period.

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[136]John Ensor Harr and Peter J. Johnson, *The Rockefeller Century* (New York: Charles Scribner's Sons), 158.

[137]George L. Stebbins to John D. Rockefeller, Jr., February 28, 1916.

Sixty yards of gravel were hauled, which would be equivalent to 3.3277 yards a day per two horse team.

I assume that a two horse team would make four trips a day from the gravel pit--this would make less than a yard per trip, and I supposed that a two horse team hauled at least a yard and a half on a trip.

It must be that additional material was hauled during this period which does not appear in the bill, or else there has been some mistake in the charge for the hauling.

Please tell me how many trips a day the two horse team made from the Jordan Pond Road gravel pit to the Barr Hill Road, and how many trips the motor truck, also how much each hauled on a trip.

In the second section of the same bill from July 29th to August 5th, there is a charge for a single team for 1 day and 6 hours, a double team for 4 hours, and the motor truck for 1 day and 6 hours.

Eighteen yards of crushed rock were hauled. I presume this crushed rock all came from the crusher at N E Harbor, and that it was all hauled by the motor truck. What then did the two teams haul?

In the third section of the bill, from August 12th to 19th - there is a charge for teaming 3 days and 6 hours, motor trucking 4 hours, and six yards of gravel was hauled.

Something else besides the gravel must have been hauled to occupy the team and the truck for so much time. Can you tell me what it was?

In your bill of October 4th, there is a charge for Main Driveway, 186 yards of crushed rock and material for Barr Hill, 22 yards of crushed rock, but no charge for hauling of either.

I have no doubt that the charges in both of these bills are entirely correct, both as regards material and the time for the teams and the motor truck. I have gone into this detail, however, to show you how difficult, in fact impossible, it is for me to intelligently ok your bills when they are presented as they are. . . .

Now that the matter is up, I shall be glad to have you give me the information asked for in the early part of this letter and also to have you arrange

> to make out and send to me all of the bills for all work done during each week at the same time, and have them follow in consecutive order.[138]

Clement acknowledged a small error in the bill, and deducted $15.30 from it.[139] That the heir to the Standard Oil fortune would scour his road-builder's bill to this degree over an amount of this magnitude is remarkable. It is no less remarkable that Rockefeller's knowledge of road construction techniques was sufficient to allow him to make such a thorough analysis. It is clear that the minute savings were less important to him than his desire to have his bills in a tidy and comprehensible condition. His admonition to Clement to present his bills in a more orderly fashion, however, was largely in vain. Rockefeller sent Clement time sheets to fill out for each of his workers. These were neglected. Clement's bills--in fact all of his correspondence--were written by his bookkeeper, Miss Jenny M. Libby. She also read Rockefeller's correspondence to Clement. Miss Libby's letter to Rockefeller about the fifteen-dollar overcharge demonstrates the extent to which bookkeeping methods of Clement's boarding stable and road-building operation differed from those normally encountered at 26 Broadway:[140]

> Now that I have finished the letter with the exceptions of the bills not being sent promptly, I feel that its up to me, the book-keeper, to explain about that, as it is entirely my fault. Mrs. Clement has been without a cook all summer--just couldn't get anyone--and she being so lame I tried to help her and still hold my job with Mr. Clement. In so doing I neglected Mr. Clement's work which I aught [sic] not to have done. I should have given up my work with Mr. C. as he could easily have gotten some one to do the book-keeping but I didn't want to give that up for I know I haven't education enough to get a position elsewhere and I didn't want to always have to cook. I wouldn't mind so much if I only had myself to care for but I felt I must hang to my job if possible but the work of both was just too much for me. I couldn't do it all. Therefore the book-keeping got ahead of me, but Mrs. Clement has a cook now so I am trying hard to catch up.

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[138]John D. Rockefeller, Jr. to A. E. Clement, November 23, 1916.

[139]A. E. Clement to John D. Rockefeller, Jr., December 1, 1916.

[140]The New York offices of the Standard Oil Company, where Rockefeller's private office was located.

> That charge for the rock was entirely my mistake. Mr. Clement wouldn't charge a cent more than the actual cost of anything. He is the most honest, straight-forward man I ever met, so please don't think he did it. Am sorry to have given you the extra trouble.

Three months later, Miss Libby was in hot water again. Rockefeller had raised a question about what he regarded as a high price for catch basin covers. Libby wrote to Rockefeller:

> I am ashamed to have to make another apology and this mistake is worse than the first one. About the catch basin covers--The price $5.00 was a terrible mistake of mine. Where I got the price from was the estimate Mr. Clement made on the ones he placed about your house. That included the foundation. . . . I should have known better but I was so tired all the fall and winter trying to get caught up with the work that I was not accountable for all I did. . . . If I hadn't been so tired that my brain refused to work, I would have noticed the way Mr. Clement spoke that $3.50 was what he intended to charge (It all looks clear enough to me now). . . . When Mr. C. returned he discovered my mistake. He was terribly cut up over it for he said it looked as though he was trying to beat you, which it certainly did. . . . [141]

While Clement's and Libby's billing and bookkeeping techniques never met Rockefeller's expectations, he continued to work with Clement; and Miss Libby remained in Clement's employ as long as he worked on the carriage roads. Rockefeller also continued to scrutinize all the bills with great patience and care. A decade later, however, Clement's seat-of-the-pants approach would lead to problems when he was faced with working through intermediaries instead of directly with Rockefeller.

The next section of the carriage road system constructed extended from Gardiner, north to Mitchell Hill, west across Squirrel Brook and Jordan Stream, thence north to a gate on the public road near the Jordan Pond House. This road was called the Gardiner-Mitchell Hill-Jordan Stream Road. Charles P. Simpson, a civil engineer and surveyor from Sullivan Harbor, Maine, designed the road. Simpson had considerable experience in working on Mount Desert Island. He had contributed toward the mapping of the island in 1887.[142] Simpson became an important force in shaping the character and quality of all of the carriage roads to follow. This new section of road was built for Rockefeller by Clement and Joy, and was completed in the fall of

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[141]Jennie M. Libby to John D. Rockefeller, Jr., March 23, 1917.

[142]Colby & Stuart, *A Map of Mount Desert and Adjacent Islands, Maine*, 1887, private collection of Captain and Mrs. Charles Marinke.

1917.[143] The road cost $49,167.44.[144] (This equals $442,150.00 in 1988 dollars[145].) The Gardiner-Mitchell Hill section of the road became the standard of design for most of the future carriage road construction.

The construction of the Gardiner-Mitchell Hill-Jordan Stream Road necessitated the crossing of the Jordan Stream, near the point at which this road intersected with the Barr Hill Extension road. This crossing required the construction of a bridge. Rockefeller turned to the New York architect William Welles Bosworth for the design of this bridge, now known as the "Cobblestone Bridge" (See Figure XXIX). His choice of Bosworth to design the bridges was an interesting and revealing one. Bosworth was a personal friend who shared Rockefeller's love of Chinese porcelain. Bosworth's early professional career had included employment with Frederick Law Olmsted, Sr., where he worked on the development of the grounds of Stanford University.[146] Prior to World War I, Bosworth had designed extensive gardens for Rockefeller at his Pocantico Hills estate (1908-1910), and designed his New York house (1914). He also had designed the main buildings for the Massachusetts Institute of Technology (1913). After his return from military service in France, he resumed his architectural practice, during which time he designed several bridges for Rockefeller on Mount Desert Island. In 1925, Bosworth returned to France, where he directed the restoration of the Cathedral of Chartres, the Cathedral of Reims, the Palace at Fontainebleau, and Versailles (restorations funded by Rockefeller).[147] It is clear from the quality of architectural advice he sought that Rockefeller did not regard these bridges as insignificant projects.

Although Bosworth designed this first bridge on the carriage roads, the most striking characteristic of the bridge, its rounded-boulder facing, was suggested not by Bosworth but by Charles Simpson. Bosworth's drawing of the bridge shows squared cut stone facing. Simpson, however, wrote to Rockefeller ". . . If the face of stones showing could be the natural moss-faced rocks as far as possible, would it not add much to its

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[143]John D. Rockefeller, Jr., to George Dorr, March 18, 1918.

[144]Charles O. Heydt to John D. Rockefeller, Jr., July 31, 1919.

[145]Appendix XI.

[146]Master Draftsmen, IX--Welles Bosworth, in *Pencil Points*, Volume VI, Number 1, January 1925.

[147]Adolf Placzek, *Macmillan Encyclopedia of Architects* (New York: The Free Press Division of Macmillan PUblishing Company, 1982), 261.

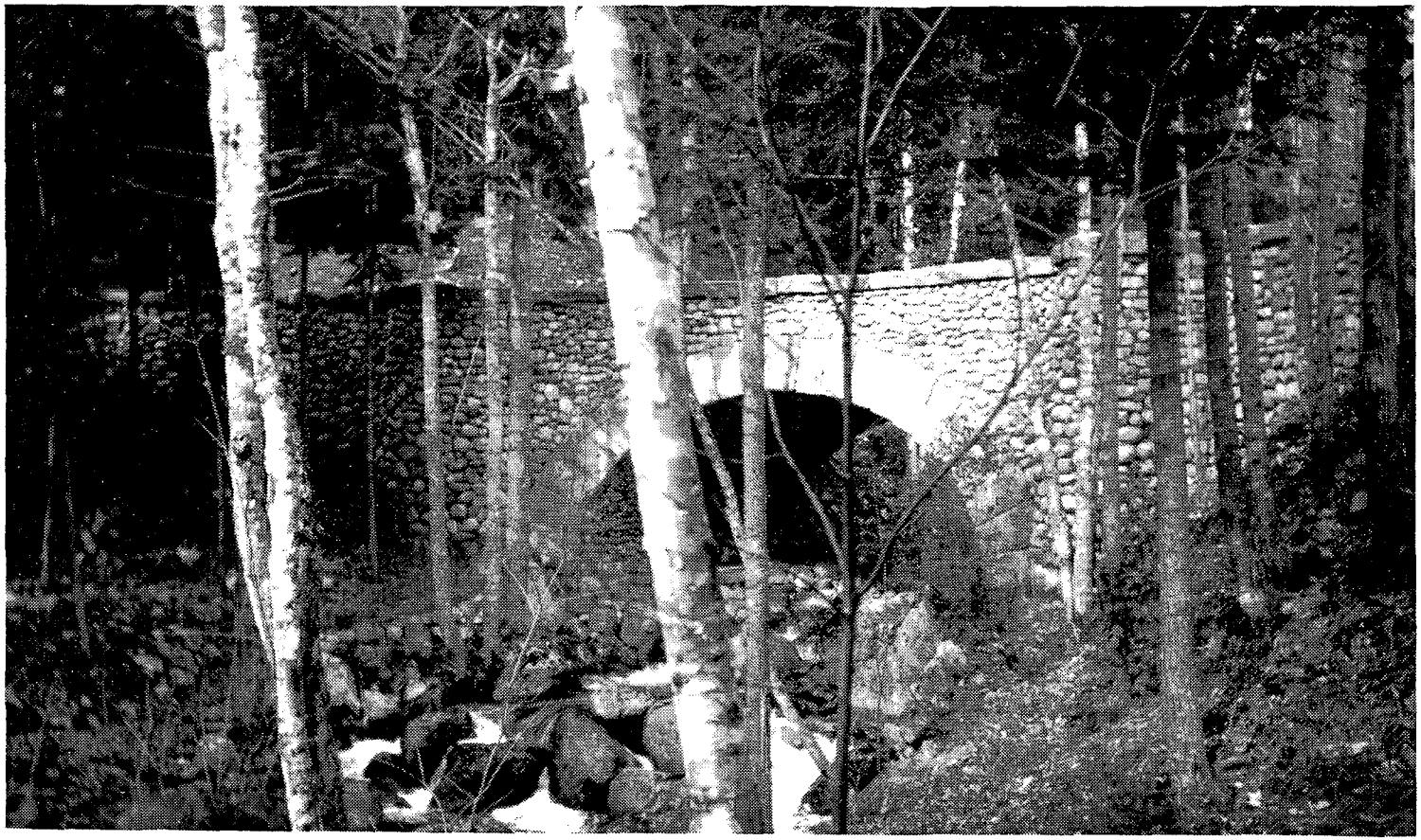


Figure XXIX. Cobblestone Bridge, ca. 1920

appearance? . . . "[148] Rockefeller seemed reconciled to squared-up stones but agreed with Simpson in his partiality toward rounded stones:

> . . . As regards the stone bridge across the Jordan Stream, I suppose it will be necessary to have the stones used in its construction squared up. If rough boulders could be used, and a sufficient number are obtainable in the immediate vicinity, it seems to me that the bridge would look less artificial and be more harmonious with the surroundings. Mossy faced stones will be desirable in so far as obtainable. . . .[149]

Simpson obviously found an adequate supply of boulders for this bridge. An addendum to the contract for construction was prepared which stated:

> The stones of the arch are to be made irregular instead of tooled and cut to severe lines as shown on the drawings. They are to be made of boulders, or natural face stones. . . . [T]he under side of the arch shall be lined with small stones laid over the wood form with sawdust between to produce the effect of raked out joints when the form is removed and laid with the largest size up and so that they will not fall out when the form is removed. . . . Picturesque freedom may be followed in the stone work. . . .[150]

The use of cut stones on subsequent bridges resulted from insufficient quantities of uniform boulders, more than from Rockefeller's or Simpson's preference for squared-up stonework. While today most would agree with Simpson and Rockefeller that the rounded cobbles or boulders "add much to its appearance" (Figure XXX), admiration for the bridge was far from universal. In 1924, George Dorr wrote of the Cobblestone bridge, "Done in the winter by a local contractor, all have agreed in regretting it from the artistic standpoint, but vegetation now is closing in around it and it will soon be little noticeable."[151] The Cobblestone bridge and a much smaller "culvert-bridge" over

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[148]Charles P. Simpson to John D. Rockefeller, Jr., April 15, 1916.

[149]John D. Rockefeller, Jr., to Charles P. Simpson, April 17, 1916.

[150]Memorandum Addendum to Contract Agreed to be Messrs. A. E. Clement, C. D. Joy, Charles P. Simpson and W. W. Bosworth, September 28, 1916.

[151]George B. Dorr to Arno B. Cammerer, January 10, 1924, Acadia National Park files.

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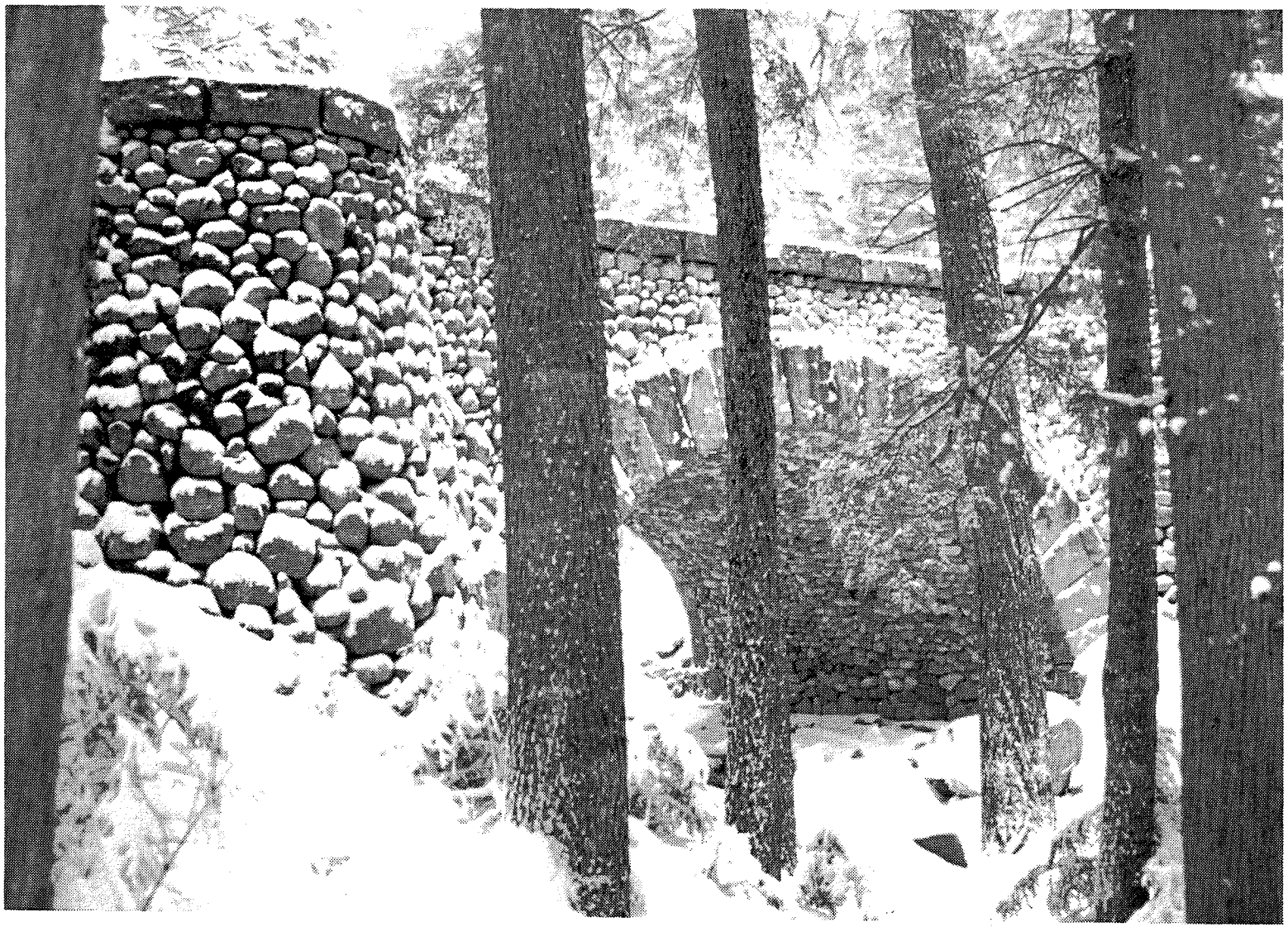


Figure XXX. Cobblestone Bridge

the Squirrel Brook, were built by Clement and Joy for $3,563.17[152]. (Equivalent to $35,500.00 in 1988 dollars.)[153]

The Cobblestone bridge's semi-circular concrete arch is faced with rounded "boulders" or cobblestones on both the barrel and spandrel walls.[154] The ornamentation is crude when compared to the other bridges on the carriage roads (e.g., on the spandrel walls, the weep holes are not decorative, but simply pipes), although the configuration of the bridge exhibits elements developed in the later bridges. For example, the approaches are widely flared and conform to the layout of the two intersecting roads, and round tower-like buttresses project from the wing walls to provide lookouts both down- and upstream, which allow views of the arch from above. The simple ornamentation consists of roughly articulated granite voussoirs and coping distinguished from the body of the arch. The date of construction, 1917, was carved on the keystone by the mason Samuel Candage. His father's construction firm would eventually contract to build eight of the carriage road bridges.

The northern section of the Gardiner-Mitchell Hill-Jordan Stream road was built to the east of Jordan Stream. A bridle path was built to the west of the carriage road, along the Jordan Stream, crossing it in several locations with wooden bridges. This section was designed as a 12-foot wide bridle (or saddle) path, and was built in 1918.[155] The bridle trail was built on Reservation land in accordance with the 1915 agreement. Today, both of these roads are considered part of the carriage road system.

The main feature of the proposal to build carriage roads on Reservation property was a road which would connect the Jordan Pond House with the Brown Mountain Road (line at the top of Figure XXVIII). The road would progress from the southwest corner of Jordan Pond, around the southern end of Jordan Mountain, swing north into a beautiful and dramatic valley known as "The Amphitheater," cross the Little Harbor Brook, proceed around the southern end of Cedar Swamp Mountain, and join the Brown Mountain Road (a public road) near the settlement of Asticou at the northern tip of Northeast Harbor. Rockefeller intended to acquire land on the Asticou end of the proposed road, which was not in Reservation lands. This road, named the Asticou-Jordan Pond Road, became the centerpiece of the carriage road system in the southern

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[152]Charles O. Heydt to John D. Rockefeller, Jr., July 31, 1919.

[153]Appendix XI.

[154]See Appendix XII-XIII and Glossary for definitions of bridge terms.

[155]John D. Rockefeller, Jr., to George Dorr, February 8, 1918.

part of the island and the focus of opposition by opponents of Rockefeller's road building program for nearly twenty years. By 1918, when he was ready to begin construction of parts of this road, the Trustees of Public Reservations had deeded their land to the Federal Government. George B. Dorr had been made the Custodian of the new Sieur de Monts National Monument. On February 8, 1918, Rockefeller wrote to Dorr:

> You have perhaps heard that I have at length bought the property to the east of the Brown Mountain Road between that road and the Reservation . . . in order to enable me to build the ASTICOU-JORDAN POND ROAD which the Reservation Trustees gave me permission to build several years ago. With the scarcity of labor and the high wages which now pertain it would be difficult to build this road at the present time.[156] However, the horse lovers of North East Harbor are very eager to have some way, if nothing more than a bridle path, opened up from the Brown Mountain Road to connect with our Gardiner-Mitchell Hill-Jordan Stream Road as soon as possible. To comply with that desire . . . I have laid out a new road through the Reservation which, availing of the first half mile or more of the proposed Asticou Jordan Pond Road, will then branch across the valley to connect with my present [Gardiner-Mitchell Hill-Jordan Stream] road.
>
> The purpose of this letter is to ask if the Trustees, or if you, as Curator [sic] of the Reservation, will give me the authority to build this additional road. . . .[157]

Rockefeller enclosed his own hand drawn map (Figure XXXI) which shows the roads previously approved, as well as two new roads. He described the roads previously approved, shown on his map as black lines, as follows:

> ROAD NO. 1. THE ASTICOU-JORDAN POND ROAD, which, starting at the Brown Mountain end, is indicated by the letters A-G-B-C-D-X-E.
>
> ROAD NO. 2. CONNECTING THE ASTICOU-JORDAN POND ROAD with my GARDINER-MITCHELL HILL-JORDAN STREAM ROAD, -- which is indicated on the plan by the letters C-J-F.

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[156]The scarcity of labor to which Rockefeller refers was the result of World War I. Construction costs were rising rapidly--a trend which would continue until 1920. After that time the cost of road construction generally declined for the duration of the carriage road construction. See Appendix XI.

[157]John D. Rockefeller, Jr., to George Dorr, February 8, 1918.

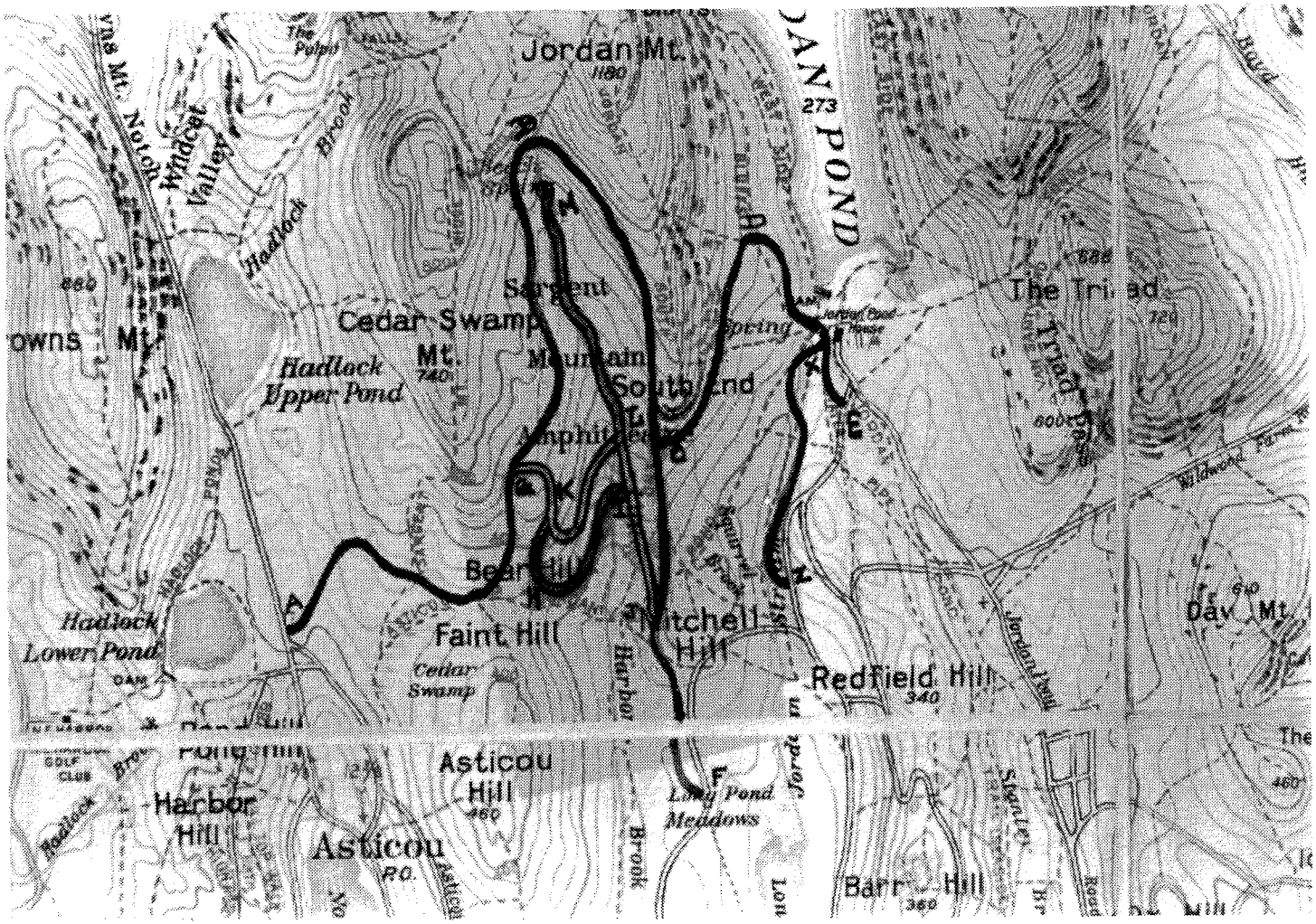


Figure XXXI. Rockefeller's Map of Proposed Roads
Through Reservation Lands, February 1918

> ROAD NO. 3. A BRIDLE PATH, coming up Jordan Stream from beyond the new stone bridge which I built last year [Cobblestone Bridge] almost to Jordan Pond and joining my present Jordan Pond Road just inside my gate near Jordan Pond House. This road is marked on the map, starting from above the bridge, Z-X-E; it is a saddle path, 12 ft. wide, where it follows the stream, is now being built and will, I hope, be opened next summer.[158]

Two new roads, not previously approved by the Trustees, were indicated on the map as double lines:

> ROAD NO. 4, indicated on the plan by the letters G-K-H-I-J, which will connect the Asticou Jordan Pond Road with my Gardiner-Mitchell Hill-Jordan Stream Road, as above set forth. It would probably not be over 12 ft. wide, being intended primarily for saddle horses although usable by carriages, but I should like to have the privilege of building it of a 16 ft. travelled width if I should so desire.[159]

This road would later be called the Little Harbor Brook Road. It was built 16 feet in width, except for a section in the valley which was constructed as a bridle path, ten feet in width. The second new road for which Rockefeller sought permission to build was:

> ROAD NO. 5, indicated on the plan by the letters G-K-L-M-L-I. This road is not necessary as a part of the above described scheme but it develops very beautiful country, passing over the top of Bear Hill traversed by no paths from which a really marvelous view of the sea as well as of the mountains is obtained, and runs up Little Harbor Brook as far as a reasonable grade will permit, crossing the brook from time to time. . . . [160]

Road No. 5 was never constructed. Rockefeller went on to describe to Dorr his scheme for phasing of the carriage roads and bridle paths for which he was asking permission to construct:

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[158]Ibid.

[159]Ibid.

[160]Ibid.

> If permission is granted to me to build these two new roads what I would do would be to build this summer if possible a road traced on the map, starting at Brown Mountain Road, as follows
>
> A - G - K - H - I - J - F
>
> . . . it would make the desired connection between Asticou, North East Harbor, and our roads . . . adding a small new section of road which would be beautiful and a permanent improvement to the Reservation. Another year . . . I could go ahead with the main Asticou-Jordan Pond Road, completing the section X-D-C-J. . . . Later I could complete the main road, building the section C-B-G.[161]

The vision of how this road system would evolve over time was clearly Rockefeller's. It was the mid-nineteen thirties before the main Asticou-Jordan Pond Road was finished. His engineers had changed, his bridge architect had changed, his primary road builder had changed; but the road, when finally completed, was substantially the same road described to Dorr in early 1918, and to the Trustees of Public Reservations three years earlier. In addition to consistently viewing the "big picture," he was intimately involved with the location of the lines for the road, in the field. He went on to say:

> I have been working on the survey of these new roads for some time, and spent a few days at Seal Harbor late in November going over them finally with Mr. [Charles] Simpson. I feel sure that they are rightly located, for the entire section . . . was carefully and repeatedly cruised, first by Mr. Simpson and then by me, before the locations were decided upon.[162]

Dorr, however, as Custodian of the national monument, informed Rockefeller by telegram that the permission granted by the Trustees prior to the dedication of this land to the government no longer persisted. His telegram also said, ". . . It will be necessary according to National Park rules to submit surveyor's plans of work intended and specifications for the manner of it. Government exacting upon these particulars. . . . "[163] Clearly irritated, Rockefeller wrote to Dorr, on March 14, 1918, an eleven-page letter. After outlining the history of the Trustees agreement to allow the construction of these roads, he said:

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[161]Ibid.

[162]Ibid.

[163]Telegram: George B. Dorr to John D. Rockefeller, Jr., February 28, 1918.

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> If, as I presume must be the case, you are right in saying that the permission granted me by the Trustees of Public Reservations prior to the taking over of its holdings by the Government is now void, what is the process by which permission can be secured under present conditions? Does it not lie in your power as curator to grant such permission when no expenditure of Government funds is involved?
>
> . . . You suggest that surveyor's plans of the work intended and specifications for the manner of doing it will be necessary. I can quite understand such a requirement in connection with contract work let by the Government, but if you as Curator [sic] approve of what is suggested, it is difficult for me to believe that such exactions are essential where no expense is involved on the part of the Government. To survey all of the roads which appear on the map which I sent you would be a long and costly operation.
>
> I should hesitate to begin one road unless I knew that the authority already granted to construct the system had been confirmed and permission to build the new ones granted. It would seem to be so obviously to the advantage of the Government to have paths built for it through the Reservation, so long as the roads were approved by its representative, that the exaction of technical requirements in the acceptance of such a gift is hard to understand . . . .[164]

This letter is marked *Not Sent*. The reason it was not, it may reasonably be assumed, is the arrival of a letter from Dorr, dated March 12, 1918. Dorr wrote:

> . . . I took up the matter of your roads and bridle paths with Secretary [Franklin K.] Lane when he was with us in the summer and obtained his approval, in principle, for their extension in the park. This was essential, as when I went on to Washington in the spring of 1916, I went authorized by the Trustees of Public Reservations to offer the lands accepted later by the Government as free of any easement . . . and the deeds were already in the Government's hands and accepted by the Secretary of the Interior some weeks before . . . your second, more extensive road-plan was brought up. . . . Secretary Lane has given me power to meet you fully in the matter, and has besides authorized me at my request to close to motor use, in the Park Service name, the roads you build within the park. This . . . gives you the support of the Government in making the system motor free. . . .
>
> . . . Secretary Lane at the same time makes me responsible for what is done. I want so far as your work within the park is concerned, to place you in that same position of freedom and responsibility . . . . I should only like to have you consult with me about your plans from time to time, as opportunity

[164]John D. Rockefeller, Jr., to George Dorr, March 14, 1918.

> comes. . . . You know that area in a way that I do not, and I shall rely on your good judgement regarding it and its development in the public interest. It is a superb opportunity in a landscape sense; I know of nothing like it in the East, and what is done will be at once enduring and singularly conspicuous.
>
> Please regard yourself as having authority to proceed in accordance with your plans. . . . [165]

This, of course, was exactly what Rockefeller wanted to hear. It marked the beginning of a remarkable, and occasionally tense, partnership between the Department of the Interior and Rockefeller in the development of what was to become Acadia National Park. The tone of his letter of response to Dorr, dated March 18, 1918, the following Monday, was markedly different from that of the unsent March 14 letter:

> Your letter of March 12th is received, and is in every way most gratifying. I appreciate your forethought in regard to my possible plans and desires in the matter of roads and also the complete confidence which you repose in me in the matter of working out these plans. You know that whatever is done will be done with the same painstaking care, forethought and study that I would put into work on my own property, and more can no man do.
>
> . . . My plan will be to start to build this Spring or Summer, if possible, the road referred to in my letter of February 8th which will connect the Brown Mountain Road from just north of the Cemetery Road with the Gardiner, Mitchell Hill, Jordan Stream Road, which I completed last Fall--thus giving access from Asticou and Northeast Harbor to the roads which I have already constructed, without using the Highway.
>
> . . . Your idea of securing Secretary Lane's authorization to close to automobiles those portions of roads which I have already built through the Government property thus relieving me from being the sole obstacle to such use of the roads, is an excellent one and greatly appreciated.[166]

With this historic authorization in hand, Rockefeller proceeded with plans for the construction of this section of road which would connect the Brown Mountain Road with the Gardiner-Mitchell Hill-Jordan Stream Road. This new road would come to be called the Little Harbor Brook Road. He was, however, unable to get the road under construction in the spring or summer, as he had hoped.

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[165]George B. Dorr to John D. Rockefeller, Jr., March 12, 1918.

[166]John D. Rockefeller, Jr., to George B. Dorr, March 18, 1918.

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As has been shown, Rockefeller's wealth was increasing a hundredfold during this period; however, it did not follow that he became less attentive to the cost of his roads. The day after acknowledging the authorization granted to him to build on government land, he wrote to Clement:

> Is it true that Seal Harbor has voted to pay three dollars a day to common labor? If so, when does this regulation become effective? What effect will it have on the wages you will have to pay?[167]

Clement responded:

> . . . The Town did vote to pay three dollars a day for men working on the Town road and I suppose that will affect other labor more or less but I do not propose to pay three dollars for all laborers. Some are worth it and in that case it is cheaper to hire a three dollar man for three dollars than to pay two and a half for a man that's not worth two and a half. They can't all work on the Town roads and I think I can still get some men for two and a half and two seventy-five. I shall probably have to go up a quarter of a dollar on all wages owing to the high cost of living but I will do the best I can to keep wages down.[168]

On August 5, 1918, Rockefeller wrote to Welles Bosworth, requesting the design for a second bridge--this one for the Little Harbor Brook road:

> I am making more roads here at Seal Harbor. One road now in contemplation will cross one stream several times. The stream is in a wider valley and less rapid than the Jordan Stream, for which you designed a bridge [the Cobblestone Bridge]. In the summer but little water runs down the stream, which is known as the Little Harbor Brook.
>
> . . . Will you please suggest a design of a masonry bridge, with a concrete core, the same as the one you designed before, but adapted to the much smaller stream and of a much less important roadway?[169]

---

[167]John D. Rockefeller, Jr., to A. E. Clement, March 19, 1918.

[168]A. E. Clement to John D. Rockefeller, Jr., March 25, 1918.

[169]John D. Rockefeller, Jr., to W. W. Bosworth, August 8, 1918.

Rockefeller went on to describe the size, thickness of the arch, and height above the stream. He concluded by asking, "What, if anything, that would look well and not too heavy, could be designed with such limitations?"[170]

In two weeks and two days from the date of Rockefeller's request, Bosworth responded: "We send under other cover 2 rendered drawings of bridge, also 1 cloth print and 3 paper prints of drawing giving dimensions and other structural details."[171] The bridge was a small, segmentally arched rustic bridge with a horizontal belt course at the road level and a parapet composed of abutting rough boulders giving the effect of the coping stones which lined the road (Figure XXXII). Rockefeller, however, changed his mind about the design before the bridge was constructed.

In late September Charles P. Simpson had staked the center-line of the east end of the proposed new road (Little Harbor Brook Road), and was at work on the vertical profiles.[172] He wrote to Rockefeller:

> I have a profile of the Mitchell Hill end of the road nearly completed. I will finish it and send to Mr. Clement. I will also prepare a profile of the balance of the road over Bear Hill and send him.[173]

Rockefeller was in Seal Harbor until September 18.[174] He had given the bridge drawings, prepared by Bosworth, to Simpson for his information and suggestions, when he was in Maine. Simpson wrote:

> I have looked over the drawings of the bridges which you gave me, and I am sure I can make no suggestions for their improvement.
>
> In my humble opinion they fit in with the surroundings very nicely. The sketches of the bridges, No. 1 and No. 2, have just arrived.

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[170]Ibid.

[171]Welles Bosworth to John D. Rockefeller, Jr., August 28, 1918.

[172]C. P. Simpson to John D. Rockefeller, Jr., September 23, 1918.

[173]Ibid.

[174]John D. Rockefeller, Jr., to A. E. Clement, September 24, 1918.

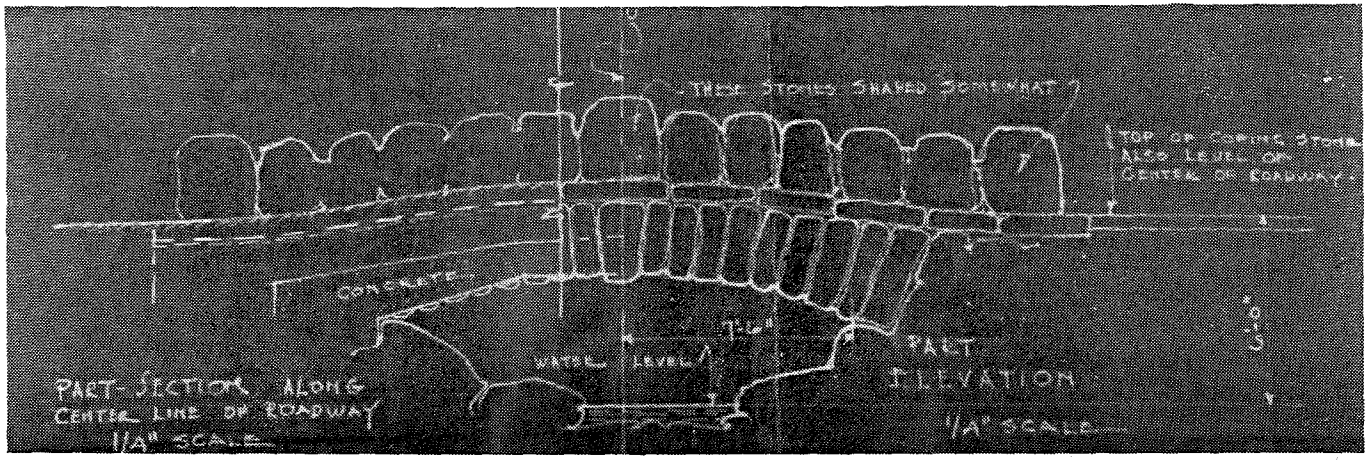


Figure XXXII. Original Design for Little Harbor Brook Bridge

Rockefeller rejected this design in favor of one based on a Central Park bridge.

> I agree with you that No. 1 would be easier to obtain and it seems to me to be more in harmony with the surroundings.[175]

On September 24, Rockefeller sent a contract and specifications to A. E. Clement for the section proceeding west from the Gardiner-Mitchell Hill-Jordan Stream Road, later to be named the Little Harbor Brook Road. He was as good as his word to Dorr about constructing roads on government land to the same standards as roads built on his own property. His letter to Clement, conveying the contract and specifications stated that ". . . The specifications for this road will be practically a duplicate of those used on the Gardiner-Mitchell Hill-Jordan Stream Road."[176]

The contract and specifications (Appendix XIV) stipulated that Clement was to:

> . . . provide all materials and perform all work for the construction of a road at Seal Harbor, Maine, as surveyed by C. P. Simpson, C.E., beginning at the Gardiner Road, running along the West side of Mitchell Hill, crossing the Little Harbor Brook and to a point on the West side of the brook where the road makes a turn to go South and around Bear Hill. . . . It is understood that the bridge across the Little Harbor Brook is not included in this contract but will be made the subject of a separate contract.[177]

The agreed price for this road was $3.00 per running foot, including all culverts, whether of stone or metal. Coping stones were to be supplied as an extra, to be paid for on the basis of cost plus ten percent. Clement was instructed that the road was to be a 16-foot wide broken-stone or "rock-filled" road, except for one section (Station 11 to Station 24--some one-quarter mile) which was to be built as a bridle path, ten feet wide, with ". . . frequent wider stretches where teams can pass," but otherwise the same as the full width portion.[178] Clement was informed in the cover letter transmitting the contract and specifications that another contractor (Chauncey D. Joy) had begun at the Brown Mountain end of the same road, and was building east.[179] Rockefeller contracted with Joy for the western section of the road, which he called the Brown Mountain Road, Division A, on September 27, 1918.

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[175]Ibid.

[176]John D. Rockefeller, Jr., to A. E. Clement, September, 24 1918.

[177]Specifications for a Road at Seal Harbor, September 24, 1918.

[178]John D. Rockefeller, Jr., to A. E. Clement, September 24, 1918.

[179]Ibid.

Three months later, Rockefeller was back in Maine, looking over his new road. He wrote to Clement on December 17, 1918: "I walked over the road which you are building (Little Harbor Brook Road) the other day and reached the conclusion that the 16 ft. traveled width should stop at about Station 12,[180] from which to Station 24 the road will be simply a bridle path like the one along the Jordan Stream."[181] He went on to describe to Clement his rationale for building the road at two different widths:

> . . . My purpose in having a 16 ft. width of traveled road, except in the bottom land along the stream is that wherever the road is built on a hillside and walling is necessary, it will be costly out of proportion to widen the road later, if necessary. On the other hand, a bridle path in the flat land has advantages, for two reasons: First, that it makes the smallest opening, can be so adjusted as to spare the largest number of trees; and secondly, it can always be increased in width, if desired, with relatively little additional expense.
>
> . . . Be sure your men cut trees for too narrow a roadway rather than too wide a one, as they cut down into the valley. I want to spare every tree possible, without spoiling the line of the road, just as I did along the Jordan Stream bridle path.[182]

The section of the road built as a bridle path was never enlarged to the full carriage road width. Figure XXXIII demonstrates the adjustment "to spare the greatest number of trees . . . without spoiling the line of the road." This letter reveals to what a degree Rockefeller was involved in the planning of the carriage roads--walking the line prior to construction, and making decisions about particulars of the road. It also shows his dual concern for the protection of the natural setting (in this case, the trees) and the functional and aesthetic requirements of the roadway (the "line of the road").

In January, Clement wrote to Rockefeller that he was continuing to work on the road, and that he had figured the cost of the bridge at $2,250.00.[183] Rockefeller questioned the amount in a letter two days later:

> I note your estimate on the cost of the bridge over the Little Harbor Brook. Would you be kind enough to send me the details which make up this

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[180]Road plans are typically measured in "stations" of 100 feet in length.

[181]John D. Rockefeller, Jr., to A. E. Clement, December 17, 1918.

[182]Ibid.

[183]A. E. Clement to John D. Rockefeller, Jr., January 15, 1919.

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Figure XXXIII. Little Harbor Brook Bridle Path

". . . I want to spare every tree possible, without spoiling the line of the road . . ." John D. Rockefeller, Jr.

> estimate? Since the large bridge over the Jordan Stream and the Squirrel Brook bridge cost $3,500, it would appear that the bridge on which you are now figuring would cost about as much as the Jordan Stream bridge, although it is so much smaller.[184]

Simpson continued to develop the plans for the middle section of the road during the winter, while Clement and Joy were working on both ends.[185] Rockefeller, still unhappy with Clement's price for the bridge, asked Simpson to make his own estimate of the cost.[186] Simpson sent his estimate to Rockefeller; however, Rockefeller wrote back to him, on March 29:

> Recently I found a rough stone bridge in Central Park [Figure XXXIV] which I think a much more beautiful design and which I have adapted to the requirements of the Little Harbor Brook crossing. It is my thought to substitute this bridge for the one previously designed and upon which you were kind enough to send me an estimate. I have sent Mr. Clement a blueprint of the new bridge and have asked him for an estimate. I am sending you a blueprint herewith. . . . Have you any suggestions to make in regard to its construction which you think would insure greater durability, economy of construction or strength?[187]

---

[184]John D. Rockefeller, Jr., to A. E. Clement, January 17, 1919.

[185]In February of 1919, when Charles Simpson was working on the alignment for the Little Harbor Brook bridle path, an historic event was underway in Washington. On February 26, an Act of Congress established Lafayette National Park, the first national park east of the Mississippi River, superceding the Sieur de Monts National Monument. The national monument status had been created by President Wilson's proclamation in 1916, to secure the land until political support could be mustered to have Congress create the national park. A national monument could be created by Presidential proclamation, through authority granted in the Antiquities Act of 1906, while creation of a national park required an Act of Congress. The lesson of this sequence was not lost on Rockefeller. In 1943, the same technique was used by President Franklin D. Roosevelt--with the encouragement of Rockefeller, passed through Secretary of the Interior Harold Ickes--to secure the Jackson Hole National Monument. This national monument was later incorporated into an enlarged Grand Teton National Park, when local public sentiment had shifted enough to make an Act of Congress possible. The creation of Lafayette (Acadia) National Park twenty years earlier was clearly the model for this procedure. (Harr and Johnson, 200-211.)

[186]John D. Rockefeller, Jr., to Charles P. Simpson, February 14, 1919.

[187]John D. Rockefeller, Jr., to Charles P. Simpson, March 29, 1919.



Figure XXXIV. Gap Stowe Bridge Over Swan Lake
Central Park, New York City

Little Harbor Brook, Jordan Pond Dam, and Hadlock Brook bridges were copied from this bridge.

Simpson immediately set to work figuring how to adapt the bridge to its location over the Little Harbor Brook and then developing an estimate. He made an important suggestion about the design of the bridge. He wrote to Rockefeller on April 7:

> . . . As the banks of the stream at this point are low, especially on the western side, if the bridge could be kept as low as possible, without impairing its beauty, either by flattening the arch, or lowering the spring line, or by a combination of both, it would lessen the fills on each side which I fear are going to look rather ugly. I will make an estimate of the cost, and forward it to you soon.[188]

The next sequence of events documents the continued close attention Rockefeller paid the development of his carriage road system, and the respect and friendship developing between Rockefeller and Simpson. Rockefeller's return letter included an invitation for Simpson to join him in New York to discuss the bridge:

> . . . I am going to France the middle of May and shall not be in Seal Harbor until late July or early August. I am anxious that the roads and this bridge should not be delayed. It is important that the bridge should be adapted in every respect to the conditions at the Little Harbor Brook and that all points should be fully discussed before it is built. I am writing therefore to ask if you cannot arrange to come to New York and talk the matter over with Mr. Bosworth, the architect, and me. This will give you a chance to see the original bridge in Central Park, which will be most helpful to you in describing to Mr. Clement the details of construction. Then, too, I should be glad to have you see my Father's country place at Tarrytown, which I am sure you would enjoy and find suggestive and helpful in your work. Can you not come to New York for a few days, and will you not bring Mrs. Simpson with you? In addition to its being a great convenience to me to have you come, it will give me genuine pleasure to defray the expense of the trip for both Mrs. Simpson and yourself.[189]

Mrs. Simpson did not come, but Mr. Simpson agreed to make the trip. Rockefeller, then, took great pains to ensure that Simpson's visit was both productive and enjoyable. He wrote to Heydt:

> You have already seen a copy of my letter to Mr. Simpson asking him to come to New York and see the bridge in Central Park which Mr. Bosworth has sketched for the Bridle Path at its crossing of the Little Harbor Brook, Seal Harbor. Mr. Simpson writes that he will come, arriving on May 10th. Herewith is a copy of a letter which I have just written him. Please arrange with the

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[188]Charles P. Simpson to John D. Rockefeller, Jr., April 7, 1919.

[189]John D. Rockefeller, Jr., to Charles P. Simpson, April 15, 1919.

house about his coming. Louis knows Mr. Simpson. He can be taken care of in one of the spare rooms, if he wants to wash up and leave his things there. Then please see if Mr. Bosworth could take the time to go with Mr. Simpson to Central Park, either in one of our electrics, for which you can arrange, or in a taxi-cab, and show Mr. Simpson the Narrow High Bridge on the far end of the Big Lake on the West of the Park, which Mr. Bosworth sketched for me - and also the Long Bridge crossing the little lake at 59th Street, opposite the Plaza Hotel, which is the one we are copying for Seal Harbor. Mr. Simpson should have time to carefully study the visible construction of this Bridge in every respect. He should have a blueprint of the Bridge, which Mr. Bosworth can supply him with, so that he will be familiar with all details of its external construction.

Mr. Bosworth very probably will not feel that he can stay with Mr. Simpson while he is studying this bridge. The electric could take Mr. Bosworth back to his office and then return later for Mr. Simpson.

Mr. Simpson should also discuss fully with Mr. Bosworth the internal construction of the Bridge, the several suggestions which he made me recently about reducing the fill on either side of the stream and Mr. Bosworth's answer to this suggestion. In other words, I should hope to have Mr. Simpson and Mr. Bosworth come to an entire agreement on how this Bridge can be most completely adapted to the conditions at the Little Harbor Brook, so that both from appearance and from a structural point of view it will be right. I think Mr. Simpson is wise in saying that it may be better to make the travelled width of the Bridge, inside of the coping, 16 feet instead of 15. It seems to me that in Mr. Bosworth's last blueprint sent me here, in which he reduced the height of the fill, which means reducing the height of the bridge over the water, he flattened the curve of the arch, which was in my judgement an improvement in the appearance of the Bridge. I am wondering whether, if this is necessary in order to reduce the fill, the apparent curve of the Bridge as one follows the line of the top of the coping could not be kept as it is by letting the coping be somewhat lower after it leaves the stone posts at either entrance to the Bridge.

Mr. Simpson should be taken back to No. 10[190] for his lunch, which he could have either with the children or Miss Scales, for the children all know Mr. Simpson and it would be my hope that I could go with him later in the afternoon to Pocantico, which he could spend the night at Abeyton Lodge[191] with us and see the place there on Sunday. Mr. Simpson could go back to Maine on Monday night. Saturday morning while he is in the house it would be

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[190]Rockefeller's residence on West 54th Street, designed by Welles Bosworth.

[191]The house at Pocantico occupied by John D. Rockefeller, Jr., and his family from 1903 until 1937.

pl 9

> nice if some of the children could show him all over the house from top to bottom, or if the children are not there, perhaps Louis, Miss Scales or Miss Orton could do so. I know he would be greatly interested in everything he sees there. I leave this matter entirely in your hands.[192]

As Rockefeller had planned, the trip proved productive. The external and internal construction for the Little Harbor Brook bridge were completely worked out, and the plans and specifications developed for that bridge were eventually used for two other bridges on the carriage road system. In addition, the sketch Bosworth had completed and the engineering studies made by Simpson of the "Narrow High Bridge on the far end of the Big Lake on the West of the Park" (Figure LXXVII, page 218) were ultimately refined by Bosworth's successor into the West Branch bridge on what is now called the Amphitheater Road.

In its final form, the Little Harbor Brook bridge (Figure XXXV) was built with a segmental arch and faced with roughly square stones laid in a random pattern. Its parapet walls are capped with corbelled coping stones of the same material and the bridge terminates at each end in squared posts which are topped with a composite bevelled capstone. As Simpson suggested, Bosworth flattened the arch of the bridge to avoid using as much fill, a change which makes the Little Harbor Brook bridge distinctively different from the bridge over Swan Lake, and which substantially augments the bridge's comfortable fit with its surroundings.

The Little Harbor Brook bridge is more refined than the bridge in Central Park which inspired it (Figure XXXVI). This is in part due to the fact that the Central Park bridge was constructed of Manhattan schist, the local stone, a very hard and difficult to work metamorphic rock. The Little Harbor Brook bridge was built of local granite which is much more adaptable to the stone-cutter's art. This refinement is also due to the revisions made by Bosworth and Simpson. The voussoirs on the Little Harbor Brook bridge taper as they approach the center of the arch, similar to the treatment on the Cobblestone bridge, while the original bridge at Central Park has voussoirs of uniform depth. The extrados are irregular on the Central Park bridge and even on the Little Harbor Brook bridge. The distinctive peaked caps for the end posts on the bridge over Swan Lake were simplified and refined for its Mount Desert counterpart. A memo from Heydt records for posterity the dimensions of both bridges (Appendix XV). One detail copied from the Central Park bridge for the Little Harbor Brook bridge is most obvious--the small arches built around the weep holes (Figures XXXVII and XXXVIII).

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[192]John D. Rockefeller, Jr., to Charles O. Heydt, April 15, 1919.

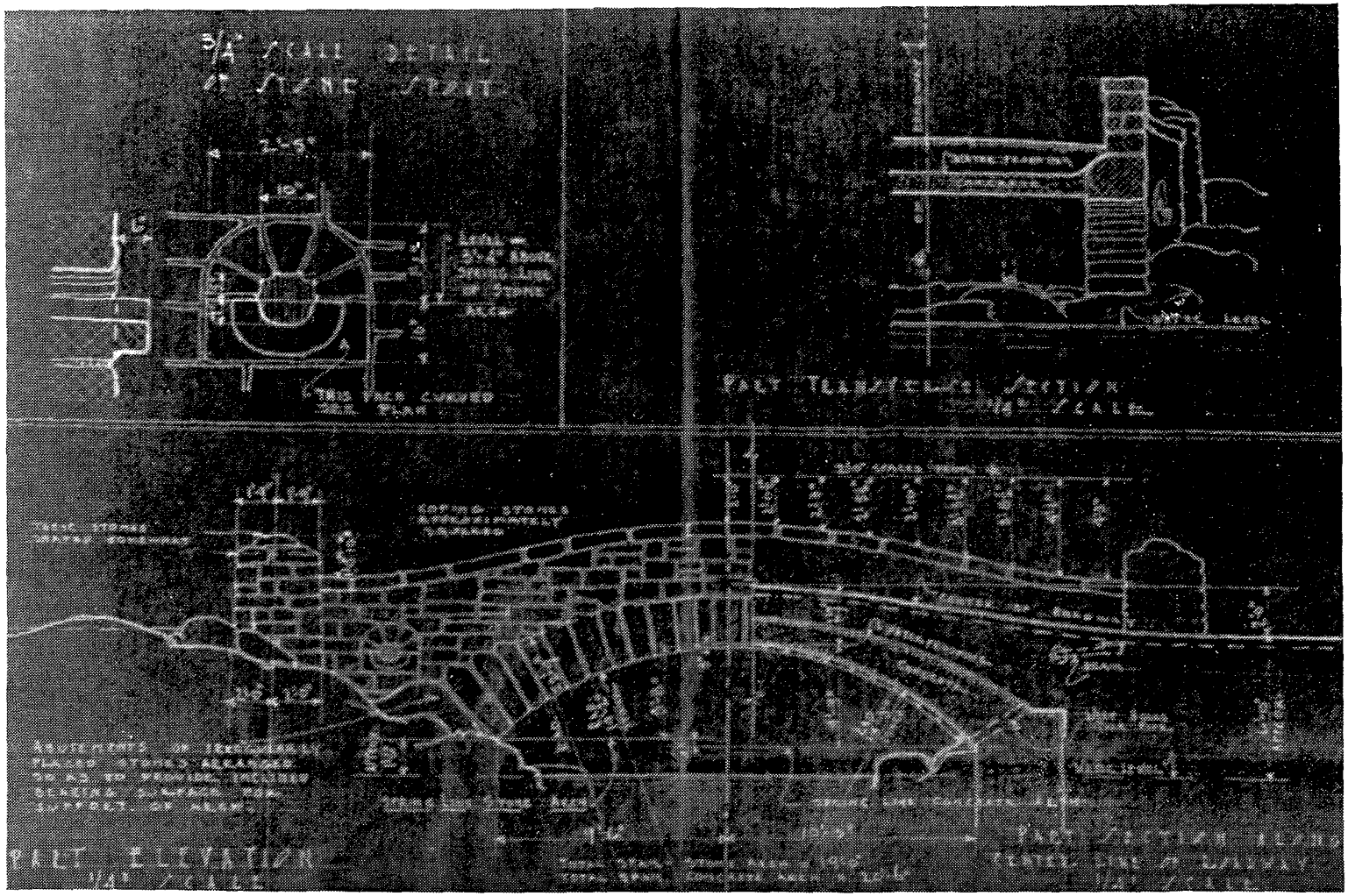


Figure XXXV. Little Harbor Brook Bridge

William Welles Bosworth's final design for this bridge, based on the Gap Stowe bridge in Central Park.



Figure XXXVI. Little Harbor Brook Bridge



Figure XXXVII. Weep Hole on
Little Harbor Brook Bridge

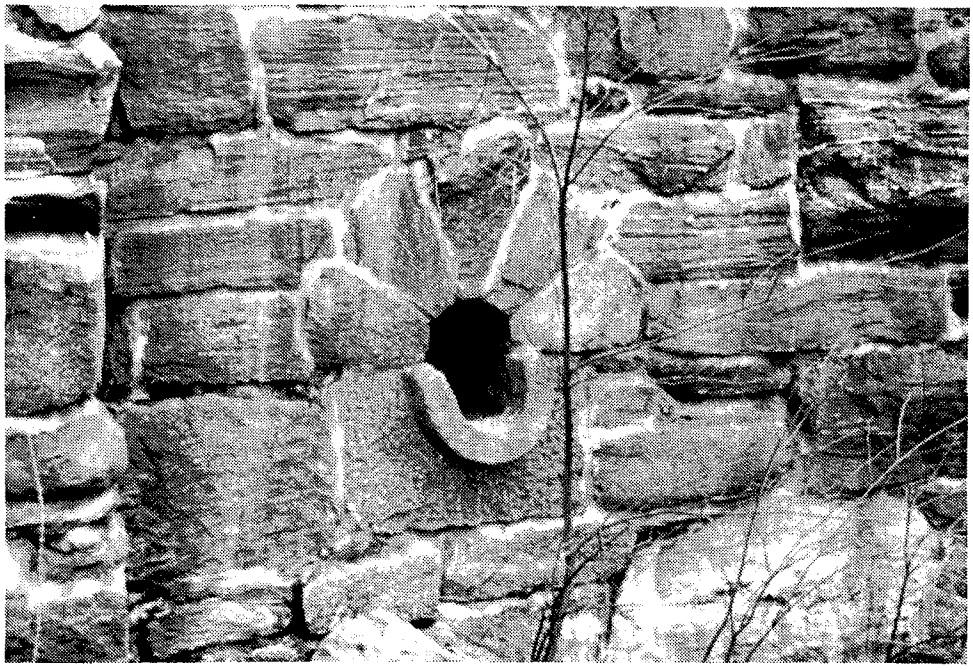


Figure XXXVIII. Weep Hole on
Gap Stowe Bridge

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Rockefeller was also successful in making the trip enjoyable for Charles Simpson, for Simpson was reluctant to charge him for all his expenses. When Heydt asked him about charges which should have appeared on his expense voucher for the trip, he replied:

> In regard to the hotel, etc., expenses of my trip to New York, it went very much against my inclinations to include the car fare for the trip in the bill rendered. It was so nice of Mr. Rockefeller to ask me to his home, and to show me so many courtesies and kindly attentions that I cannot bring myself to the point of charging him with anything more than I already have so I am going to ask to be excused from making any further charge.[193]

The Little Harbor Brook bridge was directly and intentionally based on the bridge over Swan Lake in Central Park; but there is another remarkable parallel to the Central Park bridge. It was the relationship between the key planners of both these bridges. At Central Park, the overall scheme was landscape architect Frederick Law Olmsted's--his was the grand vision. The specific design of each of the bridges was the provence of architect Calvert Vaux. The precise engineering and execution of each bridge was overseen in the field by engineer Jacob Wrey Mould. The grand vision of the carriage road system was Rockefeller's (once again, he reserved for himself the role of the landscape architect). The specific design of the bridges fell to William Welles Bosworth, and the on-site engineering to Charles P. Simpson. In both cases, there was genuine respect and unity of purpose between each of the members of the team; and in both cases all three designers collaborated on decisions regarding the final appearance of the bridge.

The Little Harbor Brook Bridge marked, in addition to a change in style, a change in bridge builders. This bridge was contracted for, not by Clement, as the Cobblestone Bridge had been, but by B. W. Candage, a local building contractor. Although Byron W. Candage was the contractor, it is probable that the work was executed by his son, Samuel (B. W. Candage was 74 years old in 1919; Samuel was 51. Further, B. W. Candage was listed on the 1900 census as a carpenter, Samuel as a mason[194]). The Candages were not strangers to Rockefeller as they were his neighbors in Seal Harbor. Further, B. W. Candage & Son had done more than $50,000.00 worth

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[193]Charles P. Simpson to Charles O. Heydt, June 17, 1919.

[194]*Twelfth Census of the United States*, June, 1900. (Maine State Archives), Vol. 9, ED46, Sheet 3, Line 13.

of masonry work on The Eyrie in 1915 and 1916, and had worked for Rockefeller as early as 1911.[195]

When Simpson was in New York, in May of 1919, he and Rockefeller discussed the point at which Clement, building west on the Little Harbor Brook Road, would meet Joy, building east on a portion of the main Asticou-Jordan Pond Road. On May 12, Rockefeller wrote to Clement from New York:

> Mr. Simpson is here. He has been telling me of the progress of your contract and Mr. Joy's. As you know, I am anxious to have the two ends of the road come together so that the road will be passable for horseback riders this summer.[196]

Rockefeller determined, in consultation with Simpson, that the two contractors were to meet at a point described as Station 53 on Profile #3, which would mean that Joy would build 7,849 feet, and Clement, 7,675 (approximately 1½ miles each). He told Joy that he would be in Seal Harbor on that Friday (May 16), and would want to meet with both him and Joy to look over the ground on Saturday, . . . if not on Friday."[197]

On July 31, 1919, Rockefeller received an accounting from his assistant, Charles O. Heydt, of all the work done by Clement and the amounts received from him from about the first of January, 1914. The elements which are today considered a part of the carriage road system (both Park and private) were:

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[195]Eyrie Construction Accounts.

[196]John D. Rockefeller, Jr., to A. E. Clement, May 12, 1919.

[197]Ibid.

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Barr Hill Road (Clement and Joy), $14,321.40
Mr. Clement's one-half $7,160.70
Barr Hill Extension 10,000.00
Eyrie Roads 18,666.11
Gardiner Road and Bridle Path 5,869.59
Gardiner-Mitchell Hill-Jordan Stream Road,
Clement and Joy contract and extras, $49,167.44
Mr. Clement's one-half 24,583.72
Jordan Pond Road 1,050.13
Jordan Bridge & Gate Road & Bridle Path 8,930.28
Jordan Stream Bridge[198] and Squirrel Brook Bridge
Clement and Joy contract and extras, $3,563.17
Mr. Clement's one-half 1,781.58
Little Harbor Brook Road,[199] (including $3,000 advance) 16,215.31
Long Pond Crossing 7,189.65
Long Pond Bridle Path 3,472.89
Upkeep of Roads ..... 3,291.32[200]

In August of 1919, planning was in full swing for the main Asticou-Jordan Pond road which would connect the Brown Mountain Road with the Jordan Pond House, and pass through a beautiful, isolated valley known as the Amphitheater. On September 30, 1919, Rockefeller contracted with Joy to construct a ". . .[p]ortion of main Asticou-Jordan Pond Road continuing from where the turn is made just north of where Mr. Clement's piece began and going north up around the amphitheater and then south on the west side of Jordan."[201]

By October of 1919, Clement had finished all but 725 feet of the Little Harbor Brook Road and was at work on the Redfield Hill Road and a "new road" which was ". . . all filled and covered . . . as far as the dam [at Jordan Pond]."[202] Clement asked Rockefeller what the new road was to be called. He received a letter from Rockefeller's office informing him that ". . . Mr. Rockefeller has decided to call [the

[198]Cobblestone Bridge.

[199]Unfinished at the time.

[200]Charles O. Heydt to John D. Rockefeller, Jr., July 31, 1919.

[201]Charles O. Heydt to John D. Rockefeller, Jr., August 30, 1920.

[202]A. E. Clement to John D. Rockefeller, Jr., October 25, 1919.

new road] the EAST END ASTICOU JORDAN POND ROAD."[203] It was determined to build a bridge on this section of road near the dam at the outlet of Jordan Pond. Rockefeller wrote to Charles Simpson:

> I went with Mr. Clement this morning myself to the Jordan Stream bridge site, just below the dam. . . . I am hoping to receive from you here, certainly by the end of next week, data giving the height above the water level of the Jordan Stream bridge, the width of the span and the necessary height for the opening.[204]

This third bridge was to be a virtual copy of the Little Harbor Brook bridge--the second bridge modeled after the bridge over Swan Lake in Central Park (Figure XXXIX). Rockefeller wrote to Samuel W. Candage, asking how much saving could be expected since this bridge was nearly duplicate of the previous one. Candage replied:

> In answer to yours of the 25th will say to build the proposed bridge at Jordan Pond with the footings the same as the Harbor Brook bridge using the same waterproofing past, making the roadway 1 foot wider and the walls a little higher using split stone I really do not think I could do it for much less than I did before. I would like to do this work and want to please you when it is done, and I want to be satisfied with it myself.[205]

Rockefeller wrote back, stressing his desire that Candage direct the masonry work in such a way as to assure that the cut stone for this new bridge would be as rustic as the gathered stones used on the Little Harbor Brook bridge:

> . . . I want to reiterate most strongly the importance of not having the stone work on the bridge which you are building near the Jordan Dam too well and sharply cut. It is highly desirable to get as nearly as possible the effect of the Little Harbor Brook bridge, that some of the stones should be of irregular shapes and sizes suggesting a natural rather than artificial condition. If this bridge were to be made as neat, true and fine a piece of stonework as the posts of the gates at my Jordan Pond entrance, it would be a failure. It must be much rougher and more natural. I quite meant what I said in a recent letter, namely, that if you could make this bridge an exact duplicate of the Little Harbor Brook bridge, in very respect except your inability to get the weathered color on the stone, I should regard it as most successful. This, you see, necessarily involves irregularity in the shape of the stone and a lack of evenness in splitting the edges, so as to

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[203]Office of John D. Rockefeller, Jr., to A. E. Clement, October 28, 1919.

[204]John D. Rockefeller, Jr., to Charles P. Simpson, August 30, 1919.

[205]Samuel W. Candage to John D. Rockefeller, Jr., October 2, 1919.



Figure XXXIX. Jordan Pond Dam Bridge, ca. 1920

> reproduce, in so far as possible, the character of the material used in the Little Harbor Brook bridge.[206]

Despite these detailed instructions, and the use of the same drawings and specifications, the execution of the Jordan Pond Dam bridge is more finished than the Little Harbor Brook bridge. The stones are rock-faced, more uniformly sized and laid in a semi-coursed pattern. This was an issue which would continue to be a source of frustration for Rockefeller. On each bridge he admonished the masons make the stone work more irregular and rustic and on each bridge they made it more "neat, true and fine."

So by the fall of 1919, Rockefeller had virtually finished the segments of roads which he had described in his letter and drawing to Dorr of February 8, 1918, by the letters A-G-H-I-J-F (Figure XXXI, Page 87), connecting the Brown Mountain Road with the Gardiner-Mitchell Hill-Jordan Stream Road. Further, he had let contracts with Joy and Clement to finish the main part of the Asticou-Jordan Pond Road, described by points G-B-C-D-E. As with the earlier road, Clement would start at the east (point E on Rockefeller's drawing), Joy would begin at the west (point G), and they would meet in the middle (around point C).

While these roads were funded and directed by Rockefeller, they were within the boundaries of the national park. Dorr, as Superintendent, felt justified in making suggestions about the design and construction of these additions to the Park. He passed his concerns along to Charles Simpson, who forwarded them to Rockefeller. Rockefeller wrote to Dorr, first listing, then dismissing, each of his concerns. His letter reveals his conviction about several of the details of construction, and also the terms under which he was willing to donate work to the Park:

> Mr. Simpson, in writing me of your inspection with him of a portion of the line of the proposed Jordan Pond-Asticou Road, mentioned the following points which you had raised in regard to the road which we are now building:
>
> 1. That the coping stones should be natural boulders and placed much farther apart.
>
> 2. That wherever the wall supporting the road is prominently visible, it should be laid up with natural faced, not quarried, stone.
>
> 3. That the bridges need not be so wide.

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[206]John D. Rockefeller, Jr., to S. W. Candage, December 18, 1919.

4. That minute specifications should be prepared and submitted to youfor approval.

5. That you should have plans and profiles of the roads.

I appreciate your taking the trouble to make these suggestions and want to comment on them as follows, in order:

1. As to using natural boulders instead of broken or quarried fragments of stone, while I agree with you that natural boulders would be softer in appearance, it would add very greatly to the cost and would moreover necessitate disfiguring and marring a great deal of the surrounding country in order to get boulders of the right size and in sufficient quantity. You perhaps do not realize that only a few years will be required to give the present copings a weatherbeaten appearance. Then, too, on some of our older roads you will notice that vegetation has quickly grown up between and around the coping stones, thus helping to hide them and soften their appearance.

I agree with you that to place the coping stones so near that they touch is not desirable. On the road now under construction the stones are about a foot apart. This I have always urged the contractors to do; but wider openings I have not thought would be safe, either for foot passengers or horses, for an opening which gives a sense of lack of protection seems to me undesirable and risky.

This coping costs at the present about 40 or 50 cents a running foot. The stone comes largely from the road itself, often being stone that would otherwise have to be disposed of. To haul weather beaten boulders would, I should think, quite double the expense. You may perhaps have forgotten that rough split stone has been used for the coping along the Sargent Drive, but time has so discolored it that it is not at all conspicuous and it gives the effect of weatherbeaten boulders. . . .

2. While I agree with you that natural faced stone walls would give an immediate effect that would be preferable to quarried walls where the roadway has to be built up, here again in a very few years I believe no one would know the difference, and furthermore, vegetation quickly grows up in front of those walls and covers them. I would show you many such instances along the Barr Hill Road where walls originally exposed are now completely concealed. Since at several points the various roads which I have built on my property and on the reservation are visible from my own house, I am constantly studying this question of coping and walls, and seeking in every possible way within reasonable limits of expense to make these features inconspicuous in the general landscape.

3. As to making the bridges narrower, I do not assume that you would suggest a narrower bridge over the Jordan Stream, which is the first bridge built. The bridge is on a turn, teams are apt to pass on the bridge, 2 or 3 saddle horses abreast require considerable space, and when the stream is full the noise of the dashing water is apt to frighten a horse if he is obliged to go near the side of the bridge. The bridge across Little Harbor Brook is wider than the present road. This I did purposely, because only that portion of the road which lies along the stream is a 12 ft. width. The balance of it is 16 ft. and I felt that it was wise to make the bridge wide enough so that if it should ever be desirable to widen the road, the bridge would still suffice. With a 16 ft. travelled width of road, would you think a bridge of the same travelled width too wide? It hardly seems so to me.

4. As to the preparation for your approval in advance of construction minute specifications, and

5. Plans and profiles of the road lines,-

I had not assumed from the correspondence which you and I had on this subject a year ago last winter that such a procedure was necessary. . . .

The specifications for the roads which I am now building are simply copies of the specifications used in earlier roads. The profiles are made for the convenience of contractors in figuring cuts and fills and estimating for the work. . . . If in your busy life it had been possible for you to come to Seal Harbor during the summer, at some time when I was there and could myself have gone with you over the new work as well as some of our completed roads, instead of having sent me your views through Mr. Clement, Mr. Dodge and Mr. Simpson, I think I could have made clear to you my point of view in regard to certain matters which have arisen in your mind. . . .

When you suggest things that will add to the cost of building these roads, I wonder whether you realize that I am now paying three dollars a running foot for road building (this is very confidential), to which must be added the cost of coping at not less than fifty cents a foot, the very substantial cost of the extensive forestry work and clearing of dead timber, down and standing, which I always do, not only along both sides of a road but as far back as the eye can see into the woods, the work of grading and planting many of the banks, which has been done at quite an extravagant cost, and the cost of bridges.. . . [I]f you do not feel that the work which I have done is of such a character as to justify you in permitting me to continue with the further work which you have authorized, under the general authority given me and on the terms stated in your letter of

> March 12, 1916, I should feel happier to terminate the road-building program. . . . [207]

Dorr's response was delayed but gracious. In his eleven-page letter he responded to each of Rockefeller's points, and said was it was never his intention to unnecessarily increase the cost of construction. Rather, he felt many of his suggestions would result in less cost, would be approved by National Park Service officials in Washington, and would be less likely to draw criticism that the park was being developed ". . . for the benefit and pleasure of wealthy summer residents only, or that the work we are doing is not in harmony with the wild beauty and primeval quality that drew, first the artists and their friends, and then so many here in the early days."[208]

The details of construction they discussed, however, were minor compared to the division of opinion which was forming over the construction of the carriage roads in the Park. Among the summer residents of Northeast Harbor, several of the older residents, who loved to drive carriages and buckboards, welcomed the opportunity to have access to this system of automobile-free roads. Others, however, came to view the ongoing road-building in the wilderness areas with alarm.

When Rockefeller had written to Dorr the previous year that ". . . the horse lovers of North East Harbor are very eager to have some way, if nothing more than a bridle path, opened up from the Brown Mountain Road to connect with our Gardiner-Mitchell Hill-Jordan Stream Road as soon as possible," he was not engaging in hyperbole to sell his project. The Northeast Harbor Village Improvement Society was building bridle trails in the Northeast Harbor area and was interested in making a connection to Rockefeller's Gardiner-Mitchell Hill, Jordan Stream property, thereby insuring a ride, free of automobiles, from Northeast Harbor to the Jordan Pond House, as well as access to Rockefeller's private system of carriage roads and bridle trails.[209] Their solicitation for funds made it clear that they were by no means opposed to "driving" (carriage) roads:

> The Bridle Path Committee of the Northeast Harbor Improvement Society came into existence in the year 1915, following the legislation which admitted automobiles to all parts of the island.

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[207]John D. Rockefeller, Jr., to George B. Dorr, November 19, 1919.

[208]George B. Dorr to John D. Rockefeller, Jr., January 2, 1920, 8.

[209]Circular, "Bridle Path Committee," 1917.

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> Its object has been to make paths suitable for riding along routes so situated that eventually they would connect with the system of roads constructed by Mr. Rockefeller.
>
> . . . It is very much cheaper to make a bridle path than a driving road, but it would be a great advantage to the community if, as time goes on, the liberality of the public should make it possible to widen these paths into good driving roads. The location of the paths is being chosen with that end in view.
>
> The work contemplated for next season, and for which the Committee asks your generous support, is the construction of a bridle path 1¼ miles long which shall connect the present Hadlock bridle path with the magnificent new road constructed last year by Mr. Rockefeller [Gardiner-Mitchell Hill-Jordan Stream Road]. Such a path would start from his road at a point south of Mitchell Hill, extend across Harbor Brook, up and along the north side of Asticou Hill and comes out at the entrance to the Jordan Pond Trail. . . .[210]

This connection was made, not by the Bridle Path Committee, but by Rockefeller. One illustrious admirer of the new section of road was Charles W. Eliot, President of Harvard University and founder of the Hancock County Trustees of Public Reservations. In the fall of 1919, President Eliot wrote Rockefeller:

> . . . Mrs. Eliot and I drove through your new road on Thursday, September 25th, and were filled with admiration of its beauty. Taken together the roads you have constructed are a great asset for Seal Harbor and Northeast Harbor, and indeed for the whole Island. Mrs. Eliot and I felt obliged to sell our horses and carriages when we left Mount Desert on Sept 27th - a fortnight earlier than we meant to; but we cherish the hope that we shall be able to drive over your roads next summer with horses hired at the stable which I hear is to be established in connection with the Jordan Pond House. . . . The roads you have constructed, and mean to construct, will further protect the natural and quiet enjoyments of Mount Desert against destruction by the rushing automobiles.[211]

Not all of the summer residents of Northeast Harbor, however, were as complimentary of these new roads. After this connecting link had been made, from the Brown Mountain Road to the Gardiner-Mitchell Hill-Jordan Stream Road, and new contracts were let to build the remainder of the Asticou-Jordan Pond Road (Amphitheater), apprehension began to be expressed by some Northeast Harbor summer residents. An informal meeting of the Northeast Harbor Village Improvement Society was

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[210]Ibid.

[211]Charles W. Eliot to John D. Rockefeller, Jr., October 2, 1919.

held at the house of Lincoln Cromwell, President of the Northeast Harbor Village Improvement Society. George Wharton Pepper, a prominent Philadelphia lawyer (and summer resident of Northeast Harbor) expressed his opposition to the roads on the basis that they disfigured the natural scene.[212] Others joined opposition to the portion of the Asticou-Jordan Pond Road which passed through the Amphitheater. George B. Dorr vigorously and effectively defended the roads, but in the fall of 1920, bowing to the concerns of these summer neighbors, Rockefeller terminated work on the main portion of the Asticou-Jordan Pond Road.[213] The project would remain dormant for more than a decade, but not abandoned permanently. For the immediate future, however, he limited carriage road construction work to that on his own property, concentrating on the area north of the connection to the Brown Mountain Road, and south and east of Upper Hadlock Pond.[214]

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[212]Lenard E. Brown, *Acadia National Park, Maine: History Basic Data*, (U. S. Department of Interior, February, 1971), 79.

[213]George B. Dorr, *Acadia National Park: Its Growth and Development* (Bar Harbor: Acadia Publishing Company, 1985), 17.

[214]John D. Rockefeller, Jr., to Sam Candage, May 18, 1923.

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SEQUENCE OF DEVELOPMENT

Part II -- Expansion

When Charles Simpson fell ill in the summer of 1921, he called on his son, Paul D. Simpson, who was also trained as an engineer, to assist him. On August 1, 1921, Rockefeller wrote *four* letters to Paul Simpson, outlining a greatly expanded vision for the carriage road system in the National Park. By this time, World War I had ended, Rockefeller's personal wealth had increased dramatically,[215] and the cost of road construction was declining (Appendix XI). This combination of circumstances allowed Rockefeller to undertake expansion of the carriage road system on a much larger scale.

Each of his four letters outlined a different project for the younger Simpson to undertake. The first, described in "Letter A," was a carriage road circuit from the Jordan Pond Road to the north end of Bubble Pond and a return by a lower, more southerly route:

> Starting from the Jordan Pond Road opposite my Jordan Pond Road gate, to go between the southern end of Pemitic [sic] Mountain and the Triads, to continue around the Eastern end and side of Pemitic some two hundred or three hundred feet above Bubble Pond, to descend at the northern end of Pemitic where the ground flattens out, make a turn to the East and the South where a view at the north end of Bubble Pond would be obtainable, then to follow the present line of the bridle path along the west side of Bubble Pond until the southern end is nearly reached.
>
> From that point to keep to the west of the Boyd Road, skirting around the lower slopes of Pemitic and the lower western and southern slopes of the Triads, passing through property owned by Charles Clement at a point a few hundred feet from the Wildwood Farm Road, thence back of Mr. Dane's place, over the rocks, continuing on around the lower southern slopes of the Triads and returning via the western slope of the triads until at a point some hundreds of feet from the starting point on Jordan Pond Road the outward bound road was reached, thus making a circle.[216]

Rockefeller went on to describe the desirable grades and points of potential views on both the outward-bound and the return road, and passed along descriptions of

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[215]Harr and Johnson, 198.

[216]John D. Rockefeller, Jr., to Paul D. Simpson, Letter A. - Bubble Pond Survey, August 1, 1921.

the ownerships through which the road was to pass. The route Rockefeller described was more than six miles in length. He requested both a route survey for the road and boundary surveys for land acquisition. The lower, or return, route was eventually built. It was called the Bubble Pond Road, and it now connects the Jordan Pond Gate Lodge with the north end of Bubble Pond.

The second project was a road to connect the Asticou-Jordan Pond Road at each end, around the north of Sargent and Jordan Mountains, creating a circuit of Jordan, Sargent, Little Brown's, and Cedar Swamp Mountains. Rockefeller wrote in "Letter B":

> I would like to have the road line run from some point on my Asticou-Jordan Pond Road on the west side of the southern slopes of Sargent Mountain to the Falls, thence around Little Brown Mountain around the northern slopes of Sargent and Jordan, back along the eastern slopes of Jordan above Jordan Pond to connect with the road which I built last winter, starting from the stone bridge at the Jordan Pond dam.[217]

In the same letter, he also asked Simpson to "please exhaust the possibilities of a branch through some of the gorges to the East of Little Brown Mountain." This second project amounted to more than seven miles of surveying and road design work.

The third project, described in "Letter C", was a carriage road which would connect the road described in the second letter with an existing road which ran along the eastern side of Eagle Lake. This road section would be approximately one mile in length.

Rockefeller then outlined the fourth project in "Letter D" as follows:

> Mr. Dorr is anxious to have completed the survey for the National Park, which your father started last year for an automobile road from the Eagle Lake Road running on the east side of Eagle Lake to the Jordan Pond Road, passing along the eastern banks of Jordan Pond on the western slopes of Pemitic Mountain.
>
> . . . In surveying the road just referred to, it is desirable to keep in mind the possibility of a road running from the northern end of Bubble Pond near the southern end of Eagle Lake, thence around to the road referred to in either Letter B or C written you under this same date.

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[217]John D. Rockefeller, Jr., to Paul D. Simpson, Letter B - Jordan-Sargent Mountain Survey, August 1, 1921.

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> I should hope that since this last mentioned road would be for horses, it would be possible for it to pass either under or over the automobile road described in this letter so that the two roads would not intersect on the same level. [This was ultimately accomplished with the Bubble Pond Bridge.]

This automobile road was approximately two and one-half miles in length. In addition, he asked that several boundary lines be run for the National Park. Regarding the timing of this work--some seventeen miles of preliminary road surveys and design, and a great deal of associated boundary surveys--Rockefeller added:

> It is obvious that the work outlined in my letters to you of this date marked A, B, C, and D will require all of your time until winter sets in and probably some months in the spring.[218]

Whether Rockefeller actually expected that this quantity of work could be done by a single engineer with a small field crew, in steep and wooded terrain, in a few months is unknown. It is virtually certain, however, that the younger Simpson was wondering what he had gotten himself into. It was, of course, an impossible task; and work on pieces of the program outlined in these four letters was still underway several years later. The work was far enough along, however, for construction to begin on one important segment the following year. On July 12, 1922, Rockefeller wrote to George B. Dorr:

> . . . On various occasions for some time past you have told me of your feeling that it was of the utmost importance to connect the driving roads in the National Park on this side of the Island with Bar Harbor, so that the people on that side might have easy access thereto. You have intimated that if a road could be built from Jordan Pond, on the West side of the Pond, through the pass between Jordan and Sargent Mountain and the Western Bubble, connection could be made, if necessary, with the old Wood Road which runs from that vicinity out to Eagle Lake Road. You have further told me that as soon as the general plan for road building in the Park which you have recently laid out has been approved by the Department you would like to begin work upon this road if funds were available, but that thus far no sufficient sum for such an undertaking was available or in sight. Realizing how much it will mean to the horse lovers of Bar Harbor to be able to get into the Park from the Bar Harbor side of the Island, I will contribute whatever amount may be necessary up to $25,000 to enable you to build this connecting link, the money to be paid from time to time as required by the progress of the work, but this pledge not being good unless availed of within two years from date.

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[218]John D. Rockefeller, Jr. to Paul D. Simpson, Letter D., August 1, 1921.

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> If you should decide to go ahead with this work, may I suggest that the road be so laid out, if that should prove to be practicable, as to form the first part of a road around Jordan and Sargent Mountain on the North, joining the present Park roads back of and to the South of Upper Hadlock Pond, should such a road ever be deemed desirable.[219] [Rockefeller must have felt confident it would be, as this is one of the lines he had already directed Paul Simpson to survey.]

Dorr wasted no time in accepting Rockefeller's offer, and Rockefeller wasted no time in getting the project under way. This was not to be simply a pledge of funds for Mr. Dorr's disposal in the construction of a road in the Park. The road was designed by Rockefeller's new resident engineer, Paul Simpson (now a full-time Rockefeller employee, rather than an independent consultant as his father had been). The road was to be built by Rockefeller's road contractor, A. E. Clement. Rockefeller not only sent Dorr the specifications and contract for this road, but also authored a letter to be signed by Dorr offering the work to Clement. He had negotiated the contract with Clement prior to sending it to Dorr. His letter conveying the specifications, contract, and cover letter for Dorr's signature was written on Saturday, July 15, only three days after the initial offer was made, indicating that the matter had been planned for a good while before the official offer and acceptance were made. Rockefeller wrote to Dorr:

> . . . In line with your own illustrious example, I am enclosing herewith a draft of such a letter as you may care to write Mr. A. E. Clement, Seal Harbor, with reference to the construction of the piece of road on the West Side of Jordan Pond, when the Government's approval thereto is secured. This letter is the result of negotiations with Mr. Clement; it has been read to him and meets with his approval in all respects. If you desire any information in regard to the various matters therein referred to, I shall be glad to give it to you. This is such a contract as I would let were I contemplating such a road; it is in line with the contracts under which I have done work on my own property and the price has been adjusted to meet the particular piece of road under consideration. I feel it is a fair price and the best at which Mr. Clement would be willing to do the work.

And with noteworthy understatement, he added:

> . . . Please understand this is only a suggestion.[220]

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[219]John D. Rockefeller, Jr., to George B. Dorr, July 12, 1922.

[220]John D. Rockefeller, Jr., to George B. Dorr, July 15, 1922.

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Figure XL. Rockefeller's Engineering Office in Seal Harbor, Maine

If Dorr resented this "just sign on the dotted line" approach, he did not show it. On August 3, as Superintendent of LaFayette National Park, he wrote:

> . . . I have been over the form of contract you asked me to examine with reference to construction of the section of road defined in the contract and have submitted it to and talked it over in detail with Mr. Lynam and Mr. Simpson, and as applied to the section of road contemplated it seems to us admirable, covering all points.[221]

In September, Rockefeller modified both the draft letter and the specifications. However, the specifications remained essentially the same as for the Little Harbor Brook Road and the Gardiner-Mitchell Hill-Jordan Stream Road (Appendix XIV and XVI). By early October, Clement was at work on the new road. Dorr wrote to Rockefeller, on October 3:

> . . . Yesterday I walked over the road Mr. Clement is building. He will soon reach the commencement of the rock fall with a road available for teaming. Last night I talked with Mr. Simpson and we agreed it is important to commence work on the rock fall sections as soon as a derrick and an anvil can be taken to it [Figure XLI]. I am anxious to get the utmost possible done this autumn on the rock fill section so that it can be finished in the spring and a road be shown across it next June that will not provoke criticism through being seen in an unfinished state or need to be justified.[222]

Dorr's concern about criticism and the "need to be justified" proved to be well founded. He was also justifiably concerned about the difficulty of constructing the road across the rock-slide (Figure XLII) above Jordan Pond. He reported to Rockefeller:

> . . . I crossed the rock fall on leaving the section Mr. Clement is at work upon and studied it from the construction point of view. No blasting can be done upon it, lest it jar the often delicately balanced rocks and bring them down . . . . It is a critical piece of work both from the engineering and landscape points of view. I plan to spend myself considerable time upon it, consulting as the work goes on with Mr. Simpson. . . .[223]

Mr. Dorr was now inserting himself into the relationship between the engineer, Mr. Simpson, and the contractor, Mr. Clement, which had, in the past been solely

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[221]George B. Dorr to John D. Rockefeller, Jr., August 3, 1922.

[222]George B. Dorr to John D. Rockefeller, Jr., October 3, 1922.

[223]Ibid.

175 176p



Figure XLI. Construction Equipment

Derrick, left; stone sled, right; crawler tractor, center; and power crane, background.

Rockefeller's role. Mr. Clement, for one, came to bitterly resent Mr. Dorr's "consulting." Unlike the incident three years earlier when Dorr incurred Rockefeller's displeasure by suggesting changes, Clement was now officially under contract to the Park, not to Rockefeller. Dorr's political acumen and optimism, however, are in evidence when he described to Rockefeller the reason for his concern:

> . . . It is the section of the work now planned that is the most liable to attack, on the ground that Mr. Walcott took of disturbing a natural scenic feature, and it is from my own point of view as superintendent the section most important to secure for Park connection and control. The situation in Washington is now entirely favorable to our plans. Changes are always liable to occur and different influences to come in, and it will be well in my judgement to get past what I look on as the danger point from the point of view of opposition, and into plain sailing and a clear field beyond.[224]

Clement was under contract to the federal government to build this new road. Funds were supplied by Mr. Rockefeller and administered by A. H. Lynam, a Bar Harbor attorney, whose firm served as Rockefeller's legal counsel on Mount Desert, and also served as the Assistant Superintendent of the Park. On October 11, 1922, Rockefeller wrote to Clement, making an extraordinary offer to his old road builder. It was an offer which would give Rockefeller's bookkeepers fits for years:

> I understand that you are building a road on the west side of Jordan Pond for the Government [an unusual opening from the man who authored the contract]. . . .
>
> Because of the interest with which I am watching the development of the National Park, because I know how much time and thought you will give to the carrying on of this construction so that it will mar the country through which it passes as little as possible, because of our friendly neighborly and business relations for many years past, and because I should be sorry to see you make less than, say, ten or twelve per cent on the job, I am volunteering to make you the following guaranty:
>
> . . . The premiums for the accident liability insurance on the men are being deducted from your compensation as Superintendent. If at the end of each month when your statement of account is sent Mr. Dorr, your compensation before the premiums on the liability insurance are paid does not equal twelve per cent of the work billed to Mr. Dorr on the basis above mentioned, I will pay you the difference between the actual compensation which you receive each month

[224]Ibid.

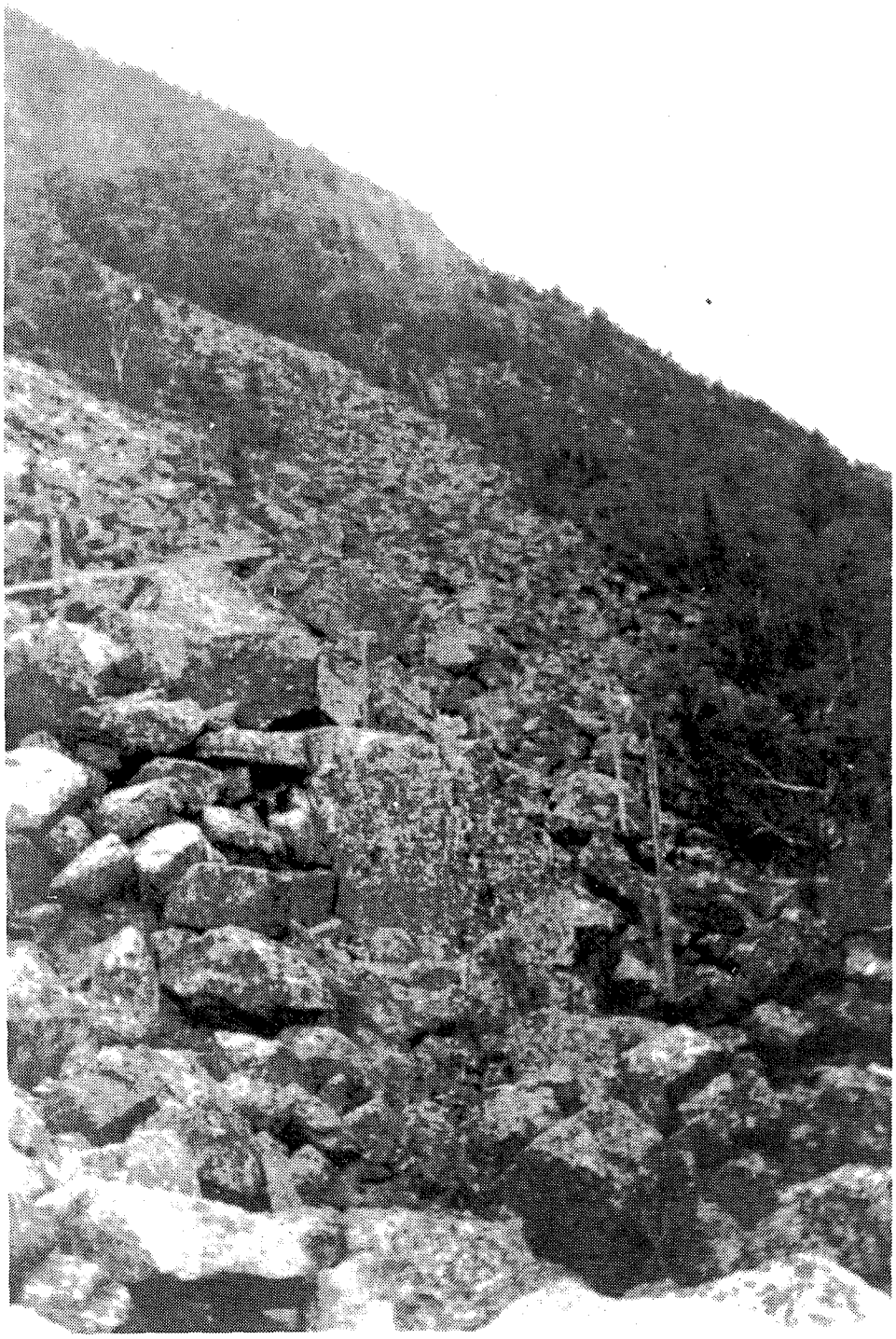


Figure XLII. Engineer's stakes for road rock-slide, ca. 1922

201 202



Figure XLIII. Rock-slide work above
Jordan Pond, ca. 1923

203 201
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and twelve (12) per cent of the above net costs for the month, aside from your compensation.[225]

In early November, Mr. Clement wrote to Rockefeller, indicating that Dorr, as he said he would be, was "consulting" on the progress of the work. He appealed:

> We have been the whole length of the 3550 ft. and have half the length graded and the balance about two thirds done. We have gone in over the rough place to the dangerous part of the slide. We have just commenced on the edge of the slide. Mr. Dorr was over Thursday, and he suggested some changes in the grade. Now I have been over the line with Mr. [Paul] Simpson and I had rather not make any changes unless I find something I can't overcome.[226]

Rockefeller wrote to Lynam suggesting that Dorr should not attempt to overrule the judgment of these men with professional and practical experience in the matter:

> . . . In the last paragraph of his letter of Nov. 4 to me, you will note Mr. Clement says that Mr. Dorr had been over to Seal Harbor and that he suggested some changes in the grade on the edges of the rock slide at the upper end of Jordan Pond; that later Mr. Clement went over the line with Mr. Simpson, and felt that it was better not to make any changes unless some difficulty were encountered. Since Mr. Simpson and Mr. Clement have both studied this question many times carefully, I should assume that Mr. Dorr would probably not want to insist on a change in the present alignment which these two men agree upon, unless he feels very strongly that it would be an improvement. . . .[227]

The same day, Rockefeller wrote to Clement, informing him of his judgment and actions in the matter:

> I have told Mr. Lynam that in view of the view which you and Mr. Simpson hold that the present alignment and grade across the rock slide at the upper end of Jordan Pond is the best route, you were hoping that Mr. Dorr would not urge any change unless obstacles now unforeseen should arise. You will doubtless hear from Mr. Dorr or Mr. Lynam on this matter. . . .[228]

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[225]John D. Rockefeller, Jr., to A. E. Clement, October 11, 1922.

[226]A. E. Clement to John D. Rockefeller, Jr., November 4, 1922.

[227]John D. Rockefeller, Jr., to Fred C. Lynam, November 14, 1922.

[228]John D. Rockefeller, Jr., to A. E. Clement, November 13, 1922.

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It was quite characteristic of Rockefeller to trust the judgment of his men in the field. These letters also demonstrate Rockefeller's continuing assertion of his position as patron. The cooperation between Dorr and Rockefeller was at the core of the creation of Acadia National Park, as we know it today; but their relationship was not without tension--particularly in regard to the construction of the carriage roads in the Park. In an interview in 1988, Charles E. Peterson characterized the relationship between Rockefeller and Dorr as "cautious." He said that while Rockefeller approached the design and construction of roads in a highly professional manner, ". . . George Dorr was a real complete amateur. . . . he would get a horse and scoop and some laborers and build a little piece of road, and he would stand back and look at it. Well, that wasn't quite what he had in mind, so he would have them smooth it over and try something else. . . . Rockefeller had his playground and George Dorr had his, and they interconnected at times. In a funny way, they were sort of rivals."[229]

The rock slide to the west of Jordan Pond which concerned Dorr was indeed a difficult engineering and construction task. The work went extremely slowly, and, for this reason, eventually resulted in the purchase of a steam shovel. A letter from Charles Heydt to Rockefeller demonstrates the magnitude of the difficulty imposed by the rock slide and the great benefit of the steam shovel (Figure XLIV). Heydt outlined the distance of road constructed, the time of construction, and cost:

3,650 ft. of easy construction	3 mo.	$4,794.39
550 ft. of rock slide	1 year and 10 mo.	$46,208.41
2,950 ft. of rock slide and other	8½ mo.	$40,833.24

> . . . with the use of the shovel, there has actually been completed in one-third of the time, nearly three times as much of the rock slide work. . . .[230]

During the same time that Clement was building the road on the west side of Jordan Pond, Joy was at work on the west side of Sargent Mountain, on land owned by Rockefeller, building north. It is apparent that Rockefeller was working toward a circuit of Jordan, Sargent, Little Brown (now Parkman) and Cedar Swamp Mountains. This western property was miles from his Seal Harbor Property. The improvements he was making on the western land made little sense as a private endeavor. It is obvious that his plan was to make logical connections to other roads being constructed in the Park, and then donate this land to the Park. He ultimately did just that.

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[229]Charles E. Peterson, conversation with the author, April 15, 1988.

[230]Charles O. Heydt to John D. Rockefeller, Jr., June 1, 1925.



Figure XLIV. Steam Shovel

"[W]ith the use of the shovel, there has actually been completed in one-third of the time, nearly three times as much . . . work." C. O. Heydt

The carriage road as planned around Sargent Mountain required the construction of two bridges very near each other to cross streams that eventually combine to form the Hadlock Brook and feed the Hadlock Ponds. In May of 1923, Rockefeller wrote to Samuel Candage, his masonry contractor:

> We are building a road around the west side of Sargent Mountain and the south side of Little Brown Mountain, which goes among the hills back of Upper Hadlock Pond. We started from our old road near the Brown Mountain highway two years ago and have been making slow progress. We started last fall from the Brown Mountain Road at the highest point on that road, and are working in on the south side of Little Brown Mountain to meet the other road.
>
> There are two bridges involved on this road [Hemlock and Waterfall] . . . . I am having plans prepared for both these bridges. They will shortly be sent to you direct or taken up with you by Mr. Simpson.
>
> . . . I should fancy that surely within a month . . . your men would be able to get in to begin to select and quarry, in places near by the bridge, the stone they will require, also to prepare for the foundations, the concrete work, etc . . . .[231]

On May 28, 1923, William Pearsall, of Welles Bosworth's office, sent the plans and specifications for the Hemlock and Waterfall Bridges to Samuel Candage and Paul Simpson.[232] Three days later, Pearsall wrote to Rockefeller about how the drains for the central portion of the bridge might be designed, and suggested that drains be omitted for the roadway as it crosses the bridge.[233] Characteristically, Rockefeller deferred to his men in the field. He wrote to Pearsall on June 7," . . . [t]he matter of the drains it seems to me is one which Mr. Simpson, who is the engineer on the ground, and Mr. Candage, the stone mason, can deal with more wisely than I. I have asked for their views on the matter."[234]

These two bridges are very different from each other and distinct from the other bridges built up to that time. Bosworth designed both of them to take advantage of the dramatic topography at each location. The parapet walls of the Hemlock bridge form sweeping curves to follow the curve of the roadway and end in spiraled end posts. The

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[231]John D. Rockefeller, Jr., to Sam Candage, May 18, 1923.

[232]William R. Pearsall to Paul D. Simpson, May 28, 1923.

[233]W. R. Pearsall to John D. Rockefeller, Jr., May 31, 1923.

[234]John D. Rockefeller, Jr., to Mr. Pearsall, June 7, 1923.

high lancet arch which bridges the stream is flanked by two smaller false arches on the downstream side which surround the weep holes in the spandrel walls. The barrel is also entirely stone faced as it is completely visible.

In 1925, the Waterfall bridge, one-tenth of a mile away from Hemlock, was completed. It is literally built into the stone around it, and again, although the stone-work differs, its parapet walls curve with the road and end in spiraled end posts. Its arch, however, is semi-circular and is flanked, not by small false arches, but by two round buttress-like towers which form lookouts at the parapet level. From these lookouts, there is a view of the waterfall on the upstream side, and a vista (now obscured by overgrown trees) across the Hadlock Ponds to the ocean beyond. The curve of the bridge and the semi-circular arch result in a skewed barrel which is also faced with stone as it is visible in approaching the bridge.

Several factors combined to make the construction of both these bridges a difficult and expensive process. First, access to the sites of both bridges was very difficult. Getting the necessary stone to the area proved challenging. Second, by this time, Charles Simpson was no longer playing an active role in the construction. His son, Paul, was overseeing the construction of his first bridge on the carriage roads when Hemlock was built. This resulted in both communication problems and financial misunderstandings. As a direct response to the difficulties encountered in this regard, Rockefeller hired a superintendent to oversee construction work on his estate as well as on the carriage roads. This superintendent essentially became a general contractor, using his own crews to build many of the carriage roads themselves and several bridges.

Paul Simpson solved the problem of getting stone to the site, although not until serious consideration was given to building the bridges entirely of concrete. Candage wrote to Rockefeller in June, 1923, explaining the problem and outlining his solution:

> . . . My object mostly was to find a suitable place handy that the stone to build two such bridges out of could be quarried. This we could not find. I think they could be got at the Sound but it is a long haul, at least three miles. It would be a nice chance to set up a crusher and build them of concrete. Then if it could be arranged to make the arches about the same size the same forms could be used for both. The ugly pieces of stone could be used for fill in the piers. They could be finished outside with a dark colored cement. These suggestions I have made as my idea of the most practicable way to do this work at this particular place.[235]

[235]S. W. Candage to John D. Rockefeller, Jr., June 9, 1923.

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Paul Simpson elaborated:

> In my earlier letter on this subject I advised you of the difficulty Mr. Candage and I found in locating suitable stone near the bridge sites. Since then I have found some good stone about half a mile south of the Waterfall site - but this would not be available for work on the Hemlock bridge this summer. If we made the stone masonry construction as planned it will probably be necessary to haul the stone for this season's construction from Brown's quarry, as stated in my earlier letter. Of course if we could use concrete masonry here it would simplify matters considerably, for reasons which are obvious - from the point of view of economy and saving in time. On the other hand stone masonry would, in my judgement make the better appearance.[236]

He goes on in the same letter to make several other recommendations regarding the engineering details of the bridge. Rockefeller informed Bosworth of these recommendations from both Candage and Simpson, going so far as to suggest he give consideration to a concrete bridge. Bosworth agreed with the engineering changes but held fast on the issue of stone masonry. Rockefeller telegraphed to Simpson: "Bosworth strongly opposed to cement bridges as inappropriate to location. His office sending today revised engineer's specifications based on your suggestions. Please have Candage figure cost of Hemlock bridge in stone and wire me how soon will work road to the bridge be ready."[237]

Stone it was, although Candage's estimate of $42,120 tested Rockefeller's conviction that in this instance aesthetics should prevail over economy. He wired to Simpson: "Assumed Hemlock Bridge about same size as Jordan Stream Bridge [Cobblestone] which cost under $5,000 in 1916. Supposing labor and material now twice as expensive. On this basis if my assumption correct Hemlock bridge should cost around $10,000. Please wire tonight how you explain Candage's estimate which is more than four times as much."[238]

After a flurry of telegrams and letters about the cost of the bridge, and getting an estimate of $27,000 to build the bridge in concrete, the following letter was sent to Candage:

> I am sailing tomorrow for Europe. I want to go ahead with the Hemlock bridge without delay. I feel that a cement bridge would not be appropriate for the location an that we must use stone as originally planned and as shown on the drawings.

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[236]Paul D. Simpson to John D. Rockefeller, Jr., June 9, 1923.

[237]Telegram: John D. Rockefeller to Paul D. Simpson, June 15, 1923.

[238]Telegram: John D. Rockefeller, Jr. to Paul D. Simpson, June 21, 1923.

> I am unable yet to understand why the bridge should cost as much as you have estimated. Mr. Bosworth's office tells me that the amount of stone work in the Hemlock bridge is about two and one quarter times the amount in the Jordan Stream bridge. In addition the stone is of a different character and probably will require more time and labor to prepare.
>
> The Jordan Stream bridge cost less than $4,000. Assuming that the increase in labor and material would make that bridge cost today $10,000, and assuming that Hemlock bridge has in it two and one quarter times as much stone work as the Jordan Stream bridge, the cost of the Hemlock bridge would be $22,500.
>
> Of course, I realize that it may be somewhat difficult to get the stone required and that the cut stone for the arches may have to be hauled some little distance, both of which items would add something to the cost.
>
> I am hopeful that this bridge can be built for certainly not more than $30,000 and perhaps nearer $25,000. Under the circumstances I think the best thing to do is for you to build it on a cost and percentage basis, for I know that you will keep the cost just as low as is possible and have the finished result which it ought to be. I therefore authorize you to proceed with the work on this basis. I should hope that you could start quarrying stone at once so as to have the stone ready by the time the work road to the bridge site is in. I should hope you could also do the necessary preparation at the site and order lumber, steel, cement and any other materials required so that when you can actually begin building there will be no unnecessary delays.[239]

The ironic conclusion to this story is that the bridge finally cost $58,619.80. If Rockefeller had accepted Candage's lump sum bid of $42,120, Candage would have had to absorb the overrun. On a cost plus percentage basis, however, Rockefeller was obliged to pay Candage his actual costs plus a percentage for profit on the work. After he and Candage had studied all the costs involved, they struck a bargain. Candage agreed to cut in half his profit for the work which exceeded his estimate. Since he had already been paid for the entire profit, he returned $512.58 to Rockefeller. Rockefeller then magnanimously replied:

> . . . Because of my high regard for you and the warm friendship which has always existed between us, I would not be happy at any time to profit at your expense through a technicality in an specific arrangement, any more than I believe you would be willing to profit in such a way at my expense. Our relationship must

[239]John D. Rockefeller, Jr., to S. W. Candage, June 23, 1923.

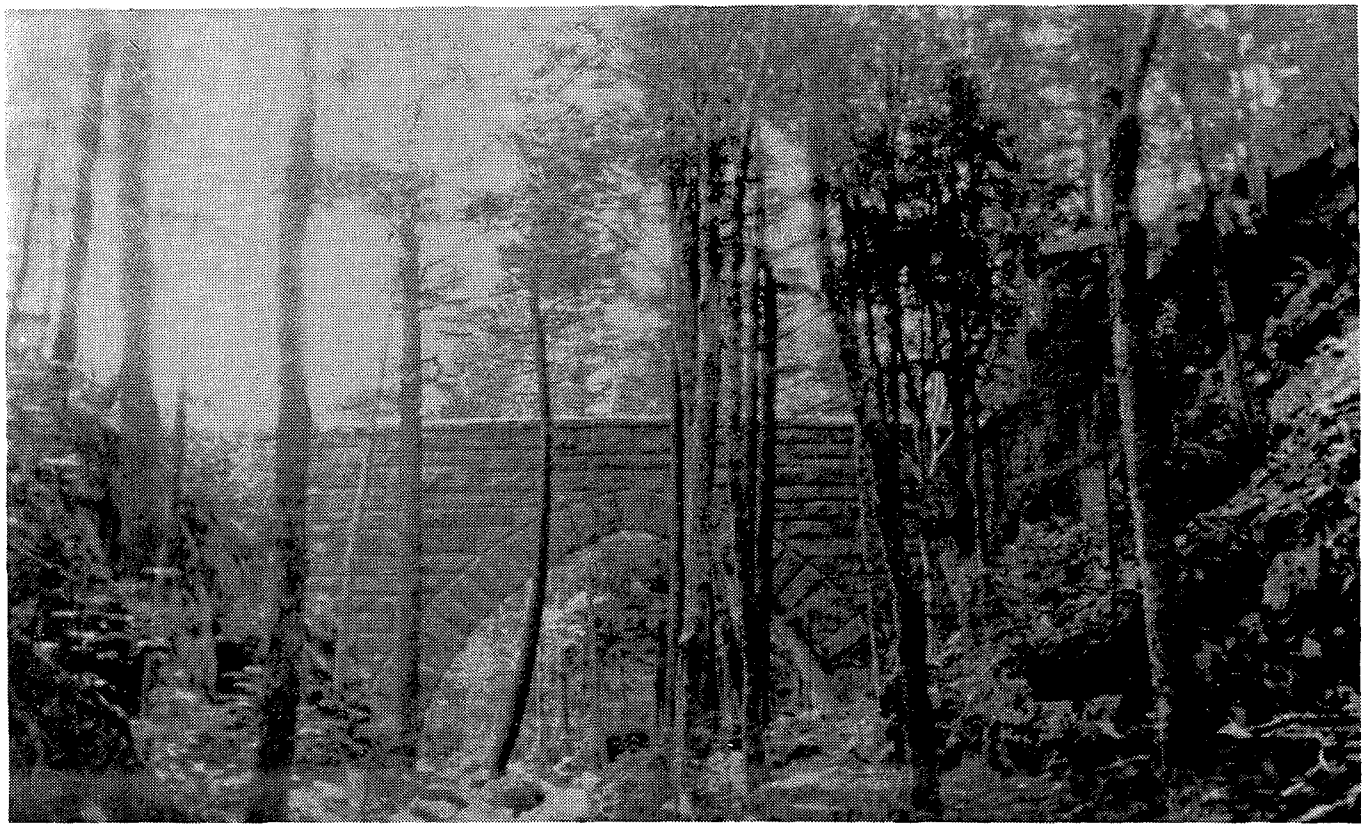


Figure XLV. Hemlock Bridge, ca. 1926

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Figure XLVI. Workers removing "centering" from Hemlock Bridge

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be a mutually satisfactory and advantageous one, and that is what we both want. From this point of view, I cannot be happy or satisfied in the thought that on neither the Little Harbor Brook bridge, which my records show cost $2,843.08, or the Jordan Pond Dam bridge, which my records show cost $2,375.11, did the contract price leave any percentage of profit over and above the actual cost. Therefore, the first step I want to take, looking toward a mutually satisfactory and advantageous adjustment of the bridge question, is to enclosed herewith my check for $836.73 being your usual 15% profit on these two bridges.[240]

He also took steps to ensure more careful financial monitoring in the future. Through Heydt, he queried Simpson about the reasons for the overrun. Simpson responded very carefully and completely:

I have received your letter of June 18th in reference to cost of work on Hemlock Bridge. I was somewhat surprised at the total of payments to date - as I had hoped and believed that the total cost would fall below the estimate. The accounts have not been going through my hands - and I did not realize they had reached such a large total.

There are a number of causes for the cost over-running the estimates, some of which are mentioned below, in the order of their importance.

1. Winter conditions. The work was carried on through the winter, during which time, in my opinion, the costs were increased almost 100%. Snow and ice and freezing weather made operating conditions in the quarry and at the bridge site very difficult. The cost of transportation of materials was increased on account of the difficulty of keeping the supply road in condition. The water and materials for the concrete had to be heated by steam, for which special machinery had to be installed. The cost of stone cutting in the open was increased, and all labor was less efficient than in warm weather. For efficiency and economy the work should have been suspended during the winter months. The desire to complete the work as early as possible and to keep up the organization ruled however - at the expense of economy.

2. Class of work. The masonry has really been of a somewhat better class than was contemplated in my estimate. In building the next bridge I should advise making coarser joints - which would decrease materially the cost of stone cutting and laying, and which, I believe, would be perfectly satisfactory for bridges in this location. It might also be well to consider rubble instead of squared stone masonry - or making concrete walls, with stone facing.

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[240]John D. Rockefeller, Jr., to S. W. Candage, February 21, 1924.

3. Foundations. On account of conditions found beneath the surface it was necessary to go considerably deeper for foundations for the abutments than was thought probable, which correspondingly increased the amount of excavation and masonry.

4. Preparatory work. The quarry was opened and developed to supply stone for both the Hemlock and Waterfall bridges - and a certain amount of this work should be charged to the Waterfall bridge.

5. Increase of wages. During the progress of the work there was a general increase in wages, which would add somewhat to the cost of the work - but to what extent I do not know without going into the accounts.

6. Equipment. On account of crammed quarters, conditions for handling the stone and materials were difficult. Better equipment for handling the stone would have reduced the cost to a small extent. Mr. Candage has now installed a power hoist and is in better shape for the work on the next bridge.

All the work has been thoroughly and honestly done - and Mr. Candage has done his best to do the work efficiently. I am confident he was anxious to make the cost come within and below the estimate. The local conditions were especially hard. Conditions are much better for building the Waterfall bridge and if he does that work I think the results will be found to be satisfactory.[241]

Heydt's conclusions were that the contractors were honest but not sufficiently organized to get the best results, and that Simpson should be reviewing the bills. Rockefeller, instead of relying on Simpson, hired a superintendent to keep a watchful eye over the progress and cost of the work. Simpson's description of building in winter conditions did not go unnoticed. Care was taken throughout the remaining construction of the carriage road system to ensure that construction was stopped when winter weather set in.

Despite the optimistic predictions that the Waterfall bridge would cost significantly less, the cost of construction again exceeded Candage's estimate of $35,000. The final cost was $44,103.81. Again, Candage agreed to take only half of his usual profit on the work which exceeded his estimate. A final, interesting note about the Waterfall Bridge is that a scale model was built by the firm of Neumann and Evan, at Bosworth's request, to help the stone masons accurately build the bridge. The skewed barrel and curve of the bridge made the stone cutting difficult. The model evidently worked so well that models were also built for some of the later bridges.

[241]Paul D. Simpson to Charles O. Heydt, June 23, 1924.

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Figure XLVII. Waterfall Bridge Under Construction

Note wood guides for stonework on left.



Figure XLVIII. Waterfall Bridge, ca. 1926

As Clement and Joy were at work on opposite sides of the Jordan-Sargent-Little Brown-Cedar Swamp mountain group, Rockefeller was also funding a proposed new motor road to connect the Eagle Lake Road with the Jordan Pond House. On November 1, 1923, Rockefeller wrote to Dorr:

> I am glad to hear through Mr. Simpson, who keeps me posted from time to time, . . . that the work on the Eagle Lake-Bubble Pond Road [section of the present Park Loop Road] is progressing satisfactorily. . . . I read with interest Mr. Simpson's current reports of conferences with Mr. Hill[242] on the ground, and thus keep closely in touch with the work.[243]

There is the implication in Rockefeller's letter that Dorr may once again have been directing the project in a way which was not to Rockefeller's liking. He suggested that:

> . . . it occurs to me that it might be an advantage to the work to have a general understanding to the effect that whenever recommendations which Messrs. Simpson and Hill make do not for any reason meet with your full and immediate approval, a conference should be had, and the matter threshed out before final action was taken. It is not improbable that situations may arise in which the view which these gentlemen have arrived at would be materially modified were they to have the advantage of conference with you on the subject on the ground; at the same time, it is quite likely that where you may have formed an opinion as to a desirable procedure, were you to hear the views of the engineers your conclusion would be modified. I am so eager to have this road in every way the best possible that I am anxious that the method of procedure should be as much as to insure the fullest exchange of view before action is taken, when any difference of view exists.
>
> I am sending a copy of this letter to Mr. Simpson and to Mr. Hill, and will understand that the suggestion therein contained meets with your approval and will be adopted, unless I hear to the contrary.[244]

It must have been terribly frustrating for a perfectionist like Rockefeller to see his road building projects directed by a "real complete amateur," who, we may read

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[242]Walters G. Hill, an engineer from Bar Harbor who worked on both the motor roads and the carriage roads.

[243]John D. Rockefeller, Jr., to George B. Dorr, November 1, 1923, personal collection of Mr. and Mrs. Charles P. Simpson.

[244]Ibid.

between the lines, was making decisions without consulting Rockefeller's own hand-picked engineers. But while Dorr may have been a difficult intermediary in the construction process, he was an able and staunch ally in the political arena. In early 1924, his political skills would be required for the continuance of the carriage road system.

George W. Pepper, now an interim U. S. Senator from Pennsylvania, once again attacked the Rockefeller and Park road building projects. This time, however, instead of imploring Rockefeller and Dorr to restrain their activities as he had four years earlier, he went to Secretary of the Interior Hubert Work.

On January 5, 1924, Arno B. Cammerer, Assistant Director of the National Park Service, wrote to Dorr, informing him of Pepper's initiatives:

> . . . Thursday [January 3] Secretary of the Interior Work called me up and said he had been requested by Senator Pepper to give a hearing the next morning to himself, Harold Peabody of Boston [President of the Bar Harbor Village Improvement Society], and Mrs. Eliot Wadsworth, and that he had agreed. He went over the Lafayette Park situation with me, saying that these people were going to protest against the road program. I went over the entire plan with him, including the history of the case, the elimination of certain of the road trails [carriage roads] and the approval of those shown on the map, as well as the approval of the through motor road [section of the present Park Loop Road from the Eagle Lake Road to the Jordan Pond House] and the proposed road project up Cadillac. I explained to him about young Mr. Rockefeller's donations as being part of donations from half a dozen people for the same purposes (he had told me Senator Pepper had told him that Rockefeller was standing the cost of all the work.) . . . Senator Pepper was particularly fine in his statements, giving you and Mr. Rockefeller all possible credit, but claiming that you had not taken anybody into your confidence despite many inquiries on you from your most intimate friends and neighbors so that a cloud of suspicion has been cast on what you really intended to do. That they were protesting against the road trails in particular, since there were more than enough trails . . . and that there was no assurance that these road trails would be kept as such, but would eventually be motor roads. They protested strongly against the type of some of the bridges you were putting in, stating that you were putting in bridges more fitted to Central Park[245] or a city park than Lafayette Park. . . . [W]hat they wanted was a meeting at which all these plans could be discussed and the various points of view on these matters thoroughly discussed and brought into the open. . . . The Doctor [Work] is a great man for holding these hearings . . . and the plan is to

[245]Two of the five bridges built or under construction at this time were, indeed, copied from the bridge over Swan Lake in Central Park.

> shortly to arrange for this hearing here in Washington . . . . The Doctor also told me that he wanted all work stopped until this matter had been decided. I told him that . . . winter conditions would prevent work on the roads till June.
>
> . . . My advice to you would be to keep this matter quiet from Mr. Rockefeller, and come down and see me. If you could get Dr. Eliot and some of your other supporters to come down when the hearing is held it would be the right thing to do. . . .[246]

Dorr replied to Cammerer, that " . . . [w]inter is no hindrance to the work that I am doing on the motor road. . . . No pains are being spared to bring the road into harmony with its surroundings and no criticism has come to me from any source of my work upon the portion now completed, but only commendation."[247] He pointed out that the carriage road west of Jordan Pond had already been approved, and in fact inspected by Cammerer, and that the other carriage roads were being built on private land. All of the projects in question had been previously approved by Secretary of the Interior Lane. Lane, however, had left office in 1920 and Work was the third man in three years to hold the office. In response to Pepper's criticism of the bridges Dorr said:

> . . . With regard to bridges, no bridge but a big boulder culvert planned by myself where the motor road crosses the deep cut of a brook upon the mountain-side in the section now completed has been built within the Park since you were here. Only a single other bridge, [Little Harbor Brook Bridge] in point of fact, has been built at any time within the Park since its creation, and that bridge I who am critical consider excellent. One other, which you saw when here, was built over Jordan Stream before the Park's establishment [Cobblestone Bridge]. . . . [248]

Dorr contended that the government had a moral obligation to complete the roads which it had accepted donations to build. He concluded:

> Both these roads are necessary to the Park for accessibility and control, and to give unity, and each constitutes an important feature in the parklands' adaptation to the use and enjoyment of the people. By the generosity of contributors the Government is saved large constructional expenses which otherwise it would have been ultimately compelled to meet, and its acceptance

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[246]Arno B. Cammerer to George B. Dorr, January 5, 1924, Acadia National Park files.

[247]George B. Dorr to Arno B. Cammerer, January 10, 1924, Acadia National Park files.

[248]Ibid.

> formally, deliberately, and after careful study, of the proffered gift, a full half of which has been expended with its knowledge and approval, constitutes an obligation, moral if not legal, to give what it has expended value through the works' completion.[249]

Meanwhile, Pepper wrote to the Hon. John A. Peters, Judge of the U. S. District Court and former Speaker of the Maine State Legislature, re-stating his position that the roads were a mistake, and that local concerns for the employment which they would bring the local population should not enter into the plans. Pepper stated that the current feeling about oil companies, created by recent congressional investigations (the Teapot Dome scandal), could be used as a base for an attack on Rockefeller. He decried the "network" of roads, but apparently supported the idea of both a motor road, in the location of the present Loop Road from Eagle Lake Road to the Jordan Pond House, and bridle paths.[250] The distinction, then, between the 10- to 12-foot wide bridle paths and the 16-foot wide carriage roads was very significant in this controversy.[251]

Peters wrote back to Pepper, in an attempt to ameliorate the conflict, sending Pepper a map showing the proposed roads and Park boundaries. On March 17, Pepper replied to Peters, describing his opposition to the roads:

> I am familiar with the road which is intended to girdle the Sargent-Jordan Mountain. It is a very fine piece of engineering. It is wide enough for automobiles and in the finished arts has an excellent parkway surface. Its curves, however, have apparently been planned so as to make its use unsafe for motor use.
>
> With regard to this girdling road unavailable for automobiles, unnecessarily large and formal for the equestrian use and uninteresting for pedestrians, I have always thought (and still think) that it spoils the park without benefitting the public. I recognize the force of this argument and have no intention of doing more than urging upon the Secretary of Interior the appointment of some fairly representative body of advisors to check up on Mr. Dorr's activities. The whole development has been adroitly slipped through by him without any such publicity as should characterize government work. I doubt if anybody higher in

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[249]Ibid.

[250]George B. Dorr to Lincoln Cromwell, March 19, 1924, Acadia National Park files.

[251]The carriage roads also replicated the Central Park road system in this regard. There too, "carriage roads" and "bridle roads" were clearly discrete.

> the scale of authority ever made any study of the situation until the thing had gone too far to be dropped.
>
> . . . What I want to do is preserve the feature that makes Mt. Desert unique--the neighborly coexistence of wilderness and civilization. If we keep the mountain barriers between the two we shall be acting wisely. If we mix them up and try to strike an average everywhere we shall destroy the distinctive character of the Island and reduce the whole proposition to a dead level of mediocrity. I should be sorry to have the whole thing degenerate into the Lafayette National Picnic Park with tin cans and egg shells on the side.[252]

Public sentiment in Maine, however, was overwhelmingly in favor of the road projects. Distinguished citizens signed petitions in favor of the roads. Landscape architect Beatrix Farrand, who would later play an important role in the design of the carriage roads, wrote to the Director of the National Park Service:

> Please let me emphatically approve the continuation of the road building program already approved by the Department of Interior for the development of the Lafayette National Park on Mount Desert Island, Maine.
>
> The location of the roads has been carefully studied and if followed out will afford means of access to parts of the Island now only possible to visit on foot . . . .
>
> As I have been a summer resident of the Island for forty years and have done much professional work on the Island . . . I have kept informed of the progress of the road-building as outlined in the Park and have approved the various steps in the accomplishment of the well thought out plan. Temporary defacement is, of course, unavoidable when large construction is necessary . . . .
>
> The homely adage should be remembered, that an omelet is not made without breaking eggs, and those who are worried by certain details of present construction should remember that in all large schemes any temporary discomfort must be accepted in view of developments which should be planned for the use of those generations which will follow ours.[253]

An editorial in the *Bangor Daily Commercial* newspaper titled "A Strange Objection" contended that:

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[252]George W. Pepper to John A. Peters, March 17, 1924, Acadia National Park files.

[253]Beatrix Farrand to the Director of the National Park Service, March 10, 1924, Acadia National Park files.

> Residents of Mt. Desert Island have learned with some surprise that opposition has arisen to the plans for road construction within the Lafayette National park. . . . A large amount of money has been raised by subscription, one summer resident giving in excess of $100,000, and a splendid improvement is underway.
>
> Then came news that United States Senator Pepper of Pennsylvania, who has a summer home on the island, is opposed to the road construction on the understood grounds that it would bring many more people to the island, which hardly appears a valid ground for objection for a member of the United States Senate to take.
>
> The Lafayette park has proven a fine attraction and has brought and pleased many visitors but much of the large acreage of the park is practically inaccessible to visitors except those who visit it on foot. Road construction will enable many more people to enjoy the attractions of the park and it is very difficult to find any valid argument in opposition to the road construction.
>
> . . . A splendid start has been made on Mt. Desert Island for a national park that will be of service to the people and the opposition of a few persons, even of high position should not cause the federal government to fail in the effort to bestow the advantages of the park upon the greatest number possible.
>
> If Senator Pepper clings to the idea of keeping the attractions of Mr. Desert for a favored few and objects to opening the island to visitors, there remain other resorts.[254]

Of course Pepper had never, at least publicly, opposed the roads on the grounds that they would bring more people to Mount Desert; but the gauntlet had been thrown down, and Pepper would discover that Dorr was a formidable opponent when it came to marshalling public and political support. It seems, also, that the opponents of the carriage roads made a major tactical error when they linked them with the highly popular motor road projects (the connection from Eagle Lake Road to Jordan Pond house and another to the summit of Cadillac [Green] Mountain). It was an easy matter to portray the opponents of the roads as a tiny group of rich and influential snobs who wanted to exclude the citizenry from public land to protect their own private interests.

[254]Editorial, *Bangor Daily Commercial*, February 25, 1924.

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Judge Peters sought the aid of U. S. Senator Hale, of Maine;[255] however, Hale was reluctant, according to Dorr, because of his " . . . affiliations with Senator Pepper, in whose old-guard, reactionary group he had found his niche . . . ."[256]

Until the hearing both Clement and Joy had continued to work on the carriage roads on opposite sides of the mountain. Paul Simpson was at work on the design of the connecting link between the two contractors. He wrote to Rockefeller a week before the hearing:

> . . . I have been quite busy perfecting the location of the Jordan-Sargent Mountain road between the sections where Joy and Clement are working - and also the branch to Bar Harbor [west side of Eagle Lake]. We have several crews chopping out these lines. Mr. Dorr is very anxious to have as much as possible chopped out before the date of the hearing in Washington. Just now, I am working on the Chasm Brook section . . . . [257]

Dorr arrived for the March 24 meeting with an impressive delegation. The Governor of Maine sent the State Commissioner of Inland Fisheries to represent him. The President of the University of Maine came to speak in favor of the projects, as did a member of the State Legislature from Southwest Harbor. Chauncey D. Joy, one of the road contractors, was asked to represent ". . . the native element in his district and tell about construction." Fred C. Lynam, vice-president of the Bar Harbor Village Improvement Society, and Clarence E. Dow, the president of the Bar Harbor Board of Trade, and former chairman of the Selectmen's Board of Bar Harbor, appeared. The editors of the *Bangor Daily Commercial* and the *Lewiston Journal* were brought to represent the wider interests of the State. The Maine Federation of Women's Clubs, the Maine Automobile Association and other groups sent representatives to Washington.[258] Dorr described the hearing:

> When Secretary Work opened the hearing at Washington . . . the room was largely filled with the delegation I had brought on from Maine and others interested with us. . . . Senator Pepper arose, and, recognizing, apparently, the representative character of the delegation and its friendly attitude toward my

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[255]John A. Peters to Senator Frederick Hale, January 8, 1924, Acadia National Park files.

[256]George B. Dorr to Lincoln Cromwell, March 19, 1924, Acadia National Park files.

[257]Paul D. Simpson to John D. Rockefeller, Jr., March 18, 1924, personal collection of Mr. and Mrs. Charles P. Simpson.

[258]George D. Dorr to Lincoln Cromwell, March 19, 1924, Acadia National Park files.

> work, began with a most courteous reference to it and to myself, and said no word along the line of attack. . . .
>
> He was followed in due course by Mr. Peabody, chairman of the Path Committee of the B. H. VIA [Bar Harbor Village Improvement Association] who, as it chanced, centered his attack on the work done by Mr. Rockefeller in the construction of his horse-road system around the basin of Upper Hadlock Pond where two major bridges [Hemlock and Waterfall] had been built. Letting him say his say on this, I waited until he was done, then simply said that there was evidently some misapprehension in Mr. Peabody's mind . . . for none of that area lay within the Park, but all was private property, owned by Mr. Rockefeller, and lay wholly outside the hearing's scope.[259]

As for Rockefeller, unlike the controversy of four years earlier, he was not about to back down. In a letter dated March 24, 1924, the day of the hearing, he wrote to Dorr in Washington:

> The road which the Government authorities have authorized in Lafayette National Park, circling Jordan and Sargent Mountains, has its inception on the western side, as you know, on property which I own, I having agreed to build the road to the boundary line between my property and the Park. Toward the continuation of this road . . . I hereby pledge $25,000, on account of which pledge I am enclosing herewith check to your order for $5000. . . .
>
> Since Mr. Joy, who has been building this road for me, was approaching the boundary line when I was at Seal Harbor in the fall . . . I am sending this letter to you at Washington, in the event that you should desire to continue the road at this time and should not have in hand funds with which to do so.[260]

The hearing provided a forum to air the issues on all sides. After all the parties were heard, Secretary Work announced that he would postpone a final decision until he had seen the construction work himself. However, he directed that all previous commitments would continue until that time. The road construction continued.

Before the visit of Secretary Work in July, the Park received visits from the chief landscape architect of the Park Service, Daniel R. Hull, and Director of the Park Service Stephen T. Mather. A Boston newspaper gave this account of Mr. Mather's and Dr. Work's visits:

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[259]George B. Dorr, *The Story of Acadia National Park: Its Growth and Development* (Bar Harbor: Acadia Publishing Company, 1985), 22.

[260]John D. Rockefeller, Jr., to George B. Dorr, March 24, 1924.

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> [Mr. Mather] made several appointments with representatives of those opposed to the road-building scheme and gave careful consideration to their objections. Mr. Mather was particularly impressed, as he publicly stated, with the unusually high quality of the engineering work as he had witnessed it, and he announced that in September he should summon all the road engineers of all the national parks to meet in conference at Mt. Desert for an object lesson in road construction. Secretary Work reached Bar Harbor just before Mr. Mather left. It was his first visit to Mt. Desert Island, and he did not hesitate to give a very pronounced opinion as to the extraordinary beauty of the island and the manifold attractions of Lafayette Park. He also gave much time to a first-hand investigation of the road situation and to listening to objections as they were presented on the ground.[261]

On July 24, 1924, Dorr received the official word from Secretary Work:

> I have just reviewed the map and blueprint drawn at my request showing the roads in Lafayette National Park, both for motor use and for carriages and horses.
>
> It has been decided that the motor road already constructed from Great Pond Hill [at the Eagle Lake Road] to Bubble Pond should be continued as shown to its connection with the Seal Harbor Road near the Jordan Pond House. . . .
>
> I, also, see no objection to a motor road to the top of Cadillac Mountain as outlined . . . .
>
> The road for the use of carriages and horses encircling Sargent and Penobscot [Jordan] Mountains is approved for this use, so its completion should be pushed . . . .[262]

It was a victory for Dorr and Rockefeller. During the month preceding Secretary Work's approval of the road plans, Fred C. Lynam had obtained from the Hancock County Trustees of Public Reservations permission for Rockefeller to build a section of the carriage road around Jordan, Sargent and Little Brown's mountains which passed

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[261]Herbert W. Gleason, "Distinguished Specialists Remove Obstructions in Lafayette Park Auto Road Case", *The Boston Evening Transcript*, August 9, 1924.

[262]Hubert Work to George B. Dorr, July 25, 1924, Acadia National Park files.

over its lands.[263] This loop had now been approved, and Rockefeller, once again, looked to expansion of the carriage road system.

The land to the west of Eagle Lake was still retained by the Hancock County Trustees of Public Reservations (Figure XLIX). On December 6, 1924, they passed the following resolution:

> . . . ON MOTION it was voted that this corporation authorize the construction by Mr. John D. Rockefeller, Jr. of a driving road, or horse-trail so-called, according to the best location to be arrived at by Engineers over its lands west of Eagle Lake extending for the Eagle Lake Road southerly to connect with the driving road encircling Little Brown's, Jordan's and Sargent mountains; and the legal rights which might restrict in the future the rights of the Public in land owned by the Trustees of Public Reservations are expressly reserved.[264]

Now Rockefeller opened up a third leg of construction, beginning on the west side of Eagle Lake, at the Eagle Lake road, building south to meet the work of Clement and Joy. He put Edgar M. Walls in charge of a crew of men, and Walters G. Hill in charge of on-site engineering. This marked the beginning of a new method of constructing the carriage roads. Walls did not function as an independent road-building contractor, like Clement and Joy. He was a Rockefeller employee, and worked under the direction of S. F. Ralston, Rockefeller's new superintendent at The Eyrie. Perhaps because of the increased complexity of running three road building projects at the same time, and perhaps to keep Mr. Dorr from meddling, a committee was established to oversee the work of the road contractors. A. H. Lynam, Paul D. Simpson, and S. F. Ralston were members of the Committee. Since Lynam was Rockefeller's attorney, and Simpson and Ralston Rockefeller employees, it was very clear who was calling the shots. Although the Committee was the official authority, Rockefeller continued to take an active and personal interest in the progress of the carriage road construction.

A few hundred feet north of the rock slide on the road west of Jordan Pond which Clement was building, another bridge was required. Bosworth designed for this location a two-span Roman arch to cross the Deer Brook (Figure L). In addition to being the only two-span arch on the carriage road system, the Deer Brook bridge could have had another unique feature had it not been for difficulties encountered in execution. The bridge now has a medallion date-stone centered in the spandrel wall between the two arches. As it was designed, a bronze deer's head would have been

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[263]Charles O. Heydt to Fred C. Lynam, July 5, 1924.

[264]Resolution of the Hancock County Trustees of Public Reservations, December 6, 1924.

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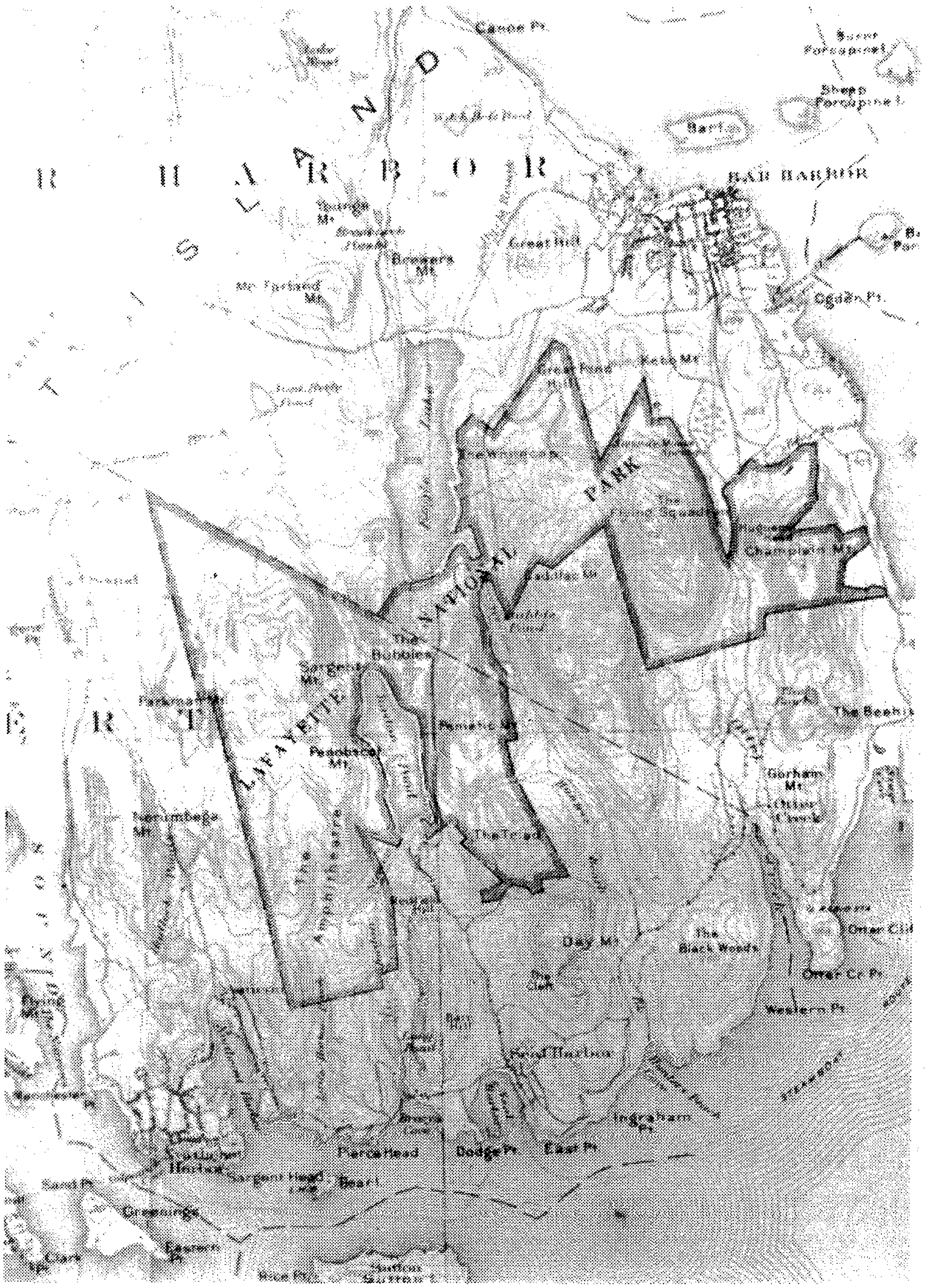


Figure XLIX. Boundaries of the Park, 1924



Figure L. Deer Brook Bridge, ca. 1926

placed in the center of the medallion instead of the date. A model was made by Neumann and Evan (the same firm who did the model of Waterfall bridge). Bosworth at the time was in Paris, thus communication with his office was limited. His staff's understanding was that the head would be carved from stone. After that was determined to be too difficult, word came from Bosworth that he had always intended it to be cast in bronze. It was never completed, however, perhaps because it was too expensive, too involved, or because the Park Service raised an objection.

The Deer Brook bridge was the first bridge for which Rockefeller sought the approval of the National Park Service because he was building it on Park land. The Park Service, now officially ten years old, had established an engineering division which was tackling the problems of opening up the national parks to serve the American public. Road design, of course, was a principal issue, and the primary occupation for the landscape engineering division then located in San Francisco. In 1925, Daniel R. Hull was the Chief Landscape Engineer and it fell to him to accept or reject the Deer Brook bridge. The following letter from Stephen T. Mather, the first director of the Park Service, to George B. Dorr, explains the procedure and the decision:

> In the absence of Mr. Cammerer [Assistant Director of the Park Service], I have received your letter of May 7 and the tracing mailed under separate cover of the bridge design across Deer Brook on the horse trail Mr. Rockefeller is contributing funds to build. The blueprint which you brought to Mr. Cammerer was sent to our Chief Landscape Engineer, Dan R. Hull, who returned it with recommendation for approval, and I have therefore placed my approval on the original tracing, which I am returning to you together with two blueprints.
>
> Chief Landscape Engineer Hull, in returning the blueprint, has stated that the bridge in general has a very fine feeling with good rock work and that the simplicity of its lines would be further enhanced if the deer heads were shown in medallion rather than in the projecting bronze head.
>
> I agree entirely with Mr. Hull's suggestions, but if it does not meet Mr. Rockefeller's approval, I have no objection to carrying out the original idea.[265]

With the drawings approved and Waterfall bridge nearing completion, plans were made to undertake the construction of Deer Brook bridge. Simpson and Candage proposed the use of a very "dark and old looking seam-faced stone" available in the quarry. Simpson wrote:

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[265]Stephen T. Mather to George B. Dorr, May 12, 1925.

> Mr. Candage has suggested that we use this stone for the body of the bridge using triangular and irregular pieces, as we had planned, without cutting the joints, and not in course as in the other bridges. The ring stones, belt courses, and coping would show the quarry face and would be of lighter color than the body of the bridge. The seam faced rock, as you know, has a smooth surface and is dark brown in color. This combination would be very attractive architecturally. Do you think it would be appropriate for the location?[266]

Rockefeller vetoed the idea, indicating he did not like the idea of combining weathered and cut stone. He also sent the following instructions to Candage:

> Please instruct the stone cutters to make the stonework even rougher if anything than that of the last bridge. The more rustic the bridge is in appearance the better. Your men usually err on the other side and will need constant coaching from you in order not to do too nice and refined a job.[267]

In transmitting his estimate of $24,918.00 to build the bridge, Candage noted, "It is understood by the men that we make this one rougher than the last one." At Rockefeller's insistence, Candage's contract for this bridge was again on a cost plus percentage basis, with the understanding that, if the estimate was exceeded, Rockefeller would pay the extra cost, but Candage would charge no commission on the excess.

Included in the files kept by Rockefeller's office on the bridge construction is a memorandum to Heydt from S. F. Ralston, Rockefeller's new superintendent. He had been on the job a year now. This memo documents his observations and gives a clear picture of those involved in building the bridge:

> . . . I visit the work as often as my time will permit to see how the work is done, the progress made and the amount of labor performed by the men working there; I see stone cutters at the bridge and at the stone quarry, also quarry men and derrick men at the quarry; stone masons, derrick men for both the hand derricks and the power derrick, and common laborers, helpers mixing cement and handling stone, also a blacksmith on the work at the bridge. I see these men at their various work and while I am not on this work continuously it would be impossible for me to keep the time, but from my observations I have every reason to believe the payroll correct.[268]

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[266]Paul D. Simpson to John D. Rockefeller, Jr., June 18, 1925.

[267]John D. Rockefeller, Jr., to S. W. Candage, June 21, 1925.

[268]S. F. Ralston to John D. Rockefeller, Jr., October 13, 1925.

While Candage and Clement were at work on the section of the Jordan-Sargent Mountain road between Jordan Pond and Eagle Lake, Chauncey D. Joy was building the connecting link around Sargent Mountain, and a bridle path behind the Upper Hadlock Pond. In July of 1925, Rockefeller inspected the work and wrote Joy:

> I have been over all your roads except the [Hadlock Brook] Bridle Path. The original road going over to the bridge [Waterfall] is one of the finest pieces of road I have ever seen. The gutters are beautifully formed, the road perfectly shaped, the surface the best possible, the coping splendid, the banks in good shape, and the whole thing most satisfactory. My cordial congratulations on what you have accomplished.
>
> I note the large cut in the bank necessary on this end of the Waterfall bridge. Nothing else would suffice, and although you are taking heroic measures, I fully agree with you that you are doing just right.
>
> . . . I went around on the North side of Sargent Mountain to the end of your advanced work. What a magnificent line that is. The difficulties, however, are very great, but the finished result will more than justify the trouble and expense involved. You are making splendid progress. . . .[269]

While Joy was receiving kudos, Clement was struggling first with the rock slide and then with the Committee. The rock slide area, as has been detailed, was enormously expensive and slow. In June of 1925, when Heydt wrote to Rockefeller concerning the cost of the rock slide work, he noted that the steam shovel had resulted in a 15% saving, but he also noted that " . . . [w]e should also give the Committee credit for assisting in reducing cost on the Clement road."[270] The Committee posted a timekeeper on Clement's workers. The friction between the Committee and Clement came to a head in the fall of 1925. Clement was instructed to build a rough haul road only to the site of the Chasm Brook Bridge. He defied the Committee and constructed the road as the final road section. The Committee decided to halt work on the road and Simpson was authorized to so advise Clement. A. H. Lynam reported to Heydt that:

> . . . Last night Mr. Clement, over the telephone, told me he was "through with such child's play", that if he could have been left alone he would have had the entire road completed to Chasm Falls. He said he was going to wire Mr. Rockefeller . . . that he was through and would get all his things off the road today.

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[269]John D. Rockefeller, Jr., to Chauncey D. Joy, July 17, 1925.

[270]Charles O. Heydt to John D. Rockefeller, Jr., June 1, 1925.

> I am very sorry this has happened just now but I would not be doing right to allow it to go on, nor is the Committee of any advantage unless their instructions are followed.[271]

Rockefeller, upon hearing of these events, sent his judgment in the matter to Mr. Ralston, as a member the Committee and Rockefeller's superintendent at the Eyrie. The communication was sent through Rockefeller's assistant, Mr. Heydt:

> Mr. Lynam has written me quite fully under date of December 16th and 17th regarding Mr. Clement's failure to follow the directions of the committee.
>
> Mr. Rockefeller has read these letters and is very greatly surprised and disappointed in Mr. Clement. While the committee will deal with the matter as it sees fit, he does not see how the committee can allow Mr. Clement to work for it after the position Mr. Clement has taken. While Mr. Rockefeller does not want personally to have any break with Mr. Clement or any unpleasantness, he is assuming that you will take adequate means to protect his interests in such further work, if any, as you may find it necessary to entrust to Mr. Clement for Mr. Rockefeller personally.[272]

The following spring, the Committee put Edgar Walls in charge of both the Clement road and the new road on the west side of Eagle Lake. Now officially discharged, Clement wrote to Rockefeller on April 8, 1926:

> I understand that I am through on the Mt. road. I have been discharged by rumor ever since last fall and Mr. Heydt has written me that the money is all gone and the 12% guarantee between us is closed. Now that don't bother me in as much as this letter is not dealing with my discharge but would like to explain certain circumstances that occurred at the time I started the slide on the Mt. road and that is this--you will remember that I mentioned about Mr. Dorr coming thru and making suggestions about different things. I did not tell you all the trouble about Mr. Dorr's interfering but I would like to tell you more of what he said. He came to me and suggested changing the grades and lines of the road and asked what I thought about it. I said Mr. Dorr you have an engineer here that has spent much time and thought as to where this road should go and I can't see any way it could be bettered. He made a lot more talk and thought it could be changed without an engineer. Now my idea in writing this is to show up how Mr. Dorr was trying to implicate Mr. Simpson as well as myself. This was a big job and he didn't want Mr. Simpson and I to put it

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[271]A. H. Lynam to Charles O. Heydt, December 16, 1925.

[272]Charles O. Heydt to S. F. Ralston, December 22, 1925.

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> through because he and his associates had said it could not be done. I would also like to call attention to this--when you go over the roads from Mr. Walls end to the Bar Harbor part also from the end I built to Bar Harbor note the difference in workmanship and quality between Mr. Simpson's and Mr. Hill's supervision.[273]

Alanson E. Clement was 71 years old at that time.[274] He had been Mr. Rockefeller's first road builder on Mount Desert Island. He had constructed more miles of road than any other contractor, including the difficult section of the rock slide on Jordan Mountain. He had worked smoothly with Rockefeller and both Simpsons for more than a dozen years, but he did not survive the transition to administration by government representatives and the Committee. The following month, Rockefeller wrote to Clement expressing admiration for his work:

> I went over your road from one end to the other, and was more than ever impressed with its great beauty and grandeur. The view of Jordan Pond and the ocean, as one comes south, away to the north of Deer Brook Bridge, is beautiful beyond description.
>
> The work you have done on the road, particularly at the slide and both sides of it, is such work as it would be difficult to find the equal of any place. This road will long stand as a monument to your road-building ability. Since I did not have an opportunity of doing so in person, I am taking this occasion to express my satisfaction with this work.
>
> As I said to Mr. Simpson, I have not had the courage to ask my office what the total cost of the road has been, for I knew it was so high that I feared the knowledge of that fact would mar my enjoyment of the road. Aside from that consideration, the road, in my judgment, is beyond compare. It is a pleasure to speak thus unqualifiedly of what you have accomplished.[275]

The haul road to the Chasm Falls which caused so much consternation and eventually led to Clement's dismissal was to provide access for the construction of another bridge. This small bridge was designed by Bosworth and built during 1926 (Figure LII). Since the Chasm Brook bridge was, like the Deer Brook bridge, being built on land already within the Park, it, too, was submitted for and received Park

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[273]A. E. Clement to John D. Rockefeller, Jr., April 8, 1926.

[274]*Twelfth Census of the United States, June 1900*, (Maine State Archives), Vol. 9, ED 46, Sheet 3, Line 44.

[275]John D. Rockefeller, Jr., to A. E. Clement, May 6, 1926, Rockefeller Archive Center.



Figure LI. Rockslide Construction

"The work you have done on the road, particularly at the slide and both sides of it, is such work as it would be difficult to find the equal of anywhere." J. D. Rockefeller, Jr. to A. E. Clement.



Figure LII. Chasm Brook Bridge

Service approval. Its design was similar to the earlier low, segmental arch bridges, but also incorporated were the parapet details and spiraled end posts of the Hemlock and Waterfall bridges. In this case, however, the coping stones of the parapet wall are large rock-face ashlar, not the smoother ashlar as on Hemlock and Waterfall. This was perhaps a response to Rockefeller's admonishment to Candage about the character of the stonework for both the Chasm Brook and another small bridge for the Hadlock Brook bridal path:

> Please send me, at your convenience, an estimate of the cost of each of these bridges, which as we have talked are to be built of the seam-faced granite from your quarry. It is highly important that both bridges should be built of split stone, rather than tool-edged stone. The bridge at the Jordan Pond dam should be taken as a sample. It is not necessary that the joints should be all the same width, but exceedingly desirable that the most rustic appearance should be given to both bridges. As I pointed out to you, this is the only respect in which you have not been successful in the large bridges which you have built during the past two or three years. In each instance the same specifications have been made as regards split rather than tool-edged stone, but in each instance your men have insisted on cutting the stone to a straight edge. I am counting upon your taking steps to prevent their doing again such "good work" as they would call it, but work which is not so artistic from my point of view.[276]

Candage's estimate for the Chasm Brook bridge was $15,202.64.

Candage also built, in the same year, a bridge over the Hadlock Brook on the bridle trail Joy was constructing behind the Upper Hadlock Pond. The previous year, Rockefeller wrote William Pearsall in Bosworth's office requesting the plans for the bridge Mr. Bosworth drew for him:

> . . . the same being a copy of the bridge in Central Park over the little lake at 59th Street. The bridge as used up here was called the Little Harbor Brook bridge. A year or so later we reproduced the bridge calling it the Jordan Pond Dam bridge.[277]

Pearsall's response was to send him a new sketch of the Central Park bridge. Rockefeller again asked B.W. Candage & Sons to construct this bridge, modified for its site on the Hadlock Brook bridle path. The construction did not start, however, as quickly as Rockefeller had anticipated. Heydt wrote to Ralston in December, passing

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[276]John D. Rockefeller, Jr., to S. W. Candage, May 6, 1926.

[277]John D. Rockefeller, Jr., to William R. Pearsall, July 29, 1925.

along Rockefeller's questions as to whether Candage had started to cut the stone for the bridge yet, and asking for the expected completion date. Ralston's reply was not what Rockefeller wanted to hear. He himself wrote to Sam Candage:

> What about the little bridge on the bridle path above Hadlock Pond? Perhaps from Mr. Heydt I have gained the impression that there seemed to be some doubt as to what type of bridge had been decided upon. I am sure you will remember that I told you last summer I wanted to copy the bridge which you built at the Jordan Pond Dam, only making it even rougher and with less tooling than that bridge. I am also quite sure that I sent you duplicated blueprints for the bridge. You were hoping to put the footings in when the water was low last fall. This I supposed had been done, and in fact, was hoping to hear that the bridge had been built before cold weather set in. What is the situation? I am anxious to be able to use this bridle path this coming summer.[278]

Candage replied:

> The little bridge on the bridle path at Hadlock Pond we have not started. The plans came all right and we made the patterns. One day I went up with Mr. Simpson and the best we could do it did not seem to fit the place without cutting some large pines and I think he wanted to see you about this before going ahead. If we can get started in the early spring I am sure we can have it for you in the summer.[279]

Debate then ensued between Simpson and Rockefeller about where and how to build the bridge with the least disturbance to the site. Resolving this issue meant the involvement of Bosworth's office, a trip to the bridge site in snowshoes by Simpson and Ralston, and several trips to the original bridge in Central Park by Rockefeller. The problems, as Simpson saw them, were how to build the bridge to protect the 30-inch [diameter] pine to the west of the road, and how to bridge the stream with an arch as low as those over the Little Harbor Brook and the Jordan Stream. Moving the location of the bridge to protect that pine would mean the sacrifice of two pines and a maple; raising the arch would change the appearance of the bridge.

The problem of the arch occupied Rockefeller as he took his exercise in Central Park:

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[278]John D. Rockefeller, Jr., to S. W. Candage, December 31, 1925.

[279]S. W. Candage to John D. Rockefeller, Jr., January 4, 1926.

> Regarding your revised sketch of the proposed bridge for the bridle path near Hadlock Pond, I have walked several days in Central Park lately, where the original of this bridge is, and find that the arch stands high above the little lake which it crosses - I should think not less than seven, probably 10 feet. Evidently Mr. Bosworth lowered the sides of the bridge where the arch springs from considerably, to meet the conditions of the two small brooks over which we used the bridge. To raise these sides as you show in your pencil sketch will not hurt the bridge at all, but rather improve it and make it more like the original. . . . We can get all the clearance over the stream we want with this bridge, and instead of harming its appearance it will make it finer and handsomer, so do not hesitate to give me as ample dimensions as the situation requires.[280]

The problem of the trees proved a more difficult decision. After considering substituting a rustic bridge like those on the Jordan Stream bridle path, the decision was made to build the stone bridge and cut down the 30-inch pine. This decision Rockefeller did not regret:

> I am much pleased with the bridge on the Hadlock Pond bridle path. It seems to me very attractive and well adapted to the crossing and the conditions. I think we made no mistake in cutting down the big pine tree instead of moving the whole road up the stream.[281]

The bridge was constructed of rock-face ashlar, and is simply ornamented with uniformly colored voussoirs and coping stones which contrast with the variegated stone of the spandrel walls, corbelled coping and the weep hole arches (Figure LIII). Again, the barrel is not faced with stone. Unlike its sister bridges, however, the parapet walls of the Hadlock Brook bridge curve toward the upstream side to follow the curve of the road.

Candage estimated he could build the bridge for $6,983.60. Both Heydt and Ralston were monitoring the bridge costs, no doubt aware of Rockefeller's growing impatience with actual costs exceeding estimated costs. Heydt wrote to Rockefeller in June, 1926:

> While at Seal Harbor on June 21st, I went over to the bridle path bridge and was assured by Mr. Candage that the work would be completed within two weeks, and that it would come within his estimate of $6,983.60.

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[280]John D. Rockefeller, Jr., to Paul D. Simpson, January 13, 1926.

[281]John D. Rockefeller, Jr., to Paul D. Simpson, August 13, 1926.



Figure LIII. Hadlock Brook Bridge

> Mr. Ralston and Mr. Simpson both say that the bridge is somewhat larger than the Little Harbor Brook bridge and the Jordan Pond bridge and has taken a good deal more stone and concrete filling. In addition to that, Mr. Candage says that stone-cutters are getting $8.00 a day as compared with $3.00 a day when the other bridges were built.[282]

In August, 1926, Heydt reported to Ralston that Candage's final bill was $8,172.06.

During the following summer, Rockefeller continued to keep a close watch on the construction of the carriage roads. In October he wrote to Chauncey Joy:

> While I have only seen you two or three times this summer, I have been over your roads many times and always with increasing pride and satisfaction. I want you to know how thoroughly pleased I am with the work which you are doing. It will be always a great credit to you. I am particularly delighted with the careful and thorough way, slow and tedious though it has been, in which you have cleaned up the ledges over which blasted rock had been thrown. . . . In the spring I shall count on your entirely finishing the Hadlock Pond bridle path in all its details including the grading of the banks where necessary, and all cleaning up, also on your entirely finishing all of the main road up to the turn around place on the north before the road turns south into the gorge. I am anxious to have both of these stretches of road put in their final and completed condition not later than early June so that they can be open to the public without the impediment of work being done at any points on them. . . . [283]

This letter further affirms Rockefeller's close attention to the details of construction and his great appreciation for the craftsmanship of his road builders. It also shows his concern that the roads would be open for *public* use, not just for himself and his friends, as has often been asserted. This road and bridle path, which he was anxious to have open to the public, was on his private land, not government land.

As Mr. Walls was working to complete the carriage road to the west of Eagle Lake, Rockefeller had determined to build a grade-separation structure at the Eagle Lake Road. George Dorr recommended this bridge, or "tunnel" as he called it, to Rockefeller in 1923. Rockefeller responded favorably to the idea. He wrote, "The advantages of such a crossing, from the point of view of horse driving, would be very great. I shall be glad to hear more about the project when Mr. Hill has studied

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[282]Charles O. Heydt to John D. Rockefeller, Jr., June 24, 1926.

[283]John D. Rockefeller, Jr., to Chauncey Joy, October 21, 1926.

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PATH MAP
OF THE EASTERN PART OF
MOUNT DESERT ISLAND
MAINE

COMPILED BY

WALDRON BATES, EDWARD L. RAND AND HERBERT JAQUES.

REVISED

— 1926 —

Scale 1: 29.000

0 ½ 1 2 Miles

0 ½ 1 2 Kilometers

Topography and hydrography adapted from the Map of Mount Desert Island issued by the United States Coast and Geodetic Survey, June, 1882.

Nomenclature—revised and corrected—adapted from the map dated June, 1893, compiled for the Flora of Mount Desert Island.

The curves of equal elevation are given for every forty feet difference of level. These curves are shown by brown lines; where close together they indicate cliffs or steep slopes.

The area of Lafayette National Park and other Reservations (so far as disclosed) shown thus

Broad trails are shown on the map in double red lines; main trails in single red lines; and other trails in dotted red lines. Generally speaking, all trails are marked by cairns, pointers or signs.

Double solid black lines indicate public roads open to motors. Double broken lines indicate horse and carriage roads, also private or wood roads, many of the latter being overgrown and difficult to follow.

Red numbers indicate distances in miles from the steamboat wharf, Bar Harbor. Small blue circles indicate springs.

Since the trails cross private properties, the owners of which may at any time exercise their legal right to close them to the public, the law in regard to setting fires should be strictly observed, and great care should be taken to remove all remnants of luncheons and to avoid the breaking of bottles and doing any injury.

The trails are maintained by the Bar Harbor, Northeast Harbor and Seal Harbor Village Improvement Associations; users thereof are urged to help in the work by sending contributions to the Path Committees of these Associations.

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Figure LIV — 1926 Path Map

it . . ."[284] This new bridge would provide a route for the carriage road under the automobile road and into the country north of the Eagle Lake Road. Bosworth's early sketch of the bridge showed a lancet arch with prominent buttresses topped with lookouts (see Figure LV). While the bridge's final design incorporated these features, it was quite different in massing.

Bosworth also designed this bridge, but because he was in Paris, the details of construction were managed by William Pearsall of his office. Once again, however, these details were not worked out without Rockefeller's advice and approval. In October, 1926, he wrote Bosworth:

> . . . There are several points requiring consideration. It is our practice to have a thicker road cushion on top of the concrete arch. We desire to add at least 8 inches, thus increasing by that much the total thickness of masonry from the bottom of the keystone to the top of the parapet coping. Is there any objection to our adding 8 inches of masonry between the top of the keystone and base course of the parapet? I am assuming there can be none. Again we have wondered whether particularly in view of the above suggestion it would look better if the arch stones at the base of the arch did not butt into the parapets but rather if the parapets were separated from the arch stones by a couple of feet of masonry. There would seem to be no reason why the parapets could not as well be separated by a little greater distance. The third point is that the blueprint seems to show the floor in the parapets parallel with the arch and on two levels instead of parallel with the road and the coping. It is our thought to have this surface all on one plane and have it parallel with the road. The grade would be so slight as to be barely perceptible. Do you see any particular objection to this? The fourth point is that the posts at either end of the parapet wall do not seem particularly graceful in design. but more than that they project in as well as out with the result that at the point of projection the roadway will not be the full 21 feet. This seems unwise. Could not the inner line run straight through to a square end, the projection be only on the outer sides or could not another termination be designed? On one end of the parapet you have no post or termination but have shown boulders right against the end of the parapet wall.
>
> As a rule boulders do not look particularly well in juxtaposition to a cut masonry wall. Perhaps the parapet wall should be continued far enough so that boulders would be unnecessary. In any event there should be some adequate termination of the parapet so designed as not to reduce the full width of the road. May I trouble you once more to consider these details which I promise are the last?[285]

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[284]John D. Rockefeller, Jr., to George B. Dorr, June 21, 1923.

[285]John D. Rockefeller, Jr., To William Welles Bosworth, October 21, 1926.

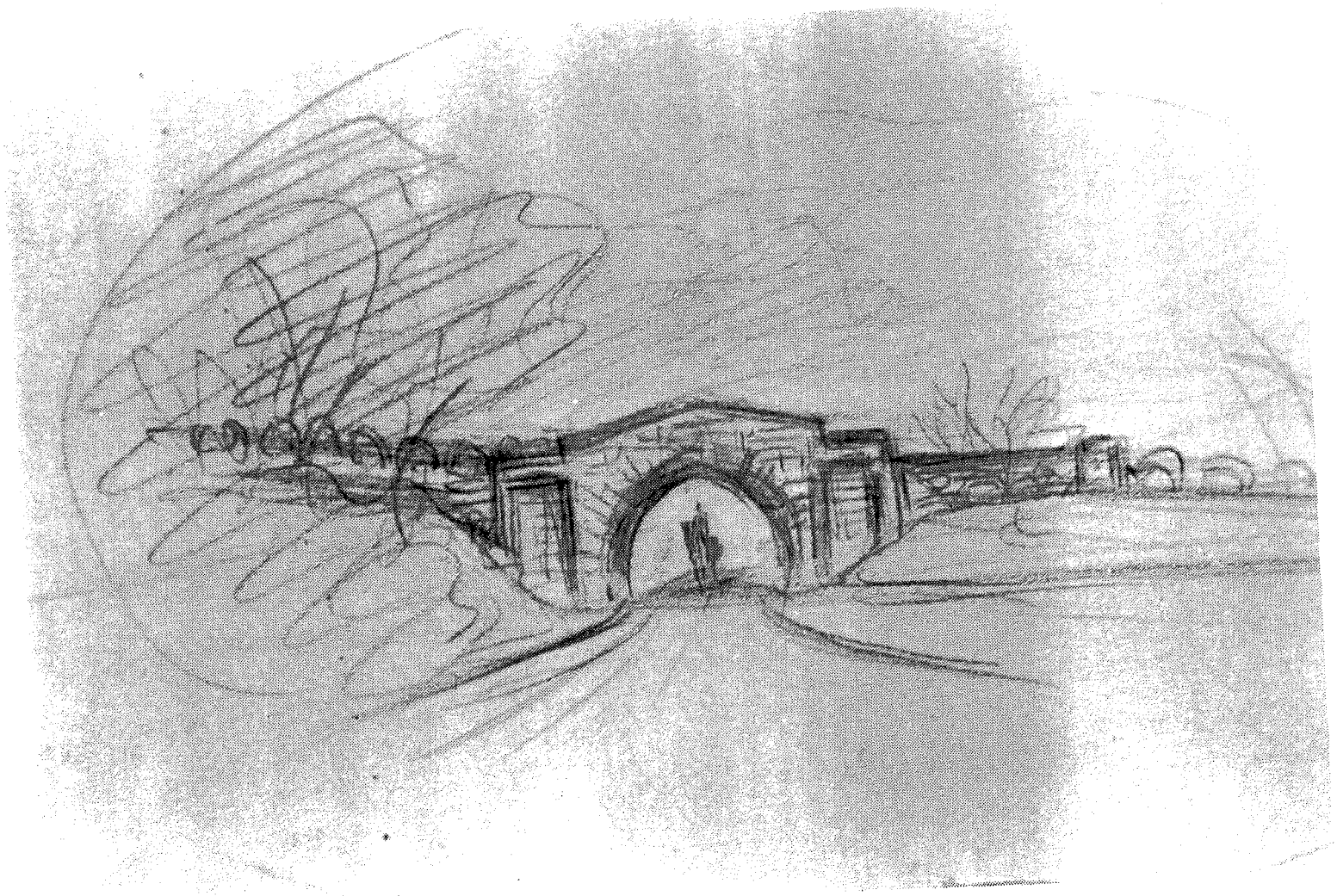


Figure LV. Bosworth's Study Drawing for Eagle Lake Bridge

Mr. Pearsall agreed to all of Rockefeller's suggestions and added:

> Do not hesitate to suggest any further changes if they occur to you. We all enjoy the evolutions which you have produced in studying this problem and are happy that the first idea is now being realized in practical form.[286]

When Simpson presented the plan to Bar Harbor Town officials, their engineer, Mr. Crockett, suggested that the bridge be constructed 27 feet wide instead of 21 feet as designed. Simpson informed Rockefeller that this change would cost approximately $4,000.00.[287] Rockefeller's response to this suggestion was negative:

> As to widening the bridge to 27 ft., I do not find myself at all enthusiastic. As I said to you in a recent telegram, if the Bar Harbor people were paying for this bridge themselves, I do not for a moment believe they would dream of suggesting widening it at the additional cost of several thousand dollars. Since the bridge onto the Island is only 20 ft. wide, it seems to me that it stands to reason that there is no possible ground for urging that this bridge be made wider than 21 ft. However, I leave the decision of this question . . . to you three men [Simpson, Ralston, and Lynam], having thus clearly stated my views. . . .[288]

Although he held fast about the width, he received permission to build the structure on the town road with the stipulations that the Town of Bar Harbor would not contribute monetarily and that A. H. Lynam would be the agent authorized to supervise the work.[289] Rockefeller usually planned very far ahead and, as in the case of the Little Harbor Brook Road, would spend money in the present to avoid greater expense later. In this case, however, he failed to anticipate the need for a wider bridge deck and the bridge had to be widened later at a very great expense.[290]

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[286]Welles Bosworth (P.) to John D. Rockefeller, Jr., October 26, 1926, personal collection of Mr. and Mrs. Charles P. Simpson.

[287]Paul D. Simpson to John D. Rockefeller, Jr., November 1, 1926, personal collection of Mr. and Mrs. Charles P. Simpson.

[288]John D. Rockefeller, Jr., to Paul D. Simpson, November 8, 1926, personal collection of Mr. and Mrs. Charles P. Simpson.

[289]Resolution, Town of Bar Harbor, September 16, 1926.

[290]In 1974, it was necessary to widen the road to 34 feet. One wall of the bridge had to be moved out on ball bearings to accommodate the new road width. The effort involved to preserve the bridge and yet widen the road resulted in a first place award from the Federal Highway Administration to the contractor who did the work, Harold MacQuinn, Inc. for

While he was unconvinced of the necessity of a wider bridge for automobile traffic, he was quite concerned that the bridge be *tall* enough to accommodate not only a carriage, but a coach. He wrote:

> . . . If there is any possibility of the 13 ft. 6 in. clearance bridge not giving entirely adequate head room for people on a coach, I would prefer to err on the safe side and use the 16 ft. clearance height . . . .[291]

B.W. Candage & Sons was once again the contractor. Their estimate in 1927 was $48,000. The actual cost was in excess of $67,500. After the bridge was finished, (Figure LVI) Rockefeller wrote to Candage:

> . . . As a result of several careful examinations of the bridge, I am glad to express my unqualified satisfaction with it. In all fairness, however, I must also register my disappointment at its cost . . .[292]

While the bridge at the Eagle Lake Road was being designed, in 1926, another important link of the carriage road system was being planned. In December, Rockefeller wrote to Simpson:

> . . . I want a dozen copies of a blueprint made . . . which will show accurately the line of the proposed horse road from my Jordan Pond gate around the Triads to the south end of Bubble Pond, and also the horse road from the north end of Bubble Pond crossing the automobile road, going around to the south end of Eagle Lake and connecting with the horse road on the west side of Eagle Lake.[293]

Rockefeller's explanation to Simpson of the reason for the map gives a clear picture of the administrative review process which was now required for the construction of the carriage roads in the Park:

> . . . It is my purpose to send one of these blueprints to Mr. Cammerer with a letter advising him that I am prepared to finance the construction of these added two pieces of road and the bridge involved [Bubble Pond Bridge].

"Outstanding Sympathetic Treatment of Historic, Cultural, or Natural Environment."

[291]Ibid.

[292]John D. Rockefeller, Jr., to Sam W. Candage, August 24, 1927.

[293]John D. Rockefeller, Jr., to Paul D. Simpson, December 22, 1926, personal collection of Mr. and Mrs. Charles P. Simpson.

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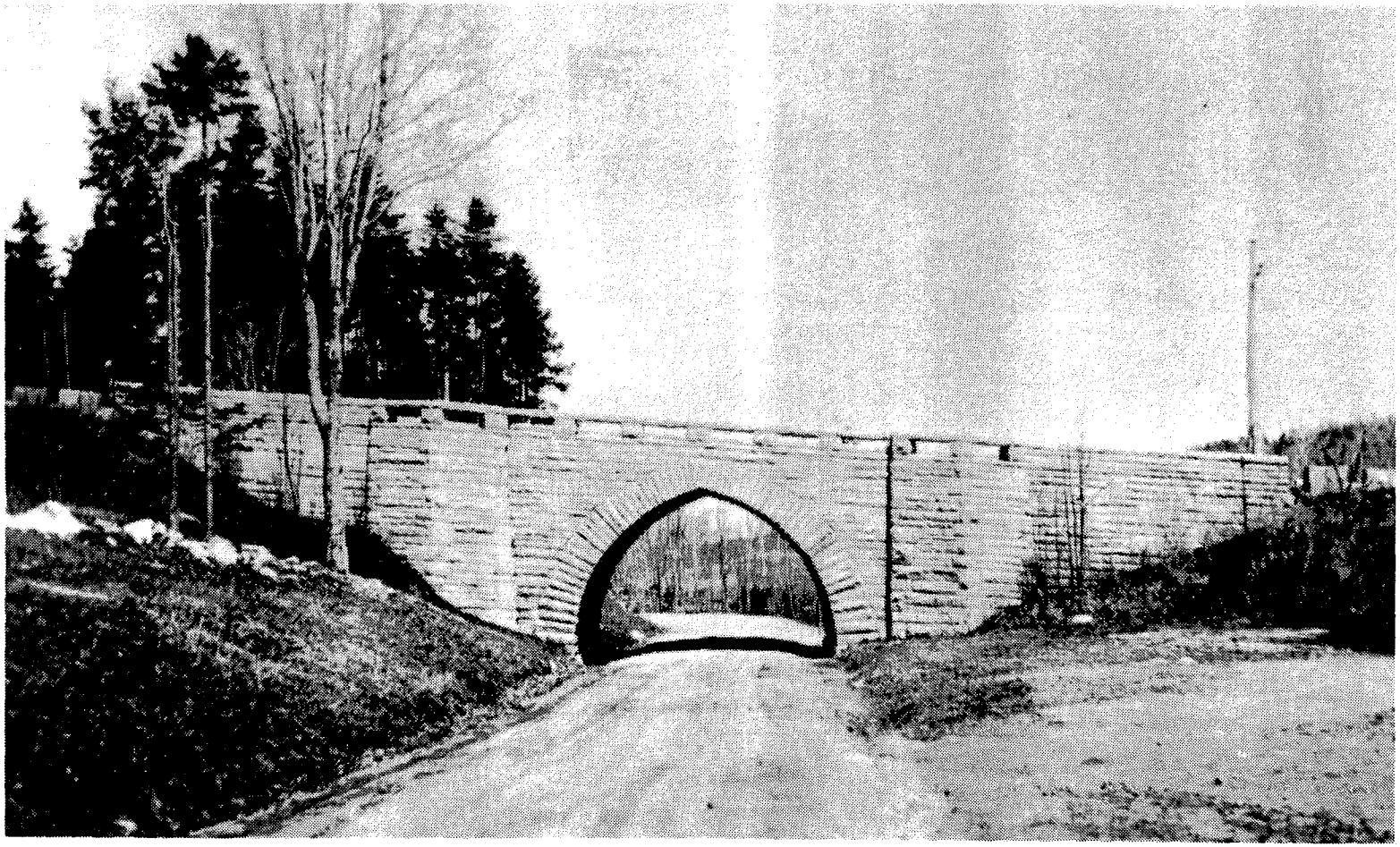


Figure LVI. Eagle Lake Bridge, ca. 1928

Note roadside cleaning.

> Mr. Cammerer will in turn ask Mr. Dorr for his recommendation in the matter. He will also, in line with informal assurance given by the Secretary of the Interior, ask Mr. Dorr to send copies of these blueprints to the presidents of the several village improvement societies on Mount Desert Island, so that these societies . . . may be fully advised of what is under consideration and have ample opportunity to express any views in regard thereto. Mr. Cammerer in writing to Mr. Dorr will indicate some date on which the whole matter will be brought to the Secretary of the Interior for consideration and action and prior to which any expressions of opinion pro or con should be received.[294]

He also made clear that further planning was underway (north of the Eagle Lake Road) and that this was not to appear on the maps:

> I make this explanation so that you will understand for what purpose I want these blueprints and that you may further understand that no projected roads other than the two specified should appear thereon. . . .[295]

The inclusion of the Village Improvement Societies into the procedure added a great deal of time to the review process. It was, in fact, more than a year before these roads (one south of Bubble Pond and one north, to the east side of Eagle Lake) were fully approved. The Bar Harbor Village Improvement Society had selected Bishop William Lawrence as its president. The group interpreted the Secretary of the Interior's offer of consultation as veto power over the plans. During the fall of 1926, the Bar Harbor Village Improvement Society engaged landscape architect Charles Eliot II, the grandson of the founder of the Hancock County Trustees of Public Reservations, to make a report on the development of Mount Desert Island. Bishop Lawrence asked Rockefeller to meet with him and Eliot to discuss an overall plan for the Island. Rockefeller described the meeting to Cammerer:

> . . . I have said frankly to Bishop Lawrence and Mr. Eliot that after hearing from them what their plan is, I cannot agree as to its feasibility or wisdom. To undertake to get out of the diverse ownership interests of this Island an agreement on a common plan for the development of the Island seems to me utterly impossible . . . .
>
> I have, therefore, told these gentlemen that since my judgement did not approve of their program, I obviously could not cooperate with them in it. I am confirmed in my feeling that this committee was organized for the sole purpose

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[294]Ibid.

[295]Ibid.

> of preventing or at least delaying as long as possible the further construction of any roads . . . .[296]

Upon reading this correspondence, previously unknown to him, in 1988, Charles W. Eliot II responded:

> . . . Mr. Rockefeller's 9/3/27 letter to Arno Cammerer of the National Park Service is an argument against all "planning" for Parks or Areas, and based in this case, on the false assumption that the plan for "The Future of Mt. Desert Island" was proposed for "the sole purpose of preventing or at least delaying as long as possible the further construction of any roads." That was certainly NOT our "purpose"--as evidenced in the printed report of 1928.[297]

Mr. Eliot's report, "The Future of Mt. Desert Island" did, indeed, present an evenhanded description of the issues involved in the controversy over the carriage road construction (Appendix XVII). It also recommended, however, that any future carriage road construction be limited to "a small amount of additional road construction in connection with 'Centers.'"[298] Rockefeller's suspicions about the motives of the planning efforts of the Bar Harbor Village Improvement Society may have been colored by his earlier experiences with Senator Pepper and the Northeast Harbor Village Improvement Society. This public planning ran counter to his accustomed manner of operating. Rockefeller had been working quietly behind the scenes for years acquiring land to expand the Park and protect its resources, as well as planning for means of access to its many attractions through the construction of horse and automobile roads. He felt that the preparation of a public plan for the use of the island to be a naïve endeavor.[299]

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[296]John D. Rockefeller, Jr., to Arno B. Cammerer, September 3, 1926.

[297]Charles W. Eliot, II, to the author, Nov. 27, 1988.

[298]Charles W. Eliot II, *The Future of Mount Desert Island* (Bar Harbor: Bar Harbor Village Improvement Association, 1928), 26.

[299]In November, two months after his letter to Cammerer, Rockefeller made his first visit to Williamsburg, Virginia. Here, he would once again work behind the scenes to execute a clear plan out of diverse ownership and interests. During this same period, Rockefeller bought huge amounts of land through an anonymous entity (The Snake River Land Company) in Wyoming to preserve the Jackson Hole Valley, and provide for its eventual inclusion in the National Park system. Considering his remarkable success in assembling the components of these public landscapes at Acadia, Williamsburg, and Jackson Hole, it is difficult to criticize his cautious and indirect methods.

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The plans for the Bubble Pond roads were being closely scrutinized by Bishop Lawrence's committee, Secretary Lane, and by Dorr's and Rockefeller's old nemesis, Senator Pepper. Near the northern end of Bubble Pond, a carriage road intersected the new motor road which had been one of the focuses of the 1924 controversy. This crossing, it was determined, required a bridge to separate the horse and pedestrian traffic from the automobile traffic.

Once again, Rockefeller turned to Welles Bosworth for a design. Bosworth drew a sketch of a bridge with a multi-centered arch, finely cut stone work, and open balustrades (see Figure LVII). Since he was financing the endeavor, Rockefeller no doubt expected approval would be as forthcoming as it had been for both the Deer Brook and Chasm Brook bridges. That would not be the case. Instead, a written debate ensued between Rockefeller and Cammerer on the appropriate style for bridges in national parks. The issue was resolved only after Cammerer involved the National Fine Arts Commission. Once again, Bosworth prepared the design for this bridge. Cammerer sent it, as per procedure to the Chief Landscape Engineer's office for review and approval. The response was:

> . . . This design is pleasing in general outline, but I think it falls down at several points in detail and we are sending along a sketch which I think you will agree is more fitting for the site.
>
> The arch stones in Bosworth's design are very smug and sharply cut. The main face wall of cut stone with each course running narrower as it approaches the top is not nearly as pleasing and certainly a great deal more expensive than the random face which we have indicated. At the end of the rail or baluster I would suggest a square post rather than round and for the baluster itself, the stone work indicated is entirely too frail. I wish you would make clear to those interested in this bridge that our design while very simple and fitting the landscape picture will at the same time eliminate a great deal of the cost, I should say at least $2,000.

After relating these comments, Cammerer went on to say very diplomatically say:

> . . . I was a little bit concerned when I saw the very excellent sketch that Mr. Bosworth had prepared for this location that it would look too 'citified' and might make it look somewhat out of place for that important location within a national park. Cut stone in rails and balusters seems to always have that effect, and I hope you will agree with me that the sketch will be acceptable as being somewhat more simple in design and less expensive.

> I hope that the suggestion as to a square post rather than a round post at the end of the bridge will also commend itself as an interesting change from such designs of terminals that have been tried out.
>
> I hope these suggestions will be considered by you. In reality the main lines of the bridge are being maintained, and rough stone substituted in this arrangement for cut stone.[300]

Rockefeller's response was to ask Bosworth to redesign the bridge, making a compromise between the original design and that received from the Landscape Engineering Department. He told Cammerer that, "It is a very difficult thing to reconcile the ideas of two men when they are so wholly different as the ideas of these two architects. However, I will do the best I can and let you know the result."[301] The result was a design he forwarded to Cammerer (Figure LVIII) along with blueprints of the Deer Brook and Chasm Brook bridges, noting:

> It seems to me that Mr. Bosworth's revised drawing is about as rustic as can be and have this bridge reasonably harmonious with the other two just mentioned. Your architect's design would, I fear, make an unhappy contrast with these other bridges already built and the existence of which and his earlier approval thereof, he has probably forgotten. You will perhaps want to send him the blueprints of these former bridges together with the new sketch so that he can consider the bridge now under discussion in the light of existing bridges. While your architect suggested square posts instead of round, I think you will agree that the curving lines of the bridge make round posts rather more appropriate.[302]

Rockefeller had put Cammerer in a difficult position. Cammerer found it necessary to hold to the Park Service's design for the bridge. Therefore, he had to ask Rockefeller to pay to build a bridge he disliked. Cammerer's solution was to consult the National Fine Arts Commission, of which he had been assistant secretary prior to joining the Park Service. The Commission was to be consulted on artistic matters in the national parks. Cammerer saw seeking their approval as a way to put the decision in the hands of a third party, thereby hoping to avoid hard feelings between the Park Service and its benefactor. This is his carefully worded letter to Rockefeller on the subject:

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[300]Arno B. Cammerer to John D. Rockefeller, Jr., September 22, 1926.

[301]John D. Rockefeller Jr., to Arno B. Cammerer, September 28, 1926.

[302]John D. Rockefeller, Jr., to Arno B. Cammerer, October 6, 1926.

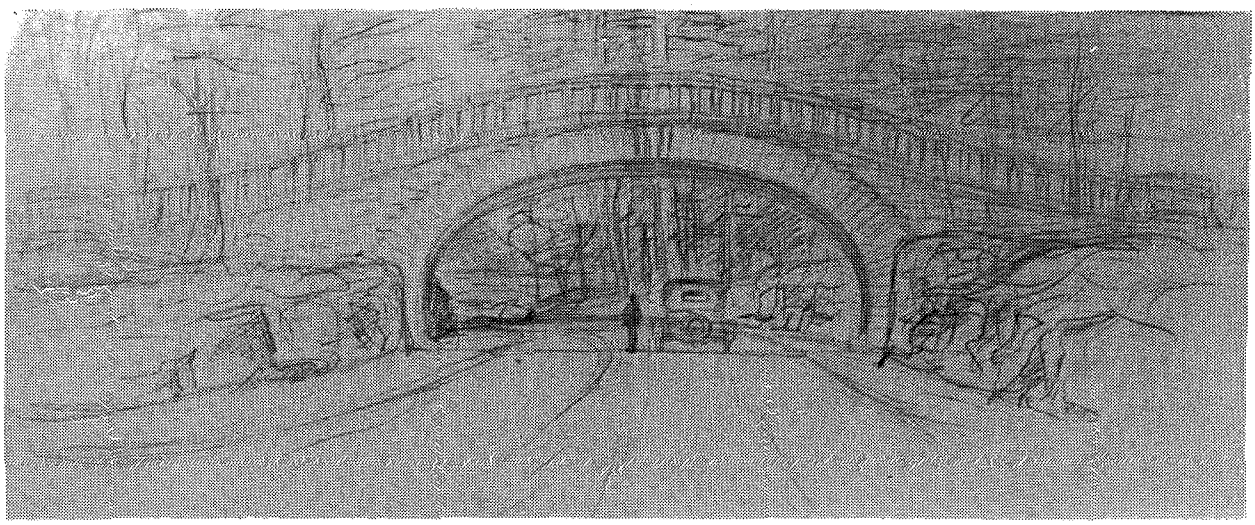


Figure LVII. Bosworth's Sketch
for Bubble Pond Bridge

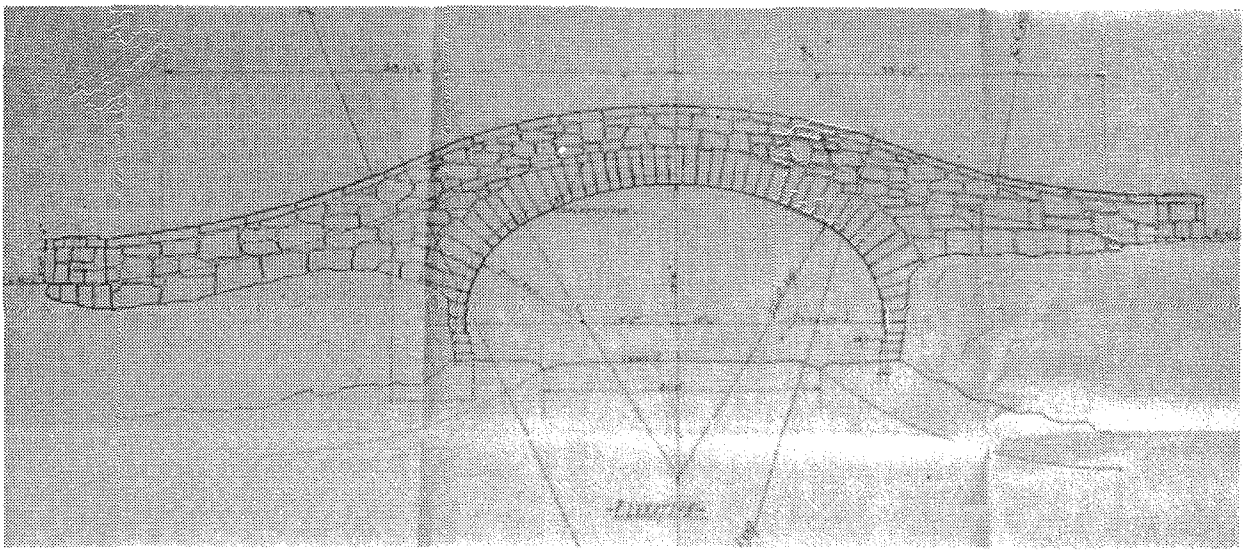


Figure LVIII. Bosworth's Revised Version of
the Bubble Pond Bridge

A reply to your letters of September 28 from New York and October 16 from Seal Harbor bearing on questions involved in the design and redesign of the proposed horse-trail bridge in Lafayette National Park over the new automobile road between Eagle Lake and Bubble Pond, has been held in abeyance because I thought I saw a way that might be acceptable to you of securing the highest disinterested professional opinion available on the merits of the different designs prepared by our architects. . .

Our Service, as one of the Federal bureaus, has available for professional advice on matters involving questions of art arising in the national parks, the National Commission of Fine Arts composed of seven well-qualified, outstanding leaders in the field of art in this country. We consult them on practically every important structural problem arising in our parks, and through their representative on the Pacific Coast, our architectural department there has had the opportunity of consultation on our architectural matters which is availed of. The Commission held a two day meeting here this week, and granted me a hearing on this bridge design problem, acting through Milton B. Medary, architect of Philadelphia, as a committee with power. Mr. Medary and I went over this whole situation for an hour yesterday noon, including the sequence of plans. He told me that he had spent some time on the island several years ago and so was somewhat acquainted with the topography and the lay of park land. He also mentioned that he had met you, so you may have knowledge of his standing in the profession.

Mr. Medary recognized the merits of your architect's designs in themselves, but unreservedly declared them too 'sophisticated for their purpose', that such bridges would be more properly for construction in a city or a private estate. He equally unreservedly declared himself in favor of our architect's composition, without a single adverse criticism or suggestion, being willing to approve it as it stands on paper, and was particularly pleased with the informality of the composition as a whole. He stressed the pleasing impression of the stepping-down effect in the arrangement in building up the side walls and the texture and random arrangement of stones as indicated in the elevation which your architect has eliminated, and agreed that the square terminals were simpler and better than the round ones. He observed that the revised design has had the essence taken out and been left without the character essential for its purpose.

Referring to certain observations in your letter of September 28 on previously approved designs of two bridges by your architect which are now constructed, don't you think there is a sense of satisfaction to the mind when one passes over bridges dissimilar in character thereby avoiding a monotony which it appears would inevitably arise where certain designs are carried through with but slight modifications? In all our parks we strive to avoid similarity of design for this reason; compare the Chittenden Bridge in the Yellowstone with other bridge

structures there, or the variety of design in bridge structures in the Yosemite. It gives the architect an opportunity to play with each individual problem and do something quite unique and distinguished from what has been done elsewhere. And isn't it really a comparatively simple problem that a competent architect can solve to secure stone, either natural or faced, to conform to the individual units of a plan? In other words, departing from what has been done before in the character of bridges, as you point out, might be considered an advantage instead of a drawback.

By the way, Mr. Medary suggested that in order to emphasize that these road-trails would and could not be used for automobiles at any time in the future, and contrary to the charges made from time to time by those who have been ever ready to criticize, it might be wise to cut the width of the bridge down from 16 to 14 feet, - wide enough to permit the passing of horse-drawn vehicles and horseback riders, and obviously too narrow in view of modern road construction practice for motors to pass conveniently. He also mentioned that the Wissahickon Drive in Fairmount Park, Philadelphia, was barred to motorists, with success and approbation of the public, so here we have an example of what is being done elsewhere along the lines we have planned for Lafayette.

I am sincerely hoping that with the above explanation you will not withhold your approval of the design. You and the Service are striving to do the right thing in this matter, and getting the right solution is all that we are interested in, irrespective of divergent professional opinions intimately involved in any design, and it is my feeling that with the approved design adopted it would prove one of the finest structures in the Park Service and one which we would be able in every way to withstand criticism.[303,304]

The next month, Rockefeller made one more attempt to persuade the National Park Service to his point of view. The architect responsible for the Park Service version of the bridge, Daniel R. Hull, and his assistant, Thomas C. Vint, were invited by Rockefeller to inspect the site of the proposed bridge. Ralston was told to show these two men both the Deer Brook and Chasm Brook bridges and the local stone available.

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[303]Arno B. Cammerer to John D. Rockefeller, Jr., October 16, 1926.

[304]The Eleventh Report of the National Commission of Fine Arts, January 1, 1926-June 30, 1929, includes on page 139 the following reference: "In October, 1926, Mr. Arno B. Cammerer, Associate Director of the National Park Service, presented alternative plans for the proposed bridge [Bubble Pond] to be constructed within the Acadia National Park, Mount Desert, Maine. Mr. John D. Rockefeller, Jr., was planning to build this bridge. The Commission reported that the designs submitted by the architect [Bosworth] were not as satisfactory for the location in this national park as was the design of the National Park Landscape Architectural Department; that the latter had character and fitted into the landscape."

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Ralston was also directed to have them talk to Mr. Candage. The day before their arrival, Rockefeller telegraphed from New York a final instruction for Ralston: "Our position is simply that of seeking to give them full knowledge of the situation and to get their judgment as to what is best, not to try to persuade them to one view or another."[305]

After his inspection tour, Hull met with Rockefeller in New York. Both men reported to Cammerer about the event. Hull indicated:

> . . . A second trip [the first being an inspection of the new motor road] was arranged with Mr. Rockefeller's manager, Mr. Ralston, this time inspecting the driving roads on the Rockefeller and Government lands. Special attention on this trip was given to the subject of bridges and here again we hoped that the superintendents and those entrusted with the spending of funds could see the high standard of work being done in this park.
>
> The driving roads, 16 feet in width, have been so developed that they are hardly noticeable in the landscape. While the road may be 16 feet, the grass has been allowed to grow over until just the width of the wheel tracks remains unclothed. Here again the roadside planting results are noticed and the great care which has been used laying up rock walls and parapets. The bridges are all of a fine permanent type and, being built of the local stone, are well-suited to their situations. The Amphitheater [Little Harbor] Brook bridge with weather-faced rock was particularly fine.
>
> On the second day of our visit we met Mr. Simpson, engineer for Mr. Rockefeller, and Mr. Candage, his rock man. In company with them we again visited Bubble Pond and looked over the proposed site for a driving bridge, which it is proposed to have built over the automobile road. The bridge becomes of vital importance because of the large amount of gravel at this point which must be crossed by the driving and horseback parties which are touring the park by that means. The lower end of Bubble Pond is also bound to be a concentrated point in the traffic flow and a crossing at grade would be a certain hazard. A happy arrangement presents itself for working out of this bridge crossing and we believe a result can be secured which will be very pleasing. The line of the driving road, extending from Bubble Pond to Eagle Lake, was covered on foot and this is sure to open up an interesting section which in the past has been little used; in fact, with the high standard of workmanship resulting we believe we should urge the completion of the horse road system as soon as funds

[305]John D. Rockefeller, Jr., to S. F. Ralston, November 22, 1926.

are available and as shown on the map of Lafayette National Park, dated 1922, ...[306]

Hull did not indicate in his report that he held fast to his version of the Bubble Pond bridge. Rockefeller, being a practical man, made arrangements with Ralston to provide for the stone Hull's bridge would require in an economical and efficient manner. He also noted, however, that if the bridge were not authorized, the stone set aside could then be crushed and used on the Bubble Pond road. His letter to Cammerer was short and to the point:

> I saw Mr. Hull yesterday. He impressed me as a very earnest young man, deeply absorbed in his work and thoroughly interested in parks. I should say that he has a natural bent for the work to which he has given himself. Of course as an architect his training and experience has been quite limited.
>
> As a result of our talk, I asked Mr. Hull to say to you that if, on behalf of the Park Department, you decided to adopt his design for the horse bridge at the north end of Bubble Pond, it seemed to me to be highly desirable that he should . . . provide all drawings necessary for the proper interpretation of his ideas. Should Mr. Hull be able personally to superintend the construction of this bridge, in the event of its being authorized, that would be a happy circumstance, for then the ideas of the Department would be best carried out. If that is not possible, it would be the more important that every point connected with the bridge be fully illustrated by drawings, for I would not want to assume any responsibility for the proper interpretation of Mr. Hull's ideas or sketches.[307]

Cammerer simply responded that Hull would be detailed in the spring to complete the drawings for the bridge, a tacit indication that the Park Service version of the bridge would be built as designed. Cammerer mentioned, too, that as Hull worked on the plan locally, he would also work on the General Development Plan being prepared for the park. Rockefeller's participation in the preparation of this plan was assumed. Hull did work on the design drawings for the bridge, but he left the Park Service in the spring of 1927, not wanting to leave Los Angeles when the Engineering Division was moved to San Francisco. His assistant, Thomas Vint, a trained architect and landscape architect, assumed the job.

The problem of the bridge was apparently laid to rest until the autumn of 1927 when Rockefeller wrote to Cammerer:

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[306]Daniel R. Hull to Arno B. Cammerer, December 3, 1926.

[307]John D. Rockefeller, Jr., to Arno B. Cammerer, November 29, 1926.

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> Since the government has preferred to develop its own design for this bridge, and since I have found it so difficult to get rustic stone work done here, I desire, as I said to you, to have the entire matter of drawings, specifications, selecting a builder, deciding on the terms on which the bridge shall be built, as well as the interpreting of the plans and the architectural oversight of the construction, all in the hands of the government representative . . . .

Although this was his official position, he worked behind the scenes to influence the construction process. In the same letter to Cammerer, he directed:

> In this connection you said the other night that the Park Department would naturally turn to Mr. Dorr as its representative in this matter. Since in order to relieve him from the details of building construction and of the financial matters connected therewith, Mr. Dorr some time ago appointed a committee with Mr. Lynam, the Assistant Superintendent of the Lafayette National Park, as its chairman, and since he has left all these matters in the hands of this committee, which is currently in conference with him, and to the chairman of which letters of pledge are addressed, would it not be the logical thing for you to take up with Mr. Lynam rather than with Mr. Dorr these questions on the bridge construction? Were you to discuss the matter with Mr. Dorr, he would ultimately and properly turn it over to Mr. Lynam, hence you very probably will think it best to take it up directly with Mr. Lynam, of whom I have already spoken about the matter. . . .[308]

Mr. Lynam and his committee, of course, worked closely with Rockefeller on the development of most of the bridges. The committee also included Ralston, Rockefeller's superintendent. The Park Service hired a Philadelphia mason, Pringle Borthwick, to build the bridge, thus avoiding the use of local contractors. Once that decision had been made, Rockefeller contacted the mason directly, and Borthwick and Simpson worked out together the details of the bridge construction, modifying outline specifications sent to them by Vint. The actual construction drawings for the bridge (arch centering, etc.) were done by Simpson.

At Borthwick's recommendation, the structure of the Bubble Pond bridge became unique among the carriage road bridges. Simpson reports to Rockefeller an early conversation with Borthwick about the stone work for the bridge:

> In accordance with our suggestions, Mr. Borthwick visited us last month and spent a few days getting acquainted with the problems and conditions to be

[308]John D. Rockefeller, Jr., to Arno B. Cammerer, September 20, 1927.

> met in building the bridge. I took him to see all our other bridges - as well as all the important stone structures and masonry construction jobs on Mount Desert Island - so that he could see the character of the work done by the local stone masons and the quality of the stone used. I found Mr. Borthwick apparently a man of large experience in this kind of work - and of good taste and judgement. He liked the stone here very much. It was our understanding that quarried stone would be used for the ring stones of the arch, weathered stones for the abutments, and a mixture of the two for the rest of the bridge - the spandrel walls, soffit, retaining walls and coping.
>
> With reference to the kind of masonry to be used - whether all stone or plain or reinforced concrete with stone facing - as far as the appearance of the bridge is concerned it does not matter which is used. Mr. Borthwick does not like the idea of what he calls a veneer - but which is more properly a stone facing. We can easily make the bridge all stone - but for economy and speed in construction the concrete is probably preferable. If all stone masonry is used the barrel of the bridge will have to be built for arch action - and all the joints will have to be laid on radial lines - somewhat as in the construction of the ring stones [voussoirs]. As a rule, in this kind of a structure, concrete is more economical than stone masonry - as less skilled labor is required and the work can be much more quickly done. . . .[309]

Since Rockefeller was paying for the bridge (he had pledged $20,000 for its construction), he still played an important role in how it was constructed. Thus, his letter to Simpson regarding the points raised in his November 9th letter included two final decisions. The Park Service and Borthwick had lobbied hard for using as little quarried stone as possible in order to obtain a more rustic appearance. Rockefeller, thinking that weathered stone would be more expensive, decided that Borthwick would have to use the weathered stone available near the quarry and then make do with quarried stone. About not using a concrete core, he writes:

> Since we are hoping to learn much from Mr. Borthwick, since he strongly recommends the former course and does not believe it will cost more, and since I want to put the responsibility squarely on him and on the Government for the result which is obtained in this bridge, I have decided to follow Mr. Borthwick's recommendation in this matter. . . .[310]

The Park Service's bridge, as built by Borthwick, thus is the only bridge in the carriage road system not built with a concrete core. Borthwick proved more accurate

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[309]Paul D. Simpson to John D. Rockefeller, Jr., November 9, 1927.

[310]John D. Rockefeller, Jr., to Paul D. Simpson, December 15, 1927.

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in his estimates than Candage. The cost of the bridge exceeded his $20,000.00 estimate by only $1,301.08.[311] Whether it was because of the bridge's final appearance or his careful accounting, Borthwick was asked by Rockefeller to remain on Mount Desert Island long enough to build the next bridge planned for the carriage roads--Duck Brook.

The Bubble Pond bridge marked a turning point in the development of the carriage road system because it marked a shift in both the design and construction of Rockefeller's bridges. From this point forward, neither Bosworth nor B.W. Candage & Sons were involved. Charles W. Stoughton, an architect who had worked on the Bronx River Parkway, designed all the remaining bridges on the carriage roads which Rockefeller built. Borthwick, Rockefeller's own crews, and another general contractor did the remaining construction.

Beatrix Farrand would later make plantings recommendations for the area around the Bubble Pond bridge. She advised Charles Miller[312] to fill the spaces around the bridge as thickly as the ledge permitted. She suggested maples, oaks, birches, as well as dewberry, clematis, and sumac.[313]

Cammerer sent Rockefeller his report on the roads for his review prior to their being sent to the Bar Harbor Village Improvement Society for their comments. Rockefeller made many editorial suggestions, including a slight display of pique regarding the alignment of the section east of Eagle Lake:

> . . . A little lower down I have suggested the addition of the words "including relocation where desirable." This I do lest some carping critic may later say, should this road be approved, that it was supposed to follow the old alignment and had been changed in several places . . . .[314]

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[311]Charles O. Heydt to John D. Rockefeller, Jr., August 11, 1928.

[312]William Miller ran a nursery on Ocean Drive called "The Miller Gardens". His son, Charles, worked directly with Beatrix Farrand on The Eyrie gardens and accompanied her on many of her planting inspections along the carriage roads. She referred to him in a letter to Rockefeller as their "honest, granitic friend." After his father's death in 1939, Charles resigned to join his sister in managing the nursery.

[313]Beatrix Farrand to John D. Rockefeller, Jr., November 10, 1931.

[314]John D. Rockefeller, Jr., to Arno B. Cammerer, October 6, 1927.

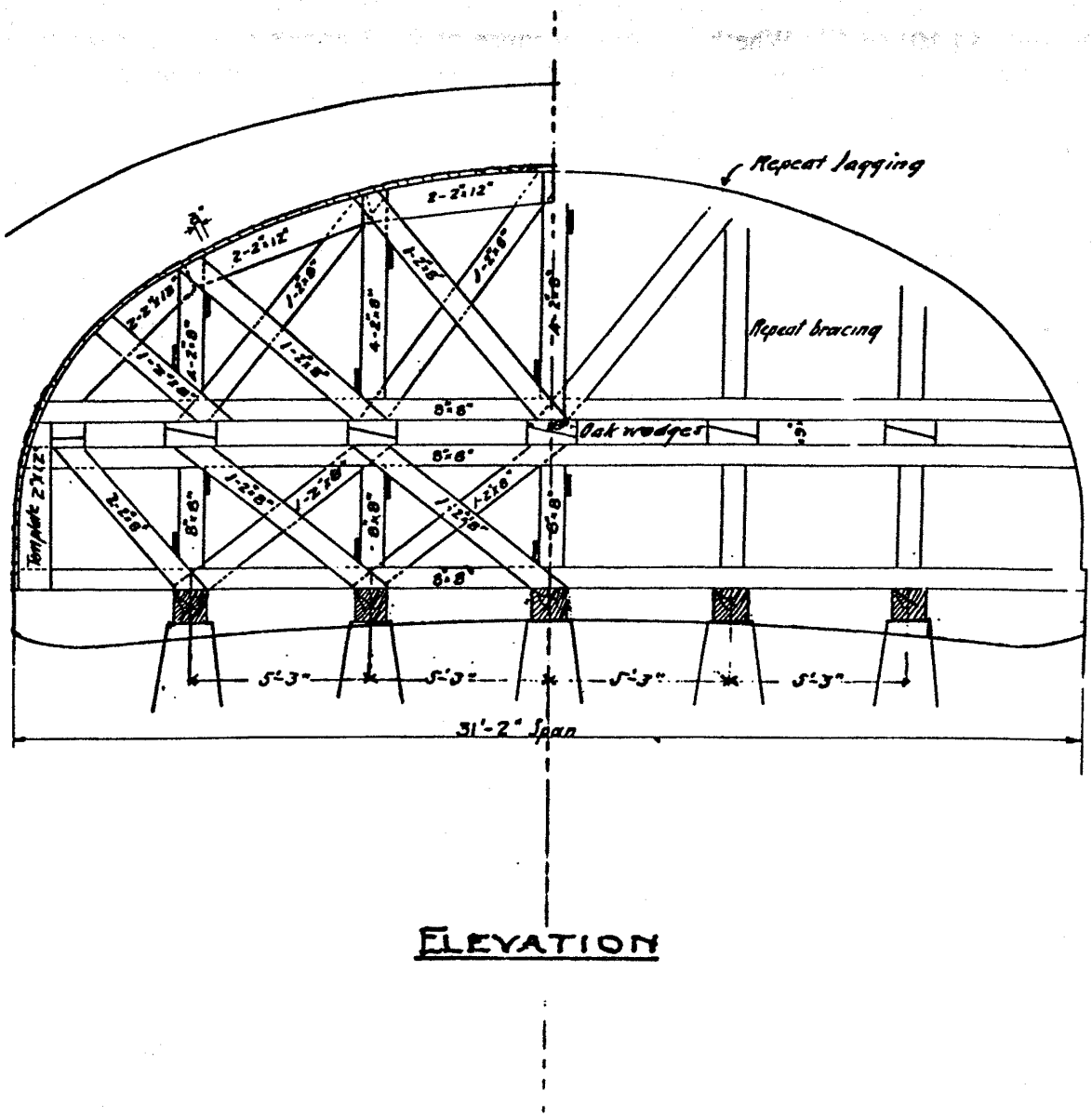


Figure LIX. Paul Simpson's Drawing of Arch Centering for Bubble Pond Bridge

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Figure LX. Bubble Pond Bridge, ca. 1928

Final design of the bridge by Park Service landscape architects Daniel Hull and Thomas Vint.

While the bureaucratic requirements of approval were becoming more demanding, this did not appear to diminish Rockefeller's interest in the specifics of alignment and construction. He wrote to Cammerer, in December of 1927, that Paul Simpson had been studying two alternative routes for the carriage road on the east side of Eagle Lake.

> . . . On general principles, one sees more of a lake by being a little higher up and not too close to its edge. The view, moreover, is usually more attractive if one looks down onto the lake from little elevation than from practically the level of the lake. Then, too, the road, further back and higher up, would undoubtedly be less apt to be seen from the lake, although neither route would be seen from the lake to any extent. Mr. Simpson says that while Mr. Dorr at first favored the road nearest the lake, which avails most largely of the existing road, he subsequently favored the higher road, having in mind the desirability of leaving the present horse road for foot passengers only. In fact, his only reason for preferring the present location was his belief that it might be easier to gain public approval of it than if the line were largely over a new route.[315]

He finally concluded that the best route should be selected, regardless of the difficulty in obtaining general approval (Figure LXI). Ironically, the views of the lake, which were the primary reason for relocating the road, have been lost by the unchecked growth of trees between this section of road and Eagle Lake.[316,317]

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[315]John D. Rockefeller, Jr., to Arno B. Cammerer, December 15, 1927.

[316]This section of the road, on the east side of Eagle Lake, also crossed an interesting historical remnant. On July 4, 1883, a mountain railroad was opened, from the eastern shore of Eagle Lake up the face of Cadillac (then called Green) Mountain to its summit. Visitors were brought in coaches from Bar Harbor to the northern shore of Eagle Lake. A stern-wheel steamboat named the "Wauwinet" ferried the tourists two miles over Eagle Lake to its eastern shore, and the cog railway, about 6300 feet in length, bore them up the 1200-foot rise to the summit. Four round trips were made each day during the tourist season. After a brisk beginning, the business began to fall off, and by 1890 the railroad was out of business. The hotel which had stood on the summit of Green Mountain burned in 1884, was rebuilt in 1885, and finally was torn down in 1897, and the lumber sold. A story which became a tradition about the Green Mountain cog railroads was that a very stout and fashionable lady, when the train was laboring up the steep grade, almost at the mountain top, asked nervously, "Conductor, if these cogs should break, where would we go?" And looking down in the blue waters of Eagle Lake far below, he replied, "Madame, that depends on the kind of life we've been living!" (Frank H. Burt, "Mount Desert's Mountain Railway" in *Appalachia*, [Boston: Appalachian Mountain Club], 1943.)

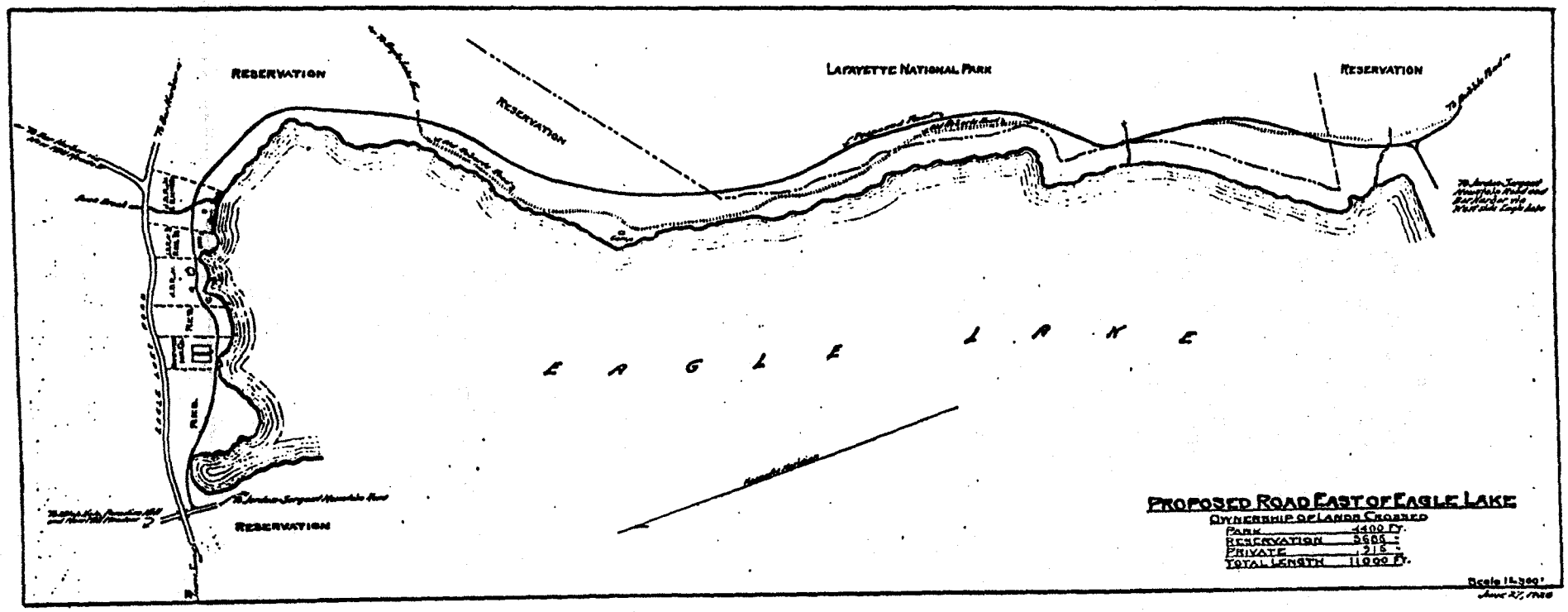


Figure LXI. Eagle Lake Carriage Road - East

Both Rockefeller and Beatrix Farrand would spend considerable time studying the planting at the Beaver Meadow Pool, located at the southern end of the lake just before the road on the east side of Eagle Lake turns west to complete the circuit. A triple culvert was installed here to regulate the flow into the small pool which was designed and managed as a spawning area for trout. Eventually, waterlilies, elders, lobelias and pickerelweed were planted to ". . . make this place a really beautiful one. . . . "[318] Some of these plants are still in place.

In the spring of 1928, the great circuit around Jordan, Sargent, Parkman and Cedar Swamp Mountains (the "girdling road", as Pepper had called it) was finally completed. Rockefeller's letter to Ralston in the early spring of 1928 describes the work planned for that year:

1. Mr. Walls is to start on the horse road to the south of Bubble Pond, beginning at my Jordan Pond entrance [where the Jordan Pond Gate Lodge was later built] and working in toward Mr. Dane's place [present Wildwood Stables].

2. Mr. Driscoll is to start on the bridle path along the west side of Bubble Pond, where the new horse road branches off to go north to the bridge [Bubble Pond bridge]. He is to complete the road to the bridge, and then start in on the north side of the bridge and continue north [toward Eagle Lake].

3. You are to open up the quarry and put in the concrete foundations for the Bubble Pond bridge and the side walls, preparatory to Mr. Borthwick's work.

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[317] Another small stone bridge was planned on this road at the north end of Eagle Lake over the Duck Brook as it flows from the lake. Charles W. Stoughton, who would soon design the Duck Brook bridge on the Hulls Cove carriage roads, designed it in June, 1929. Rockefeller wrote to Stoughton that the bridge was not built because: "After further studying the location - which is flat and quiet - it seemed best to not have a bridge which would rise and interrupt the grade of the road so we are putting a wooden bridge with a rustic railing. Please understand this change of plans is not the fault of the bridge for I thought the bridge excellent. (John D. Rockefeller, Jr., to Charles W. Stoughton, August 5, 1929.)

[318] Beatrix Farrand to John D. Rockefeller, July 11, 1931.

4. Mr. Joy is to finish his own road on the north side of Sargent Mountain, also Mr. Driscoll's unfinished section on the same road.[319]

Before planning these projects, Rockefeller took time to enjoy the completed Jordan-Sargent Mountain Road with his old friend, Charles Simpson less than a year before the ailing Simpson died:

> Nothing could have given me greater pleasure than to take the first drive over the Jordan-Sargent Mountain Road from one end to the other with you. That you and I, who spent so many happy days in doing the pioneer work on this road, should have the opportunity of viewing in each other's company the consummation of our joint efforts was a real delight to me. That road will always stand as a monument to you, and a very worthy and enduring monument it will be.
>
> But there is another and more intimate way in which I should like to commemorate the happy day which we spent together and all that it signifies. I want the pleasure of sending you the enclosed check [$5,000] as an added expression of my satisfaction in the work that you have done for me, and as further evidence of my high regard and warm friendship for you. Tuck this little fund away in the bank for safekeeping and draw upon it from time to time as the occasion arises. Thus I shall have the satisfaction of knowing that through the years to come you will have this continuing reminder of my appreciation and esteem.[320]

Simpson answered:

> Our trip over the new road together was indeed a happy event for me, and brought to my mind the happy days we spent in working out its location, but its result is a monument to you, as are all the other roads you have so generously furnished to Mount Desert Island and I am proud to think that I had the pleasure of helping in a small way in their construction. . . . I have had quite a large family to support and I fear I do not have much of a head for business. I have not succeeded in much more than furnishing my family with a home and a living. . . . [the check] will surely be a pleasant reminder of your friendship, which I prize so highly and of the many happy days passed in doing your interesting work.[321]

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[319]John D. Rockefeller, Jr., to S. F. Ralston, March 15, 1928.

[320]John D. Rockefeller, Jr., to Charles P. Simpson, November 3, 1927.

[321]Charles P. Simpson to John D. Rockefeller, Jr., November 10, 1927.



Figure LXII. Charles P. Simpson

First engineer of the carriage road system, ca. 1927

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SEQUENCE OF DEVELOPMENT

Part III -- The Culmination

As the carriage road system was expanding, so was the Park. In 1929 the Schoodic Peninsula was added, and the name was changed from Lafayette to Acadia National Park. In this year of the stock market crash and the beginning of the great Depression, the carriage roads provided much needed employment, as did other Rockefeller projects, such as Rockefeller Center in New York and Colonial Williamsburg in Virginia. During that year, the road construction on Mount Desert Island proceeded from the Eagle Lake bridge around the east side of Eagle Lake to Bubble Pond and beyond. Construction also continued on the Hulls Cove carriage road which connected Eagle Lake Bridge to Frenchman's Bay.

Hulls Cove Section

Rockefeller considered the Hulls Cove section the "grand northern terminus" of his carriage road system and planned magnificent vistas of Frenchman's Bay from this road and the adjacent Paradise Hill loop. In 1920, when Dorr and Rockefeller were planning the broad outline of the system, Dorr wrote Rockefeller with his suggestions:

> Between this area of headland and lake, which is one of the most beautiful on the Island, and Eagle Lake rises what is known as Brewer's Mountain, a broad low elevation, bordered on the east by marshlands which the beaver have lately dammed into a pond, receiving the overflow from Eagle Lake, and on the west by pasture and farm lands belonging to the Brewer family. None of this high land between is important to the Park, but to the east of the beaver pond, between that and Great Hill, and to the west of the Brewer farm where the brook supplying the Breakneck Ponds flows northward at the foot of McFarland's hill, level and attractive bridle path and driving road connections to the two sides of Eagle Lake can be secured, either now or later, at relatively slight expense. The road on the east would connect with the bridle path and driving road system to the east of Eagle Lake, extending on by Bubble Pond as now proposed; the one on the west would connect, as elsewhere outlined, with the western side of Eagle Lake, utilizing the old Curran trail for a good portion of the way, and passing on the way through one of the best pieces of old woodland remaining on the Island.[322]

[322]George B. Dorr to John D. Rockefeller, Jr., July 22, 1920.

Just past the Eagle Lake bridge, the Hulls Cove road, as Dorr suggested, passes both Breakneck ponds and the Half Moon pond and follows the route of the old Curran trail. If Champlain Road (now the New Eagle Lake Road) had been converted from an automobile road to a carriage road, the connection to the road on the east side of Eagle Lake could also have been made.

The Hulls Cove section includes the loop which circles Witch Hole pond. At the north end of this circle is the Paradise Hill loop. One of Rockefeller's crews, under the direction of his foreman, Mr. Emery, began its construction just north of Eagle Lake bridge in 1927. Seven months later, Emery's crew had been joined by another under the direction of Mr. Stover. Ralston reported to Rockefeller:

> North of Eagle Lake bridge splendid progress has been made. Mr. Emery is now working about 900 feet north of the Triangle, where the Hulls Cove branch joins, and Mr. Stover, who is working on the New Mill Meadow end of the road is making fair progress, and I feel safe in saying that you will be able to drive through this road by the middle of September.[323]

Both loops were finished when the bridge was completed in 1929. A connection from the Paradise Hill road to Duck Brook Road/Eden Street was planned but never built. The steepness meant a difficult grade, and it interfered with planned construction of a motor road. Duck Brook bridge, however, did connect the Witch Hole loop to Champlain Road (now the New Eagle Lake Road). It was designed by Charles W. Stoughton and is the most refined and finished of the all the carriage road bridges. Perhaps this was the result of the debate between Rockefeller and the Park Service over the design of Bubble Pond bridge. In that discussion, it was ironic that Rockefeller had found himself lobbying hard for Bosworth's "citified" bridge. He had for years been squarely on the other side of the argument, encouraging Candage and his masons not to do such "good work," but to make the bridges more rustic in appearance. He even used the same example--the Little Harbor Brook bridge--in instructing the masons as to the kind of work he was seeking that the Park Service pointed to as their model for the Bubble Pond bridge. When the time came to design the bridge over the Duck Brook, he was even more committed to a sophisticated bridge design than he had been for the Bubble Pond bridge. Working on his own property, with no requirement to submit the bridge to the Park Service for approval, he hired Pringle Borthwick in the fall of 1928 (just after Borthwick had finished the Bubble Pond bridge) to build Stoughton's design for a highly embellished, three-span bridge.

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[323]S. F. Ralston to John D. Rockefeller, Jr., June 18, 1928.

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This bridge was the first of six bridges Stoughton designed for Rockefeller on Mount Desert Island. Rockefeller had also hired him to design bridges on his Pocantico Hills estate in the Hudson River Valley. By 1928, the year he designed the Duck Brook bridge, he had been in practice with his brother in New York City for 34 years. In addition to designing several bridges and buildings associated with the Bronx River Parkway in New York, he also designed several buildings in Westchester County. Since this is the county in which the Pocantico Hills estate is located, perhaps this is how Rockefeller became familiar with his work.

Because the bridge Stoughton designed to cross the Duck Brook affords a panoramic view of the bay, lookouts were included as part of the design. Scenic views of the brook and of the bridge itself, both from the deck and from below, are also provided. It is a symmetrical, semi-circular arch bridge, with a 40-foot main span flanked by 21-foot spans. On both sides of the bridge, semi-circular lookouts project from the spandrel walls above the piers. A staircase on the upstream side provides a path down to the brook, thus providing a view of the bridge from below. Additional ornamental details include pierced parapets, distinctly patterned paving stones at each lookout, and coping stones with a smooth, bush-hammered finish. The stone work itself is also polished and refined. The quarry-faced ashlar is laid in broken-range coursing rather than the random stone work used for Bubble Pond. Also unlike Bubble Pond, the structure of the bridge was once again a concrete core with steel reinforcing, as designed by Stoughton's engineers. Figures LXIII and LXIV are photographs of this bridge under construction.[324]

The total cost of the bridge was $77,837.17, only a few thousand more than the much smaller Eagle Lake bridge built only a year earlier by B. W. Candage & Son. Borthwick's estimate for the job was $76,000.00. Unlike the arrangement with Candage, who was paid for time and materials plus a profit, Rockefeller paid for the actual construction of the bridge and Borthwick was paid a salary for overseeing the work. He received a total of $125.00 per week, plus expenses which included the cost of periodic visits to his home in Philadelphia. At the end of construction he had been paid a total of $4,349.09.[325,326]

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[324]Beatrix Farrand recorded in her road notes that the small construction building shown in Figure burned before construction was completed.

[325]A. H. Lynam to John D. Rockefeller, Jr., May 23, 1929.

[326]The bridge on the motor road which crosses Duck Brook is also a triple arch bridge and, s it is also called Duck Brook bridge, it is often a source of confusion.

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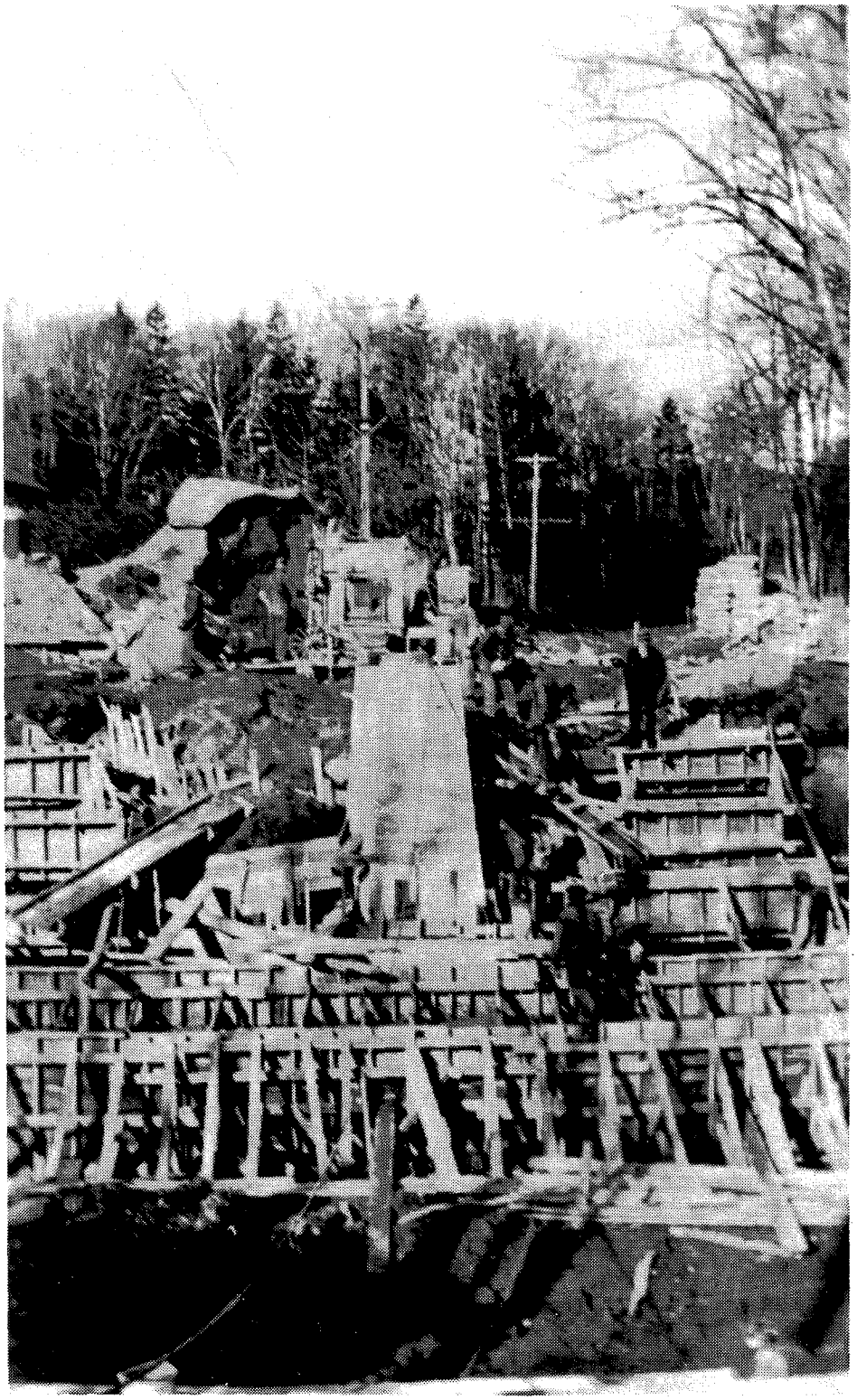


Figure LXIII. Construction of centering for Duck Brook bridge

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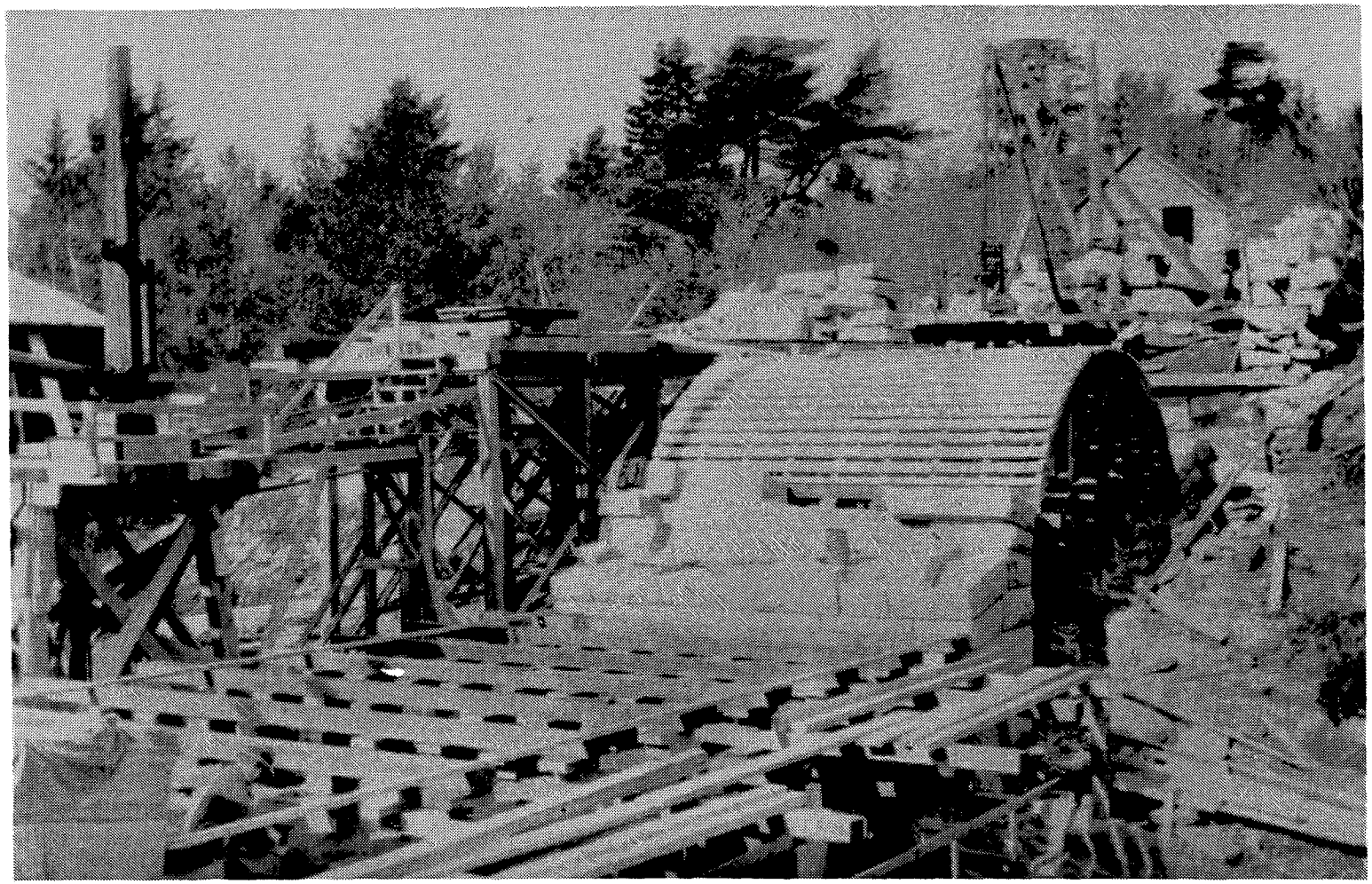


Figure LXIV. Duck Brook Bridge Construction, ca. 1928

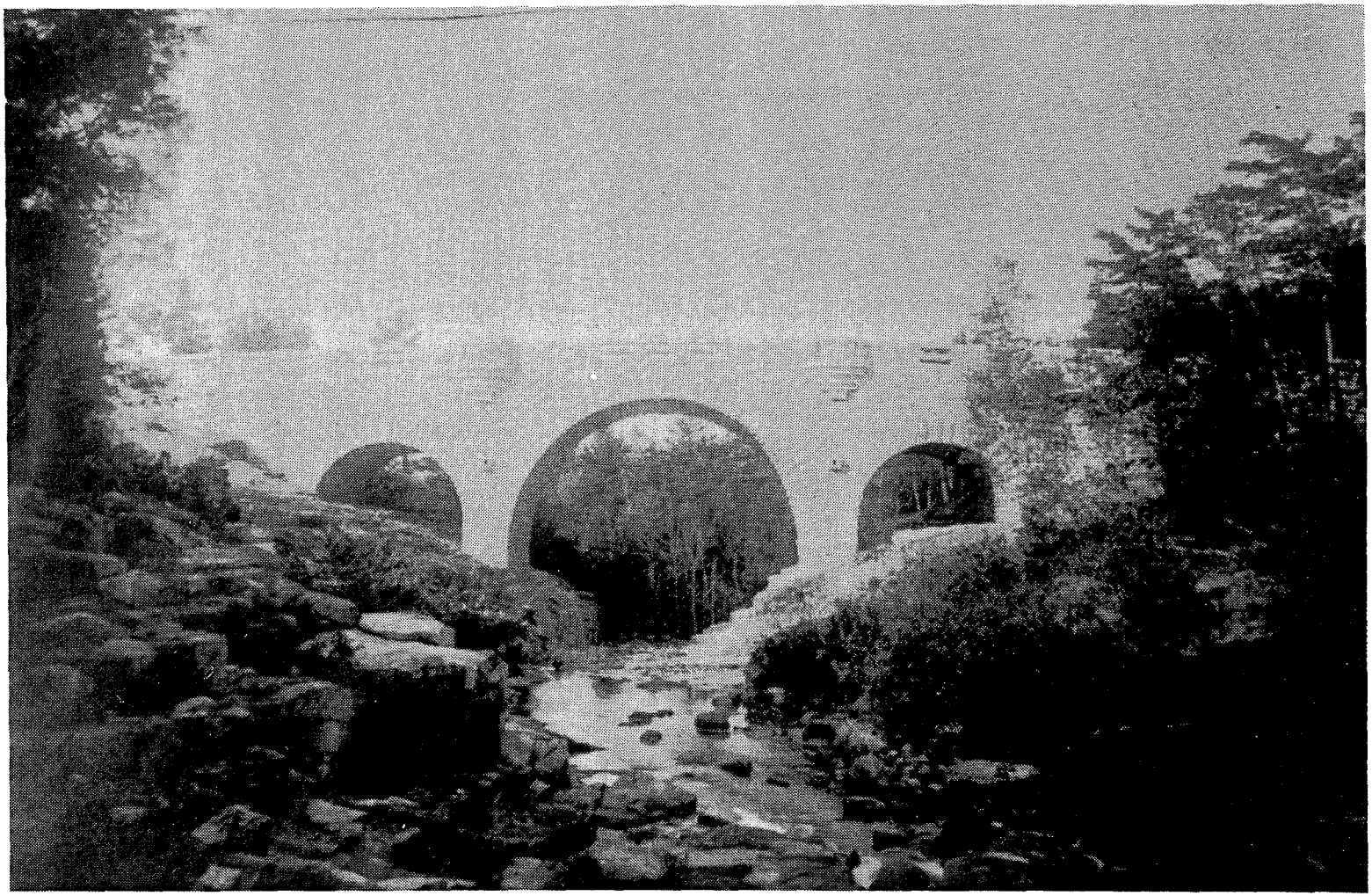


Figure LXV. Duck Brook Bridge (Postcard View)

Over the next two years, Beatrix Farrand travelled these roads frequently with Charles Miller, making notes about the planting for both the roads and Duck Brook bridge. On the Paradise Hill loop she was anxious that the bare banks be " . . . clothed with trees and shrubs, making an occasional plantation of a particular sort of shrub, such as Diervilla [Bush honeysuckle], Wild Roses and Sweet Fern, as these occur normally in masses and clumps."[327] Where scars from the road construction and quarrying operations needed concealment, she recommended planting blackberries, clematis or creepers to hang over steep rocks. Near Half Moon Pond, she suggested spruce on the upper slopes and Diervilla, sweet fern and wild roses on the lower. In other marshy areas in this section (i.e., Breakneck Ponds and Witch Hole Pond) she specified combinations of hollies, azaleas, clematis, elderberries, and Cassandra. She recorded two suggestions about the roadside planting. In the autumn of 1930, she explained:

> Instead of keeping the edges of the roads fairly and evenly planted and a continuous line of trees, keep occasional spots open in which clumps of shrubs may be set out. This suggestion is made in order to try to vary the road planting in height and quality and type of material, as these variations are usually shown in natural growth.[328]

The following spring she added:

> It was also suggested that in occasional places it would be advisable to plant shrubs outside the road copings where these show rather awkwardly from adjoining turns in the road. Blackberries, wild roses, blueberries and so on would seem useful for these purposes.[329]

As for the planting to enhance the appearance of the bridge, she recommended in the fall of 1930 that pines be added on both sides of the bridge and on both sides of the stream, ". . . trying as nearly as may be to keep one or two good views of the triple arches from the approach roads."[330] A year later, she noted:

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[327]Beatrix Farrand to John D. Rockefeller, Jr., November 4, 1930.

[328]Beatrix Farrand to John D. Rockefeller, Jr., November 4, 1930.

[329]Beatrix Farrand to John D. Rockefeller, Jr., April/May, 1931.

[330]Beatrix Farrand to John D. Rockefeller, Jr., November 4, 1930.

> The planting around the Duck Brook bridge was thought admirable by Mrs. Farrand[331] and to vastly improve the framing of the bridge, particularly the southwest portion. A group of pines has been planted fairly near the foot of the steps leading to the lower path and helps mask the expanse of masonry at this point. Other deciduous material has been planted in this neighborhood and will, during the course of the next season or two, make a very good frame and effect.[332] (Figure XXIII, p. 66)

In 1929, Rockefeller was also involved with plans for gate lodges at entrances to the carriage roads where they intersected automobile roads. This he felt necessary to ensure that automobiles were not allowed access to the carriage roads. At this time, however, his existing entrance on the Jordan Pond Road was merely stone piers with wooden gates designed by Duncan Candler, the architect who remodelled The Eyrie. The same type of gates were designed for Duck Brook bridge. Stoughton had first recommended ornamental iron gates, but Rockefeller asked that a design be prepared for wooden gates between the stone piers instead of iron. Borthwick also drew a rough sketch of his notion for this gate. None were built, however. There was discussion in the town of shifting the new Eagle Lake Road to the east and Rockefeller, hopeful that section of road could then be converted into a horse road, delayed construction of the gate, and then just installed something functional to control access to the roads.

Construction in the Early 1930s

In the early 1930s construction on the carriage road system increased dramatically. Between 1930 and 1935, three roads were completed: the Bubble Pond road, the Aunt Betty's Pond road and the Day Mountain road system (with the exception of the summit road. In addition, the Amphitheater road construction, delayed by Senator Pepper in 1920, was finished. Included in the road construction were six bridges, five built by Rockefeller's crews and one by the Park Service. Four lodges were planned and two were constructed in 1932. The lodges are discussed first, and then the discussion of the remaining road construction begins again at Aunt Betty's Pond road.

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[331]In her notes, Mrs. Farrand customarily referred to herself in the third person.

[332]Beatrix Farrand to John D. Rockefeller, Jr., November 10, 1931.

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The Eagle Lake Lodge

As early as 1922, George Dorr and Rockefeller had discussed the importance of developing a ". . . center where horses may be secured at reasonable prices."[333] Rockefeller indicated his agreement in a letter dated August 14, 1922. The letter indicates Dorr gave him an undated memo on letterhead from the Superintendent's office at Lafayette National Park which contained the following note:

> . . . Importance is attached by the Director and Acting Director to the plan presented by Mr. Dorr for the establishment of a National Park centre in the section to the west of Eagle Lake where horses may be kept and rented out at reasonable prices to visitors to the Park. An excessive price was charged when Mr. Mather and the Acting Director drove with Mr. Dorr through the system now constructed and it is thought this may be avoided by the establishment of such a centre.[334]

In 1929, Rockefeller, through the National Park Service, funded a tour of the western parks by Grosvenor Atterbury for the purpose of finding an architectural style appropriate to Acadia. Like Stoughton, Atterbury was a New York City architect and had worked for Rockefeller in Pocantico Hills. By the autumn of 1930, Atterbury had completed preliminary studies and some working drawings for this center, as well as preliminary studies for the gate lodges. It was only at this stage that Rockefeller informed George Dorr of Atterbury's trip and his plans for Acadia's buildings, though he had discussed them with Albright and Cammerer, the Director and Associate Director.

Work on the Eagle Lake Lodge went as far as staking its location on the ground on property Rockefeller owned between Eagle Lake and Eagle Lake Road. The drawings (Figure LXVI) show it would have been a remarkable structure. Nearly 400 feet long, it was intended to serve as a tea house (like the Jordan Pond House) and as a riding stable from which people could rent horses and carriages. Its architectural style was similar to that of the gate lodges which were eventually built. For example, the same single-row brick bands in stone used for the Brown Mountain Gate Lodge were shown on the drawings for the Eagle Lake Lodge.

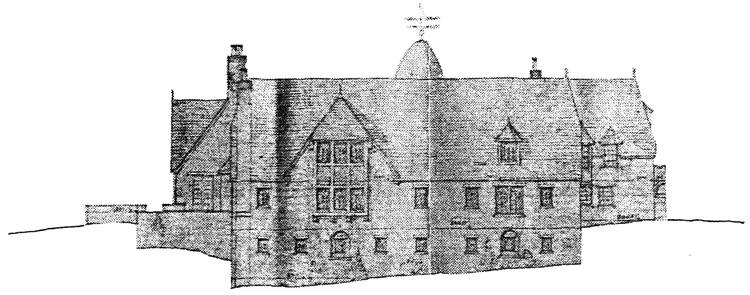
The Eagle Lake Lodge was never built because the sewage problems became a political issue which Rockefeller could not resolve. Atterbury had indicated in a letter

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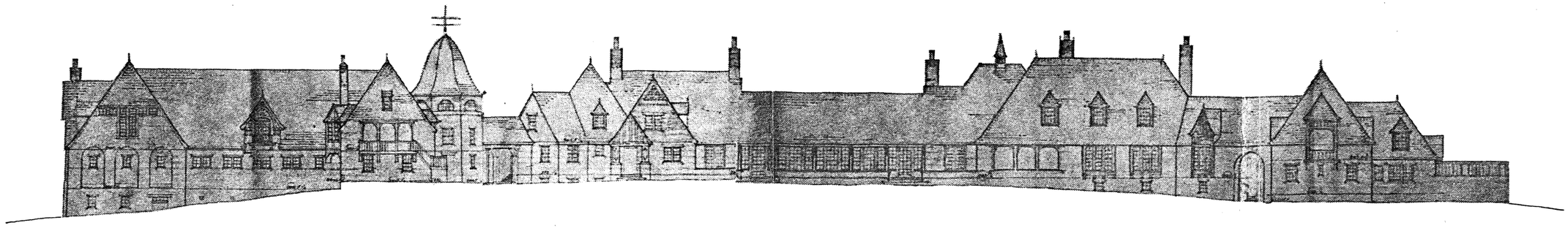
[333]John D. Rockefeller, Jr., to George B. Dorr, August 14, 1922.

[334]George B. Dorr to John D. Rockefeller, Jr., undated.

297 298



East End Elevation



Entrance Elevation

Figure LXVI. Atterbury's Drawing
of Eagle Lake Lodge

to Rockefeller that he was tabling the matter, as Rockefeller had requested, pending the study of possible alternatives for the sewage disposal system.[335] The Bar Harbor Water Company withheld its approval of the building and killed the project. Why it was able to do so is explained in George Dorr's book. Eagle Lake is the water supply for the Town of Bar Harbor. When its purity was threatened by the construction of a house, the Bar Harbor Water Company did not have the authority to condemn property to protect its water supply. At the Water Company's request, the Trustees of Public Reservations obtained the authority to condemn property in the watersheds of Eagle Lake and Jordan Pond. The Water Company then sold the land to the Trustees with restrictions attached regarding construction within the drainage basin of the Lake.[336]

How all this came to affect the construction of Eagle Lake Lodge is explained in a memo from a Mount Desert Island doctor to Raymond Fosdick, a Rockefeller employee:

> Mr. Rockefeller, Jr., owns property at the north end of Eagle Lake running from the shore of the lake to the Eagle Lake highway. He desires to build a teahouse and horse centre on this property. Mr. Atterbury has drawn plans therefor. The buildings have been staked on the ground. Mr. Lynam finds that the stable would extend over onto property owned by the Trustees of Public Reservations. An effort is being made to secure this land for Mr. Rockefeller by an exchange with the Trustees of another piece of land. Even if this effort is successful, this particular piece of land is subject to rather onerous restrictions in favor of the Water Company who formerly owned it. . . .
>
> With reference to Mr. Rockefeller's property adjoining, he is stopped from building any building thereon which the Bar Harbor Water Company does not sanction. Mr. Lynam has talked with Mr. Fred Lynam, the President of the Bar Harbor Water Company, on the ground. Mr. Fred Lynam cordially approved the proposed buildings. Later the Water Company's engineer from Boston was brought to Bar Harbor and went to the site. . . . While the Water Company's engineer and the Health Officer agreed informally in conversation that the scheme of drainage as set forth in the attached memorandum submitted to them was perfectly sanitary, Mr. Baker and the other summer residents took the position that psychologically a stable on the shores of the lake was a bad thing, and further that the Bar Harbor people did not want the house anyhow. The

[335]Grosvenor Atterbury to John D. Rockefeller, Jr., November 25, 1930.

[336]George B. Dorr, *The Story of Acadia National Park*, (Bar Harbor, Me: Acadia Publishing Company, 1985), 17.

> attitude of these gentlemen seems to reflect the present attitude of the summer residents against the motor road which has been planned.[337]

Two years later, after several engineers had visited the site and assured themselves the development would be completely sanitary; and, after discussion of chlorinating the lake, Rockefeller gave up. He wrote to Dr. L. Kast:

> . . . As you state, the matter of chlorinating the water supply of Bar Harbor was taken up at the meeting in the spring. From the newspaper account which I enclose you will see that the matter was very badly handled, so badly that it is not surprising that the proposal was defeated. I have been told that the townspeople of Bar Harbor are anxious to revive the questions of the construction of the tea house at Eagle Lake and that they are disposed to bring pressure on the water company to give the necessary consent.
>
> Having spent so much time and effort in striving to gain permission to carry out this important public improvement and having met such complete and unyielding opposition, although admittedly without reference to the merits of the case, I have not felt disposed to make any further effort to force on the people something which they are opposed to. If, therefore, the matter ever should be revived, the initiative would have to be on the other side. The necessary consents would have to be secured and subsequent thereto a request made of me to reconsider the matter.[338]

The Brown Mountain and Jordan Pond Gate Lodges

Atterbury did complete the plans and specifications in 1931 for the Brown Mountain and Jordan Pond Gate Lodges. Both lodges were then put out to bid. In October, Rockefeller awarded the contract for construction to C. M. Smallidge but the contract did not include the site work necessary before actual construction could begin. This meant the work fell to Simpson and to Rockefeller's estate superintendent, S. F. Ralston. By the time Smallidge began his work, they and their crews had laid in the roads, set the utilities, dug wells, and excavated and built formwork for the building foundations. Throughout this process Atterbury kept close watch, requesting from

[337]Dr. L. Kast to Raymond Fosdick, September 26, 1930.

[338]John D. Rockefeller, Jr., to Dr. L. Kast, July 27, 1932.

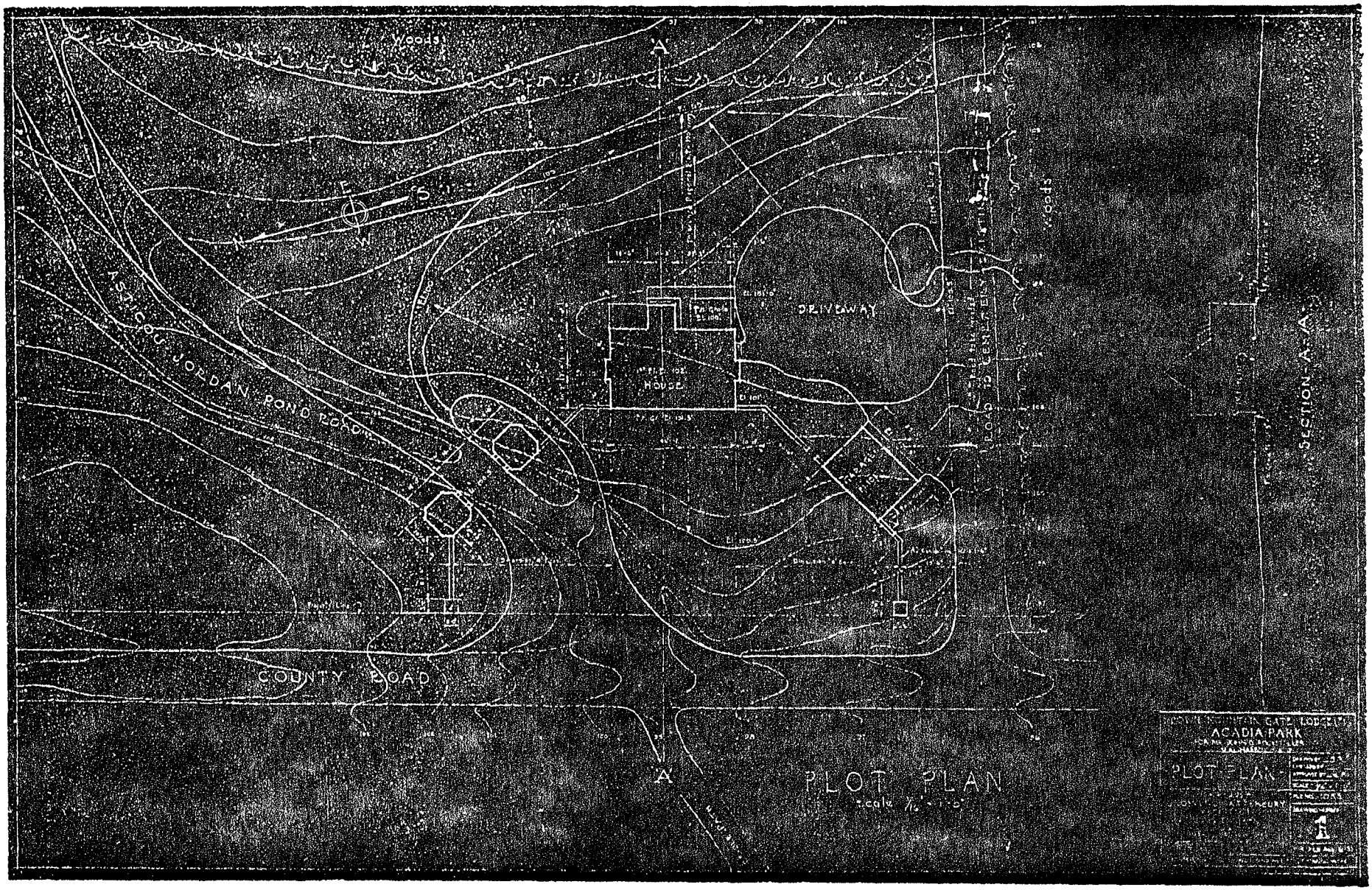


Figure LXVII. Brown Mountain Gate Lodge, Site Plan



Figure LXIX. Brown Mountain Gate Lodge

Simpson weekly written reports ". . . as to the general progress of the work being done under your supervision."[339]

After some initial confusion over the elevation of utility lines at the Jordan Pond Gate Lodge, the construction work appears to have gone smoothly for both buildings. The details of construction and the final completion of the lodges were a subject of great interest. The *Bar Harbor Times* described at length the contractors involved and the materials to be used in construction.[340] It mentioned, as well, that the gate lodges were designed as ". . . living quarters of those in charge of traffic on Mr. Rockefeller's road systems. . . . The construction of these two lodges marks a step well considered in the development of the Rockefeller system and, incidentally but none the less surely, it marks a step in development of the whole Island and for the Park, since such beautiful structures just at its borders constitute unique possessions in which it shares."[341]

When they were finished, they were universally admired. Rockefeller wrote Atterbury in 1932:

> I have just returned from a few days in Maine. The two gate lodges are the talk of the entire state. People come from all about to see and photograph them. The group of buildings in each instance is much more imposing and important than I dreamed it would be, and of course both are exceedingly charming and decorative. You have made your plans for the layout with great skill, and they have been well carried out. Mr. Graves, the contractor [from Northeast Harbor], simply adores both the buildings, and talks of them as though they were his favorite sons. They are really most successful. I am greatly pleased with their beauty and interest, and congratulate you on what you have accomplished in their construction.[342]

When an article about the buildings was published in *Architecture* magazine in 1935, Atterbury wrote to Rockefeller about the comments he received:

> When I met Secretary Ickes lately, he told me that he intended to make application as caretaker so as to live in it after he retires from public service. I told him there were two or three other applications but that I would do all I

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[339]Grosvenor Atterbury to Paul D. Simpson, September 28, 1931, personal collection of Mr. and Mrs. Charles P. Simpson.

[340]See Appendix IX for transcript of entire article.

[341]"Working on the New Gate Lodges," *Bar Harbor Times*. November 21, 1931.

[342]John D. Rockefeller, Jr., to Grosvenor Atterbury, May 27, 1932.

> could for him, and from the enclosed note it appears that he thinks he is assured of the position. . . . I have just opened two letters from officials in the National Park Service, asking if they could have some space in the building, if you and Mr. Albright and Mr. Ickes do not occupy it all.[343]

Final site work on the buildings was not completed without an interesting flurry of correspondence between Rockefeller, Atterbury, and Farrand, in which Rockefeller was called upon to mediate between two strong-willed individuals whom he both liked and respected. Mrs. Farrand offered advice on the grading and terraces for both lodges and on planting design. On May 10, 1932, she wrote to Rockefeller prior to a planned meeting in Atterbury's office to outline her grading plans. At Jordan Pond, she recommended building a rough terrace retained by a stone wall to solve grading difficulties caused by the need to accommodate the utilities. Since this approach made it possible to save the trees between the building and the road, she deemed it the most expedient solution. (See the terrace and trees in 1930, Figure LXX, and 1988, Figure LXXI). A week later, in Atterbury's office, this suggestion was approved by his associates, Tompkins and Dvorak. Her grading scheme for the Brown Mountain gate lodge, however, was vetoed by Rockefeller, apparently because of its interference with the "view of the lodge group." Her suggestion:

> A considerable amount of surplus soil of poor quality must be disposed of in the neighborhood of this building. A suggestion was made to use this surplus in an inexpensive and effective manner by using the present boulder copings now placed along the east side of the Hadlock Pond road as a sort of rough retaining wall behind which a mound of this surplus soil could be raised and which could be later loamed and planted with trees and shrubs. The mound would not be brought sufficiently near the buildings to interfere with their aspect but would tend to frame them. This mound would also give an attractive finish to the clearing east of it and would make a suitable and yet not forbidding park boundary.[344]

His response:

> As I stood on the Brown Mountain road toward the north end of the open field and looked back at the gate lodge, it seemed to me that a high planted mound along the present property line parallel with the street would seriously interfere with the view of the gate lodge group as one comes from the north, which view seems to me most interesting and attractive. I told Mr. Ralston I felt we could afford to fill the little valley that occurs in the present

[343]Grosvenor Atterbury to John D. Rockefeller, Jr., April 18, 1935.

[344]Beatrix Farrand to John D. Rockefeller, Jr., May 17, 1932.

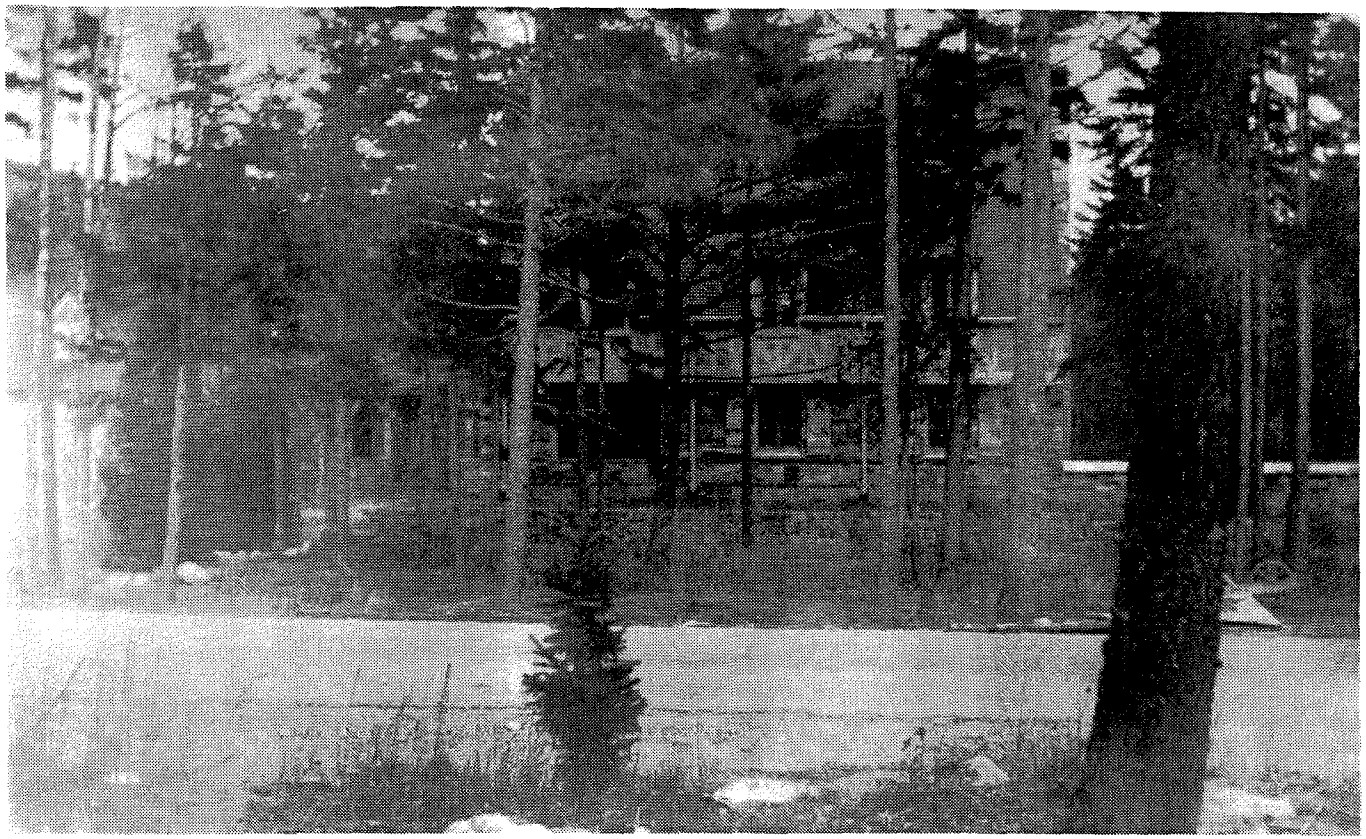


Figure LXX. Jordan Pond Gate Lodge, ca. 1932



Figure LXXI. Jordan Pond Gate Lodge, 1988.

Note absence of trees wall was built to preserve.

> boulder wall, bringing it up to the level of the ground on either side of it. This would take a good deal of fill if we were trying to get rid of it, but to raise the grade beyond that or rather beyond the grade of the present high portions of the boulder boundary wall seemed to me undesirable. Much of this extra fill can probably be used on the Amphitheater [Asticou-Jordan Pond] road. If any is left it could be put in the valley along the boulder boundary line as suggested above, or it could be left back against the woods more or less where it is and planted on there, as though it were a natural mound. That would perhaps be the cheapest way of dealing with it.[345]

As Mrs. Farrand did not prepare planting plans for the lodges, but rather staked the plants in the field with Mr. Miller, there is no record of her specific recommendations. The only written record of her suggestions is found in Atterbury's objections to them, as stated in his letter to Rockefeller. He recommends:

- The use of birches and evergreens (Mrs. Farrand indicated birches would not live.)
- The avoidance of specimen trees and the creation of a more naturalistic, picturesque, "rangy" effect.
- The use of climbing vines at corners and intermediate points, ". . . but not so many as to cover too much of the stone work."
- The absence of continuous planting at the base of the buildings, walls, and particularly the gate towers because their height should not be cut further.
- The avoidance of exotic or foreign plants.[346]

Specifically related to the Jordan Pond lodge, he desired that what was planted should appear to be natural growth similar to the surrounding woods. At the Brown Mountain lodge he strongly recommended the open court facing the highway " . . . not be cut off by any formal line of planting or other material which would emphasize the asymmetry of the road entrance and be unfortunate in other respects."[347]

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[345]John D. Rockefeller, Jr., to Beatrix Farrand, May 26, 1932.

[346]Grosvenor Atterbury to John D. Rockefeller, Jr., November 29, 1932, personal collection of Mr. and Mrs. Charles P. Simpson.

[347]Ibid.

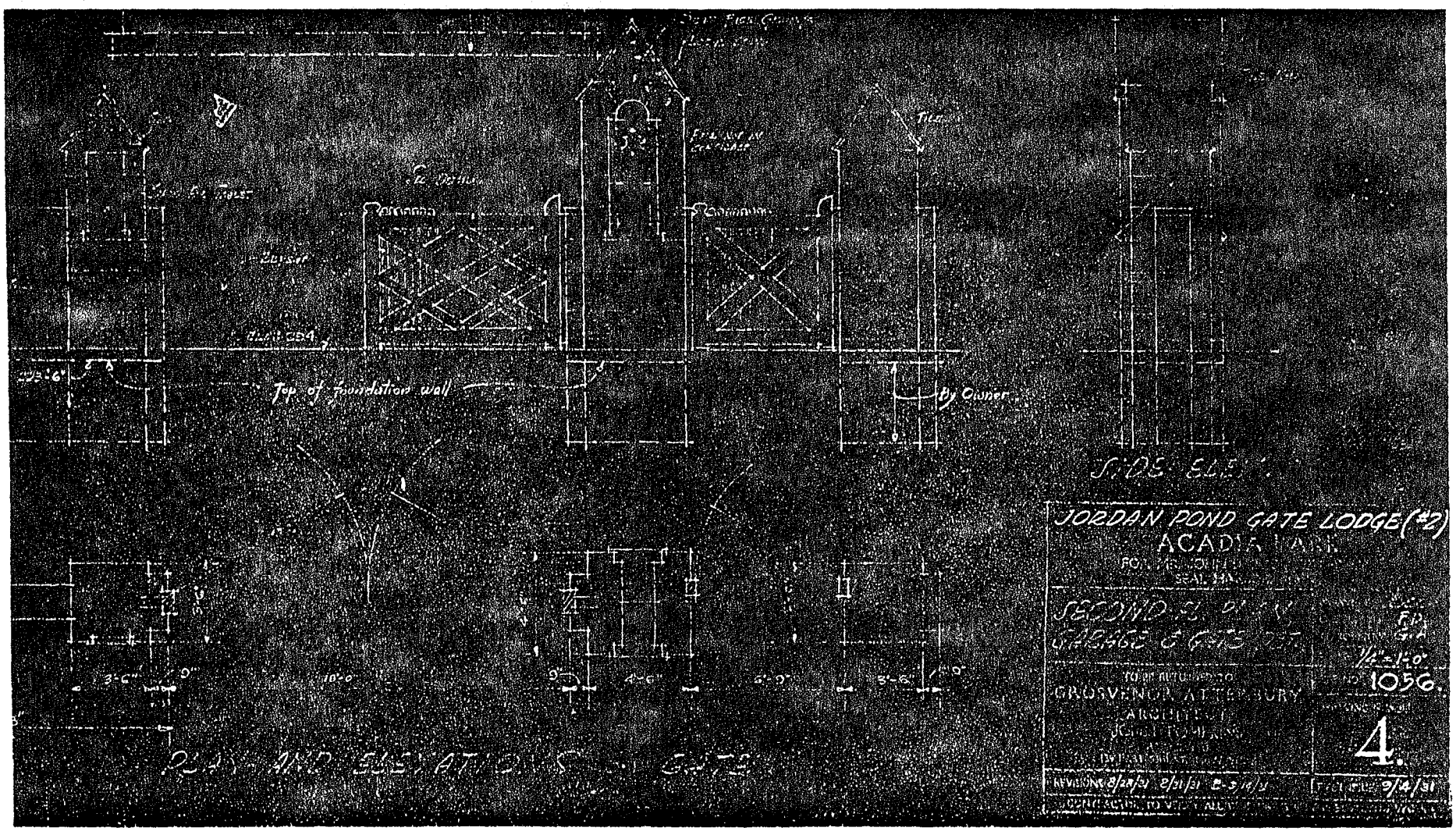


Figure LXXII. Jordan Pond Gates

Rockefeller deeded the Brown Mountain Lodge to the Park Service as soon as Albright acquired the funding to accept and maintain it. Dorr told Rockefeller he intended to house a ranger there. Paul Simpson and his family lived in the Jordan Pond lodge until 1941, two years after Rockefeller deeded it to the Park Service. They were not in year-round residence there, however. Paul's son, Charles P. Simpson, reports that after spending a cold first winter there, the family would move out of the gate lodge to spend the winter in their family home in Seal Harbor. The Lodge was difficult and expensive to heat with coal.[348]

Jordan Pond House

Rockefeller now also owned the Jordan Pond House (Figure LXXIII) and property where visitors and residents traditionally had tea and popovers.[349] He leased it to the previous owners, the McIntires, who continued to operate it as a tea house. Atterbury prepared study drawings for a new tea house and stable to replace the Jordan Pond House (Figures LXXIV and LXXV). There is no indication, however, that planning progressed any further than this stage. The original Jordan Pond House remained until it burned in 1979 and was replaced by the existing structure.

The Aunt Betty's Pond Road

Correspondence between Rockefeller and Simpson indicates that planning for the Aunt Betty's Pond road began in earnest in the autumn of 1930. Simpson wrote to Rockefeller on December 7 that he had made the final adjustments in location, marked the grades for construction, and had prepared preliminary surveys of alternative lines through the valley to connect with the Jordan Sargent Mountain road. Chauncey Joy began the construction of other segments of the road, while Rockefeller and Simpson

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[348] The elevation of the gate towers at the Jordan Pond lodge (Figure LXXII) shows that the design included tablets and brass bells. Both items were excluded from the contract in the specifications which indicated they would be purchased separately. No information is available about the tablets, but the bells were installed as planned. When the gate lodges were completed, they were occupied. Charles Simpson relates that as a small boy living at the gate lodge, he clearly remembers the bells, his delight in ringing them, and his mother's requests that he please stop.

[349] This he rented to the McIntires, who had built it and operated it for many years, on a yearly basis. This arrangement continued through 1940, when it was left to the Park Service to determine how to manage it. (John D. Rockefeller, Jr., to Arno B. Cammerer, December 21, 1939)

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Figure LXXIII. Jordan Pond House

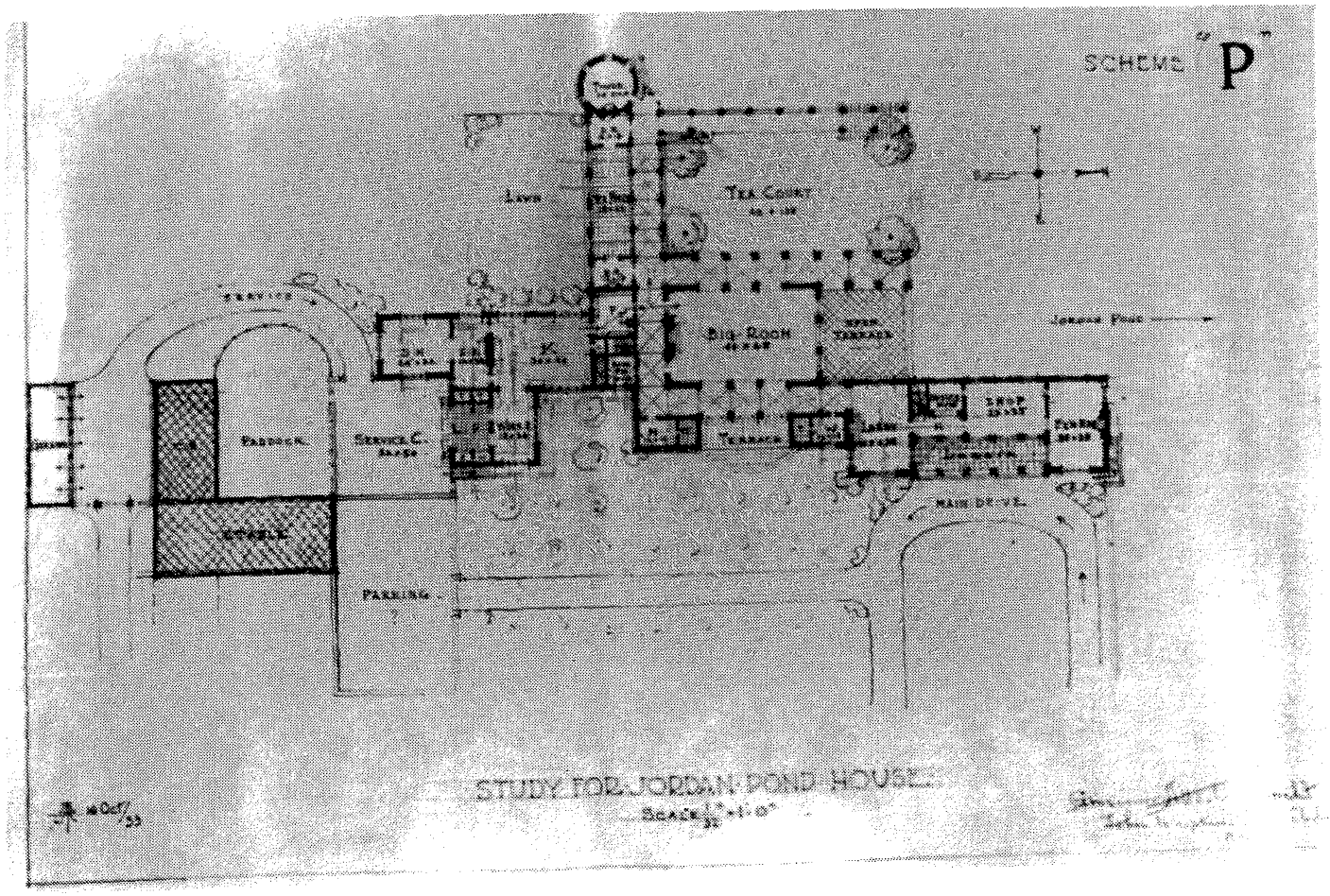


Figure LXXIV. Jordan Pond House

Atterbury's Proposed Scheme "P", Plan View

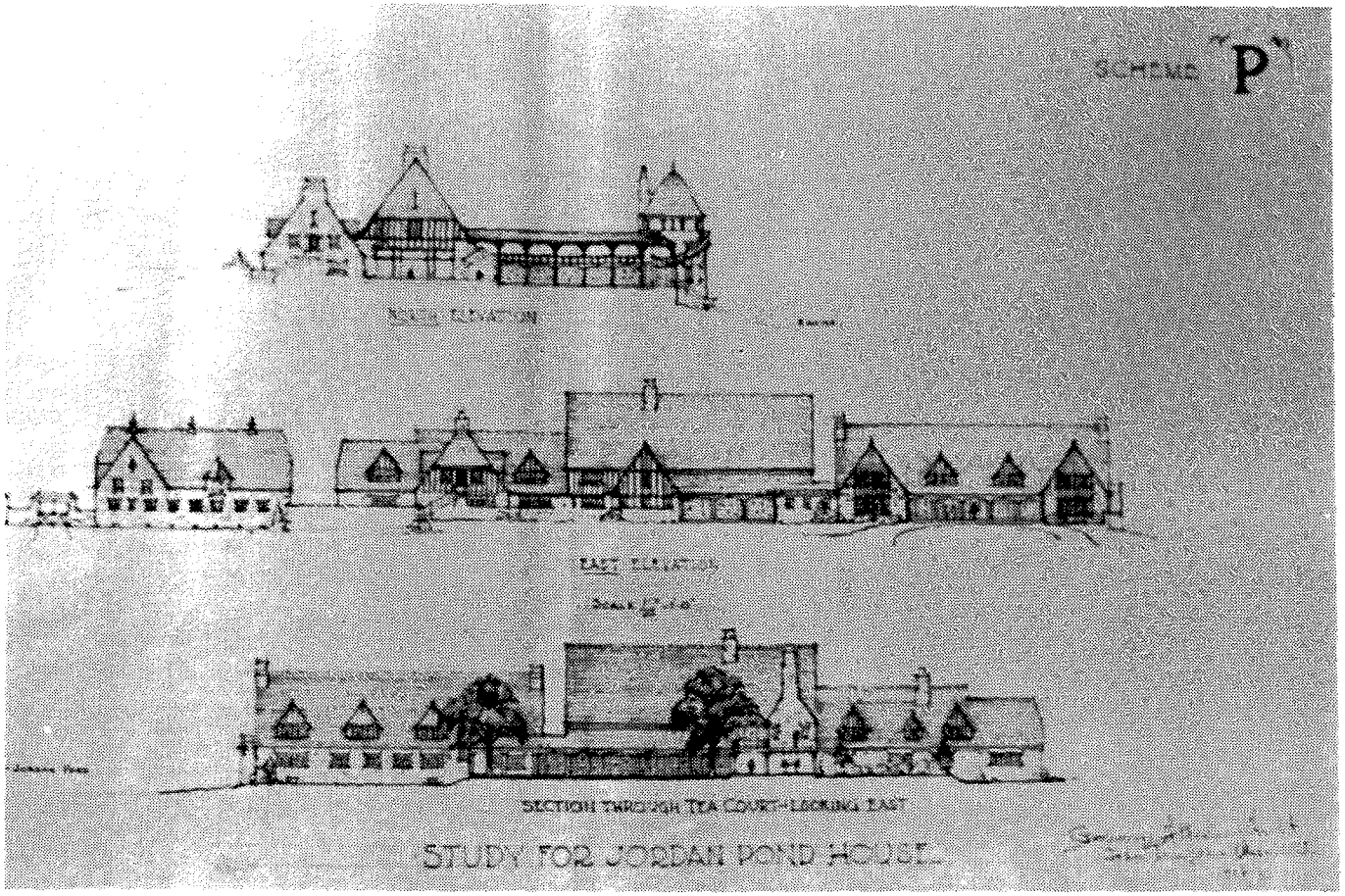


Figure LXXV. Jordan Pond House
Atterbury's Proposed Scheme "P", Elevation

continued to debate the connection between Aunt Betty's Pond and the Jordan-Sargent Mountain road which they called the "outlet" road. This short section generated much discussion. Simpson prepared three alignment studies for Rockefeller's review. Rockefeller responded on March 21, 1931, that he preferred either one or three, two ". . . being the compromise that gives us the beauty of the valley but takes us so far North and out of the way before connecting with the Seal Harbor road." He asked Simpson to further study the grades on alternative three, concerned that a seven percent grade over 1,500 feet was too steep. But he added, "I much prefer Route Three for its location, its beauty, its point of arrival and its directness. If we turn to Route One, it would be because it is the shortest and the best grade, although the most uninteresting."[350] Route Three it was.

In the autumn of 1931, Rockefeller and Farrand corresponded about the grading of slopes along Aunt Betty's Pond road. Beatrix Farrand felt the slopes in some locations were too convex. She indicated to Rockefeller her preference for a concave slope because it was a more natural landform. Rockefeller stated in return:

> You have spoken of certain banks alongside of the Aunt Betty's Pond road, the grade of which seemed to you too convex. If these grades are on the uphill side, is it not very difficult to make them concave, unless the trees are cut back to a much greater distance and a more expensive operation carried on? If they are on the downhill side, of course that is not true and a concave curve is much to be preferred. I presume the convex curve has been adopted by Mr. Ralston because it is least expensive, next to a perfectly straight railroad cut, which of course is undesirable.[351]

The last recorded controversy over Aunt Betty's Pond road involved the brook crossing at the foot of Gilmore Meadow. A debate occurred between Beatrix Farrand and Paul Simpson with Rockefeller as the mediator, centered on the issue of whether Gilmore Meadow should remain a meadow or be flooded to become a lake. Since Joy was reaching this point with his construction operations, a decision was necessary. Simpson asked Rockefeller's advice:

> The last time I talked with you about this I believe we decided that it would be well to provide the proper opening with stop-plank grooves so that any treatment of the brook and meadow later decided upon could be taken care of most easily. This is, the brook could be allowed to pass under the road at its

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[350]John D. Rockefeller, Jr., March 21, 1931, personal collection of Mr. and Mrs. Charles P. Simpson.

[351]John D. Rockefeller, Jr., to Beatrix Farrand, October 28, 1931.

present elevation--or the water could be raised to any elevation up to five feet above the present level of the meadow. As you will remember, the road along the east side of the meadow was designed and located with the possibility in mind.[352]

Rockefeller replied:

> It is true that we first talked of building this structure so that with the least possible expense the meadow could be turned into a lake should we later so desire. Since then, however, I think we have all been feeling--Mrs. Farrand included--that the little meadow is more charming than a lake would be and that there was little if any probability that we would ever want to convert the meadow into a lake. That being the case, any feeling is that it would be well to treat the brook as though we had not thought of ever turning the meadow in to a lake; in other words, treat it in a proper engineering way so as to insure adequate facility for disposing of the water and at the same time in such a way as will look well and be least expensive. My recollection is that a bridge is neither necessary nor called for and that probably a culvert is the best thing, in view of the situation above described.[353]

The meadow remained a meadow and Simpson designed a culvert to cross the brook. Simpson nevertheless answered Rockefeller with a letter outlining his point of view in detail and asking him to take one more hard look at the problem. Simpson wanted a lake because he thought it could function as a fire-fighting reservoir and reduce the fire hazard in this section of the park.[354] He also thought that forest growth was encroaching on the meadow and ". . . it is possible in time the whole meadow will be covered with small trees and bushes and that it will lose much of its beauty. On the other hand, if it could be flooded the lake so formed would have a permanent beauty. The reflections of the mountains as seen from the road which skirts its northern and eastern sides would be very beautiful."

He agreed that a wide, low culvert would keep the water from flooding the road during flood season, but, again, he urged Rockefeller to take a second look:

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[352]Paul D. Simpson to John D. Rockefeller, Jr., June 11, 1934, personal collection of Mr. and Mrs. Charles P. Simpson.

[353]John D. Rockefeller, Jr., to Paul D. Simpson, July 9, 1934, personal collection of Mr. and Mrs. Charles P. Simpson.

[354]This area did indeed burn in 1947.

> . . . Your suggested treatment of the problem is probably the best one--at least for the present. The interesting features of the location and the possibilities for development however perhaps warrant rather careful consideration before a final decision is reached. . . . With respect to the landscape value of a bridge, it might be well to have Mrs. Farrand look over the situation again carefully - and also to have the opinions of Messrs. Olmsted and Stoughton if possible. The bridge alternative plan would need to be considered only if we hold to present plans for leaving the meadow as it is. If it should be decided to form a lake as originally planned, a structure with simple gates or stop planks for regulating the flow of water would probably be sufficient.[355]

The culvert so described (like that on the carriage road east of Eagle Lake and near the Beaver Meadow Pool) is what exists now.

In the fall of 1931, Beatrix Farrand concentrated her attention on the planting along Aunt Betty's Pond road. She initially noted that "[t]he beautiful growth . . . in the valley, unusual in its fine deciduous trees," and went on to suggest that the roadside be planted with Cassandra, wild roses, winterberry, and clematis.[356] No answer is recorded to her question of weather lobelia would " . . . thrive and be appropriate on the edges of Aunt Betty's Pond." Another planting technique she specified for this length of road was to solidly plant a bank with birch and spruce in order to " . . . bring the wood edge down close to the road."[357] Her notes on this section of road also include a reference to a chronic problem with Mr. Miller. In June, 1932, she wrote:

> Possibly a small alteration or two may have to be made on the planting of the Aunt Betty's Pond road as I fear some of the tree lines may be over straight, but this can be done with trifling cost and labor. It seems very difficult for Mr. Miller to see that his foremen do not sprinkle the trees primly in an almost unvaryingly straight line."[358]

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[355]Paul D. Simpson to John D. Rockefeller, Jr., July 15, 1934, personal collection of Mr. and Mrs. Charles P. Simpson.

[356]Beatrix Farrand to John D. Rockefeller, Jr., October 5, 1931.

[357]Beatrix Farrand to John D. Rockefeller, Jr., October 10, 1931.

[358]Beatrix Farrand to John D. Rockefeller, Jr., June 3, 1932.

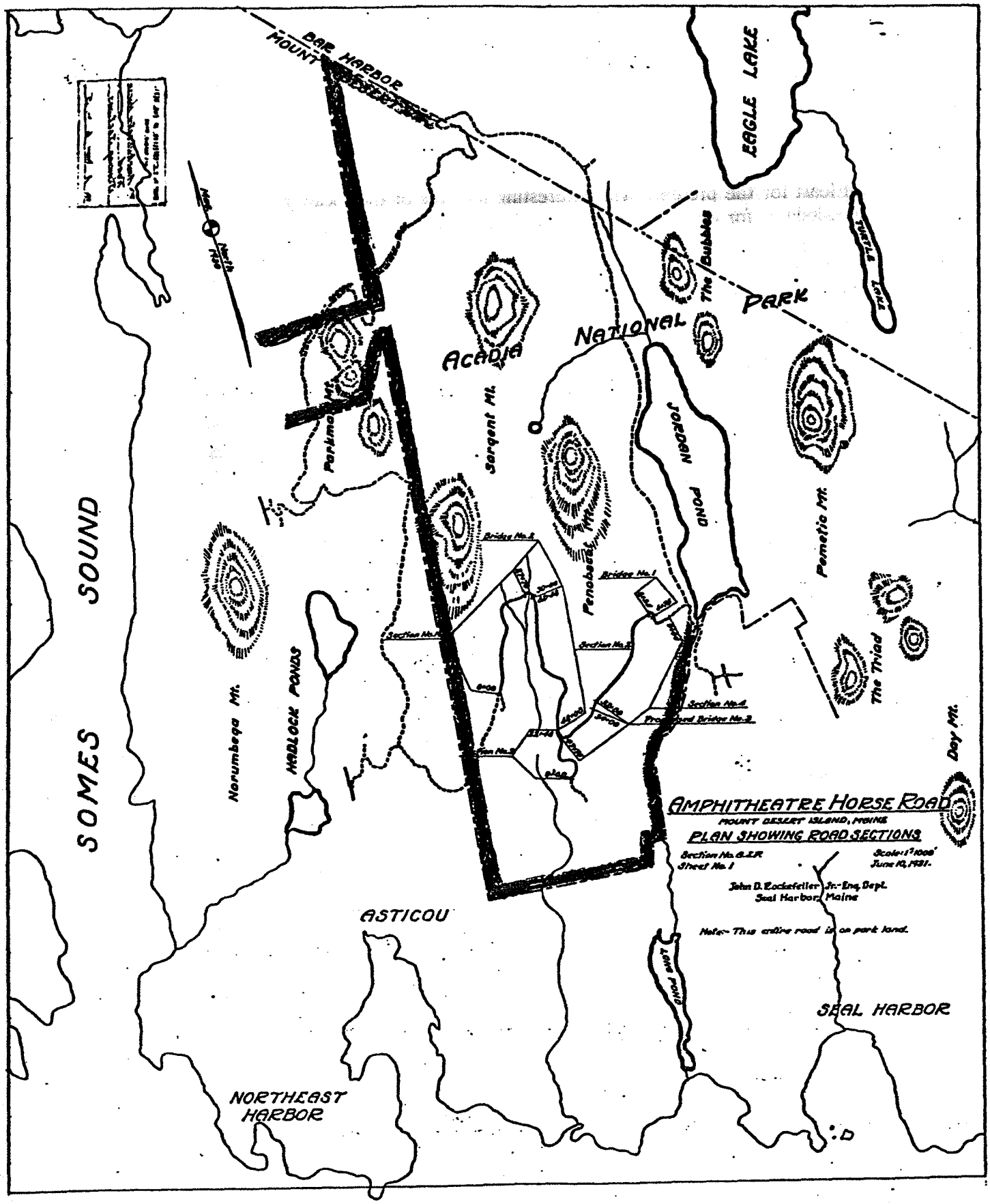


Figure LXXVI. Asticou-Jordan Pond Road (Amphitheater)

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West Branch, Amphitheater, and Cliffside Bridges

The remaining section of the Asticou-Jordan Pond[359] road construction included three bridges--West Branch, Amphitheater, and Cliffside. Stoughton, who designed the bridges, made frequent trips to Mount Desert Island in the early 1930's to inspect the work. On those trips he was a guest of the Simpsons at the Jordan Pond Lodge. Because this section of carriage road was built on Park land, Stoughton presented his bridges to the Fine Arts Commission before receiving Park Service approval. A. H. Lynam, as Assistant Superintendent and head of the construction committee again monitored the funding. The bridges were built, however, by Rockefeller's own forces with Ralston assuming the role Borthwick had played in the construction of Bubble Pond and Duck Brook. The West Branch bridge was built first to cross a branch of the Jordan Stream. The second bridge, Amphitheater, spans a fork of Little Harbor Brook north of the bridge built in 1919. Because of Rockefeller's system of building a road from each end, and meeting in the middle, Cliffside was built last, along the road between the Amphitheater and West Branch bridges.

All three bridges incorporate the surrounding rock, have long wing walls and approaches, and are horizontally curved. The curvature is most pronounced on West Branch and Amphitheater so, at Stoughton's suggestion, the bridges were made 20 feet wide to provide adequate clearance on the curve. Cliffside, however, because of its flatter curve and concern about overhanging the ledge, was built 16 feet wide. The character of the bridges' stone work marks a return to constructing bridges with a more rustic appearance, after the more polished Duck Brook bridge. All are quarry-faced, random-laid, granite ashlar.

West Branch is based on Central Park's "narrow high arch" copied by Charles Simpson over ten years earlier (Figure LXXVII). Although the Central Park bridge is merely a footbridge and thus markedly different from West Branch in scale, its high perpendicular arch and the character of its stone work are clearly seen in the West Branch bridge. West Branch has a Roman arch, six feet wide, with solid parapet walls which are a continuation of the structure and not capped with coping stones (Figure LXXVIII). Posts project above the walls to mark the ends of the structure. Its final cost was $16,889.29.

Paul Simpson queried Rockefeller about the Amphitheater bridge site. As was his routine, he prepared a topographic survey and sent it to Stoughton to use as he prepared his design. Under instructions from Rockefeller to save trees wherever

[359]This section of the Asticou-Jordan Pond road is now called the Amphitheater road.



Figure LXXVII. Rustic Bridge in the Ramble
Central Park, New York

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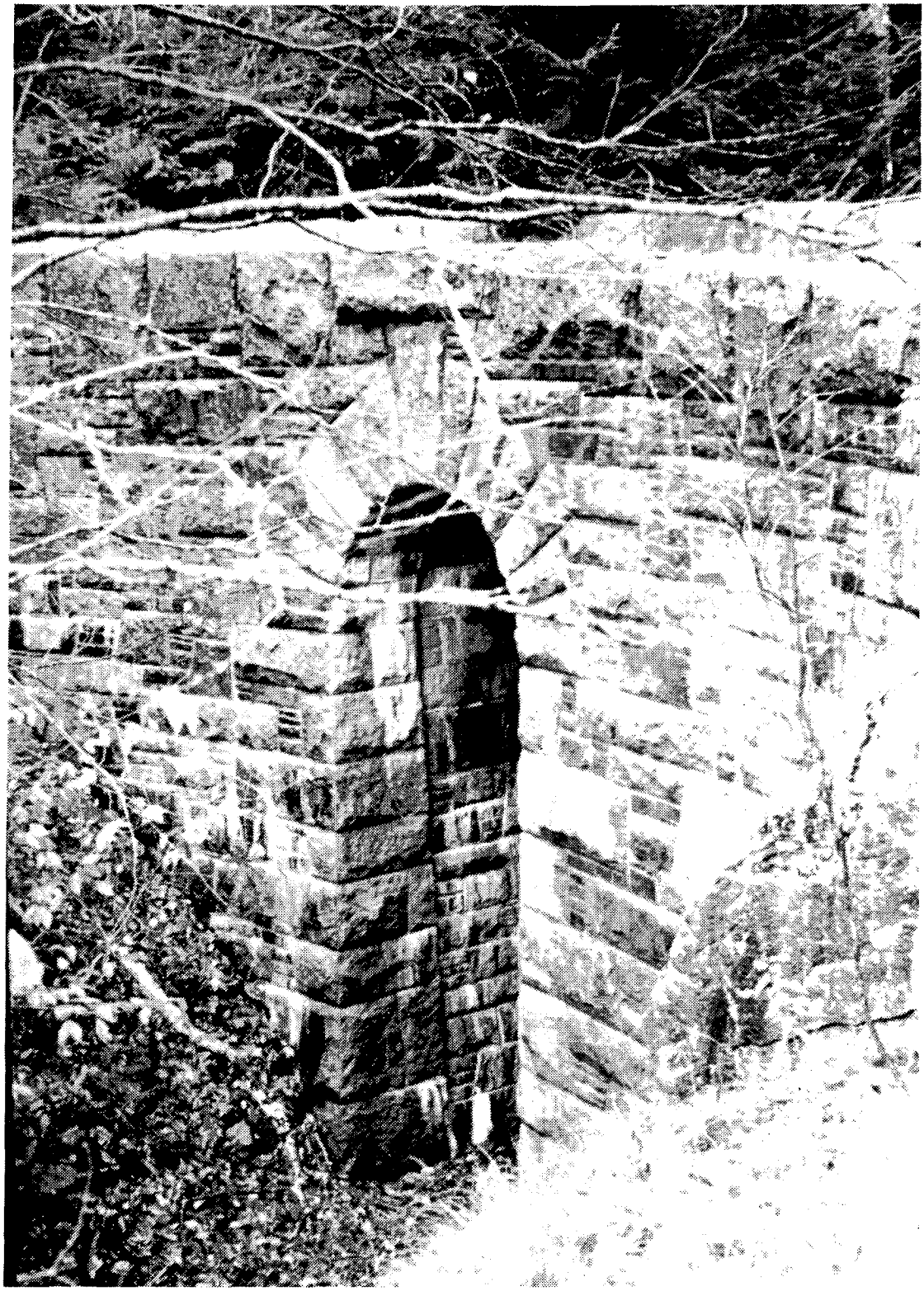


Figure LXXVIII. West Branch Bridge

329 330

possible, he thought it best to advise him that Stoughton's design would necessitate removing two large trees:

> With the 20 foot clearance between parapet walls which we are now planning for the bridges I find that on the old location we might have to lose the 20" [diameter] pine below the bridge. I have accordingly made a revised location as shown on the enclosed plan--which is probably the best we can do with the width of bridge considered. This location has the advantage of a longer radius curve but the disadvantages of crossing the stream more obliquely and on a little steeper grade and of requiring a longer span for the bridge. Of course it would be desirable to have the small waterfall above the bridge in line with axis of the arch--but with this crossing the construction would be rather difficult. With a wide opening, however, such as shown in green on the enclosed plan, a fairly wide view could be had both ways along the stream from the eastern side--where the trail should be located. As you remember, it is now on top of the western bank. By building the arch on a skew the span could be somewhat reduced and the view up the stream toward the waterfall made a little more direct. In either case I think it would be well to hold the northeast corner of the arch at the point shown on the plan in order to save the roots of the hemlock and to make room for the trail. If necessary to reduce the span it might be possible to arch over the roots of the tree--but it would be better not to this if it can be avoided. If we could sacrifice the 20" pine we could cross the stream at approximate right angles and use a shorter span for the bridge. As there are few large trees at the site, however, it would be well to save both hemlock and pine if possible -- even if we should have to reduce the width of the bridge somewhat.[360]

Rockefeller replied:

> Your letter of January 19th regarding the two large trees near the proposed Amphitheater bridge is received, also the sketch. I discussed this matter with Mr. Stoughton twice. I had forgotten that we were building bridges wider than the original 16 feet. Mr. Stoughton justifies the increase in width because of the amount of curvature on the bridge, which I think is a compelling and convincing argument. If the bridge were straight, I should see no reason for increasing its width beyond 16 feet, which I understand is the width of all the other bridges on this road. It is important to save the trees if we can. It is also important to so locate the bridge that the waterfall will be pleasingly framed by it. The bridge should also be wide enough for comfortable use. Just what

[360]Paul D. Simpson to John D. Rockefeller, Jr., January 1, 1931, personal collection of Mr. and Mrs. Charles P. Simpson.

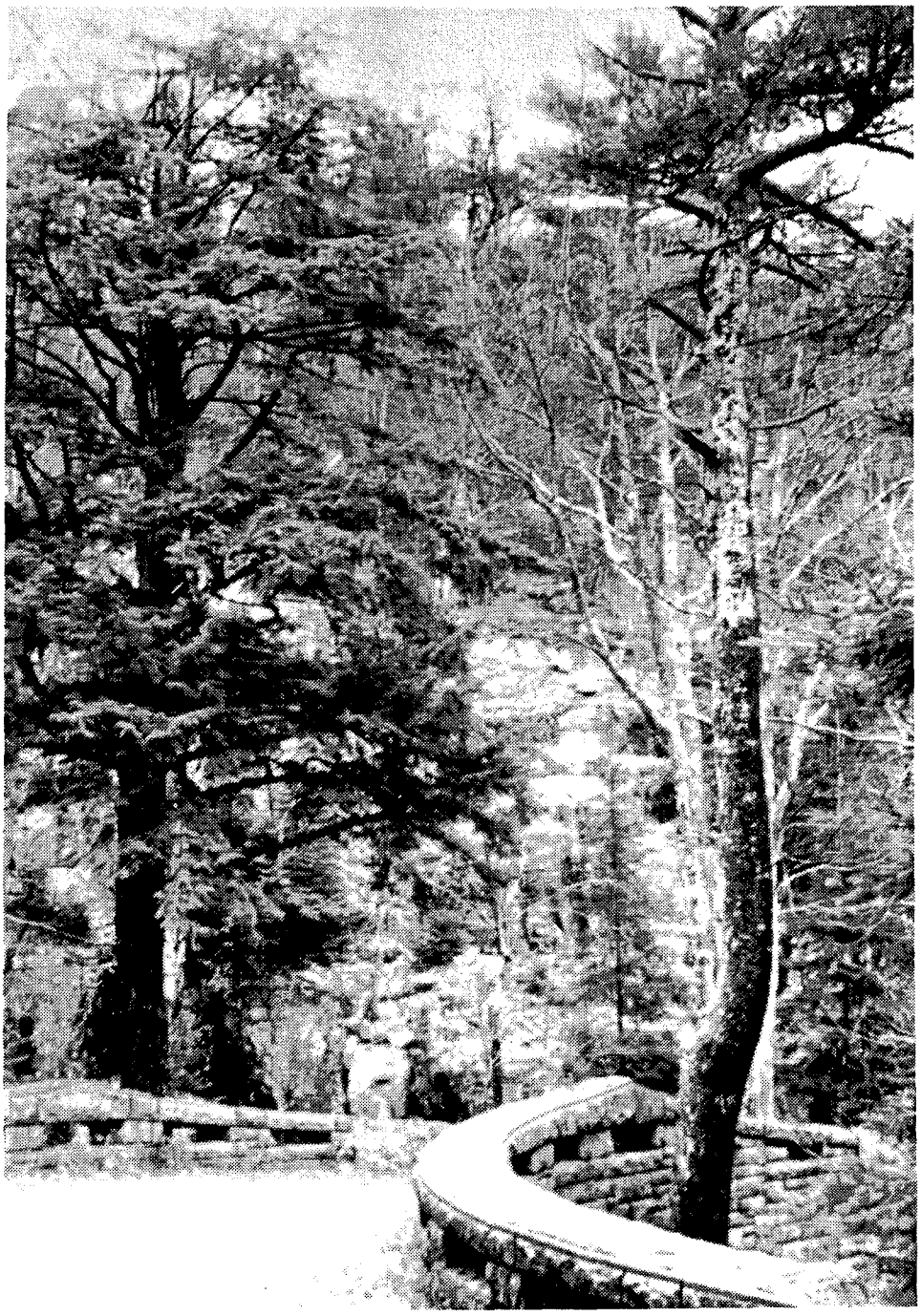


Figure LXXIX. Amphitheater Bridge

Shows two trees saved during bridge construction.

compromise may be necessary in order to give the fullest possible consideration to all these points can be determined only on the ground.[361]

The bridge was built at the 20-foot width recommended by Stoughton and the "skew" suggested by Simpson, and *both* the hemlock and the pine were saved. While both are now in declining condition, they have survived almost 60 years from the time of construction--a testament to Rockefeller's concern with detail and to Simpson's and Stoughton's skill in working in a natural setting (Figure LXXIX). Edgar Walls and Chauncey Joy built this section of road. The same construction technique was used on this road as on others: The road was built from both ends as far as necessary to provide access to the bridge sites; the bridges were constructed and then the road construction continued.

The bridge's parapet walls are both pierced and peaked. It's single arch is semicircular, although, as Figure LXXX indicates, Stoughton's initial sketch showed a lancet arch similar to those of Eagle Lake and Hemlock bridges. The coping stones are rock-face slabs with the arris clearly defined by large chiseled margins. The rock-face masonry is laid in a broken-range ashlar pattern and corresponds to the detailing of Stoughton's drawings (Figure LXXXI). The structure extends from the boulders at the site, with gradations in the stone leading from the large boulders comprising the retaining walls to the more refined ashlar spandrel walls. The lookout situated at the end of the approach was designed to provide a view of the bridge itself.

An examination of the drainage patterns in the area of this bridge leads to a comparison with two bridges previously built. Both Hemlock and Waterfall span forks of Hadlock Brook, with Waterfall crossing that fork which flows from Maple Spring. That pattern is similar to the Amphitheater bridge site. The bridge spans one fork of the Little Harbor Brook. The decision was made here, however, to span the brook flowing from Birch Spring with a large culvert, not a bridge.

The Cliffside[362], or half arch, was described by Rockefeller in a letter to Stoughton:

---

[361]John D. Rockefeller, Jr., to Paul D. Simpson, January 31, 1931, personal collection of Mr. and Mrs. Charles P. Simpson.

[362]It bears some resemblance to the partial arch built on Sea Cliff Drive. A photograph of this arch has often been identified as Cliffside.

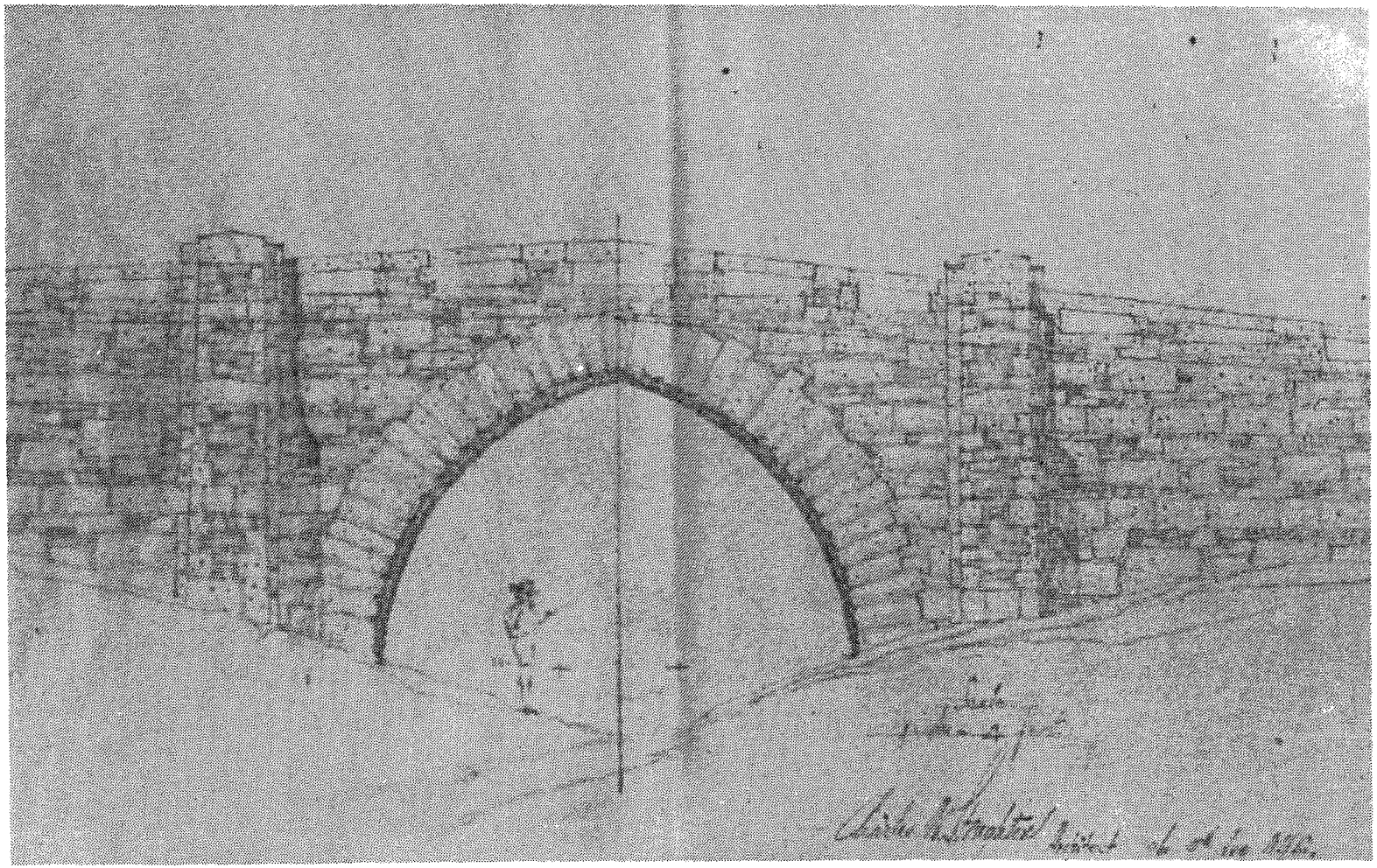


Figure LXXX. Stoughton Sketch of Amphitheater Bridge



Figure LXXXI. Amphitheater Bridge

Note stonework.

339 340

> . . . I think the half arch bridge a most robust, interesting and handsome structure, and am much pleased with it. It is different and very attractive. . . . [363]

It is a fortress-like structure with crenelated parapets which extends from the cliff leaving only a few feet of clearance. Its buttress towers provide lookouts at the deck level. The asymmetrical arch springs from a bedrock ledge. This configuration was apparently George Dorr's idea. After Charles Simpson and Dorr had walked the route of the road (Figure LXXXII), Dorr wrote Rockefeller in 1920:

> . . . I have spent a great deal of time at this point and think the difficulty can be solved by making a direct, wide-angled approach to the shelf, continuing the general road-line from the east, and building an arch against the cliff which would span the foot path, instead of making a solid fill. Mr. [Charles] Simpson's plan has not been wholly clear to me at this point but the change, if any, in the intended course would be a slight one and would be in the interest, so far as it changed the course at all, of an easier and safer sweep around the upper cliff, while the arch, Mr. Clement thought, could be built at little, if any additional expense. Such an arch . . . might be made a feature of interest and beauty and would leave the continuity of the cliff - itself a feature of great interest - as well as of the climb unbroken.[364]

Since the underside is visible only after a climb down the face of the slope, it is not faced with stone.

That Rockefeller took a direct interest in the construction of these roads and bridges is confirmed by a letter he wrote to Ralston at this time:

> I had my lunch the other day by the spring trail where Mr. Walls is working. While sitting there I saw at least a half dozen workmen come to the spring, trampling over the grass growing around it. They approached it from various sides and dipped water from different places. I could easily observe that the beauty around the edge of the spring had been considerably damaged already and was rapidly being destroyed.
>
> You not being there, I called Mr. Walls, showed him what was going on and suggested to him that no one be allowed to come to the spring except a water boy who should take water to all the men and that wires be put around all of the pools so they could be approached from a single point left open for access

[363]John D. Rockefeller, Jr., to Charles W. Stoughton, September 5, 1932.

[364]George B. Dorr to John D. Rockefeller, Jr., January 2, 1920.

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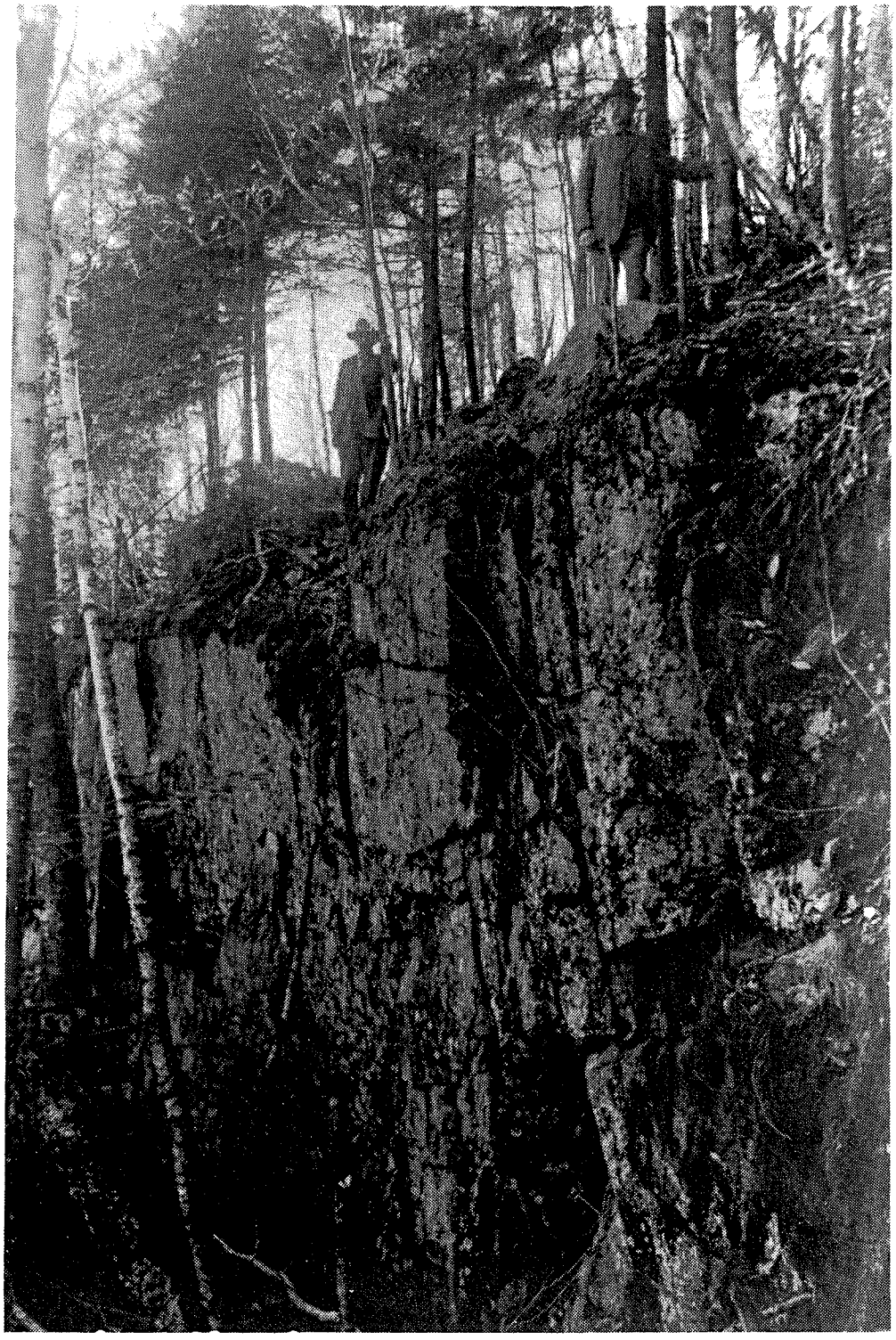


Figure LXXXII.

Two important figures in the early carriage road construction: Charles Simpson (left) and George Dorr explore the future site of the Cliffside bridge, ca. 1920.

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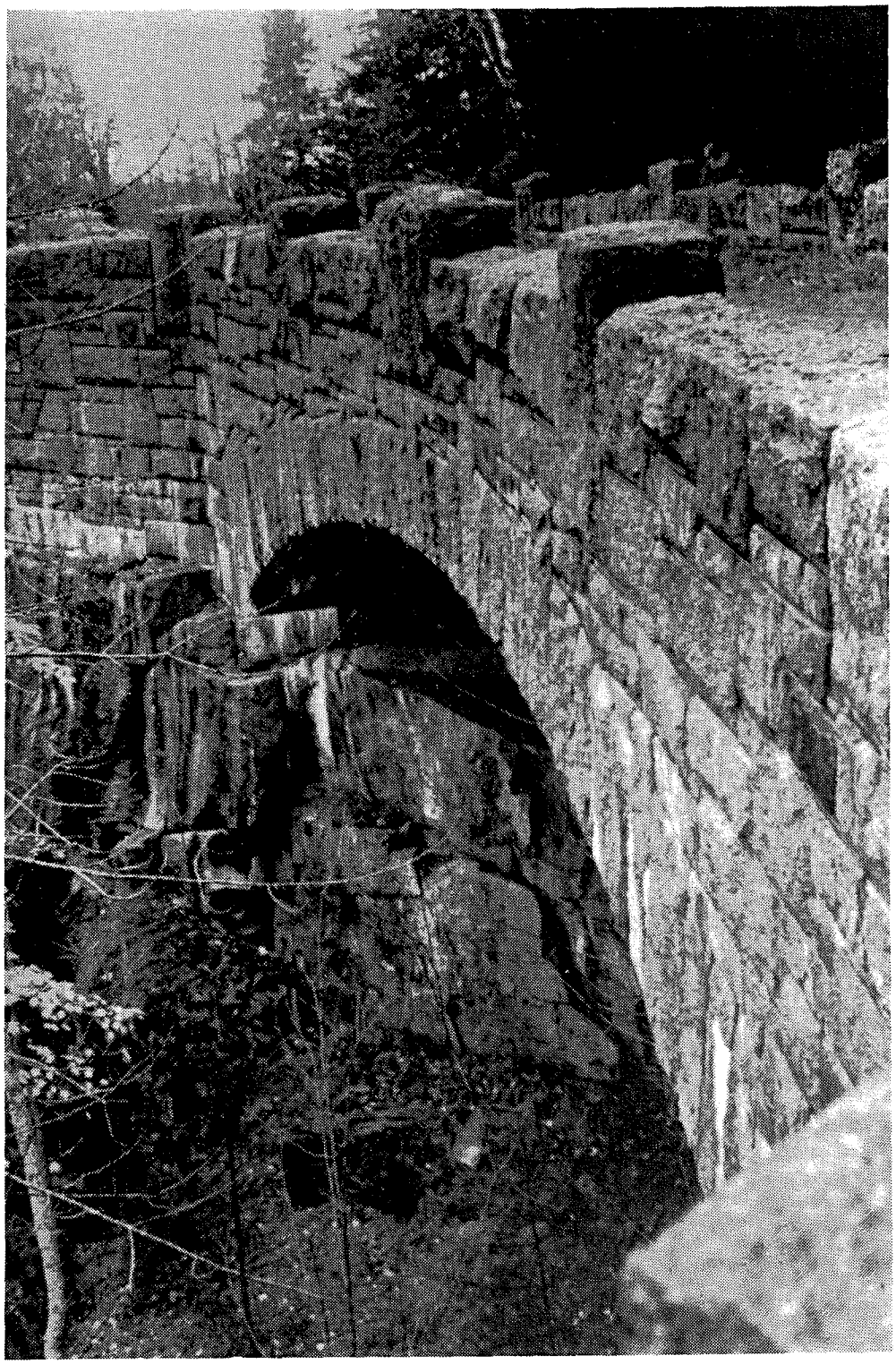


Figure LXXXIII. Cliffside Bridge

by the water boy for whom planks should be laid over the delicate edges of the spring.

Mr. Walls will, I think, take care of the matter. I mention it to you so you may have this delicate and beautiful spot, dear to the hearts of many of the summer people, sacredly preserved. Nothing would bring more criticism to our road work than the destruction of this naturally beautiful spot. . . .[365]

The Day Mountain System

Concurrent with the work on this road, its bridges, and the Aunt Betty's Pond road, Rockefeller and Simpson were planning the Day Mountain system. The first piece plotted in 1930 was the connection from Barr Hill to Day Mountain. This was a short stretch of road, but it included two bridges--the Jordan Pond Road bridge and the Stanley Brook bridge. The carriage road crossed under the Jordan Pond Road and over both the Stanley Brook and Road. Stoughton's design for the Jordan Pond Road bridge was constructed first. It is very similar to one he had designed for Rockefeller's estate in Pocantico Hills over the Bedford Road. It has a segmental arch, and, since it takes a local motor road over the carriage road, the underside is completely faced with stone. There is no ornamentation on the deck above. The solid stone parapet walls are composed of both rock-face ashlar and squared, rock-face boulders. Stoughton's drawing specified the masonry pattern for the parapet, uneven voussoirs and broken-range spandrel walls. The bridge was built according to these details. The retaining walls which flank the bridge are concrete, faced with stone.

Rockefeller's own crews, under the direction of Ralston, had built West Branch, Amphitheater, and Cliffside bridges over a two year period. They had proved their ability, and Ralston had proved his skill in planning for economical construction. Nevertheless, when it came time to build the Jordan Pond Road bridge to allow for the completion of the Barr Hill-Day Mountain Road, Rockefeller put the project out to bid. He received two: one for $25,158.00 from Candage, and one for $21,850.00 from the Augusta firm, Wyman and Simpson[366]. Both were above Ralston's estimate by several thousand dollars.[367] Rockefeller first took up the issue with Candage:

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[365]John D. Rockefeller, Jr., to S. F. Ralston, May 5, 1931.

[366]The Simpson of Wyman and Simpson was Walworth Simpson, son of Charles and brother of Paul Simpson.

[367]John D. Rockefeller, Jr., to S. F. Ralston, September 30, 1931.

> . . . much as I would like to give you this work and greatly as it would convenience me to have our organization relieved of it, do you see any ground on which I would be justified in paying you anywhere from $7,000 to $12,000 more for doing the work than I can do it for? . . . [368]

Candage, who had not built any of the five bridges completed since he built Eagle Lake, retorted:

> In reply to your letter of the 14th will say, we do not see any reason why you should pay us from $7,000 to $12,000 more for doing a certain piece of work than you can get it done elsewhere or do it yourself for. We figured this work quite carefully and for the actual work our figure was $21,724. We then added 15% for profit, liability insurance, and other things that always come up. In talking with Mr. Ralston, he tells us that he does not charge daily wages for your machines on this work, that he only charges for the repairs and supplies. In the case of any new machines it is nothing more than gas and oil. This certainly accounts for a large proportion of the difference in cost. While our profit might make up the rest.
>
> We do not feel however that outside our profit we should be able to do the same kind of work here as cheaply as you can and if we cannot that there is something radically wrong with our organization . . .
>
> There is another perplexing side to this. You are using many of the men who ordinarily work for us and at this time while we have only a few men in our crew we think we have the best of them. You are paying for the trades $1.00 more per day. This alone ought to give us the advantage of you but it seems to work the other way making our organization more inefficient. . . .
>
> We are very sorry not to have this work to do as times are so dull, but what can't be cured must be endured. . . . [369]

Candage requested in the same letter that Rockefeller have estimates done by Mr. Simpson to doublecheck Ralston's figures. Rockefeller in fact had four different engineers make estimates, each confirming the legitimacy of the bid amounts received. He then accepted Wyman and Simpson's bid, the lower of the two. Despite having

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[368]John D. Rockefeller, Jr., to Samuel Candage, September 14, 1931.

[369]Samuel W. Candage to John D. Rockefeller, Jr., September 15, 1931.

asked Candage for a price for obtaining stone from his quarry, he elected to use his own stone from Brown Quarry near the Sargent Drive.[370]

The contract with Wyman and Simpson ensured Walworth Simpson of a role in the carriage road system which his father, Charles, had worked to create, and his brother, Paul, was working to complete. Walworth, in fact, had previously corresponded with Rockefeller about his father's continued employment after Charles Simpson became ill in 1921. Changes to the contract resulted in his firm, in the early years of the Depression, being paid $38,200 to construct the bridge and its extended retaining walls. Figures LXXXIV through LXXXVII show the sequence of construction of the Jordan Pond Road bridge.

Paul Simpson's site engineering work for this bridge proved more complicated than that for the other bridges because of the utilities involved. The Jordan Pond Road was an existing town road through Seal Harbor, just a short distance from where the Simpson family home still stands. The main water and sewer lines for the town ran along this road and had to be relocated to build the bridge. Simpson dealt with the necessary authorities and managed to accommodate the utilities in such a way that the mains were accessible but that a break would not injure the bridge.

After the bridge was built, Beatrix Farrand made detailed recommendations for planting the adjacent areas. Some of this planting, though overgrown, still exists. She recommended:

> . . . The banks to be fairly heavily covered with Scotch pine (Pinus sylvestris) punctuated with an occasional white pine; big groups of the staghorn sumac (Rhus typhina), the Japanese maple (Acer ginnala), the Japanese barberry (Berberis thunbergi) and the common barberry (Berberis vulgaris), and sweetbriar roses (Rosa rubiginosa). It would be attractive to use Clematis, Virginia Creepers and Bittersweet to make a tumbled mass at the bottom of the bank, falling over the wall. An occasional plant of the American mountain ash or the European mountain ash would also be suitable. The main plantation of trees should be kept towards the top of the bank, using the lower material on the lower part of the banks in order to add to the illusion of depth in the ravine.

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[370]This decision resulted in a mishap. Ralston showed Wyman and Simpson's men where to set up their derrick in Rockefeller's quarry. After they had quarried most of the stone, the discovery was made that the derrick was on the property line between Rockefeller's land and his neighbors, the Kendalls. Much stone had been quarried from the Kendalls' property, thus Rockefeller was forced to pay what was termed an outrageous cubic foot price for the stone which was removed. (Walworth Simpson to John D. Rockefeller, Jr., June 6, 1933.)



Figure LXXXIV. Jordan Pond Road Bridge, Construction Sequence #1

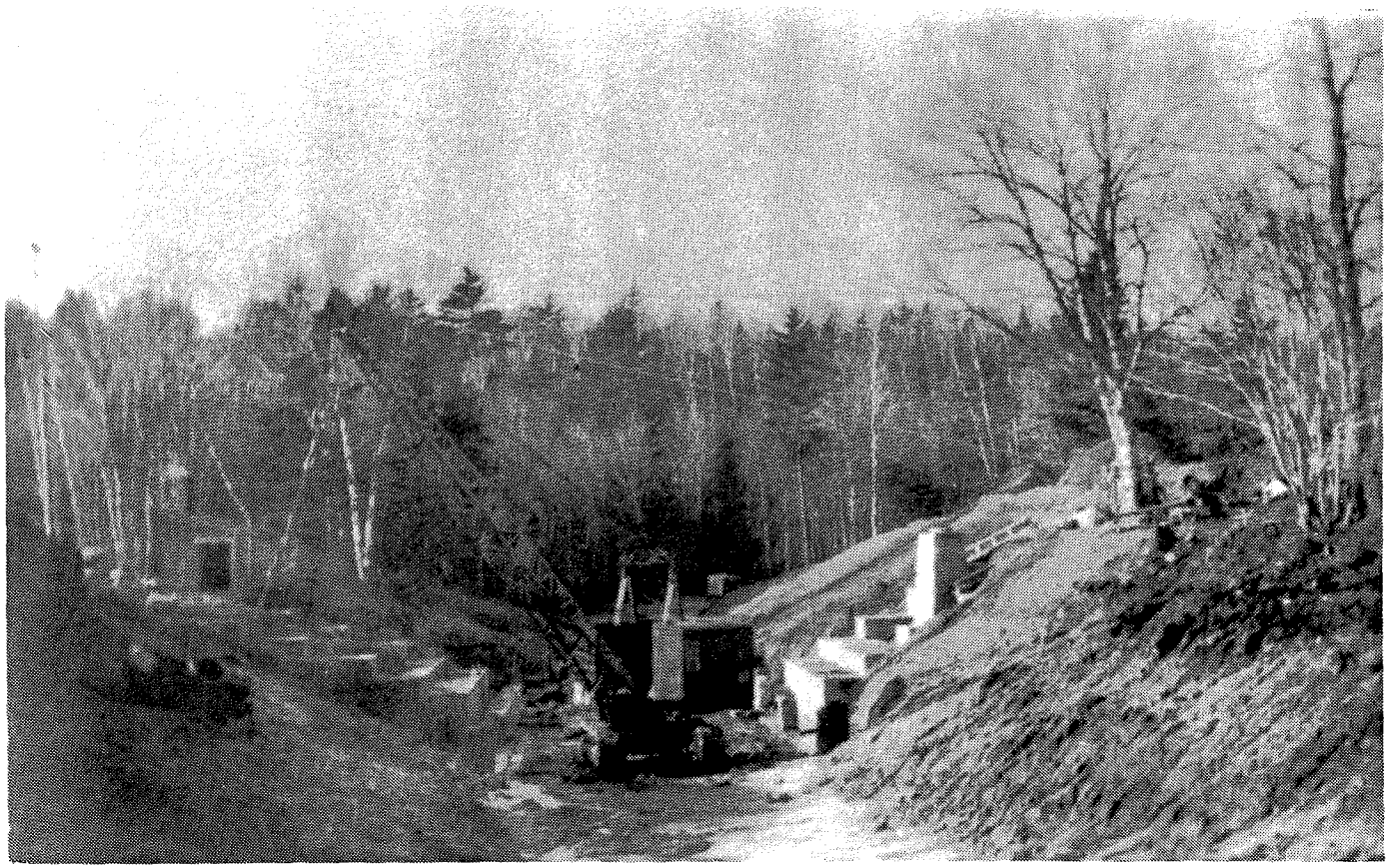


Figure LXXXV. Jordan Pond Road Bridge, Construction Sequence #2



Figure LXXXVI. Jordan Pond Road Bridge, Construction Sequence #3



Figure LXXXVII. Jordan Pond Road Bridge, Construction Sequence #4

> The American ash would be a good tree with which to taper off the evergreen plantations to the natural woods.[371]

Up to this time, all the dates on the bridges had been carved by B. W. Candage & Sons, except for the Bubble Pond and Duck Brook bridges supervised by Pringle Borthwick. With the completion of the West Branch, Amphitheater, Cliffside and Jordan Pond Road bridges, Rockefeller and Stoughton decided on the placement of dates on these bridges to mark for posterity the year they were completed. In the first of three letters exchanged over a five-day period, Rockefeller began the discussion:

> With reference to the dates of the various bridges which you have built for us here during the last two or three years, I have decided on the following positions of the dates:
>
> On the bridge just finished, the half arch bridge, I have selected the large stone panel in the centre of the circular balcony at the south end of the bridge on the east side. [Harry] Somes, the mason, tells me you have made the figures for him which he can use for this purpose.
>
> On the Jordan Pond highway bridge, it seems to me the date would look well on the keystone of the west side of the bridge. The use of the bridge is primarily for horse traffic underneath, and therefore the date should be there. I thought that you would perhaps draw and send to Mr. Ralston figures properly arranged for this keystone which would be located something as is shown on the enclosed memorandum. If you think it would be well to have dates on both keystones, well and good.
>
> As to the amphitheater bridge, where the two pine trees are in close juxtaposition to the bridge, I have selected as the location for the date the inner side of the parapet coping on the north wall of the bridge, using the central or keystone coping. I take it that Mr. Somes can use the figure you have given him for this location.
>
> As to the first bridge you built, the narrow high arch with perpendicular, I cannot quite make up my mind where the date would look best. It would be all right on the inner side of the captions of the posts at the ends of the bridge on the southern side. On the other hand, I suppose a date on a post is a little inappropriate. Another place would be the large flat stone coping on the north side which is nearest the centre of the bridge. The stone actually over the keystone is rectangular and has small stones under it which would make it seem undesirable for this purpose. To the right and left of that central stone on the road side of the north coping wall there are single flat stones, either of which

[371] Beatrix Farrand to John D. Rockefeller, Jr., October 13, 1932.

would be suitable. What is your judgment in this last instance? With the other locations I am satisfied. . . .[372]

Stoughton replied the next day:

I agree with you as to the placing of the one on the half arch bridge, of the amphitheater road bridge and of the narrow high arch bridge, as you place it to the left of the central stone of the north coping wall.

It seems to me that the dates of the bridges are a mere aside and, therefore, would suggest a less central place, of your choosing, than the keystone of the Jordan Pond highway bridge.

In the Bronx Parkway bridges we placed a word or date upon the end or side of the parapet wall inconspicuously near the ground, to be found if looked for but not to obtrude itself otherwise: This, however, is purely a matter of preference.[373]

Two days later Rockefeller continued the discussion:

I note that you approve the date locations I have suggested on the several bridges with the exception of the Jordan Pond road bridge. We have used the keystone here in one or two instances for the date and have not found it objectionable. I am therefore inclined to put the date on the keystone of the Jordan POnd road bridge. The men have cut the date on the Half Arch bridge using the size figures you had supplied. I had not seen the figures, hence had not realized that they are only two inches high, whereas we have used figures heretofore five or six inches high. The date in the little panel in the big stone both looks lost and cannot be read because it is so small. The whole panel will have to be cut back and a much larger panel and date substituted.

I am to be in New York next week and in my office Wednesday and Thursday. I suggest you come to see me on one of those days bringing with you the plans of the several bridges, so that we may discuss with the size of the stones before us the size date to be used. We have stopped the men from applying any more figures until the drawings have been supplied by you.[374]

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[372]John D. Rockefeller, Jr., to Charles W. Stoughton, September 5, 1932.

[373]Charles W. Stoughton to John D. Rockefeller, Jr., September 6, 1932.

[374]John D. Rockefeller, Jr., to Charles W. Stoughton, September 8, 1932.

Rockefeller had again spent a great deal of time on a detail incidental to the construction of his carriage road system. The result is that the Bubble Pond bridge remains the only bridge in the system with the date carved on the keystone, and the figures on the Cliffside, West Branch and Amphitheater bridges were enlarged.

Rockefeller asked Stoughton to design the last bridge on the carriage road system in which he took an active interest. It carried the Barr Hill-Day Mountain carriage road over the new Stanley Brook motor road. Because Rockefeller was interested in the bridge as it was viewed from the carriage road as well as from the motor road, both the deck level and arch vaults are finished with stone. Stoughton designed a triple-arch bridge. The central span crossed the motor road; the smaller spans on each side bridge the Stanley Brook and the Seaside Trail, the major pedestrian access from the town of Seal Harbor to the Jordan Pond House. All three arches are semi-circular, like the system's other triple arch bridge, the Duck Brook. The stone work is quarry-faced, random-laid granite. Its parapets curve at the approaches and incorporate a pedestrian lookout on the northeast wing wall. They also form a peak at the crown of the central arch and curve with the roadway. Vertical openings pierce the parapets above all three arches to provide a view below from the bridge deck. Paul Simpson did working drawings.[375] A letter to Paul Simpson from Rockefeller in February of 1933 asks him to have the working drawings ready by spring so construction could get underway.[376]

Once again, Rockefeller sought bids to construct the bridge. Wyman and Simpson were the low bidders ($29,500.00); B. W. Candage & Son were next ($30,617.68); and the firm of LeMcLaughlin, Inc. was high ($39,000.00). Ralston's estimate was $25,123.55. This time, Rockefeller chose to let Ralston build the bridge. He built it for $1,195.32 less than his estimate, which Mr. Rockefeller found "most gratifying".[377] When his firm did not get the bid, Walworth Simpson wrote Rockefeller explaining a few problems which arose in connection with the Jordan Pond Road bridge and asking why he had not been allowed to build the Stanley Brook bridge despite being the low bidder. In responding, after reassuring Simpson he was pleased with his work, Rockefeller took obvious satisfaction in explaining why his own crews built the bridge:

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[375]Paul Simpson's son, Chip, remembers his mother saying quite often as they drove under the bridge, "Look quick now, there's Daddy's bridge."

[376]John D.Rockefeller, Jr., to Paul D. Simpson, February 10, 1933, personal collection of Mr. and Mrs. Charles P. Simpson.

[377]John D. Rockefeller Jr., to S. F. Ralston, January 8, 1934.

> . . . The only criticism of it which I made was that in certain places the stone courses seemed to be running down hill and thereby give a sense of structural instability. On the other hand, Mr. Stoughton does not feel as I do about this particular point but likes the irregularity of the effect thus produced. After all, it is a matter of opinion and my general feeling regarding the bridge was that it was interesting to look at and well built.
>
> The reason why your bid on a subsequent bridge [Stanley Brook] was not accepted was because we have ourselves developed a technique in bridge building as a result of which we are able to build less expensively than by contract.[378,379]

Much of the planting at the Stanley Brook bridge, as described by Beatrix Farrand, still exists. Her secretary transcribed her description of the scene in 1934:

> . . . planting had improved the whole neighborhood. The pines have quite transformed the slopes, and big groups of sumac near the bridge, cedars north of the bridge and shrubs on the spaces between the trail, the bridle path and the large road have very much 'furnished' the whole scheme. Mrs. Farrand feels, and thinks Charles [Miller] agrees with her, that if it be possible to plant four maples north and south of the bridge (two on the north and two on the south) it would materially add to the attractiveness of the bridge arch itself. Sufficient root run should be provided for the four trees and this would probably mean cutting out a little on the west side of the road. Mrs. Farrand feels quite distinctly that this tree planting would be most desirable as otherwise there is no way of veiling or framing the big arch.[380]

With the Barr Hill/Day Mountain connection under construction, Simpson completed reconnaissance surveys of the road circling Day Mountain and the crossing over the proposed motor road through the Triad-Day Mountain pass. This bridge, the seventeenth and last on the carriage roads, was built by the National Park Service, in conjunction with the motor road, after Rockefeller granted them a right-of-way.

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[378]John D. Rockefeller, Jr., to Walworth Simpson, July 31, 1933.

[379]This accounting is deceptive. The cost figured by Ralston did not include the amortization of equipment costs or Ralston's salary. Both of these items would normally be figured into the cost of the job by a contractor.

[380]Beatrix Farrand to John D. Rockefeller, Jr., November 11, 1934.

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Figure LXXXVIII. Stanley Brook Road Bridge, ca. 1933

(Paul Simpson's Nash in background.)

By 1935, the location survey around the mountain was completed, along with a reconnaissance survey of the summit road. Simpson wrote to Rockefeller that based on this field work:

> [t]he total length of the proposed road from the end of the present road in the Triad-Day Mountain pass to the top of the mountain, including roundturns on the northern and southern summits, is 17,150' or about 3.27 miles, and the estimated cost of construction is $140,000.[381]

Simpson's detailed estimate of the cost of construction is included as Appendix XXI.

In the final stages of construction, Paul Simpson and Rockefeller turned their attention to the finishing details such as signage for the carriage roads. Simpson worked with Benjamin Breeze, a Park Service landscape architect assigned to Acadia, to develop a system of sign posts to direct travellers at various triangles and intersections on both the bridle paths and carriage roads. Having heard from Simpson of the final plans, Rockefeller wrote:

> I note with interest that you have been over the various considerations raised with Mr. Breeze at the several locations; that my suggestions and directions are being carried out; that you are in agreement as to the logic of my reasoning with regard to certain signs and their placement, as I am with the conclusions set forth in your letter which you and Mr. Breeze have reached; and that this whole matter is to be reviewed by Mr. [Thomas C.] Vint at an early date, after which it is expected that the CCC Camp will proceed at once with the work. This is very gratifying.[382]

Figure LXXXIX is the drawing done by Breeze for the sign posts. It shows their location at various intersections as well as dimensions for the signs themselves. The drawing also includes notes about the finish of the signs.[383]

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[381]Paul D. Simpson to John D. Rockefeller, Jr., July 27, 1935, personal collection of Mr. and Mrs. Charles P. Simpson.

[382]John D. Rockefeller, Jr.. Letter to Paul D. Simpson, December 9, 1936.

[383]Posts and sign arms were to be stained with Cabots shingle stain #248; the sign panels were to be treated with acid stain (a mixture of muriatic acid, lamp black, ammonia and water) and covered with two coats of varnish. The letters themselves were to be painted with one coat of flat yellow paint and another coat of enamel yellow.

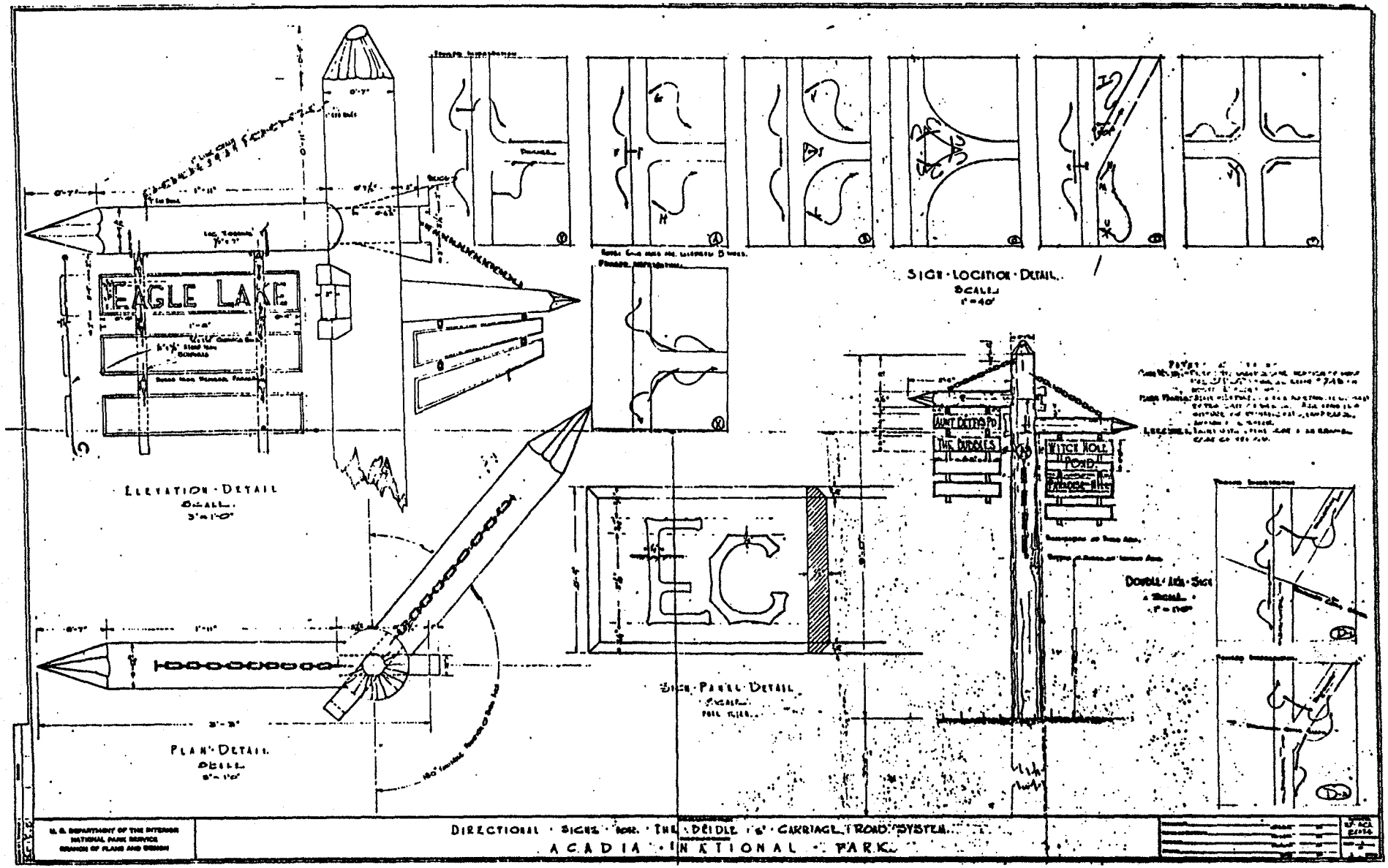


Figure LXXXIX. Directional Signs

The Kebo Valley Roads

A significant piece of the carriage road system, the Kebo Valley roads, were planned but never built. In conjunction with completing the Park Loop Road, Walter Kidde Constructors[384] designed two horse roads which would have connected Eagle Lake to the Town of Bar Harbor and Sieur de Monts Spring. [Figure XC] Planning for these roads began in the late 1920's, and, after approval by the National Park Service, the necessary construction documents were developed. Dorr notes in his book:

> The next spring [1930] Mr. Rockefeller had two surveying crews in the field sent out by a leading New York engineering firm [Walter Kidde Constructors], who worked all summer. In the fall, his plans completed, he made a formal offer to the Secretary of the Interior and the National Park Service to build a continuous Park motor road, connecting unbrokenly the Cadillac Mountain Road with the ocean-front [section of existing Park Loop road]; and at the same time two additional horse-roads which he had long had in view, in extension of his already constructed horse-road system. . . . The Secretary of Interior . . . supported by the National Park Service, accepted Mr. Rockefeller's offer.[385]

These were the first roads about which Rockefeller consulted Frederick Law Olmsted, Jr., the son of the designer of Central Park.[386] Rockefeller asked him to advise him on the development of the motor roads he was financing on the Island, most notably Stanley Brook and Ocean Drive. Insofar as the carriage roads related to the proposed motor roads, Olmsted was asked for advice about them as well. Since Olmsted was already involved in the planning when the new director of the Park Service, Horace Albright, came to visit the Park with Arno Cammerer in June, 1930, it was Olmsted who showed them the planned roads, both carriage and motor. Albright requested through Rockefeller that Olmsted prepare a report on these roads, anticipat-

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[384]Walter Kidde Constructors had previous to this time done work for Rockefeller at his Pocantico Hills estate.

[385]George B. Dorr, *The Story of Acadia National Park* (Bar Harbor, Me.: Acadia Publishing Company, 1985), 33.

[386]Frederick Law Olmsted, Jr., unlike John D. Rockefeller, Jr., omitted the "Jr." from his name after his famous father's death. This has no doubt contributed to the incorrect perception, propounded in several accounts, that the carriage roads were designed by Frederick Law Olmsted, the designer of Central Park. The elder Olmsted died in 1903, ten years before Rockefeller even began work on the carriage roads.

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ing that Olmsted's approval of them would outweigh any opposition to the continued development of roads on the island.[387]

The entire text of the report Olmsted prepared on the carriage roads is included in Appendix XIX. It includes his description of and recommendations for the carriage roads in general. Quoted here is his description of the lower horse road proposed for the Kebo Valley:

> . . . The horse road unit above described [lower] will serve to connect the entire system of horse-roads radiating from Eagle Lake pleasantly and easily and directly with the vicinity of Bar Harbor, and with the Great Meadow and Sieur de Monts Spring region and the horse trails in the eastern lobe of the National Park; it will traverse some very beautiful characteristic and varied scenery, and it will not have any appreciable effect upon that scenery.[388,389]

The upper horse road would also have provided splendid views of Frenchman's Bay and the Atlantic Ocean, views possible today only from hiking trails. Figure . shows the route of these roads on a modern map of the area. These locations are verified on a key of the construction documents found in the Rockefeller Archive Center.

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[387]Rockefeller, in endorsing this strategy, noted that Olmsted's approval of the roads could influence landscape architect Charles W. Eliot, II favorably. He said, ". . . if Mr. Olmsted's connection with them and endorsement of them have caused him [Eliot] now to favor them, the knowledge of that fact would be helpful with his old Committee [Bishop Lawrence's Committee of the Bar Harbor Village Improvement Association] here." (John D. Rockefeller, Jr., to Arno B. Cammerer, August 21, 1930.)

[388]Frederick Law Olmsted, Jr., to John D. Rockefeller, Jr., July 11, 1930.

[389]Frederick Law Olmsted, Jr., would also be called upon in a public relations capacity when Albright visited the Park in 1933 with the new Secretary of the Interior, Harold Ickes: "Mr. Olmsted with his maps explained both the motor and horse road systems. . . . [The Secretary of the Interior] was delighted with the opportunity to learn about your road systems and was greatly pleased to have the chance to study them with Mr. Olmsted. He fully approves the plans and feels that you are undertaking a work of very great importance to the park and the people who for generations will visit and enjoy the park. It was wonderful to get the Secretary so early in his administration to get such a very comprehensive view of Acadia's problems, and to get fully in his mind the scope of the road program." (Horace M. Albright to John D. Rockefeller, Jr., July 15, 1933.)

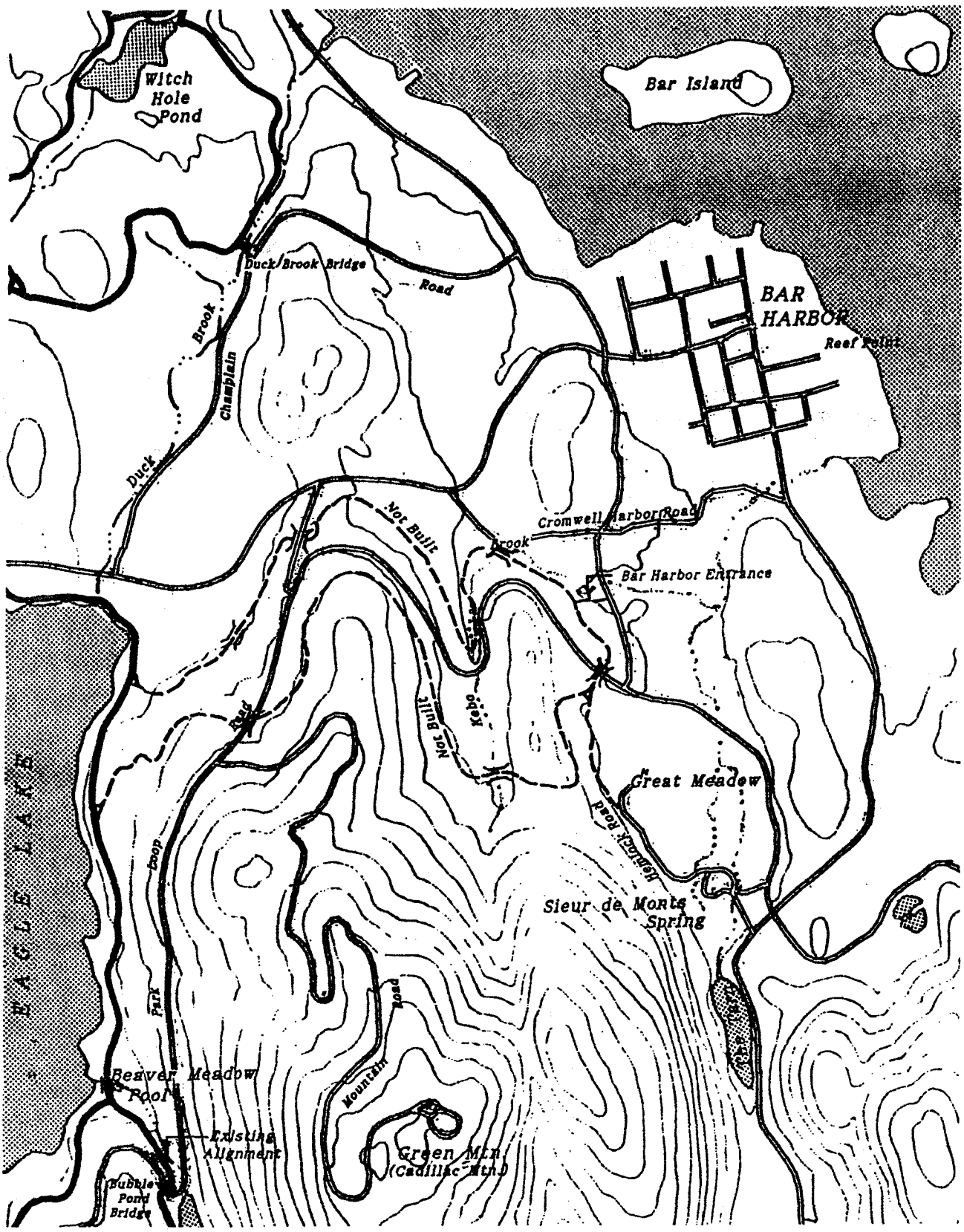


Figure XC. Unbuilt Kebo Valley Roads

Simpson and the Kidde engineers did extensive work in preparation for the construction of these roads. Lines were staked out for review in the field, plans and profiles were prepared for every foot of the road, and bridges were designed where necessary, in spite of the probability that these plans would be turned over to the Government for construction. This, in fact, is what happened in 1935. Rockefeller instructed Arthur Miller of Walter Kidde Constructors to turn his work over to the Park Service. In conjunction with the Bureau of Public Roads, the Park Service took responsibility for the future development of roads. Superintending this construction fell to Thomas C. Vint, in whom Olmsted expressed great confidence.[390]

The Park Service built the proposed motor road and, in connection with its construction, completed the last bridge in the carriage road system. The bridge, built in 1940, connects the Bubble Pond carriage road to the Day Mountain loop by bridging the Triad-Day Mountain Pass. Since Rockefeller could gain access to the Bubble Pond road from the Jordan Pond Gate Lodge, and since the Day Mountain loop directly connected to his private roads, he simply waited for the Park Service to build the bridge when they built the motor road. The Park Service drawings for this bridge show the site work for the design was done by Benjamin L. Breeze and reviewed by Mr. Vint.[391]

Though the Park Service had agreed to build the Park Loop Road to allow for the future construction of the proposed carriage roads, they would never be built, as Rockefeller suspected. He wrote to Albright:

> . . . As to the proposed horse road in the Kebo Valley section, I shall have to refresh my memory by referring to my agreement with the Government. I had hardly supposed that the Government would want to build horse roads. Under present financial conditions I doubt if I should want myself to spend the money involved in their construction. If the underpasses could be constructed at this time without great cost, my disposition would be to do nothing now about the construction of the horse roads themselves. . . . [392]

The carriage road construction was now at an end. In the early 1930s, in anticipation of its completion, Rockefeller had already begun to disassemble his organization. With the construction of his last bridge, the Stanley Brook, the masons

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[390]Frederick Law Olmsted, Jr., to John D. Rockefeller, Jr., February 6, 1936.

[391]N.P.S. Drawings, February 14, 1938, and March, 1939, North Atlantic Regional Office, National Park Service.

[392]John D. Rockefeller, Jr., to Horace M. Albright, July 12, 1938.

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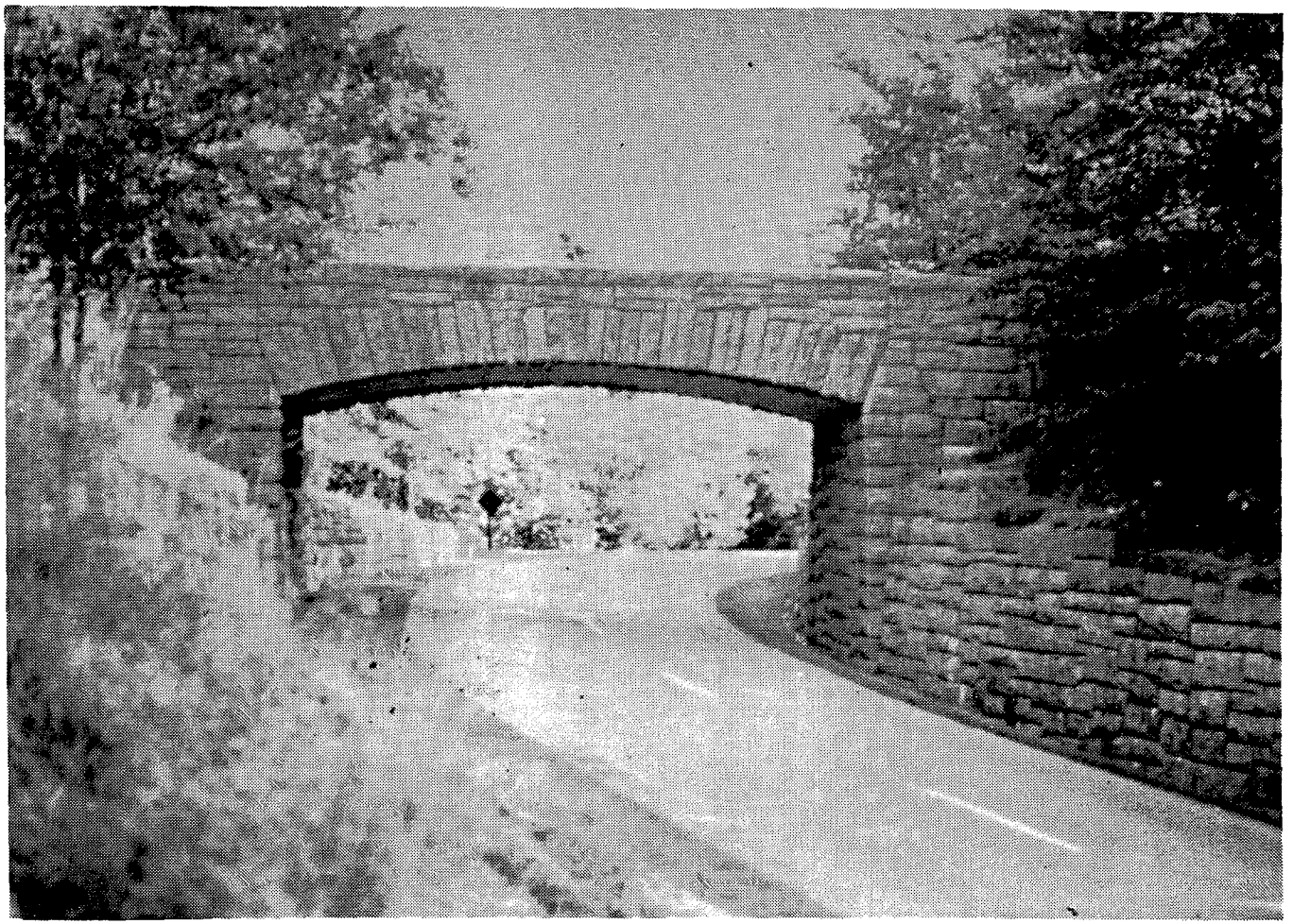


Figure XCI. Triad-Day Mountain Bridge

Built by National Park Service

were gone. The last road-building crews would be kept on until the completion of the Day Mountain summit road in 1940. Walters G. Hill had found a new position, at Rockefeller's urging, in 1935. Paul Simpson remained first on a part-time basis andthen as an occasional consultant. He and Rockefeller maintained a sporadic correspondence, however, until Rockefeller's death in 1960.

Rockefeller's last step was to establish a maintenance program under Ralston's supervision which would maintain the road system until he died. This maintenance included the forestry work made necessary by the 1947 fire.

1947 Fire

Rockefeller maintained the entire carriage road system until his death in 1960. His last major contribution to the development of the system, however, was his forestry work after the fire in 1947. Figure XCII shows the extent of the fire, which started on October 17 during an autumn in New England when rainfall was at its lowest point in 40 years. Beginning in the northern part of the island, it reached Acadia National Park three days later. By October 23, the fire had burned over Cadillac and also up Sargent Mountain toward Jordan Pond. Eventually, the fire destroyed 29 square miles of the island including over 200 structures, 16 of which were in the park.

As Rockefeller and Simpson had anticipated, the carriage roads proved important in the firefighting effort, both as a firebreak and to provide access. (One exception to the restriction of automobiles on the roads provided for their use in fighting fires.)

Since the National Park Service had no funds allocated to meet this emergency, Rockefeller stepped in. He kept in constant touch with park personnel and with his own men on the island. National Parks magazine reported that he ". . . cooperated magnificently with the National Park Service in the Acadia clean-up."[393] Rockefeller directed his efforts and those of his foresters primarily toward cleaning up areas which remained fire hazards. He also concerned himself with reestablishing the tidiness of both the roadsides and the views from the roads. This work was not a short-term effort. It continued from 1943 until Rockefeller's death in 1960. In 1954, he wrote to his employee at The Eyrie, Robert DeRevere:

> . . . Along the horse roads around Jordan Mountain and the north and east sides of the large Bubble where scraggly trees remain . . . the work required in these

[393]Editor's Note, "Healing Acadia's Burn," *The National Parks Magazine*, July-September, 1950, 86.

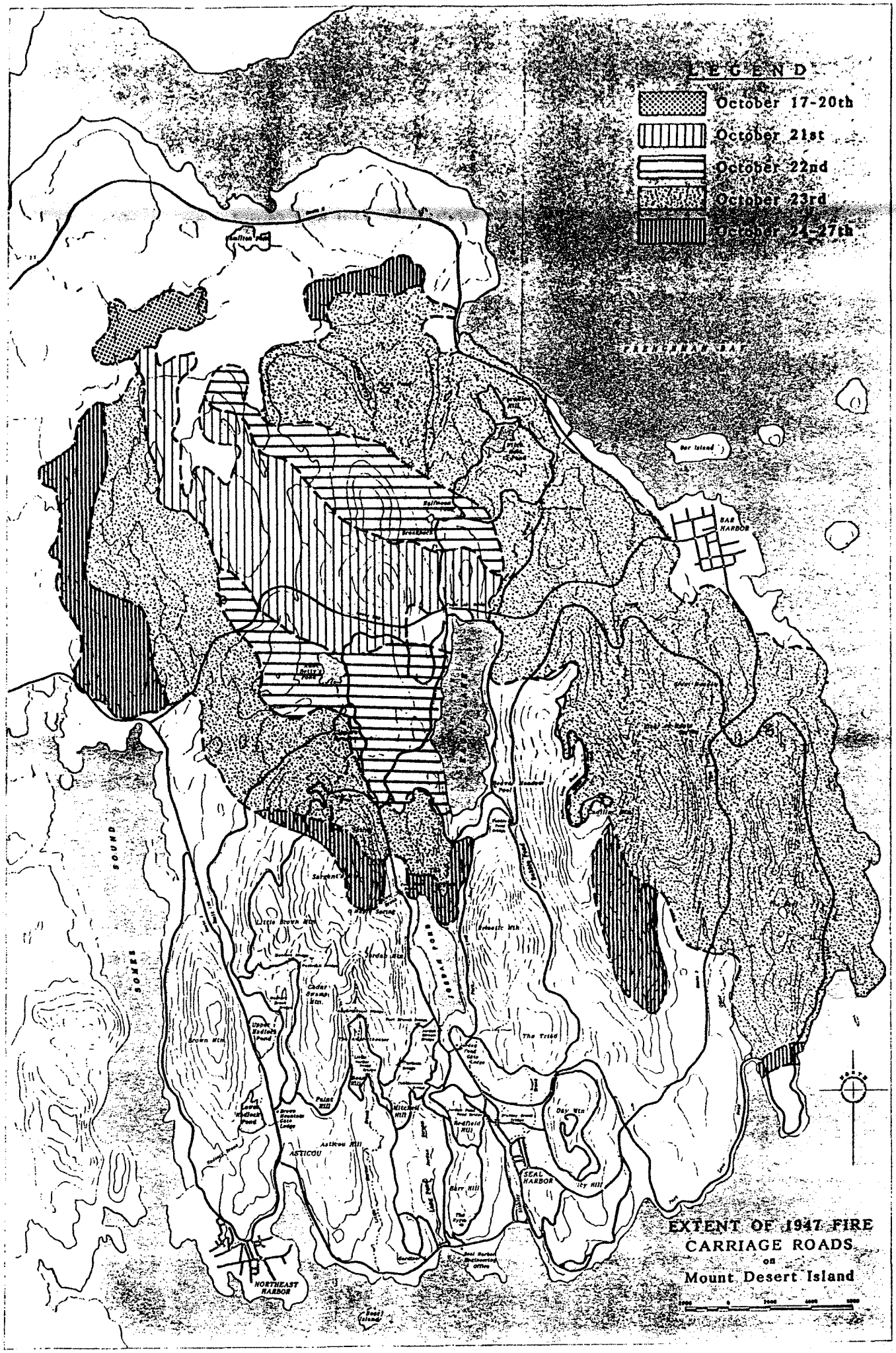

LEGEND
October 17-20th
October 21st
October 22nd
October 23rd
October 24-27th
FRENCHMAN BAY
Bar Island
BAR HARBOR
SOUND
Salisbury Cove
Little Brown Mtn.
Cedar Swamp Mtn.
Brown Mtn.
Upper Hadlock Pond
Lower Hadlock Pond
Brown Mountain Gate Lodge
Pulpit Hill
Asticou Hill
ASTICOU
Mitchell Hill
Bernard Hill
The Triad
Dry Mtn.
Ivy Hill
Barr Hill
SEAL HARBOR
NORTHEAST HARBOR
Sargent Mtn.
EXTENT OF 1947 FIRE
CARRIAGE ROADS
on
Mount Desert Island

Figure XCII

> areas is the removal of inferior trees that were left when the first clean up was made. . . . Trees of this character are unsightly and give more discomfort to the passer-by than pleasure; therefore, they should be cut down if the park superintendent gives his consent.[394]

Beatrix Farrand's planting work was one of the casualties of the fire. With the exception of a small area north of Eagle Lake, the area around Beaver Meadow Pool and Bubble Pond, all work documented in her road notes was destroyed.

The Outcome

Through the planning, construction, controversey, planting, and finally fire, the carriage roads have survived for over seventy-five years. They have given delight to millions of visitors to the Park over the years, and give promise of the same to millions in the future. They have impressed the most discerning of users.

In December of 1930, Charles E. Peterson, a young landscape architect with the National Park Service, first came to Acadia National Park to make an inspection of the automobile road being constructed by the Park Service to the summit of Cadillac Mountain. The following summer, Rockefeller invited him for a drive over some of the carriage roads which he had constructed in the Park and on his own lands. Mr. Peterson, who was one of the chief designers for both the Colonial Parkway and the Skyline Drive, recalled in 1988 his impression of the design and construction of the carriage roads:

"I got a phone call from The Eyrie which said 'Mr. Rockefeller would like you to join him to drive the carriage roads.' So, I got up early one morning, and he drove me. He was a good driver, loved to do it, and we spent the whole morning out. . . ."

Of the roads he said, "I admired them. . . . They couldn't have been done more beautifully. . . . They avoided damage to the landscape, they met the key points at the views, and in detail they were wonderfully done." [395]

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[394]John D. Rockefeller, Jr., to Robert DeRevere, October 21, 1954.

[395]Charles E. Peterson, conversation with the author, April 15, 1988.

CONSTRUCTION

Background

Any discussion of the construction of the carriage roads at Acadia National Park must begin with the fact that the drives in question are not "carriage paths" or "carriage trails." They are *roads*, built to the highest standards of rural roads of the time. In 1913, when the building of the first segments of the carriage road system commenced, the great majority of roads being constructed in America fell into three categories: earth roads, gravel roads, and broken-stone roads. While brick roads were built in the nineteenth century and experiments with coal tar, bituminous,[395] and concrete surfacing were underway during the first decade of the twentieth century, these represented a minuscule percentage of the total mileage of roads in 1913.[396]

Earth roads were the cheapest and by far the most common roads of the time.[397] They were dusty in dry weather and muddy in wet. Many earth roads were impassable during much of the year. Because of the temporary nature of earth roads, they were converted to gravel or broken-stone as soon as finances and volume of traffic warranted. The best earth roads were built with properly formed and well-drained road beds so that their conversion to higher grade gravel or broken-stone roads required only upgrading the surface material.

Gravel roads were intermediate, in both cost and durability, between earth roads and broken stone roads. Figures XCIII and XCIV illustrate the kind of gravel roads which existed on Mount Desert Island before the introduction of "engineered" roads. Gravel may be defined as ". . . a mass of small, more of less rounded fragments of stone which have been broken out and shaped by the action of water or ice."[398] The depth of gravel would vary from 2 to 8 inches, depending on the frequency and weight of traffic. The gravel would often be mixed with a binding material, such as clay or rock dust to assure that it would pack together tightly. Gravel roads were

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[395]Froidure, "Fight against Dust and Wear on Macadamized Roads," in *Institution of Civil Engineers, Minutes of Proceedings,* Vol. CLXXVI, Pt. 2, (London: 1908-09), 344.

[396]A. C. Rose, *Historic American Roads* (New York: Crown, 1976), 83-85.

[397]I. O. Baker, *A Treatise on Roads and Pavements* (New York: John Wiley & Sons, 1913), 71.

[398]Ibid., 146.



Figure XCIII. Jordan Homestead on Country Road to Northeast Harbor



Figure XCIV. Jordan Pond Road and Bar Harbor Road (Route 3) about 1890

recommended for country roads having light traffic, for little used village streets and for park roads.[399]

The carriage roads at Acadia fall into the third category--broken-stone roads. These roads were much more costly and durable than either earth roads or gravel roads. Broken-stone roads are closely associated with the names of two Scottish engineers who greatly advanced the technology of road building in the late eighteenth and early nineteenth centuries: Thomas Telford and John Louden McAdam. Telford, like the French engineer Tresaguet before him, advocated a base layer of heavy foundation stones, six to seven inches in depth, with smaller stones in the upper layers of the road.[400] Central Park in New York contains nine and a half miles of "telford" roads built between 1869 and 1878.[401]

McAdam believed that the "telford" road was unnecessarily expensive and that the load-bearing capacity of the natural soil was adequate if properly surfaced and kept dry. He wrote, "that it is the native soil which really supports the weight of traffic; while it is preserved in a dry state it will carry any weight without sinking."[402] McAdam prescribed a system of successive layers of relatively small stones (the largest passing a 2-inch ring, or no larger than would fit in a man's mouth).[403] The final layer would consist of smaller stones which would pack together and provide a water-tight surface. The action of iron wagon and carriage wheels on the road would grind the stone into "fines" which would fill the voids between the stones and further compact the top layer of the road into a hard, impervious surface.

The first "macadam" road in America was completed between Hagerstown and Boonsboro, Maryland in 1823.[404] It has been estimated that these new roads enabled a horse to triple its hauling power.[405] During the nineteenth century, advances in

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[399]Ibid.

[400]J. P. M. Pannell, *Man the Builder* (New York: Crescent, 1964), 31.

[401]William P. Judson, *City Roads and Pavements*, (New York: The Engineering News Publishing Company, 1909).

[402]Pannell, 35.

[403]Baker, 217.

[404]Rose, 36.

[405]Pannell, 36.

technology obscured the differences between telford and macadam road building systems. The first mechanical rock crusher was invented by Eli Whitney Blake in 1858.[406] About the same time, the revolving screen for assortment of various sizes of stone fragments was introduced.[407] (Concrete bins, used in rock crushing and sorting operations at Rockefeller's Pocantico Hills estate are still extant.) The first use of the steam road roller was made on roads in Central Park. on June 4, 1869.[408]

With this new technology, and with three-quarters of a century of practical experience and observation, civil engineers and road builders developed by the turn of the century a broken-stone road which combined the strong foundation and superior drainage of the telford road with the economy of the macadam road.[409] Figure XCV illustrates the evolution of the American broken stone road. The crusher and sorter allowed for the economical production of more uniform base stones and graded surface material. The steam road roller greatly hastened the process of compacting the surface layer of stone and binder into a hard, water-proof surface, which had previously relied upon much lighter horse rollers or simply wagon and carriage traffic to achieve. This macadamized road was described as "impervious to rain and so smooth and hard on the surface that the horses' hoofs would ring upon it."[410]

While broken-stone roads were generally referred to as "macadam" during the nineteenth century, in this century the same term has been used to describe "bituminous macadam" roads, in which asphalt or bituminous material is used as a binding agent between the surface stones. "Tarmac" is an abbreviation of "tar-macadam." For this reason, our discussion will refer to the construction technique of the carriage roads by either the term "broken-stone road, or by the term used by Rockefeller and the Simpsons--"rock-filled road."

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[406]Charles W. Wixom, *A Pictorial History of Road Building*, (Washington: American Road Builder's Association 1975), 41.

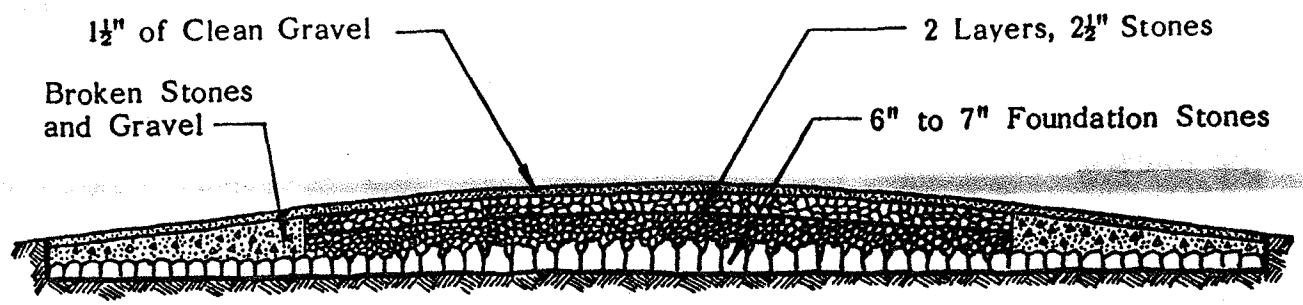
[407]Baker, 213.

[408]Rose, 67.

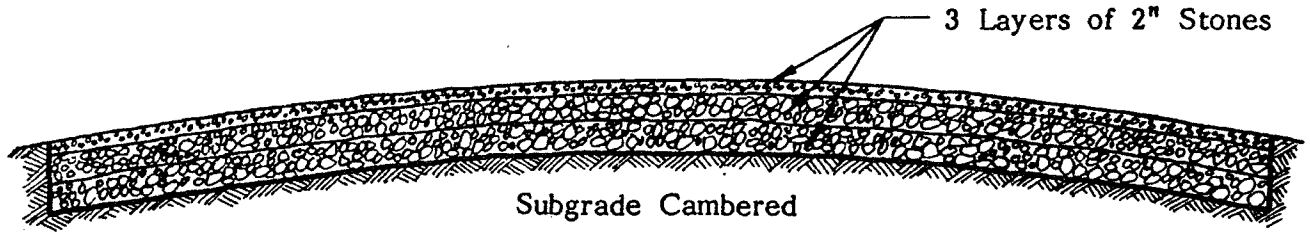
[409]Albert I. Frye, *Civil Engineer's Pocket-Book* (New York: D. Van Nostrand Company, 1913), 1099.

[410]Wixom, 61.

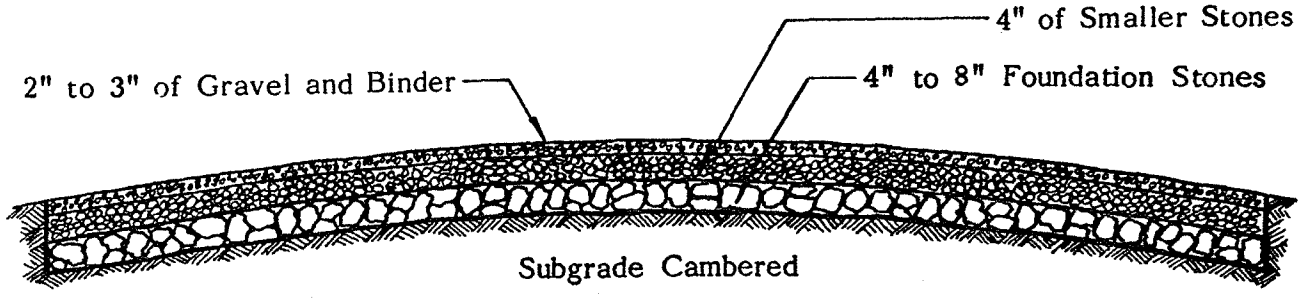
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TELFORD ROAD, ENGLAND, LATE 18TH CENTURY



MACADAM ROAD, ENGLAND, EARLY 19TH CENTURY



BROKEN-STONE ROAD, AMERICA, EARLY 20TH CENTURY

Figure XCV. Early Pavements

Specifications

The carriage roads at Acadia National Park were built according to plans and specifications developed by Charles P. Simpson, and later by his son Paul D. Simpson, under the direction of their employer, John D. Rockefeller, Jr. The first set of specifications found for the carriage roads were for the Gardiner-Mitchell Hill Road from 1916 (Appendix XIV). These same specifications were amended only slightly for future carriage road projects of Rockefeller on Mount Desert. Rockefeller's letter to A. E. Clement, the road builder, in conveying the specifications and contract for the Little Harbor Brook road a year later, states that "this road is to be of the same width, character, and quality as the Gardiner-Mitchell Hill-Jordan Stream Road. . . ."[411] The correspondence and specifications confirm that the same type of construction was used in the early roads on Rockefeller's land as on much later roads in the Park. Because the carriage roads were built according to written specifications and plans, under written contracts, it is possible to establish many details about the original construction of these roads.

Character of Road

The specifications for the Little Harbor Brook road (Appendix XII) state that "the road to be built shall be what is known locally as a rock filled road, with a top surface of clay and bank gravel, such as may be found in the vicinity of the work or the finer grades of crushed rock may be substituted for gravel. In general the road is to be of the same character as the Sea Cliff Drive and the Gardiner-Mitchell Hill-Jordan Stream Road, to which reference is made as a standard for road bed, retaining wall, gutters, etc. The road shall be built true to line and grade as established on the ground by the engineer or as shown on plans, with no humps, hollows, yanks or crocks, and the lines, particularly on curves, shall be true and even. All wet and low places shall be filled with rock." [412]

Reference to the plans in these specifications and other correspondence indicates that the road was carefully engineered and aligned both horizontally (plan) and vertically (profile). While civil engineers of the time were well acquainted with the principles of horizontal and vertical alignment, these were most commonly applied to railroad track alignment rather than to roads. Some park and estate roads were designed in plan and profile, but it was not common.

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[411]John D. Rockefeller, Jr., to A. E. Clement, Sept. 24, 1918.

[412]Specifications for Little Harbor Brook Road, September 25, 1918.

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Road builders of the early twentieth century were very concerned with gradient, or the steepness of the road. However, because of the slow rate of speed of both horse-drawn and motorized vehicles, sharp turns were allowed. A radius of as little as 30 feet at the outside edge of the roadway was recommended for four- and six-horse teams.[413] For this reason, horizontal alignment was not considered critical and was usually determined in the field by the construction crew ". . . requiring knowledge of the country and a good deal of common sense, but not much technical skill."[414] The primary reason for designing a carefully aligned roadway on paper prior to construction, particularly in the case of a horse road, was to produce a beautiful, flowing line in the landscape. Aesthetic concern with respect to the carriage roads is confirmed by the specifications' requirement that ". . . the lines, particularly on curves, shall be true and even." Horizontal and vertical curves were calculated and shown on the plans (Figure XCVI). "Off-set" stakes were set in the field as the road was constructed to assure conformance with the design (Figure XCVII).

Width and Crown

The specifications state that ". . . the road shall be 16 feet in traveled width inside the gutters, fences or walls except where a greater or lesser width is specified, and will be crowned so as to be 8 inches higher in the center than at the edges."[415] A 16-foot roadway in a rural area was a substantial width, at the time. The standard cross-section for state-aid roads in New York showed 12 to 16 feet of broken-stone surface, at the turn of the century.[416] This width was altered in some places by Rockefeller. The Little Harbor Brook road, for example, was built at 16 feet in width, except for a section in the flat land along the brook which was built 10 feet in width, with the possibility of upgrading later to 16 feet. The Jordan Stream Road, which is now considered a part of the carriage road system, was never so regarded by Rockefeller. It was designed and built as a 10-foot bridle path. Neither does it have the same alignment qualities as the true carriage roads. The great majority of the carriage roads were designed and built at the full 16-foot width.

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[413]Herschel Clemens, "Prize Essay on Road Making," *Massachusetts State Board of Agriculture Report*, 1869, 207-63.

[414]F. W. Cron, "Fitting the Highway to the Landscape," *The Highway and the Landscape*, W. B. Snow, ed., (New Brunswick: Rutgers University Press, 1959), 82.

[415]Little Harbor Brook Road Specifications.

[416]*Report of the New York State Engineer and Surveyor*, 1899, 321.

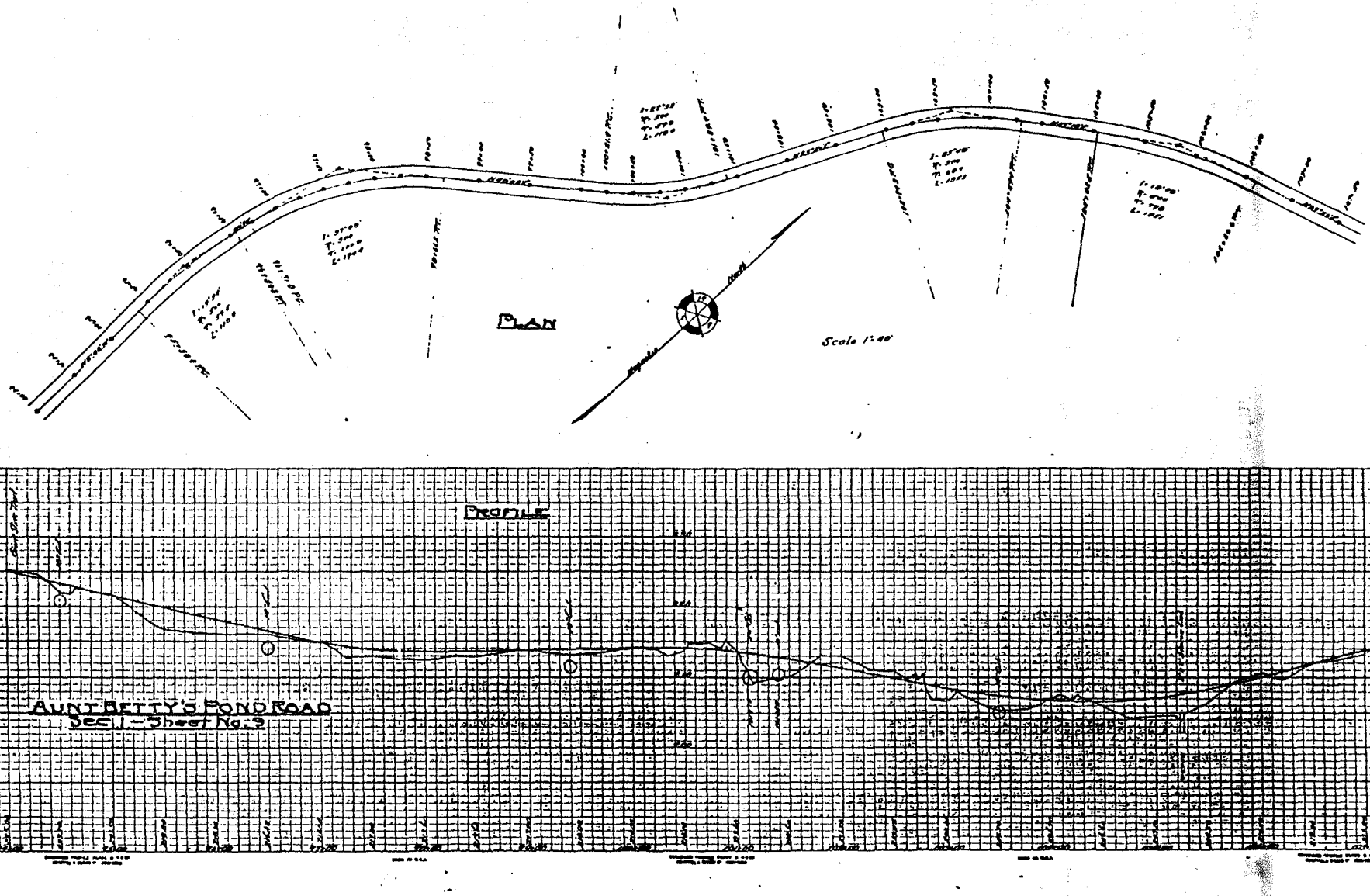


Figure XCVI. Aunt Betty's Pond Carriage Road, Plan/Profile

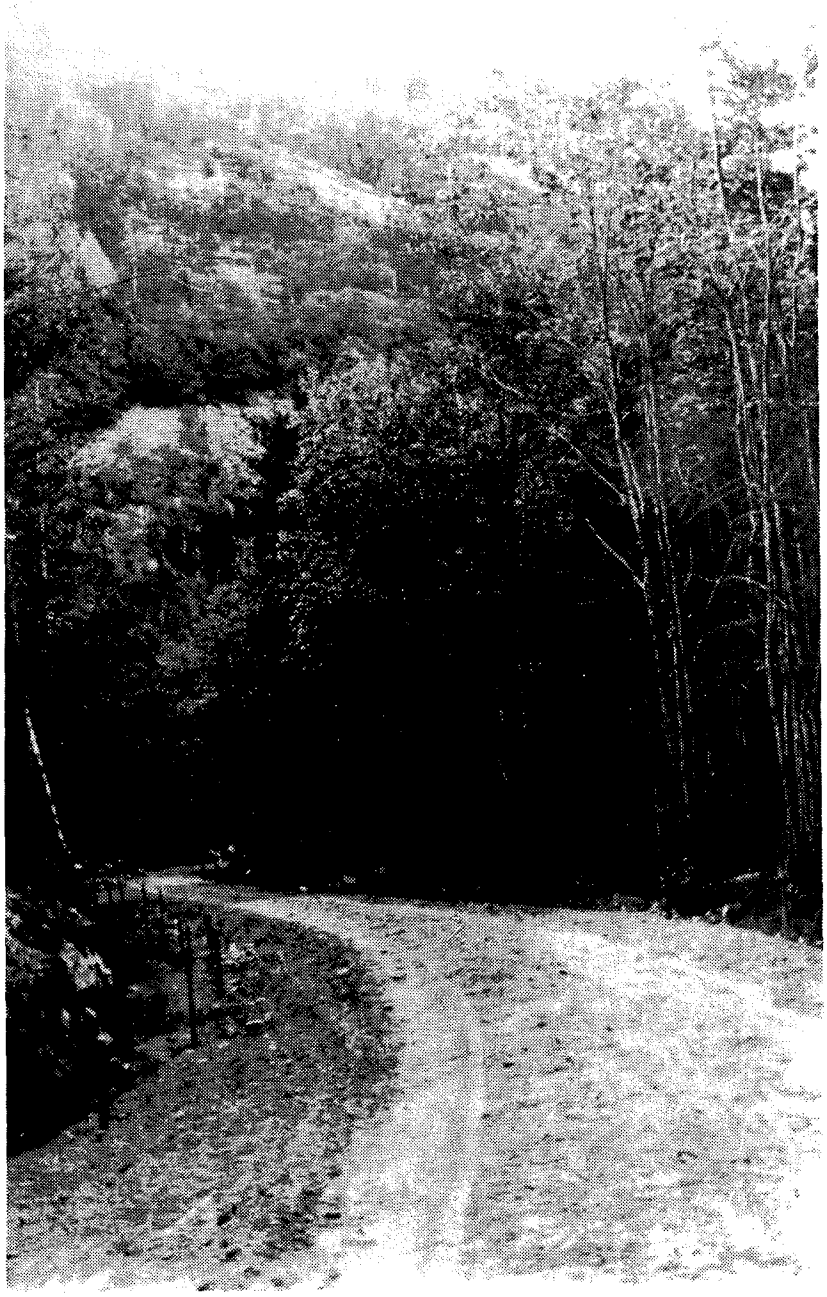


Figure XCVII. Jordan-Sargent Mountain Road

Note offset stakes on left.

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The requirement for 8 inches of crown, from center line to the shoulder, or a rate of 1 inch per foot, was generous, but within the accepted norm. A 1903 road construction text states that "broken-stone roads made of soft stone and maintained by periodic repairs frequently have an original crown of one twelfth--an average slope of 1 inch to 1 foot or 1 in 12."[417] The same source goes on to state that "there is a slight advantage of a very high crown for a broken-stone road, particularly for one that is not frequently cleaned. If the crown is great, the rains will better wash the surface clean. Dirt upon the surface is not only unsightly, but is also detrimental since it holds the water and softens the surface."[418]

The Little Harbor Brook Road specifications prescribe that "This crowning [is] to be even and to be made in the rock fill and verified before the top surface is put on. In placing the rock fill due allowance must be made for settling and wear during construction so that the crown of the road when finished shall be 8 inches."[419]

A less pronounced crown was often employed. A 1909 text says, "[t]he convexity or crown of the roadway is usually made one-half inch to three-fourth inch per foot each way from the center-line for widths up to sixteen feet. . . ."[420] The stipulation that allowance be made for settlement, so that the finished crown would be 8 inches, is the only instance in which the specifications were underlined for emphasis. Later drawings indicate that this crown was reduced to 6 inches on the 16-foot roads, or a crown of 3/4 inch per foot. This important aspect of the original construction of the carriage roads has been largely lost over the years. The crown, where it still exists at all, is substantially less than it was designed originally.

Foundation

The foundation of the road was to ". . . be of broken rock finished with at least 4 inches of small rock and to be crowned 8 inches from edge to center of road. Upon this will be put a light coating of fine screenings or coarse gravel sufficient to fill up the spaces between the stones so that the top dressing will not sift through." While the size of the foundation stones are not specified, the bottom course of broken-stone roads was

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[417]Baker, 202.

[418]Ibid.

[419]Little Harbor Brook Road Specifications, 3.

[420]Judson, 177.

typically composed of stones 3 to 4 inches in greatest dimensions, for softer stones; and 2 to 2-1/2 inches, if built of hard, tough stone.[421] The stones exposed by erosion or wear on the carriage roads generally measure in the 3 to 4 inch range, but some larger stones may be found (Figure XCVIII). The foundation stones were installed to a depth of 6 inches to 7 inches (after rolling) on the carriage roads. This was a very substantial base. The standard cross-section for state-aid roads in New York at the turn of the century shows a 4 inch base.[422] The average depth of foundation stone (or first layer of macadam) on broken stone roads in 30 American cities in 1907 was 6.67 inches.[423]

Middle Layer

The foundation course was topped with 4 inches of "smaller stones".[424] While the size of these smaller stones is not specified, it was customary to use stone in the 1 inch to 2 inch range.[425] This open-graded material would assure good drainage, and would fill some of the voids of the larger foundation stones. Upon this was to be spread a thin layer of screenings or gravel, to prevent the finish surface from sifting through.

Finish Surface

The contractor was directed to "finish with 2 inches of gravel that will pass through a sieve of 1-1/2 inch mesh and one inch of clay as a binder; all to be rolled upon completion when wet with a roller not less than 2 tons in weight."[426] The gravel size of 1-1/2 inch and smaller was consistent with current practice.[427] Binder material

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[421]Baker, 217.

[422]*New York State Engineer and Surveyor Bulletin* No. 1, April, 1899, 9.

[423]Halbert P. Gillette, *Handbook of Cost Data for Contractors and Engineers* (Chicago: The Myron C. Clark Publishing Co.), 1914, 350-351.

[424]Little Harbor Brook Road Specifications, 4.

[425]Ibid.

[426]Little Harbor Brook Road Specifications, 4.

[427]Baker, 218.

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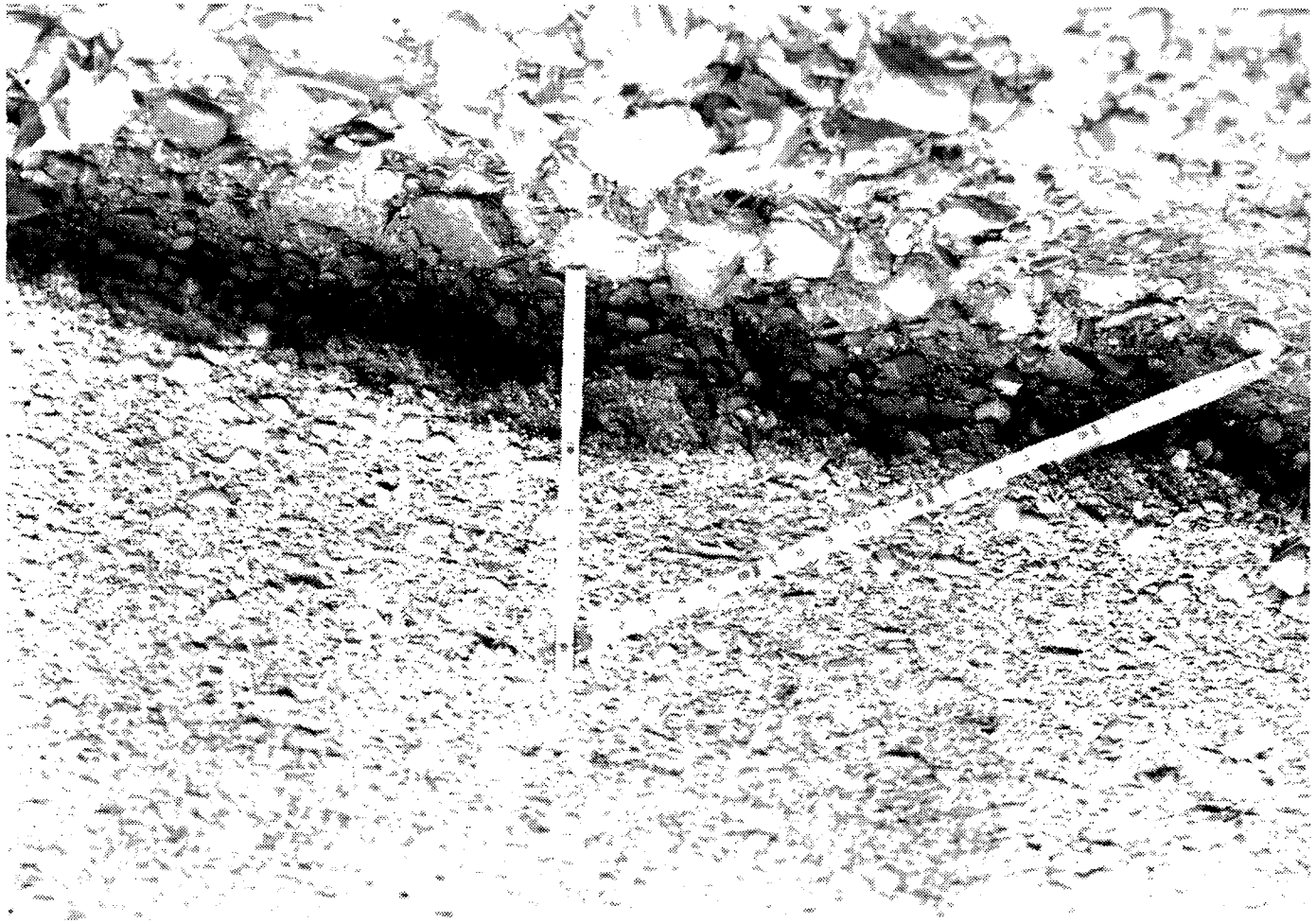


Figure XCVIII. Erosion exposes foundation stones.

was considered essential for the performance and durability of a broken stone road. Baker writes, in *Roads and Pavements*:

> The interstices between the fragments of stone should be filled with a fine material which will act mechanically to keep out the rain water and thereby keep the subgrade dry, and also to support the fragments and prevent them from being broken, and which will act physically and possibly also chemically to bind or cement the fragments into a single more or less solid mass. The proper binding of the stone is the most important part of the construction of a broken-stone road.[428]

That clay was used as the binder material on the carriage roads, as specified, is confirmed in a letter from A. E. Clement to Rockefeller in which Clement writes, ". . . [t]he teaming of this date was for hauling clay for a binder . . . which was put on with the rock."[429] Clay was not considered to be the ideal binding material. While it is cheap, easy to apply, and will give a smooth road without rolling, it is easily affected by water and frost, and likely to be very dusty in dry weather, and muddy in wet weather.[430] Because clay dissolves in rainwater over time, its binding effect will eventually be lost and the stones will loosen or "ravel." This condition has occurred on the carriage roads, where the original hard, smooth surface has become loose, in many locations.

The preferred binder material was rock dust or screenings, the finest product of the stone crusher, from 1/2- or 1/4-inch to dust.[431] The preferred stone for binder material was "trap rock,"[432] a generic term for extrusive igneous rock such as the dolerites and basalts.[433] Limestone has excellent cementing properties, but it often lacks toughness; granite (which is most available on Mount Desert) is strong but lacking in cementing properties. Sources do not agree on the use of granite dust to bind broken-stone roads. One source reports that "the screenings crushed from granitic

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[428]Baker, 229.

[429]A. E. Clement to John D. Rockefeller, Jr., December 1, 1916.

[430]Baker, 229.

[431]Baker, 230.

[432]Judson, 160.

[433]Joseph M. Trefethen, *Geology for Engineers*, (New York: D. Van Nostrand Co. 1959), 63.

Sizes of Broken Stone and Thickness of Courses, in Inches.

State.	Lower Course of Macadam.			Upper Course of Macadam.			Surface.			Size not used.
	Size of Fragments.		Thickness after rolling.	Size of Fragments.		Thickness after rolling.	Size of Fragments.		Thickness after rolling.	
	Min.	Max.		Min.	Max.		Min.	Max.		
New Jersey....	2	3	4	1	2	2	dust	¾	smooth surface	¾ to 1
Massachusetts.	1¼	2½	4	½	1¼	2	dust	½	smooth surface	none.
Connecticut ...	¾	2	4	1	1½	2	dust	½	1	½ to 1
New York	1½	3	4	1	2	2	dust	½	⅜	none. *

* One-half inch to one inch spread on subgrade as one-third of the base course.

Figure XCIX. from City Roads and Pavement

rocks and from gneiss have in some cases been successfully used to bind the crushed rock from which they were screened. In other cases, during 1901, perfect results have been obtained from granite screenings which would not 'bind' by mixing with them an equal quantity of carefully-chosen local sand."[434] Another source states, however,that "[s]and and gravel may be employed to fill the voids, but very little if any clay or loam should be used. Crushed granite should never be used."[435]

The carriage road specifications go on to require that the surface be rolled ". . . when wet with a roller not less than 2 tons in weight."[436] Rolling was an extremely important part of the construction of the broken-stone road. The top layer, in particular, was rolled to "pack or bind the pieces into place, to prevent their being knocked out by the horses' feet. Rolling accompanied by sprinkling is necessary also to work the binding material into the interstices so as to make the surface water-tight."[437] The specifications' requirement that the surface be rolled "with a roller not less than 2 tons in weight" suggests that a horse-drawn roller (Figure C-top) was used in the early road construction. When the specifications were revised for work on the Park land in 1922, this was changed to a ten-ton roller, which would have been a steam road roller (Figure C-bottom and Figure CI).

If the surface layer is of the correct composition and is thoroughly rolled, it will produce a smooth, hard, waterproof surface which "resembles a mass of concrete, and in several places has proved to be self supporting when the earth beneath it has been washed out. . . ."[438] (Figure CII).

Gutters, Drains, and Culverts

In 1935, John D. Rockefeller, Jr., wrote to George Dorr that "my experience in road building has been that the greatest economy in maintenance is obtained by the

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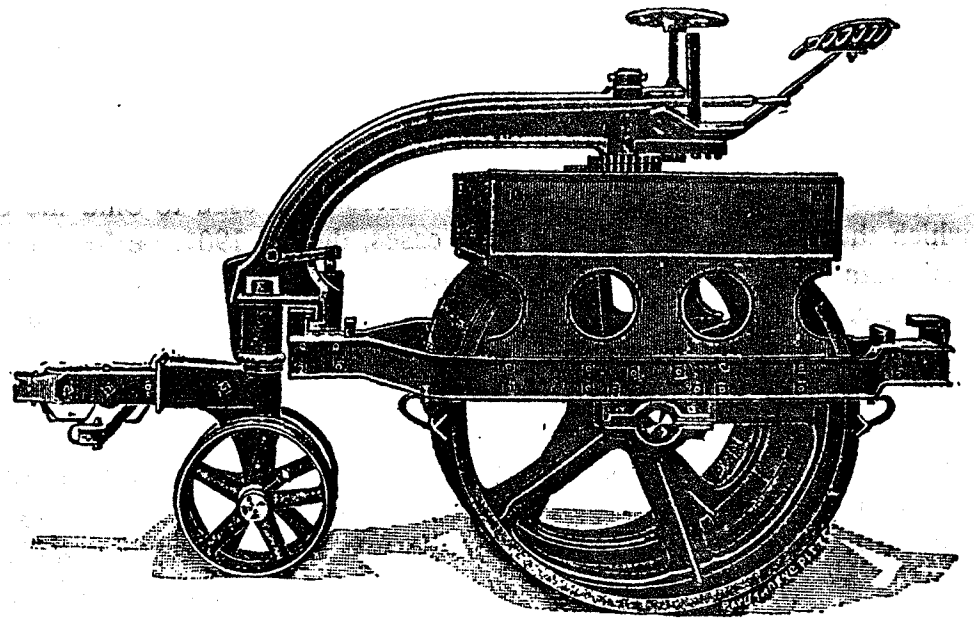
[434]Judson, 161.

[435]Frye, 1099.

[436]Little Harbor Brook Road Specifications, 4.

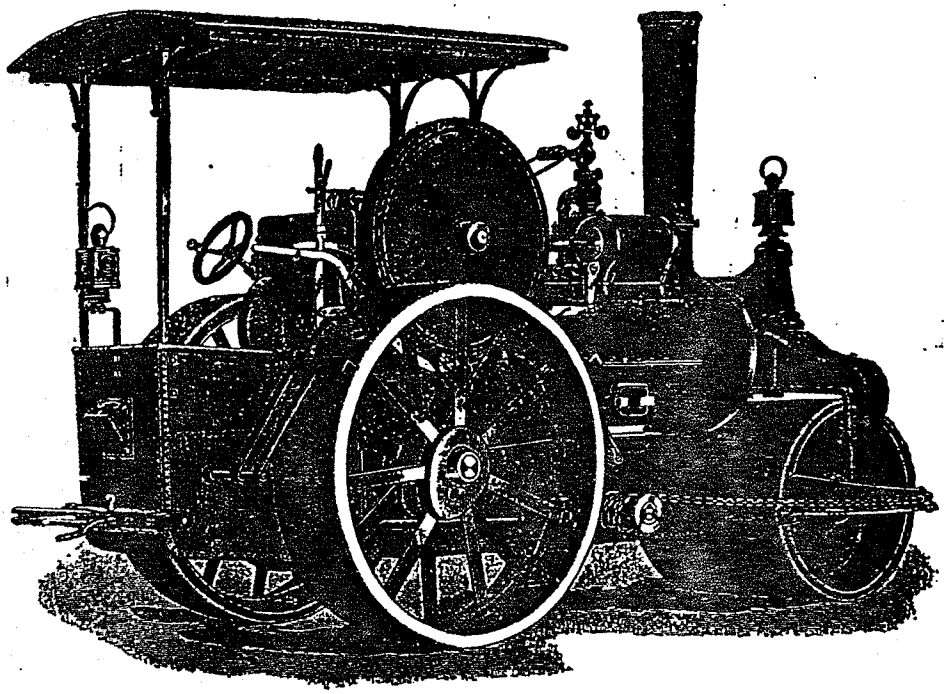
[437]Baker, 226.

[438]Judson, 175.



—Reversible Horse Road Roller.

Horse-drawn Road Roller



—Steam Stone-road Roller.

Steam Road Roller

Figure C.

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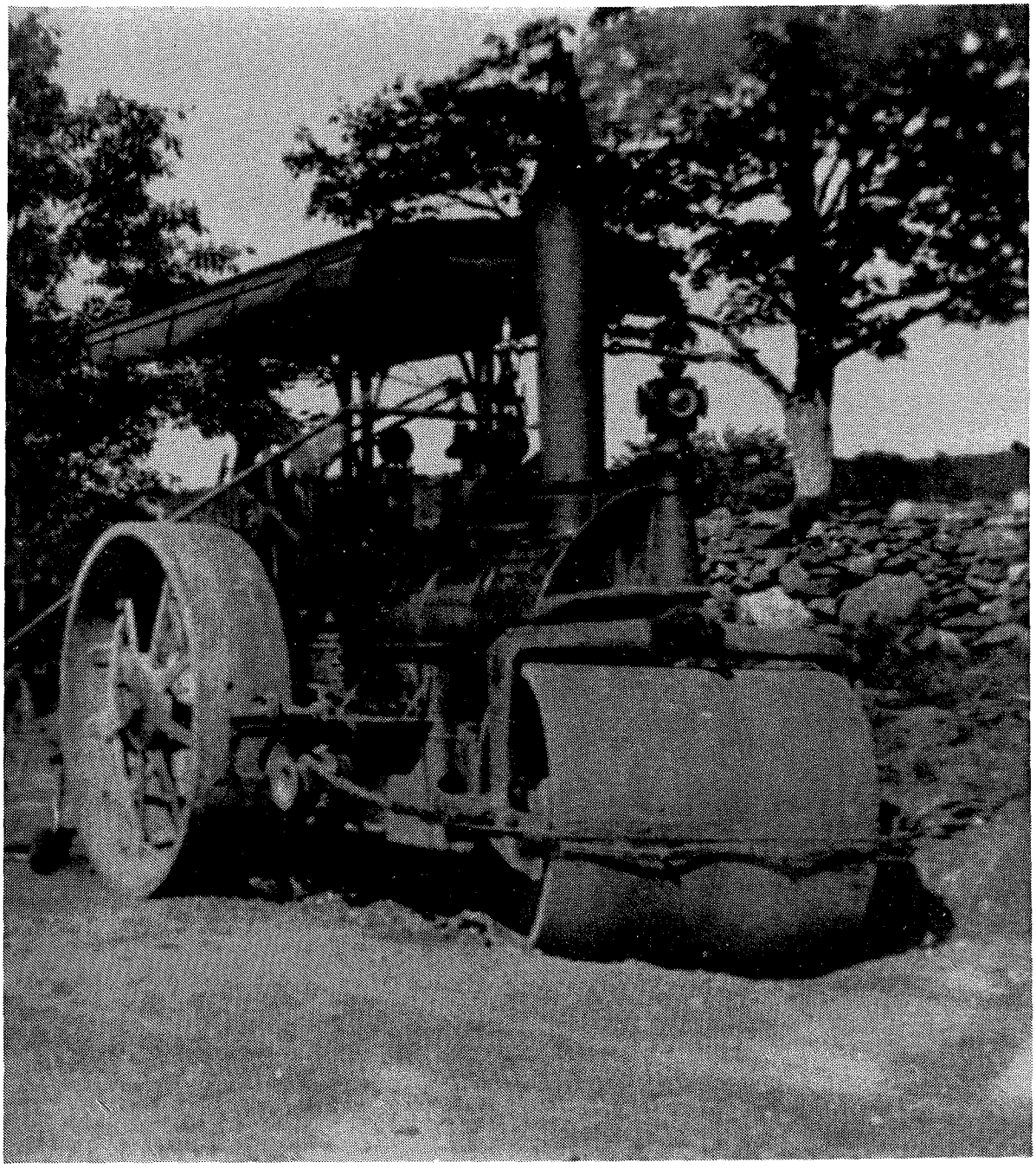


Figure CI. Steam Road Roller

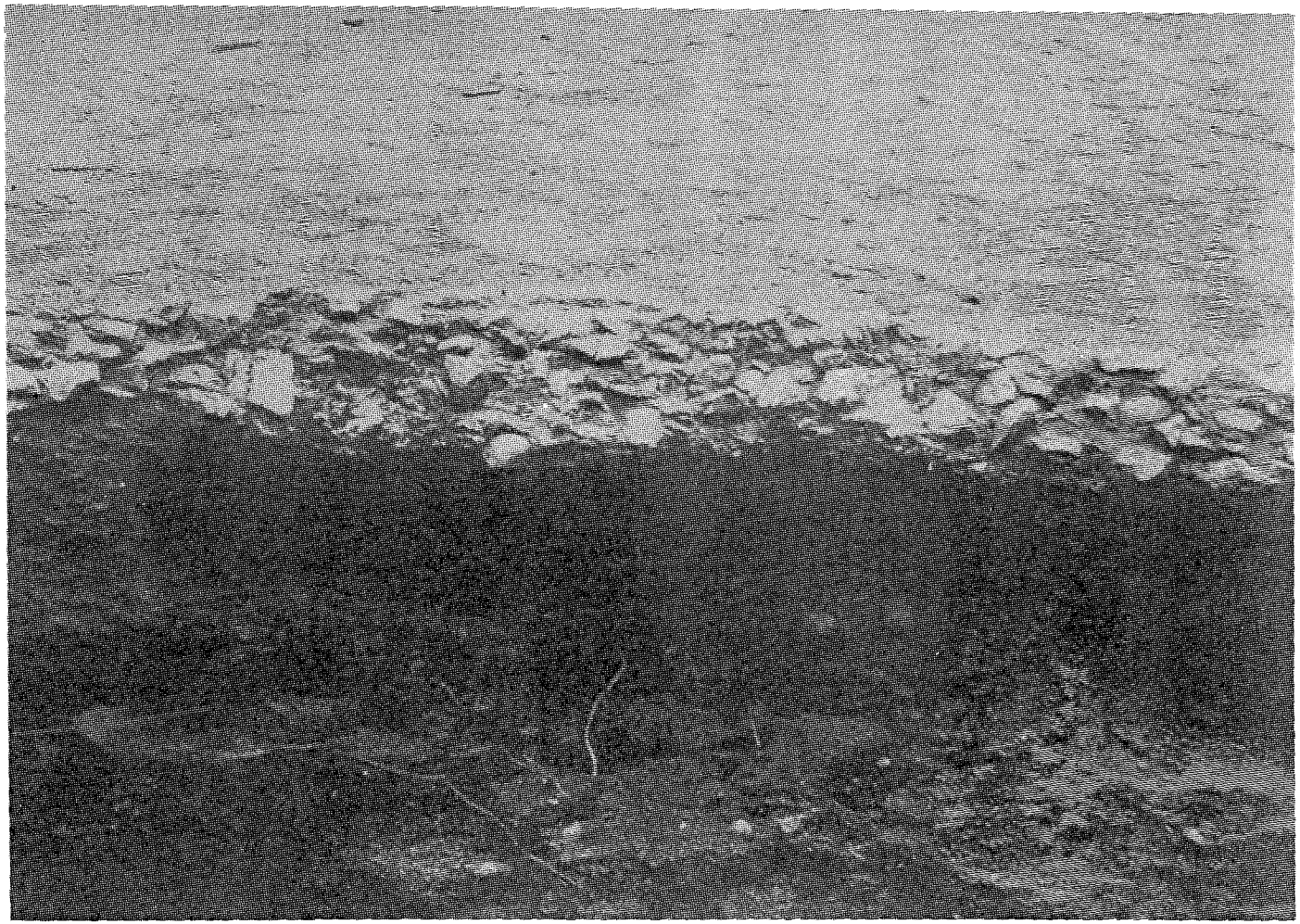


Figure CII. Broken-stone Roadway Overhanging a Washout

greatest care and thoroughness in designing and constructing the drainage system."[439] This conviction was evident in the specifications for the drainage system of the carriage roads. They stated in part that the gutters were to be at least 2 feet in width and deep enough to carry off the water.

Culverts were to be of stone or of iron pipe. If iron, they were to be at least 10 inches in diameter (this was upgraded in 1922 to 12 inches). Stone culverts were preferred and metal culverts were to be used only where there was insufficient depth for a stone culvert. Stone or concrete head walls were specified for both ends of all metal pipe. A catch basin was to be built at the entrance to each culvert, at least 18 inches square, with its bottom at least a foot below the bottom of the culvert "so as to form a receptacle for leaves and debris and prevent the stopping up of the culvert."[440] This kind of catch basin was built into the drainage systems of many cities and urban parks, but it was, and still is, very uncommon on rural roads.

Stone culverts were preferred for practical as well as aesthetic reasons. "If a ditch drains a hillside having a southern exposure, the midday sun of winter will supply a trickle of water which will freeze at night, and under this condition such pipe culverts will soon freeze solid, and sometimes burst. . . .Box culverts of rubble masonry. . . are much preferable to pipes, being less ready to freeze and less liable to be damaged if frozen."[441] That this condition was a real concern on the carriage roads is evident in S. F. Ralston's letter to Rockefeller in 1925:

> I went over the roads after the heavy rain fall to try and determine the cause of the damage, and found in most instances that the culverts were entirely closed with ice, some places for the entire length of the culvert. It rained many times during the winter when it was but a few degrees above the freezing point, and the rains were almost always followed by freezing temperatures, sometimes after it quit raining, the temperature fell to zero and at times to 6 and 8 degrees below zero, and the water running into the culverts, which were surrounded by frozen ground, and the frost in the culverts and the lowering temperature gradually filled them with ice. It was a condition that could not be guarded against.[442]

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[439]John D. Rockefeller, Jr., to George B. Dorr, August 21, 1935.

[440]Little Harbor Brook Road Specifications, 5.

[441]Judson, 36.

[442]S. F. Ralston to John D. Rockefeller, Jr., April 14, 1925.

Culverts were designed at frequent intervals to prevent the concentration of runoff, and to interrupt the natural drainage pattern as little as possible.[443]

Retaining Walls

Retaining, slope, parapet, and breast walls of very large stones were specified. No round cobble stones were allowed. The stones were generally between 1 foot and 6 inches in thickness, and at least 4 feet in length. The walls were designed to have an 1-1/2 inch per foot batter (or vertical slope) and be 18 inches thick at the top. As in the case of the drainage structures, the engineer was given broad authority to direct the extent and location of the walls. Retaining and breast walls were employed over long stretches of the carriage roads to prevent large cut and fill sections on side slopes. This method was employed to disturb the terrain as little as possible and to save the largest number of trees (Figure XX, Page 52).

The Result

When the carriage roads were begun in 1913, they represented the state-of-the-art in rural road building. Carefully aligned and structurally designed, they represented a remarkable marriage of current technology with rustic detailing and respect for the land through which they traversed, but by the time the last section was built in 1940, the system was already a technological anachronism.[444] Carriages had been replaced by automobiles. Broken stone roads had been superceded by bituminous asphalt roads. As they stand, they are a remarkable testament to Mr. Rockefeller's insistence upon high quality, his consistent vision over more than 20 years, and the talent and dedication of his engineers and road builders. They do not appear today as they were constructed, or as they were intended to be kept. They have never had the amount or type of use for which they were constructed. They are, however, a remarkable remnant of our road building history.

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[443]Jordan-Sargent Mountain Road Specifications (1922), 4.

[444]During the period in which the carriage roads were being built, the art of road and parkway design for automobiles was developing rapidly. Landscape architects like Gilmore Clark and Wilbur Simonson, working with engineers like Jay Downer and F. W. Cron, were developing principles of spiral horizontal curvature, refined relationships between horizontal alignment and vertical profile, and gradual and graceful grading of the adjacent landscape. Even though these refinements had as much to do with aesthetic principles as they did the physics of the high-speed automobile, they were never incorporated in the carriage roads.

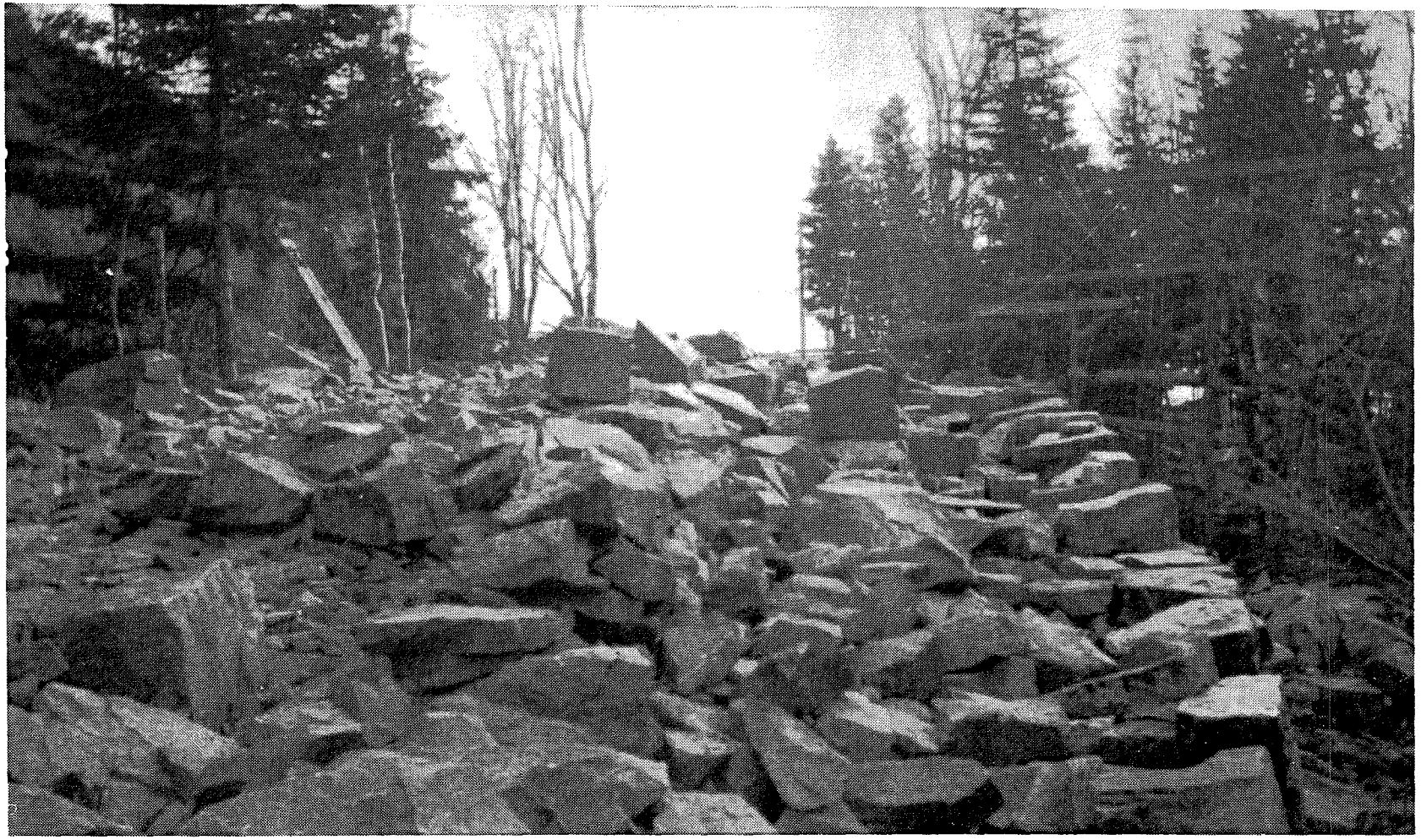


Figure CIII.

Retaining wall construction on right; broken-stone fill in center;
Note batter boards to guide stone work on right. (ca. 1924)

Bridge Construction

Building Acadia's bridges started with the selection of the quarry. This decision was based on the proximity of the quarry and the kind of stone it contained. Once the quarry site was located, the stone cutters began their work. Granite can be quarried easily because it cleaves or splits. Once blocks were cut approximately to size, the stone cutters began the finishing work. Though it splits easily, granite is a hard stone and therefore difficult to work, especially when hand tools are used. The stone cutter typically builds a template based on the architect's drawings before cutting the stone to the shape and size required. On the drawing, each course would have been given a letter and the stones in each course then numbered from left to right. This allowed for the exact placement of the stone by the masons. The masons used steel hammers to cut the stones. Typically, these steel hammers were used to break and roughly shape the stones as they come from the quarry, with bush hammers generally used for finishing granite.[445] The stone was then hauled to the site and construction began.

While the stone was being quarried, the bridge site was being prepared for construction. After completing the necessary excavation, foundations and abutments were built. For multiple span bridges, piers were built, too. With the substructure in place, construction of the arch itself began. The first step was building a temporary structure to support the stone or concrete until it was sufficiently strong. This "centering" consisted of timber trusses on struts, capped with a curved upper chord. Ribs were set in place on top of the chord and these ribs were in turn spanned by narrow planks or "laggings." The laggings formed the floor upon which the arch could be constructed (Figure CIV). The centering's configuration, of course, varied from bridge to bridge, according to the shape of the arch. All but one (Bubble Pond) of Acadia's bridges are stone-faced structures with concrete cores. The voussoirs or ring stones were the first placed. If the barrel was to be faced with stone, the stones for the arch barrel were placed directly on top of the laggings. Then the steel reinforcement for the concrete was put in place and anchored to the stone work and the concrete was poured in the forms defined by the laggings and voussoirs.

When the concrete had set, the surfaces were waterproofed with felt and hot pitch. To drain the bridge properly, pipes were placed parallel to the extrados and ending at outlets, or weep holes, in the piers or abutments. Next the spandrel wall was built and the barrel fill was placed, which meant filling the space from the arch ring to the road surface with earth and broken stones. The construction of the parapet walls then completed the bridge. After the installation of the roadbed itself (a 4-inch

[445]William S. Downdes, Ph.B., *Building Stone*. (Great Britain: International Textbook Company, 1949), 34.

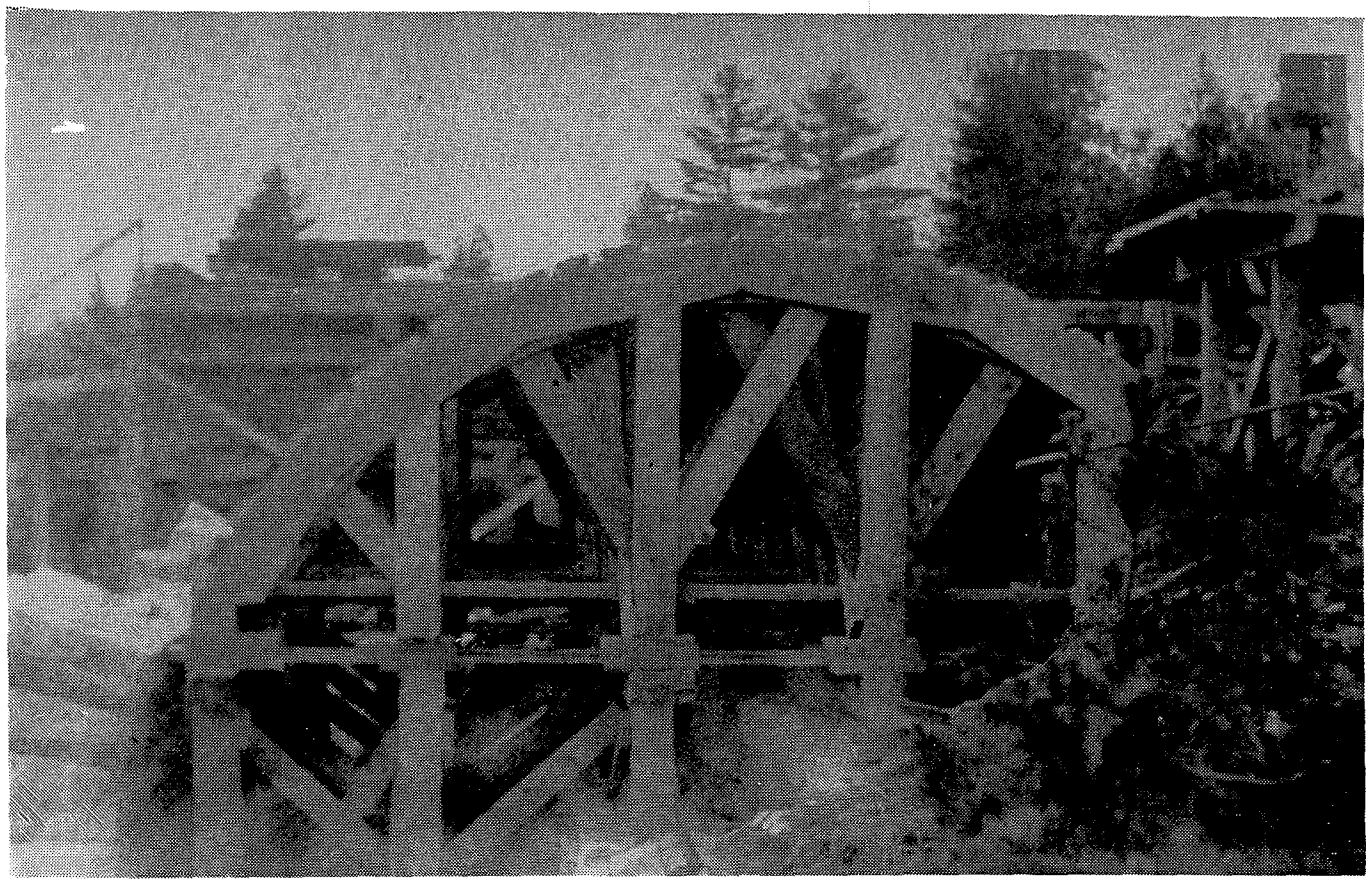


Figure CIV. Bridge Centering

concrete slab with a surface of crushed stone), the raking and pointing of the masonry joints gave the bridges their finished appearance and sealed the masonry against moisture.

The specifications which still exist for Hemlock, Waterfall and Bubble Pond bridges verify that Rockefeller's bridge builders used this typical method of constructing stone-faced bridges with a concrete core. Correspondence from his bridge builders provide additional details. For example, while working on the Hemlock bridge, B. W. Candage & Sons submitted this undated list of expenses (with their brand of gasoline specifically identified):

Derrick and Hoister	$1,850.00
Rigging, Oil and Repairs	$ 197.84
Derrick	$3,135.00
Wire Rope, Chain	$ 49.35
2 Jack Hammers	$ 342.00
3 Plug Drill Hammers	$ 135.00
Drills for Jack Hammers	$ 132.00
Concrete Mixer	$ 675.00
Recent Bill, Derrick Fittings	$ 107.02
Gasoline, Standard Oil	$ 466.88
Insurance	$ 175.00
Expense	$ 600.00

In assessing expenses for Hemlock bridge, Charles Heydt also checked with an insurance agent about the costs involved for liability insurance. In his letter he notes that the crews include laborers, helpers, stone-cutters, masons and blacksmiths. He adds, "Every one of these men, with the exception of the blacksmith, works directly on the bridge - the blacksmith has a little shanty nearby in which he sharpens the mechanics' tools."[446] This is the type of shanty shown in the photograph of Duck Brook bridge under construction (Figure LXIV, p. 193). As noted, this is the building which burned while the bridge was under construction.

Correspondence also reveals a noteworthy item about the nature of stone masonry construction. Several letters refer to sending a mason from Pocantico Hills to work on the bridges on Mount Desert Island. The following letter from A. B. Miller to S. F. Ralston explains why:

[446]Charles O. Heydt to W. B. Carter, January 16, 1924.

> Mr. Rockefeller has asked me to consult with the architect, Mr. Stoughton about recommending a mason who has worked on the bridges here and so become familiar with Mr. Stoughton's methods of laying and patterns of stone work.
>
> This mason would work with your regular gang, under the directions of your foreman and would be able to get the work just like what he had previously done on these bridges, as your stone is quite similar. Your other masons could then see better what Mr. Stoughton wants to secure, and this would be more quickly understood than just verbal explanations.[447]

Rockefeller also included rustic wood bridges in his carriage road system as well as stone bridges. They are located on the Jordan Stream bridle path, the carriage road on the east side of Eagle Lake and the road between Gilmore Meadow and the Chasm Brook bridge. This style of bridge, which he discussed with Beatrix Farrand, he also eventually included on the roads of his Pocantico estate. Rockefeller described their construction as follows:

> ". . . we were enthusiastically of the opinion that two wooden bridges with rustic cedar rails - the bridges to be built on stone or concrete piers with heavy steel beams under the planking - would be by far the most appropriate type of construction for the place [north end of Eagle Lake]. Neither the masonry nor the steel would show, only the planks and the rustic rail. . . . not interfering at all with the present rustic appearance of the stream and its immediate surroundings. These bridges can be made quite as strong as stone bridges; we have used them successfully on the Jordan Stream bridle path and they seem to us by far the most appropriate in the cedar swamp where the stream is crossed; and finally, their cost will be relatively so slight that at any future time they could be replaced by stone bridges if they had not proved satisfactory.[448]

Farrand agreed, making only one suggestion which Rockefeller would adopt:

> ". . . [a] suggestion is that the rails be made of adze-hewn timber [Figure CV], not cedar poles. Personally I think that the cedar poles quickly lose their bark and look shabby and unkempt after the first year or two. Adze-hewn timbers are

[447]A. B. Miller to S. F. Ralston, October 1, 1930.

[448]John D. Rockefeller, Jr., to Beatrix Farrand, May 16, 1929.

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Figure CV. Rustic Wood Bridge

entirely appropriate to country bridges as they have been used for a great many hundreds of years. . . ."[449]

Gate Lodge Construction

The Brown Mountain gate lodge is located on Route 198 near Lower Hadlock Pond. Built in 1932, the gate lodge complex consists of the gate, the lodge, and the carriage house, all joined by a connecting fence. An integrated appearance is given to the complex by the continuous use, in all the structures, of horizontal polychromatic bands of granite and red brick (Figure CVI). There is no break between the fence and the walls of the buildings. They are one continuous surface. The same shingle, a French tile similar to terra cotta, is also used on all of the buildings' roofs, as well as the coping of the fence, and contributes to the unity of the complex.

Inspired by the picturesque architecture of the French Romanesque period, the lodge is a 2-1/2 story dwelling with a steeply pitched gable roof. The first floor consists of the stone and brick bands, while the upper stories are half timbered with brick infill. On the western facade is a steeply pitched, bell-cast roofed oriel supported by brackets. On each side of the oriel are hipped roof dormers with vertical windows. The windows on the lodge are casement type in keeping with the style's medieval precedents. At the north and south elevations are exterior stone end chimneys.

The carriage house has a very steeply pitched hip roof topped by a small square cupola. The windows in the cupola and in the house proper are decorated with turned wooden spindle bars. The gate lodge itself consists of two towers topped with eight-sided spires. The towers are connected at the roof level by a gable ridge. The tower windows also have the turned spindles.

The 1932 Jordan Pond gate lodge complex is the more modest of the two gate lodges. It consists of a carriage house connected to a lodge house by an open-air passageway. The lodge house is then joined to the gates themselves by a low wall. The same ashlar granite is used in all the buildings and for the wall integrating the complex. The gate towers are unimposing, short square towers of differing heights, topped with gable roofs. The lodge is a 2-1/2 story picturesque dwelling, like the Brown Mountain gate lodge, of French Romanesque inspiration. It has a steeply pitched roof, an exterior end chimney, casement windows, and three hipped roof dormer windows on its main elevation. The first floor of the lodge is granite, and the second is half timbered with brick infill. The second floor overhangs slightly and is

[449]Beatrix Farrand to John D. Rockefeller, Jr., May 22, 1929.

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decorated with plain stone brackets. The carriage house, also constructed of granite, has a steep hipped roof with a gable dormer. The dormer is decorated with turned wooden spindle bars. A small cupola, also with turned wooden spindles, tops the passageway between the two buildings.

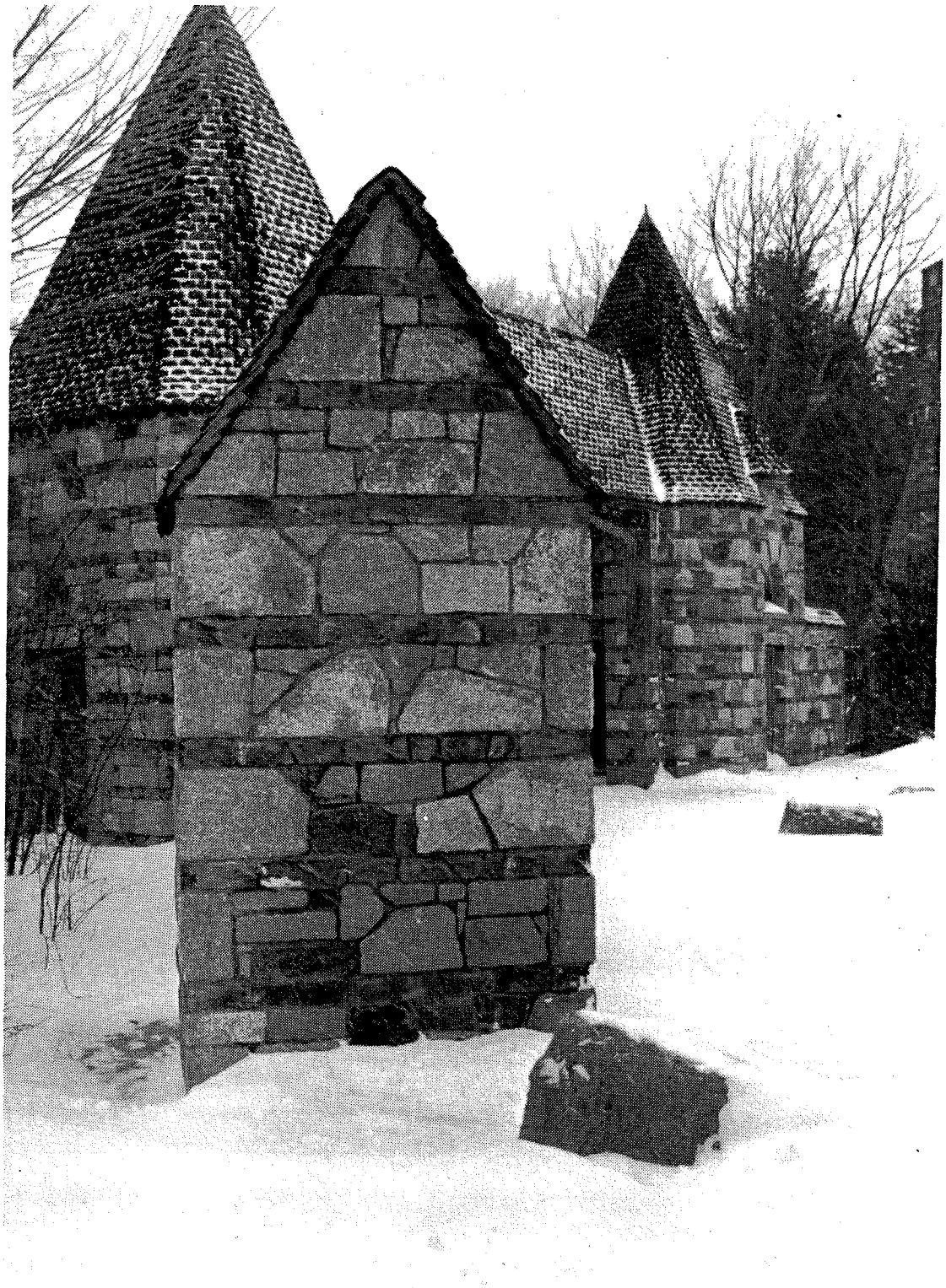


Figure CVI. Stonework on Gate Post at
Brown Mountain Gate Lodge

415 416

RESTORATION

A plan for the restoration of any section of the carriage roads should begin with a detailed analysis of the existing conditions. Where they exist, the original construction documents should be consulted. Field control points should be located to establish vertical and horizontal control relative to the original datum points. These points were set by Rockefeller's engineering crews at the time of the original construction, and are still extant. They should be used as the basis for an existing conditions survey of the section identified for restoration. The section should be surveyed and base maps prepared showing existing elevations at the same locations as those shown on the original drawings. From this information comparative plan and profile sheets could be prepared. These base sheets would also be useful in recording problems and failures in the road structure, drainage system, retaining and breast walls or coping stones. These sheets could also be used to plot the location and limits of vista clearing and roadside cleaning. In addition, the work area should be thoroughly documented with photographs, recording the existing conditions for an historic record prior to any reconstruction work.

Once the base maps have been prepared and the problem areas identified, restoration design documents can be prepared to fully describe the work. These should include plan and profile sheets, typical cross-sections, estimates of quantities of materials, and specifications. These plans should be as complete and as carefully prepared as the original plans. The original design should guide the restoration work, although modern equipment and specification nomenclature (e.g. Maine Highway Department, AASHTO,[450] FHWA[451] and ASTM[452]) should be employed in the preparation of construction documents. Plans for the restoration of Beatrix Farrand's planting designs may also be prepared with this base information in hand. While each of these plans will specifically indicate the necessary reconstruction, some of the issues that will be encountered will include the following:

Drainage

The proper functioning of the drainage system is absolutely essential to the long-term preservation of the carriage roads. The fact that the roads have are still in relatively good condition is a testament to the original design and construction of the

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[450]American Association of State Highway and Transportation Officials.

[451]Federal Highway Administration.

[452]American Society for Testing and Materials.

drainage system. However, the drainage system has begun to fail in many places. There is a need for reconstruction of many portions of the drainage system, and a critical need for a higher level of maintenance, which will be discussed in the following section. An example of how maintenance and reconstruction is linked is that of concentrated runoff being diverted to the road surface. As vegetation has grown up in the ditch-lines and culverts have silted in, runoff has been diverted across the road surface in many places, with very damaging results. Figures CVII and CVIII illustrate the results of unchecked woody vegetation which has caught leaves and other debris, forming a dam in the ditch-line, and diverting runoff into the roadway, which then washed out the road surface and middle course of stone to the foundation stones. Inadequate drainage maintenance, in this case, has caused a condition which will require reconstruction of both the drainage gutters and the road itself. Proper restoration and maintenance of the drainage system will prevent this kind of destruction of the carriage roads.

Ditches or Gutters

Runoff should be determined by hydrologic calculations. Reconstruction plans would then indicate any areas in which the existing ditch section is inadequate to carry runoff from a 10 year (10%) storm. Either the ditch section or the spacing of culverts would be adjusted to assure adequate drainage. The original trapezoidal ditch shape may be efficiently reconstructed by bolting a wing attachment of the correct shape to the blade of a motor grader. Where stone-lined gutters exist, these must be repaired by hand. Where the ditch-lines have shown erosion, stone lining should be included in the restoration work. Because of the high quality of the original design and construction, the great majority of the work will be in restoring the drainage system to its original condition, rather than in adding new structures.

Stone Culverts

The original culverts were either stone (preferred) or iron pipe, where clearance was insufficient for stone. The stone culverts were very well built and are in generally good condition (Figure CIX). Some reconstruction and repair work, however, will be required, particularly at the head walls of the stone culverts. This work should be undertaken only by a mason qualified in restoration of historic stone structures, after careful analysis of the particular structure. Unlike the roads and bridges, there are no design drawings for the stone culverts. These were designed "on the ground" by the engineer. Similarly, culvert headwall reconstruction plans can most efficiently be produced by notations on photographic, diazo reproducible images, rather than with

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Figure CVII.

Leaves caught on woody vegetation forms a dam, diverting water over road surface and resulting in erosion.



Figure CVIII. Ditch and culvert failure causes erosion.



Figure CIX. Stone Culvert

measured drawings. Any replacement stones must be carefully selected to match the existing stone in color and character. Mortar must be designed to match the existing, with consideration being given to its appearance after weathering for several years.

Metal Culverts

Many of the metal culverts have rusted out and failed (Figure CX). Some of these have been replaced with corrugated metal pipe. In several locations, this pipe protrudes out of the ground with no flared end-section or end-wall as originally specified. When metal pipes are replaced, consideration should be given to replacing them with concrete pipe. Concrete pipe will not rust, it is smooth, like the original metal pipe, and the ends should in any case be obscured by inlet basins, head walls, or in some cases, where a headwall would be out of view from the carriage road or any adjacent trail, by flared end sections. This pipe should be a minimum of 12 inches in diameter (or larger as determined by hydrologic calculations for a 10 year storm), properly bedded in gravel, and laid true to grade with a laser-level. Any section of the road which requires major repair, such as the replacement of foundation stones, should have all of the metal pipes replaced while this work is underway to prevent future disturbance of the road bed.

In the great majority of cases, the pipe locations should replicate those of the existing pipe. Changes should only be made where it is clearly necessary--for instance, where erosion is occurring at the outlet of the pipe, or water is standing in the ditch-line. These conditions are quite rare, because the original drainage system was so well designed and constructed. Great care must be exercised in the design of reconstructed drainage system elements to assure their consistency with the original design and construction techniques.

Roadway Restoration

The amount of reconstruction of the roadway itself will vary widely throughout the carriage road system. Some sections of the road are in almost as good condition as when they were built (e.g., section on the west side of Jordan Pond over the rock slide). Some of them are so deteriorated that they are in need of major reconstruction (e.g. some sections of the Jordan-Sargent Mountain Road, above Chasm Brook bridge). One of the most important considerations in the restoration of the carriage roads is in working toward the proper cross-section of the road.



Figure CX. Culvert Rusted and Silted In

Crown and Superelevation

Maintenance was clearly a concern in the original design of the carriage roads. In relation to the crown of the road, Baker wrote, "With a broken-stone road, the method of making repairs has more weight in determining the amount of the crown than in the case of either an earth road or a gravel road."[453] A road which is built with relatively low crown (e.g., 1/2 inch per foot) requires "the system of continuous repairs" whereas a steeper crown (e.g., 1 inch per foot) may be maintained "periodically".[454]

As established in the previous chapter, these carriage roads were constructed with an ample crown of 6 to 8 inches, for the sixteen-foot roads--a slope of 1/2 inch in 1 foot to 1 inch in 1 foot. This crown has been substantially lost on much of the carriage road mileage. In most cases, this is probably the result of stone in the middle of the road having gravitated toward the edges of the road, thereby reducing the crown. If the proper crown remains on the foundation layer of stones, as designed, the road may be regraded to restore the crown.

In some instances the road is superelevated, or "banked", at the curves. Where the plans or existing conditions indicate that this was the original configuration, the road should be superelevated instead of crowned.

In restoring the crown or superelevation of the roads, reference should be made to the vertical profiles and cross-sections prepared by the engineers of the road. Park Service files contain plan and profile drawings of much of the carriage road system. Bench marks, for vertical control, are still extant adjacent to the roads in many locations. By following the gradients and vertical curves of the original road, the long, smooth transitions in grade may be preserved or restored as the work progresses.

Foundation Stones (Lower Course of Macadam)

In some locations, the foundation stones themselves must be replaced. When this is the case, after the centerline has been established and recorded with off-set stakes, the stones should be removed to the sub-grade, the sub-grade regraded to the required crown (1 inch per foot), the sub-grade rolled with a vibratory roller to 100% compaction (Standard Proctor), and new foundation stones installed. The compacted sub-grade should be set at 12 inches lower than the finished elevation. The foundation

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[453]Baker, 203.

[454]Ibid.

stones will compress to approximately 70% of their loose depth.[455] That is, 10 inches of foundation stones will measure 7 inches after rolling. Additional foundation stones may be obtained, when required, from what is known locally as "blown ledge". This is broken, blasted ledge rock, quite similar to that used in the original construction, and locally available. From this material, stones which are larger than 6 inches in any dimension, or larger than 4 inches in smallest dimension, should be discarded or broken. These stones should be spread on the sub-grade to a depth of 10 inches and rolled with a vibratory roller. It is important that both the sub-grade and the foundation stones conform with the crown, or camber, of the final road cross-section.

Middle Layer (Upper Course of Macadam)

Upon the foundation stones, and filling the interstices between them, should be spread 4 inches of smaller stones. This stone would meet ASTM grading C (100% passing a 2" sieve and a maximum of 5% passing a 1/2" sieve). Then, the stones should be shaped to proper crown or superelevation, and rolled again to 100% compaction. The 4 inches of stone will roll to approximately 3 inches. Care should be taken to conform to the lines and grades established in the restoration plans (based upon the original construction drawings, where available). The middle layer of stone can be most effectively installed with a tailgate paver such as the Layton Track Paver (Appendix XX). The park currently has such a paver. When completed, the foundation and middle layers should equal 10 inches in depth, after compaction.

Surface and Binder Course

On most of the carriage roads, the surface and binder layers should be reconstructed . The original hard, smooth layer of the road's surface has been almost completely lost. The original clay binder would have had to have been periodically replaced to maintain the cementing necessary to maintain this surface. This, of course, has not been done. The cohesion has been lost and the surface has become one of loose gravel. Sources from the early part of the century suggest that resurfacing of broken-stone roads should begin with mechanical scarification of the existing surface.[456] This is generally not necessary in the case of the carriage roads because the surface in most areas has so deteriorated that there is no top crust to break up.

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[455]Albert I. Frye, *Civil Engineers' Pocket-Book* (New York: D. Van Nostrand Company, 1913), 1099.

[456]Baker, 255.

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Because of the temporary nature and high maintenance required to preserve the road's surface with the original surface mixture, we recommend testing variations which will restore the original appearance and utility, but will require less upkeep.

This surface layer could be constructed of granite or trap rock "crusher dust" mixed with a binder of soil cement or cementitious limestone screenings. The composition of the crusher dust, by weight, would be as follows:

100% to *pass* a ½" screen
25% to be *retained* on a 1/8" screen
12% to *pass* a #200 sieve

(This is effectively equivalent to 3/8" crusher dust as supplied by Harold MacQuinn, Inc., Ellsworth, Maine [Appendix XXI]).

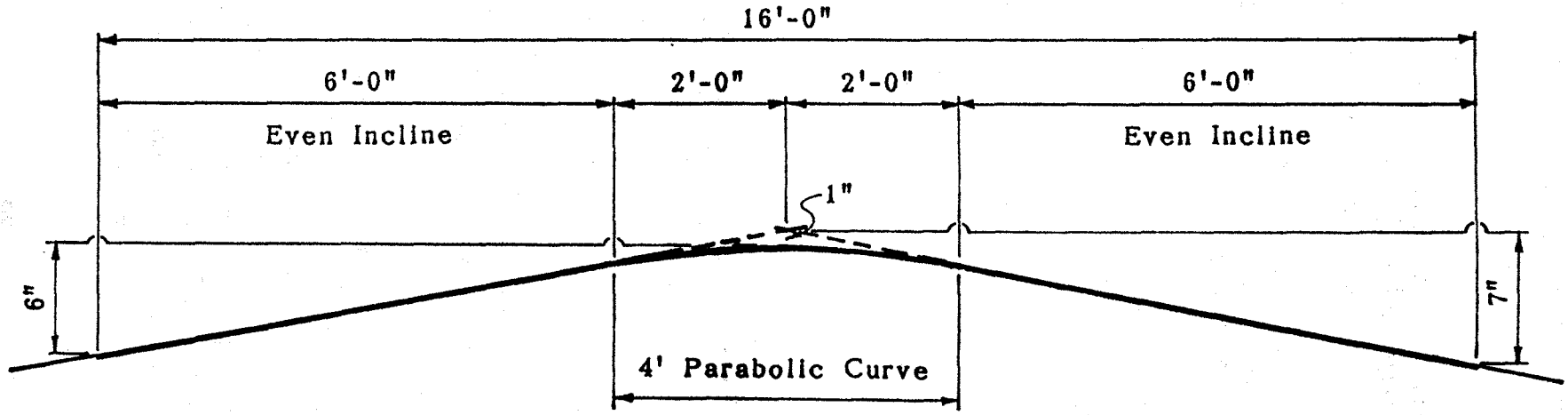
The composition of the soil cement would be:

4 parts clay
1 part Portland cement

The crusher dust is to be thoroughly mixed with the soil cement at a ratio of 10 parts crusher dust to 1 part soil cement. If limestone screenings are substituted for the soil cement, common agricultural grade limestone may be used at the same 10 to 1 ratio as the soil cement.

This surface mixture, like the middle course of stone, should be applied with a paving machine such as the Layton Track Paver. Great care must be taken in the transport and application of the material to avoid segregation of the various sizes of aggregate. The spreader box should be kept at least one-half full at all times to prevent segregation of the materials.

After application, the material is to be wetted with a mixture of water and a dust retardant, and rolled to 100% compaction with a vibratory roller. The original road crown profile was a parabolic curve; however, this shape is very difficult to construct and maintain with modern construction equipment. It is suggested, therefore, to build the reconstructed sections with two simple inclined sections joined by a 4 foot rounded section in the middle (Figure CXI). While the original crown was 8 inches, later drawings of the road cross-sections, current use and experience suggest that a 6 inch crown would be sufficient for drainage and more suitable for bicyclists and walkers.



PROPOSED RECONSTRUCTED CROWN SECTION

Scale: N.T.S.

Figure CXI.

An alternate additive to the crusher dust surface course would be the application of asphalt emulsion (CSS-1) to the surface mixture at a rate of 2-1/2%, by weight. This mixture has been used successfully on modern macadam roads in Linn County, Iowa. This would ideally be mixed in an asphalt plant, where the emulsion can be thoroughly mixed with the dried stone in a "pug mill" mixer. The operation could most economically be performed at the beginning or ending of the asphalt plant season. This emulsion, unlike hot plant-mix bituminous concrete, does not rely on heat to liquify the cementing agent. For this reason the plant may be employed for this work when it is not in use for bituminous concrete production. The material may then be stock-piled at the Park (e.g., Liscomb's Pit) until the next construction season. This low percentage asphalt emulsion does not alter the appearance of the stone surface course, but it will greatly increase its durability, and reduce dust and maintenance. The application method would be the same as for the soil cement or limestone binder alternative. This alternative was used as early as 1927, when Hubbard and Kimball wrote:

> There are at present various methods of construction of broken stone and even gravel roads and paths with some tar of bituminous cement, which give a surface not widely different in appearance for that of ordinary gravel or macadam, but which bind the particles so firmly together that the surface will stand at a steep slope without being washed out by rain. . . .[457]

A fourth alternative would be to install the surface course of stone with no additional binder. If properly installed, and periodically maintained, this surface should give perfectly satisfactory results. While slightly cheaper in initial installation, added maintenance cost and continued dust nuisance should also be considered as a part of the long-term cost of this surface.

With any of the four compositions it is important to assure that the surface course (after rolling) is kept to approximately 2 inches in depth (± ½"). Too great a depth of surface course will make the road retain moisture, and will lead to accelerated deterioration of the road.

[457]Hubbard and Kimball, 228.

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Depth of Layers

Layer:	Loose Depth:	Compacted Depth:
Foundation Stones	10"	7"
Middle Layer	4"	3"
Surface Layer	2½"	2"
Total		12"

Rolling

As noted above, each of the three courses of the broken-stone road must be sprinkled and rolled. The rolling should begin at the shoulders, roll longitudinally, and work toward the center.[458] Rolling in this way prevents pushing the crown out of line or flattening it. Careful rolling is essential to obtain a good shape to the road surface. It is also important to assure that water which falls on the road will drain off the road surface rather than through it, which will saturate the sub-grade and accelerate the deterioration of the road.

After compaction and solidification using any of the compositions outlined above, the road surface will replicate the original road surface. It will be hard, smooth, and water-tight, as a proper broken-stone road should be. Bicycles and horse-drawn vehicles have been segregated on the carriage roads, due to the difficulty of bicycle riding over the roads dedicated to horse traffic. If the roads are properly restored and maintained, this will not be a problem. The hard, smooth surface obtained will be perfectly suitable for bicycles, horses and carriages.

Coping Stones

A distinguishing feature of the roads built by John D. Rockefeller, Jr., is the use of coping stones along the edges of the road on steep fill sections or at the top of retaining walls. Most of these large stones have remained where they were placed; however, a significant number have become dislodged and have shifted from their original locations. Some of these have tumbled down the slopes they were intended to mark. (Figure CXII). These stones were set by drilling indentations on each side of

[458]Mansfield Merriman, Editor-in-Chief, *American Civil Engineers' Pocket Book* (New York: John Wiley & Sons, 1916), 1366.



Figure CXII. Displaced Coping Stones

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the stones. Into these indentations the teeth of stone tongs, or "dogs" were set, and the stones lifted into place with a derrick (Figure CXIII). The carved depressions can still be seen on the stones. The Park still has some of the old tongs in its possession. With these tongs and a small truck-mounted crane, a knowledgeable crew could re-set the displaced stones. A 15 cubic-foot coping stone could be expected to weigh approximately 2500 pounds.[459]

In areas in which the roadway is to undergo restoration, the coping stones should be numbered and removed from the roadway, and reset after the road surface has been replaced, in their original positions. Attention must be paid, during both restoration and maintenance, to assuring positive drainage through the coping stones. The development of a ridge in front of the coping stones, diverting drainage over the road surface, has had damaging results in many places on the carriage roads.

Vista Clearing

Since vista clearing has been deferred for many years on the carriage roads, the scale of the undertaking to recapture this essential element of the roads has become one more in keeping with restoration than of maintenance. While some of the important views were documented in the Vista Study (Figure XXII, page 62), it is important to state that these views represent only a charting of important views described in written documents. The carriage roads were designed to take advantage of *hundreds* of sweeping and dramatic views of the lakes, mountains, bay and ocean.

The carriage roads were carefully designed to follow the shoulders of the mountains, affording views of the surrounding scenery, but avoiding the crests of the mountains, where they would become a *part* of the views. Today, however, most of these views have grown in. The fact that one is generally enveloped in a tunnel of vegetation when on the carriage roads does not increase their appeal as a destination for Park visitors. An aggressive and effective vista clearing program is an essential element in any effort to increase visitor use of these roads.

The location, limits, and techniques for vista restoration must be as carefully considered as the other elements of the carriage road restoration. It is essential to reopen, as soon as possible, the documented vistas as well as the views from many of the bridges (Figure CXIV). The clearing from the bridges would serve two functions: to open views from the bridges and to allow better views of the bridges themselves. On

[459]National Bureau of Standards Reports.



Figure CXIII. Moving Rocks with "Dogs"

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Figure CXIV. Obscured View

"Views of the sea and mountains cut some years ago are gradually being obliterated by new growth. These views . . . should be reopened." John D. Rockefeller, Jr.

many of the bridges, turnouts designed to afford prospects of the bridges have in many cases been completely obscured by trees.

This is not to say that all of the trees in a certain viewshed should be cut. Great care was taken to save handsome trees in the original construction of the carriage roads, bridges and gate lodges. The relative importance of vegetation and views must be balanced within the context of an overall design for a sequence of views of varying character. Vista clearing designs should be developed and used as a guide for establishment and maintenance of important views over the years. Such plans have been used effectively for many years in the management of parkways like the Blue Ridge Parkway. All vista plans and on-site decisions should be made with the assistance of Park landscape architects.

The maintenance of the vistas on the carriage roads may be aided by the selective removal of plants, favoring sun-loving shrubs. Once established, these plants will shade the ground and retard the development of non-tolerant pioneer tree species, while remaining low enough to permit views over them.

Landscape architect Charles W. Eliot, II, author sixty years earlier of *The Future of Mount Desert Island* emphasized in 1988 the importance of keeping the vistas open:

> The tree growth--with no forest fires since 1949--is changing the island and Park from Champlain's "Isle de Monts Deserts"--the hills kept *bare* by the forest fires set by the Indians to foster the berry crops--to the "Island of Wooded Hills." Since we certainly do not want and must prevent and fight *any* forest fire, we will have to cut the trees blocking those views.[460]

Bridge Restoration

As is detailed in the Maintenance chapter, a thorough analysis of the efflorescence and staining on the bridges should be made to ascertain the likelihood of internal structural deterioration in the bridges. A complete program of stabilization and restoration should be undertaken after that analysis is made.

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[460]Charles W. Eliot, II, letter to the author, November 27, 1988.

Planting Restoration

One significant attribute of the carriage roads which was substantially lost in the 1947 fire was the planting done on the recommendation of Beatrix Farrand. She was a well-known and respected landscape architect and longtime resident of Mount Desert Island. It was her advice Rockefeller sought when planting design was needed to knit the new roads back into the landscape. She, like Rockefeller, was meticulous in her attention to detail. Their correspondence (with her accompanying notes) documents a carefully planned, extensive planting design which framed important views, provided a setting for the gate lodges and bridges, and enhanced the experience of travelling along the roads. Since sufficient information is available to recreate this planting, its restoration is recommended for two reasons: First, the planting was the final step in Rockefeller's plan for the development of the carriage road system, and its implementation was the crowning touch. Second, Beatrix Farrand's work continues to play an important role in the history and development of landscape architecture as a profession. Her work at Acadia is the only example of her talent as it was applied in a national park setting. If this restoration is undertaken, it is suggested that first priority be given to the bridge planting plans.

Supplementary Construction

While the great majority of the construction work needed on the carriage road system is in restoration of the original road system, the current use of the roads would suggest some associated projects. One is consideration of a redesigned access from the Wildwood Stable to the carriage road. The makeshift connection which now exists makes for a very difficult turn to get to the stables, and generally lacks the quality of the carriage road system. Another example is the parking area off of the Brown Mountain Road north of the Brown Mountain Gate Lodge. There is no sign indicating an entrance to the carriage roads at this point, and the connection itself is very rough and narrow. This is a convenient access point to one of the more spectacular sections of the carriage roads--that along the northwest flank of Sargent's and Little Brown's Mountains. More direct and commodious connections to the carriage roads should be made from two Park buildings which have been constructed since the carriage roads were completed: the Park Visitor Center, and Park Headquarters.

When the Park Loop Road was realigned at the north end of Bubble Pond in the 1940s, the alignment was moved away from the carriage road overpass (Bubble Pond Bridge). This bridge is now a relic with no function (Figure CXV). The carriage road now crosses the Park Loop Road on grade at one of the tightest curves on the road. This presents a dangerous conflict between automobile traffic and the bicycle,



Figure CXV. Bubble Pond Bridge

equestrian, and pedestrian users of the carriage roads, which will become increasingly hazardous as use of the carriage roads increases. Plans should be considered to construct a new carriage road bridge, consistent in style and materials with the other carriage road bridges, over the realigned Park Loop Road.

A more ambitious project, but one which would be of great value in making the carriage roads more accessible to more visitors, would be completion of the leg of the carriage roads planned by Rockefeller to connect Bar Harbor to Eagle Lake. Two alignments were established (Figure XC, p. 244) by Walter Kidde, Constructors, under the direction of Rockefeller and with the assistance of Frederick Law Olmsted, Jr. The design drawings still exist and both lines are completely within Park boundaries. Construction of one of these roads (or a 12-foot wide version) would greatly aid the visitor in gaining access, by foot, bicycle, or cross-country skis, onto the carriage road system. Further, it would fulfill the dream of Rockefeller to connect the villages of Bar Harbor, Seal Harbor, and Northeast Harbor with a beautiful system of motor-free sylvan roads. While priority must be given to conservation and restoration of the existing carriage roads, as visitation in the Park continues to increase, the completion of this final link in the system would provide a much needed access point from Bar Harbor.

Cost

The cost for restoration of the carriage roads will vary greatly based on location and condition of the given section. Estimates have been prepared for a "typical" section which would require repair (not complete replacement) of the foundation stones, regrading and addition to the middle layer, and replacement of the surface layer. Also included is repair of stone ditch-lines, culverts, breast walls and retaining walls, and re-setting coping stones. Costs for research, design, field engineering and construction inspection have also been included (See Appendix XXII).

These figures should be used for general preliminary planning only. Specific cost estimates should be prepared as plans are developed for each project and actual quantities can be calculated. Projections for cost were based on general hourly rates by private contractors. Savings could be anticipated if the work is accomplished by Park personnel.

It is highly recommended that a demonstration project be identified for restoration. The project should be selected on the basis of need and the range and extent of reconstruction necessary. It would be most useful to test different restoration methods on different sections (e.g., surface course with stone dust binder in one area and soil

cement binder in another) and to monitor carefully the time and expense on each section. This will give Park administrators a more firm basis on which to base the complete restoration of the carriage road system.

Work Force

With all public work, it is necessary to determine the quantity of work to be performed by private contractors and that to be performed by in-house work force. In the case of most road construction or reconstruction, this work would typically be undertaken by private contractors, with the subsequent maintenance undertaken by public maintenance crews. In the case of the carriage roads, however, there are compelling arguments that the restoration work be undertaken by Park personnel.

Broken-stone roads of this type have not been widely built by private road contractors for more than a half a century. It is now a specialized type of historic restoration, requiring a specially trained group of craftsmen. This does not answer well to the competitive bidding requirements of government contracting.

While the use of modern construction equipment will aid a great deal in the restoration of the carriage roads, the scale and construction methods necessary for this restoration work do not lend themselves to the kind of large-scale road construction equipment typically employed on road construction work today. A front-end loader, small dump truck, motor-grader, back-hoe, derrick truck, water truck, tail-gate track paver, vibratory roller and hand tools are the only construction equipment necessary for this restoration work. The Park currently owns most of the necessary equipment.

The Park maintenance staff includes personnel who are knowledgeable, skilled, and committed to the proper restoration and maintenance of the carriage roads. While current funding limitations make it impossible for this staff to appreciably slow the deterioration of the roads, much less restore them, it is a group from which the core of a restoration team should be formed. Because the Park maintenance staff cannot lose personnel and continue to perform its other work, this approach to the restoration of the carriage roads would mean adding maintenance staff equal to the number assigned to the carriage road restoration crew.

MAINTENANCE

Present Condition

As discussed in the previous chapter, the present condition of the carriage roads is in many ways very different from their original and intended state. The binder has eroded away, the crown has been lost, vegetation is growing in the ditch-lines, and in some cases the drainage system has failed to the point where water now runs down the surface of the road, exposing the foundation stones. Coping stones have been lost. Vistas have grown over. Much of the carriage road system is in need of reconstruction more than it is of repair. Once the carriage roads have been restored, it is essential that an adequate level of maintenance be undertaken to preserve them in an attractive and serviceable condition. In the areas where restoration cannot be undertaken at once, it is even more imperative that the roads be maintained to prevent further deterioration. An adequate maintenance program will include attention to the following concerns:

Ditches

One of the most pressing, and fortunately easiest to accomplish, tasks is that of cleaning and shaping the ditch-lines. The ditches (or "gutters", as they were described in the specifications) should be kept clean and free of woody vegetation. Cleaning and shaping the ditch-lines with a motor grader where woody vegetation is becoming established would be the most cost-effective method. Once properly shaped, hand pruning of the woody vegetation in the ditches would be sufficient for several years, allowing the grass and mosses to grow. Removal of woody vegetation in stone-lined ditches must be accomplished by hand. In this case, the vegetation should be cut close to the ground, rather than pulled, to avoid damage to the stone work. The use of safe, and Park Service approved herbicides could assist greatly in controlling woody vegetation which sprouts from the roots after being cut (e.g., maples).

Care should be taken to conform to the original profile of the ditch-line. Many of the ditches were designed as a trapezoidal section, with a one-foot flat section on the bottom of the ditch (Figure CXVI). Because the hydrologic characteristics of a trapezoidal ditch are different from those of a "V" ditch (i.e., the water runs slower and causes less erosion in a trapezoidal ditch), this type of ditch should be restored and retained. A custom blade can be fitted on a motor grader which will form the typical trapezoidal ditch, as originally designed. After reshaping, the ditch-lines should be seeded with grass (shade tolerant varieties, where necessary).

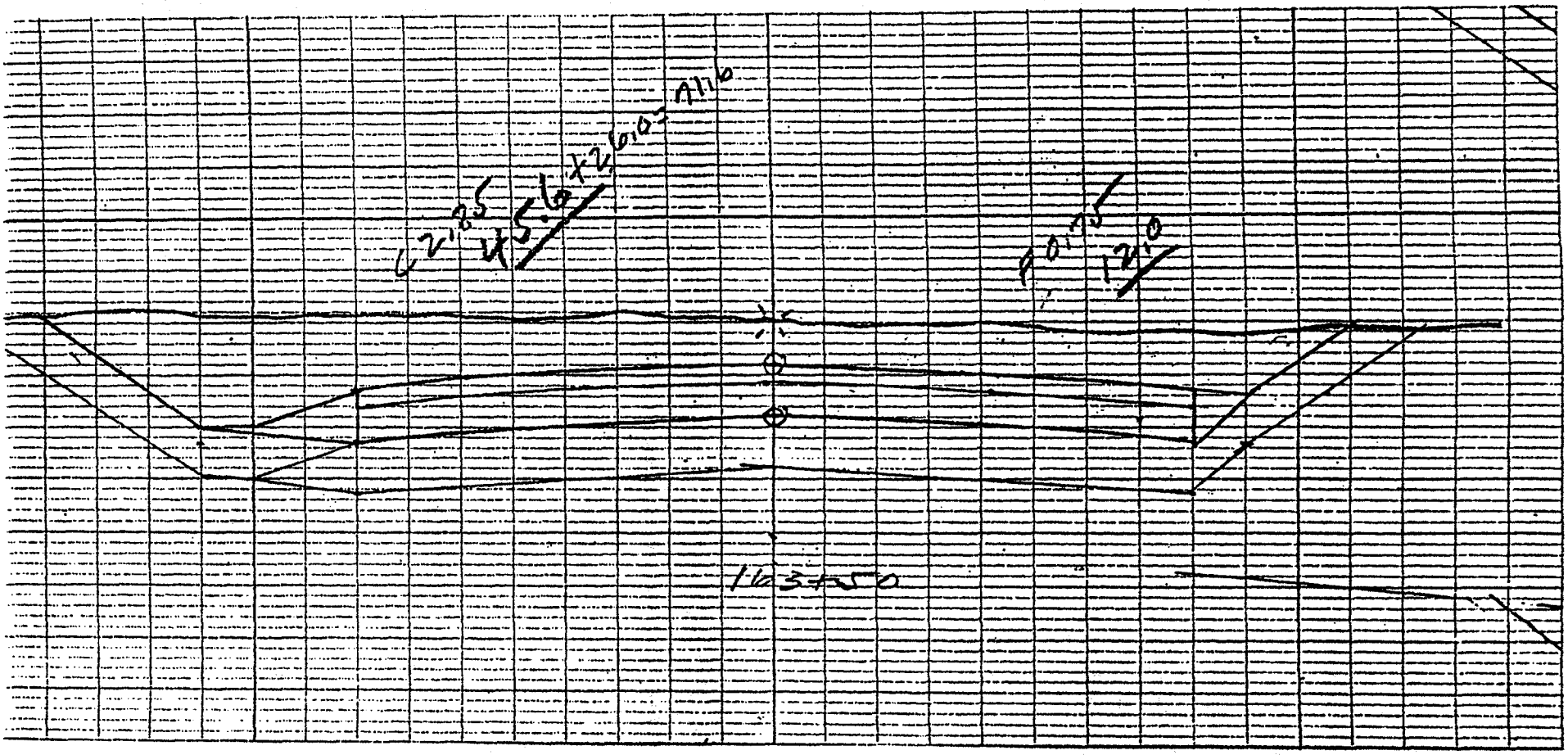


Figure CXVI. Aunt Betty's Pond Road

Section showing crown and ditch profiles. Drawn by Paul D. Simpson, 1930.

Culverts and Catch Basins

Both stone and metal culverts should be kept free of silt and accumulated vegetation, as should the catch basins at the inlet of culverts. This routine maintenance should be scheduled to occur twice per year--ideally once during the spring or early summer, and once during the autumn, after the majority of leaves have fallen from the deciduous trees.

While the manual labor of cleaning culverts and catch basins can be accomplished by seasonal labor forces, each crew should contain one maintenance employee knowledgeable about the drainage system, including the proper procedures for outlet protection, ditch lining, and stone culvert construction, so that the entire drainage system can be inspected during the routine maintenance.

The original culverts were either stone or iron pipe, The stone culverts were very well built and are in generally good condition. Some repair work, however, will be required, particularly at the head walls of the stone culverts. This work should be undertaken as part of restoration, rather than maintenance, work.

As previously reported, many of the metal culverts have rusted out. Some of these have been replaced with corrugated metal pipe. In several locations, this pipe protrudes out of the ground with no flared end-section or end-wall as specified. These pipes should be replaced as a part of the restoration work. When this work must be done in advance of the restoration work, consideration should be given to replacing the deteriorated metal pipes with concrete pipe. The concrete pipe is smooth, like the original metal pipe, and the ends should in any case be obscured by inlet basins, head walls, or in some cases, by flared end sections. This pipe should be a minimum of 12 inches in diameter (or larger as determined by hydrologic calculations for a 10 year storm), properly bedded in gravel, and laid true to grade with a laser-level.

During routine maintenance all metal pipes should be checked at the outlet end to see if drainage is following a path under, rather than through, the pipe. This indicates pipe failure, and the pipe should be replaced. Any section of the road which requires major repair, such as the replacement of foundation stones, should have all of the pipes replaced while this work is underway to prevent future disturbance of the road bed.

Stone catch basins were originally placed at the inlet of most of the culverts. These functioned by collecting debris and natural litter. Most of these catch basins,

which were originally typically 18 inches deep, have largely silted in. These should be cleaned out at least once per year to guard against future siltation of the pipes.

Crown and Superelevation

Maintenance was clearly a concern in the original design of the carriage roads. In relation to the crown of the road, Baker wrote, "With a broken-stone road, the method of making repairs has more weight in determining the amount of the crown than in the case of either an earth road or a gravel road."[461] A road which is built with relatively low crown (e.g., 1/2 inch per foot) requires "the system of continuous repairs" whereas a steeper crown (e.g., 1 inch per foot) may be maintained "periodically".[462]

As established in the previous sections, these carriage roads were constructed with a crown of 6 to 8 inches, for the sixteen-foot roads--a slope of 3/4 inch in 1 foot to 1 inch in 1 foot. After restoration of the proper foundation, and middle and surface layers of the road, this crown (or superelevation for the banked curves) may be maintained by annual grading of the surface layer, pulling the material which has migrated to the edges back to the center, smoothing, sprinkling, and rolling. As is the case with new construction or restoration, the rolling should begin at the edges of the road and work to the middle. The road should always be sprinkled with water, or a mixture of water and dust retardant, prior to rolling, with a 3-5 ton vibratory roller. If the proper crown remains on the foundation layer of stones, as designed, the road may be regraded to restore the crown.

In sections where the middle layer of stone has migrated to the surface, presenting a rough surface which becomes loose or "ravels", this may be alleviated by the application of a thin layer of surface material (as specified in the Restoration section) filling all depressions, sprinkling, and thoroughly rolling with a vibratory roller. The best time to accomplish this work is in the early spring, with no frost in the ground.

Routine maintenance will be required after the new surface has been repaired. Horse dung, vegetation, and loose dust must be removed from the road surface periodically. If allowed to stand on the road, they will eventually soften the road

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[461]Baker, 203.

[462]Ibid.

surface and cause deterioration of the road.[463] Horse manure should be scraped to the edge of the road and removed from there periodically.

While literature of the period recommended removal of all vegetation from the surfaces of broken-stone roads, Rockefeller modified this approach somewhat. He wrote to Clement in 1919:

> I am wondering whether you are having the small seedling trees and berry vines and bushes pulled out of the traveled surfaces of all of my roads, as you and I agreed. You will recall we decided that wild flowers and things of that sort might be left, but that the seedling trees and berry vines should be pulled up.[464]

Coping Stones

A distinguishing feature of the roads built by Rockefeller is the use of coping stones along the edges of the road on steep fill sections or at the top of retaining walls. Most of these large stones have remained where they were placed; however, a significant number have become dislodged from their original locations. Some of these have tumbled down the slopes they were intended to mark. In areas where the restoration work will be minor, or where it must be deferred for several years, these stones should be replaced. Using the method described in the Restoration section, employing the old stone "dogs" in conjunction with a modern small truck-mounted crane, a knowledgeable crew could replace the displaced coping stones, redressing one of the most obvious signs of disrepair on the carriage roads.

Dust Control

Broken-stone roads, particularly if they suffer from a lack of proper maintenance, are by nature dusty. This is no more than a nuisance for a single carriage travelling along the roads, because most of the dust is left in its wake. It is a more serious problem, however, when carriages and/or buckboards are run in groups. The increased level of dust creates an annoyance and a health hazard for both people and horses. While getting dusty is certainly part of the experience of being on the carriage roads, an excessive amount can also limit the enjoyment of visitors who choose to take a buckboard ride while at the Park.

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[463]Baker, 251.

[464]John D. Rockefeller, Jr., to A. E. Clement, October 28, 1919.

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The traditional method of dealing with this problem was by sprinkling the roads with water (Figure CXVII). The first official act of the Seal Harbor Village Improvement Society, on July 16, 1900, was the purchase of a six hundred gallon Studebaker sprinkler.[465] In 1917, the year the Cobblestone Bridge was built, the Seal Harbor Village Improvement Society spent almost $1400 on road sprinkling, three times as much as for the next highest expenditure, path construction and maintenance.

While park drives and city streets were commonly sprinkled, cost prevented the wide use of sprinkling on rural roads. It was estimated in 1913 that it would cost $75.00 per mile annually to sprinkle rural roads.[466] This is the equivalent to nearly $900.00 per mile annually in 1988 dollars.

Using proper materials for the surface of the carriage roads and correct grading and compacting of the surface will help control the dust, as will limiting the use of vehicles with rubber tires. The destruction of broken-stone roads by rubber tires was well known to Rockefeller. A letter from Paul Simpson to Rockefeller stated that " . . [r]apidly moving light vehicles are very destructive to untreated surfaces on account of the suction of the rubber tires, which draws out the binding material and causes the surface to disintegrate."[467]

In areas where the roads will be used heavily, the use of a dust palliative or retardant could be considered. Retardants such as calcium and sodium chloride should *not* be used--they are soil mobile salts which absorb moisture, and are harmful to both plants and stone bridges. There are also some fears that they contaminate both surface and groundwater and their use has been greatly curtailed.

Some dust retardants, though, are environmentally safe if they are designed to be non-leaching. After dilution with either fresh or salt water, they are non-toxic upon application (Appendix XXIII). Such retardants work by binding together the fine particles of the road surface to prevent them from saltating, or from being put in motion by the action of the wind relatively close to the ground surface. It is saltation and mechanical disturbances such as traffic which suspend the soil particles or, in other words, make a road dusty. The balance of fine and coarse particles provides the

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[465]Dunham, 2.

[466]Baker, 250.

[467]Paul D. Simpson to John D. Rockefeller, Jr., June 11, 1927, personal collection, Mr. and Mrs. Charles P. Simpson.



Figure CXVII. Water Wagon

cohesiveness necessary to resist saltation and the effects of wheels. Generally, two applications of a dust retardant will compact road surfaces so that traffic can move at normal speeds without stirring up dust.

Application rates and procedures vary from site to site. For example, steep grades or tight curves would require several light applications. Once the area to be treated is studied to determine the correct rate and procedure, equipment needs are assessed. Generally, a water truck, with minor modifications, can be used to apply the retardant. Additional equipment will be necessary to prepare the surface before the application of the retardant and to compact it afterwards. The top 2 inches of the road need to be in a loose, moist condition. The loosening is usually accomplished by blade-grading and shaping the road; a water wagon could supply the moisture necessary to hold the dust retardant and encourage compaction. The use of a vibratory roller would then be employed to compact the surface.

Under normal circumstances, manufacturers indicate that the first treatment will be effective for 6 to 10 months, and every treatment thereafter for approximately one year. If undisturbed by traffic, the initial application could last as long as three years.

Vista Maintenance

The first step in establishing a program for vista clearing and maintenance is determining the important vistas which need to be maintained and/or enhanced. As outlined in the second section of this report, the plan for the carriage roads is a good place to start. Rockefeller and both Simpsons had a keen understanding of how to align roads with the topography to take advantage of scenic views, and they applied their knowledge as the carriage roads on Mount Desert Island were laid out. Studying the topography and the alignment of the roads gives a clear indication of where vistas were planned. Many of these, as noted, are documented in the correspondence between Rockefeller and the Simpsons, and also with Farrand. The documented vistas discovered in the correspondence are shown on Figure XXII, page 62; however, it should be stressed that these are not the only planned views or important opportunities for vistas. It is significant that several of the carriage roads were designed to occupy the shoulders of the mountains so that fine views might be obtained from these heights. If dense vegetation obscures these, the intention of the original location is lost.

That periodic clearing of the vistas was an important maintenance activity to Rockefeller is confirmed in a letter to his superintendent at The Eyrie in 1954:

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> . . . [A]long the various of the horse roads, particularly up the Long Pond Valley and over along the Southern slopes of Jordan and Sargent, views of the sea and mountains cut some years ago are gradually being obliterated by new growth. These views originally cut are important additions to the enjoyment of the roads which traverse those areas and should be reopened where necessary.[468]

Once these vistas are re-established, the key to maintaining them is vigilance. An annual inspection would provide the opportunity to note encroaching vegetation and make plans for its removal before it becomes overgrown and therefore more difficult to eliminate. Removal of trees, but retention of sun-loving shrubs which do not obscure the vistas, will retard the invasion of pioneer tree species. Routinely removing underbrush and seedlings from designated vistas would thus prove efficient in the expenditure of both manpower and money. In several instances the location selected for the carriage roads has aided in vista maintenance. Some roads were designed to pass the up-hill side of large flat outcrops on which very little vegetation grows (e.g., Asticou-Jordan Pond Road on south side of Faint Hill). In these locations, very little additional vista clearing is necessary to maintain important views.

While much of the maintenance work needed on the carriage roads must be done in a relatively warm time of the year, vista clearing and maintenance can be effectively accomplished in the winter. When the leaves are off of the trees it is easier to see the opportunities for vistas. In addition, the noise of the necessary chain saws and chippers will disturb the solitude of fewer visitors at that time of the year. All brush and small limbs should be chipped and left as mulch. As with the restoration of the vistas, their maintenance should be accomplished with the assistance of Park landscape architects.

Roadside Cleaning

One of the issues of road construction which particularly interested Rockefelle was that of roadside cleaning. He considered the typical way in which roadsides were left after construction to be an eyesore. He funded a demonstration project at Yellowstone National Park in roadside cleanup which was so successful that it became the standard for National Park Service road work. Figure LVI on page 164 shows the condition of the roadsides adjacent to the Eagle Lake bridge shortly after it was constructed, showing how carefully the roadsides were groomed.

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[468]John D. Rockefeller, Jr., to Robert DeRevere, October 21, 1954.

Rockefeller wrote to Dorr in 1919 concerning the cost of construction of the carriage roads. He said, of the roadside cleaning:

> . . . I am paying . . . the very substantial cost of the extensive forestry work and clearing of dead timber, down and standing, which I always do, not only along both sides of a road but as far back as the eye can see into the woods. . . .[469]

Nearly thirty-five years later, he expressed his feeling about the margins along scenic roadways in a letter to Horace Albright, former Director of the National Park Service:

> As you know, the present trend among park men seems to be to leave nature alone. If a tree is dead, let it stand; if it blows over, let it lie--on the theory that nature should be undisturbed. While this policy is one thing if pursued in the interior of a dense forest where only the hunter goes, to pursue it in any area of a park like Acadia, . . . is to present a roadside aspect of standing and down dead timber . . . .[470]

The roadside, like the roadway itself, must be recognized, as Rockefeller suggested, to represent a cultural element in the landscape, with both artistic and natural components. While the hand of man should be employed with restraint and sensitivity to the natural setting, a roadside aspect of "standing and down dead timber" gives the visitor the impression of neglect more than of pristine nature. Dead timber should be cut and removed for a distance of at least 100 feet (or "as far back as the eye can see into the woods") from the edge of the roads. In addition to these historical and aesthetic reasons for roadside clean-up, this maintenance activity will also serve to act as an important fire-break for fires in the understory.

Work Force

Maintenance of the carriage roads is a highly specialized area of preservation. It requires a knowledge of the construction of broken-stone roads, including proper crown, depths of the layers of stone, surface compaction and appearance, drainage system design and function, as well as skill in techniques of their upkeep . One person on a motor grader who does not understand the proper cross-section of a broken stone road can do untold damage in a very short time. It is important for the work force to know the locations of the stone lined ditches and the culverts. They should also have a knowledge of the vista locations and extent. For all these reasons, there should be a

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[469]John D. Rockefeller, Jr., to George Dorr, November 19, 1919.

[470]John D. Rockefeller, Jr., to Horace M. Albright, May 8, 1953.

specially qualified crew who must demonstrate a knowledge of the unique maintenance and conservation issues regarding the carriage roads prior to assignment on them. Personnel who gain experience in the restoration of some of the roads would have an excellent background to continue with their care.

Cost

The cost of maintenance may vary widely based on the level of maintenance attained. The Park is now faced with the consequences of many years of deferred maintenance on the carriage roads, and is in a position of either restoring the carriage roads, at substantial expense, or watching this remarkable resource fall further into disrepair, at a time when its attraction could greatly help ease the crowding in the Park. Once restored, it is critical that the National Park Service make the kind of financial commitment necessary to maintain and preserve this important record of our road-building history and potentially vital recreational resource.

An "order of magnitude" estimate for a proper level maintenance on the carriage roads may be projected from the records of cost of upkeep during the early years of the carriage roads, before Rockefeller established his own construction and maintenance crews. As page two of Appendix XXII illustrates, Rockefeller spent $3,291.32 from January, 1914, to July, 1919, on "upkeep of the roads". If we presume that the cost of road maintenance rose at the same rate as road construction, and that the amount of maintenance increased directly with the amount of roadway, then this amounted to about $27,500 in 1988 dollars, or about $800 per mile, per year. At the time of Mr. Rockefeller's death a crew of 80 to 100 men were employed who ". . . felled trees and cleaned along Park roads." The would indicate a far greater cost; however, this work included more than maintenance of the carriage roads within the Park.[471]

This may be compared with estimates of average cost for yearly grading, top-dressing, rolling, ditch-line and culvert cleaning, and vista maintenance per mile of carriage road:

[471]Memorandum from Harold A. Hubler, Superintendent Acadia National Park, to Regional Director, Region Five, National Park Service, September 30, 1960, Acadia National Park Files.

Motor grader w/operator	4 hr. @ $50/hr.	200.00
Vibratory roller w/operator	4 hr. @ $50/hr.	200.00
Hand work	16 hr. @ $15/hr.	240.00
Sprinkler truck	2 hr. @ $30/hr.	60.00
Dump truck	2 hr. @ $30/hr.	60.00
Top dressing (stone dust)	30 cy. @ $3/c.y.	90.00
Total		$850.00

This is virtually the same amount, when adjusted for inflation, as was spent by Rockefeller during the early years of the carriage roads. Until experience with a sustainable level of maintenance can provide more accurate figures, $40,000.00 to $50,000.00 per year for the carriage road system may be used as a planning budget for carriage road maintenance (above figure times 51 miles of roads). It is important to stress that this is the estimate for a proper level of maintenance *after* the carriage road system has been restored.

Bridge Maintenance

The main factor in the deterioration of stone, mortar and reinforced concrete bridges, like those on the carriage roads, is infiltration of water. Keeping the drainage system in working order is the most cost effective means of maintaining a bridge. In addition to assuring that drainage systems are in working order, it is critical that the roadbeds be properly graded and kept free of surface depression where water might accumulate. Water should be able to drain away from the bridge easily.

Biological Deterioration

Biological growth on the stone and between the stones is encouraged by excessive moisture and long-term retention of moisture in and around the stone. Moisture from rain and groundwater, easily penetrates the opened joints and areas where there has been a breakdown in the waterproofing or the integrity of the structure. The resulting cool, damp stone surface provides an ideal micro-environment for the growth of non-rooting algae and fungi. The presence of these organisms may slow evaporation further by preventing light and air from getting to the stone surface. Following is a description of the various types of biological growth.

Green algae thrive on many types of wet materials. As algae have no roots or stems, they absorb moisture and nutrients through their entire mass. Some algae are powdery while others are masses of fine filaments. Although not directly responsible for stone deterioration, their presence may contribute to moisture retention in stone.

Fungi have no chlorophyll and therefore cannot produce their own food. They must rely on other organisms or on minerals for nutrition. Parasitic fungi probably feed off the prominent green algae and off the moisture and/or minerals in the stone. The fungi are comprised of finely branched thread-like filaments that can penetrate the stone. Forcing themselves between the mineral grains in the stone, the fungal filaments can exert stresses that may lead to separation and loss of grains near the surface of the stone. In large quantity, the loss could contribute to stone deterioration. Secretions from the fungal filaments are a prime source of acid. Acids will dissolve any carbonate material in stone, dissolved materials from the interior may re-precipitate near the surface to form a thin, insecurely bound crust which can add pressures to the stone surface. Besides secreting acids, fungal filaments cause damage by their mere presence. Growing initially on the surface, they eventually penetrate the stone, knocking off poorly bound grains as they grow.

Moss, a small green, leafy stemmed plant, grows in mats on moist stone and mortar joints. Slender root-like filaments , called rhiziods, absorb food and fix the plant in its growing bed. The matted nature of the plant allows moss to grow over its own decaying early growth, creating a shallow bed for the rhiziods and eliminating the need for much soil. As a result, moss often grows on tree trunks, rock outcroppings and building stones. Unlike algae and fungi, moss needs to grow on horizontal surfaces where water and decaying matter can collect. Small ledges at open joints or along cracks in the stone provide the proper conditions for the growth of moss. Aside from its unsightliness, the presence of moss indicates abnormally damp conditions. The biological growth problems are relatively minor on the carriage road bridges.

Recommendations

Lichen moss: Commercial herbicides, detergents, household bleach.

Algae: Soap, commercial powdered cleanser with bleach, chlorinated lime, leaching powders, peroxide.

Although steps should be taken to avoid the new or accelerated growth of algae, moss and fungi, the value of removing all of these on a regular basis is questionable. Biotoxic washes that are successful in removing algae may seriously stain the stone or damage existing vegetation. As with any treatment, a test sample should be done before any large scale cleaning treatment is undertaken. In addition, the type of stone and its susceptibility to damage from these biological growths should be ascertained. A limestone will be much more susceptible than granites and therefore a more comprehensive cleaning program may be undertaken than if the stone were a granite. In some instances, removal with a mild bleach and a firm bristle brush may suffice. Clearly, the real solution is to find the reason for the damp conditions in the stone that is supporting the biological growth.

Water Infiltration

Eagle, Lake, West Branch, Waterfall and Deer Brook bridges all exhibit the severe presence of surface soluble salts. These surface stains could be indicative of serious structural problems. A testing program should be undertaken to determine the nature of the stains and their source. The iron stains may indicate that the steel reinforcement is corroding, or oxidizing. This will cause an expansion of the steel reinforcement causing pressure on the concrete to steel bonding and resulting in the failure of the reinforced concrete. This is a result of water penetration. If this is in

fact the case, high pressure cleaning and caulking may be required. Maintaining the waterproofing and eliminating the penetration of water is the primary goal. We recommend that a testing program be initiated to precisely determine the degree of failure to the reinforced concrete and some immediate action to stabilize the situation. If reinforcement corrosion is left unchecked the deterioration will continue and the Park will be faced with a major restoration effort and the possibility of structurally unsafe bridges.

If the problem is determined to be the "standard efflorescence," it will be somewhat easier to deal with. Efflorescence is a whitish haze of soluble salts left as deposits on masonry by the evaporation of water. The soluble salts may come from the wall itself (for example, sulfates inherent in the raw materials of carbonates resulting indirectly from the use of portland cement) or may be drawn into the masonry from salty ground water. In addition, air-borne or water-deposited pollutants in the atmosphere may cause sulfates to appear on the surface of the masonry. Efflorescence also may be a combines salt residue left on the masonry surface by excessive washing or chemical cleaning (not the source in this case, I would assume) often from too strong a chemical solution or inadequate rinsing.

Efflorescence itself may be more unsightly than harmful, but its presence serves as a warning that water has found a point of entry into the structure and that more serious damage may follow. Efflorescence may also indicate potentially damaging subflorescence; this is an accumulation of soluble salts beneath the masonry surface, which may exaggerate the effects of other conditions such as exfoliation and spalling, eventually leading to deep deterioration of the masonry.

While the maintenance of the drainage structures and roadbed grades is extremely important, there still will be some water penetration even if it is only through infiltration of the surface and rain water. This is ticking time-bomb that the Park is faced with. The major problem is the need for a plan for waterproofing and examination of the integrity of the concrete.
The excessive moisture should be identified and solved first and then the efflorescence problem can be removed with dry brushing, water washing or a poultice.

Repointing

Repointing is the process of removing deteriorated mortar from the joints of a masonry wall and replacing it with new mortar. Repointing restores the visual and physical integrity of the masonry.

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A wall's mortar joints bind together the individual masonry elements into a structural whole ensuring a watertight seal. The bed of mortar also compensates for irregularities in the stones, which would otherwise lead to uneven stresses and cracking of the masonry units; the more regular the stone or brick, the thinner the joint can be. The mortar joints must be somewhat weaker than the masonry units; otherwise, the masonry units become the weakest part of the wall, and slight movements would cause the stone to crack or spall. If mortars are too strong, they tend to be more impermeable to moisture than the masonry units and thus prevent drying through the joints; moisture movement then is concentrated in the stone, possibly leading to damage of the masonry.

The decision to repoint is most often related to some obvious sign of deterioration (disintegrating mortar, cracks in mortar joints, damp walls). Because repointing alone will not solve all these problems, their true cause should be determined and solved before repointing, or the mortar deterioration will continue and the repointing will have been a waste of time and money.

Conclusion

An adequate level of maintenance is absolutely essential for the preservation of the carriage roads and their appurtenant structures. Deferred maintenance can mean enormous cost in reconstruction, or even the loss of the resource.[472] Adequate maintenance is not only more cost effective than restoration, but it also keeps the resources in a condition which makes them more appealing for their intended public use. When limited funds are allocated consideration must be given to the exorbitant cost of failing to maintain those resources in our care.

[472]One bridge currently under reconstruction in Central Park will cost approximately $900,000.00 to restore.

USE

Carriages

When Rockefeller built the carriage road system, he envisioned its use by those who enjoyed both the social and the sporting aspects of carriage driving. At the turn of the century, technological advances resulted in the development of carriages which were easier and more fun to drive. The sport of pleasure driving was an outgrowth of this phenomenon. Many chose to spend their leisure time taking a drive through the countryside or in the park. Carriage driving was also considered a form of outdoor exercise. It took great skill and strength to maneuver a horse and carriage, particularly a four-in-hand which was a team of four horses pulling a large coach or carriage. Rockefeller was said to be better than his coachman at driving either a pair or four-in-hand. He was an excellent horseman who loved the out-of-doors. He also anticipated that the sport of carriage driving would increase in popularity. Therefore, he took great care to ensure that the carriage roads were designed to accommodate both large and small carriages. For example, the roads themselves were a generous width, and the bridges were sufficiently high to allow for the passage of a coach.

Every summer, Rockefeller transported his fleet of carriages from his estate in New York's Hudson River Valley to his estate in Seal Harbor. Carriage-driving, however, never developed the popularity Rockefeller and others expected. Even the buckboards used by Bar Harbor hotels to take people for rides ceased operation. Nevertheless, carriage clubs still exist. Many continue to enjoy the sport and would relish the opportunity to take advantage of an uninterrupted, 51-mile system of carriage roads. The popularity of the current carriage concession is an indication that many visitors enjoy the opportunity to experience the carriage roads by carriage, or buckboard. Since the roads were specifically designed for this purpose, accommodating and encouraging this use seems wise.

Before Rockefeller's roads were built, buckboards were already popular on Mount Desert Island. Many enjoyed open-air rides to popular Island spots. Their approach was more rustic, however. They preferred a less convenient trip and a more "natural" experience of the wilderness. Rockefeller aimed for a more refined use of the roads. They were planned and engineered, and so did not have the character of a rustic path through the woods. Those who preferred the Island's original setting lobbied hard against the roads and lost. If the carriage roads are properly restored and maintained, the large buckboards of this era would not damage the roads. (Haywagons with rubber tires should not be allowed. Their inappropriate appearance, coupled with the destructive nature of rubber tires on broken-stone roads, make them undesirable.)

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If the carriage roads were to be used as Rockefeller intended, however, the vehicles used most on them would range in size from single horse buggies to small buckboards (2 to 4 benches instead of 6). With such usage on proper roads, there need be no limit on the length, duration or sequence of carriage rides.

The current concession includes daily buckboard trips, one hour in duration on the carriage roads, as well as two hour trips with buckboards and haywagons to the summit of Day Mountain for the sunset. In addition, park naturalists accompany two hour trips on the carriage roads as part of an interpretive program. Controlling the dust on these excursions is one of the primary difficulties. With large vehicles, one behind the other, even with dust control measures, those visitors in the second and third conveyances would be uncomfortable. Such large groups also present problems for the Park naturalist trying to speak as the carriage ride progresses. With the interpreter in the first buckboard, communication in the last haywagon is limited. Again, this is also not the way the carriage roads were meant to be experienced.

A better approach would be to hold an interpretive session at Wildwood Farm before the carriage rides leave. The Park naturalist could explain briefly the history of the roads and the nature of their development, and describe the bridges, gate lodges and other points of interest to be seen along the way. With this introduction and perhaps a pamphlet including additional information, visitors would be well-informed about the experience ahead. In addition, carriage drivers, if properly trained, could answer questions and highlight each of the important stops. A Park naturalist could also be stationed at one or both gate lodges to answer questions.

Horseback riding is available from Wildwood stables. Particularly if carriage clubs are to be encouraged to use the carriage road system, accommodations could also be provided to those who would be interested in using their own horses and carriages on the roads.

Bicycling

In 1949, John D. Rockefeller, Jr., observing that the roads were little used for their original purpose, wrote to Newton B. Drury, the Director of the National Park Service, about the possibility of using the carriage roads at Acadia for bicycling. Drury replied that Park Landscape Architect Benjamin Breeze had made a study nine years earlier of the adaptability of the carriage roads to bicycle use.[473] Breeze had observed

[473]Newton B. Drury to John D. Rockefeller, Jr., January 12, 1949, Acadia National Park files.

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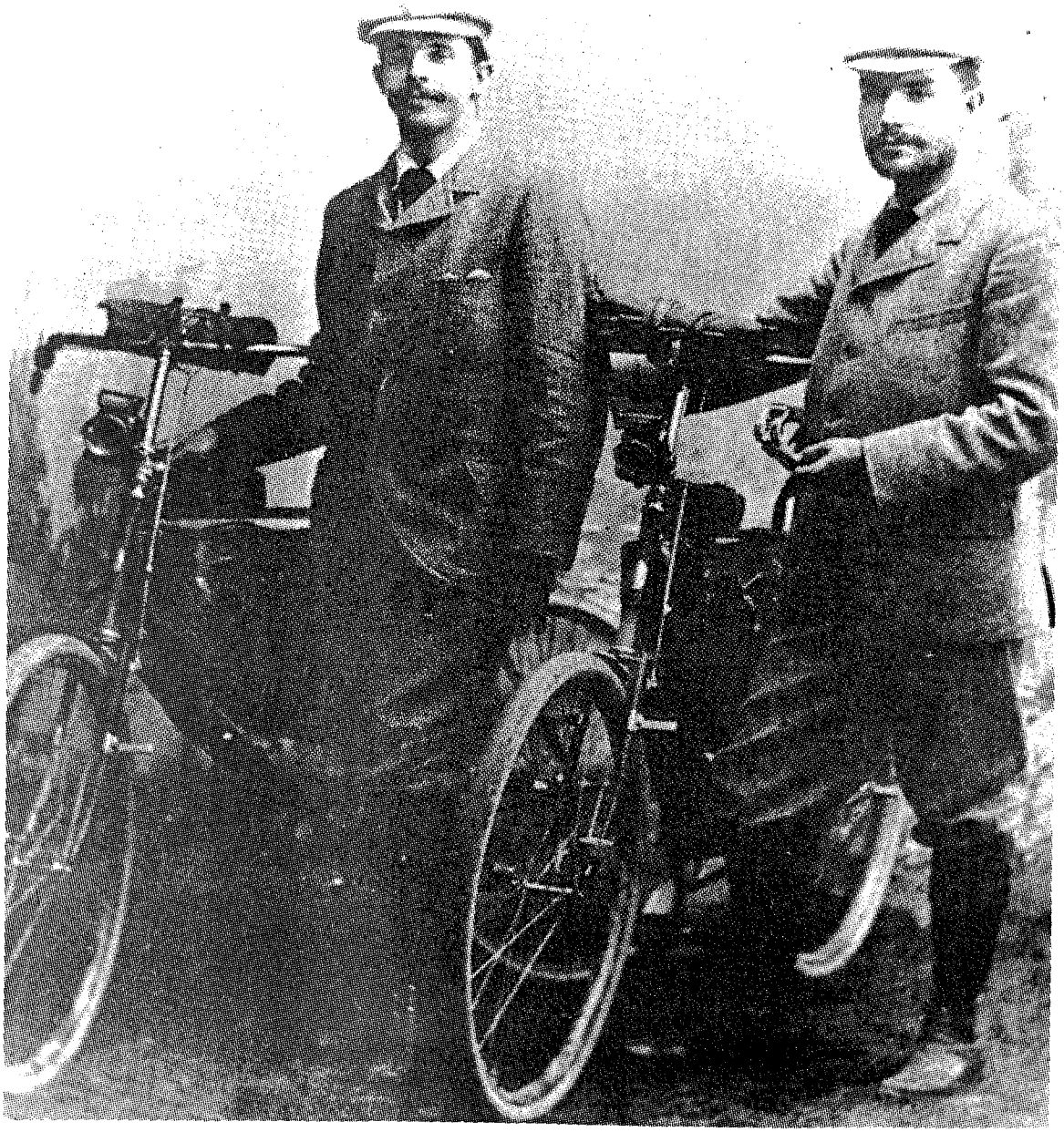


Figure CXVIII. John D. Rockefeller, Jr., (on right)
on Bicycle Tour of Europe in 1897

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that the roads were, indeed, quite suitable for bicycles. He noted that, while the conditions of the roads were quite good (the roads were still being maintained by Rockefeller at the time), he suggested that additional compaction would make them even more useful.[474]

In the early days of the bicycle the type of construction of the carriage roads--broken-stone--was considered the best road surface for bicycles. Baker states that:

> The best cycle ways are constructed much the same as first-class broken-stone roads, except that the layers do not need to be as thick and do not need as much rolling. The surface should be finished with a layer of stone screenings ¼ to 1/2-inch thick, the size ranging from 1/4-inch to dust.[475]

This is virtually the same as the surface recommended for the carriage road restoration.

George Dorr had considered the advantage of bicycling in the area before the turn of the century. He recounted his construction of a bicycle path and its dual use for a buckboard:

> Around the pool and winding among the ancient forest trees, I had built . . . for my friends' and the public's use, a broad bicycle path, at a time when a new development of geared machines and rubber-tubed tires had given new popularity to the bicycle, and everyone who could was riding. My path found instant favor, and people came down from the hotels and cottages in throngs to enjoy it, riding round and round, but not, as I had hoped they might, building others like it eleswhere to widen the opportunity and interest.
>
> The Bicycle Path, just wide enough for my mother to pass through in her little one-horse buckboard, became a favorite drive for her in days of mellow autumn sunshine, where she could quietly watch the yellow birch leaves change and fall.[476]

Since that time, and even since Ben Breeze made his report in 1940, bicycling has dramatically increased as a recreational activity. Bicycle technology has greatly advanced since that time. Shops in Bar Harbor rent ten-speed bicycles. The most popular of the types of bicycles used on the carriage roads are "trail" bikes

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[474]Ben Breeze's report "Bicycling in Acadia" is included in its entirety in Appendix XXIV.

[475]Baker, 626.

[476]George B. Dorr, *The Story of Acadia National Park: Its Origins and Background*, (Bar Harbor, Me.: Acadia Publishing Company, 1985), 12-13.

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Figure CXIX. Bicycling on the Carriage Roads

(the L. L. Bean Co. markets such a bike named the "Acadia"). While bikes with extremely knobby tires can damage the road surface, bikes outfitted with only slightly knobby tires, as are currently used on rental bikes, seem to do little damage to the road surface. As has been previously mentioned, fast-moving, rubber-tired vehicles are anathema to broken-stone roads. The relatively narrow width of bicycle tires, however, make them much less of a threat to the road surface than automobile or truck tires. The hardest and smoothest tires will do the least damage to the road surface.

Another great advantage of touring the carriage roads by bicycle is that of rate of travel. Because of the width of the road, the sequence of views and relatively long distances of the loops, walking the carriage roads strikes some as tedious. The speed of a bicycle, however, is much more like that of a carriage behind a jogging horse. The scale and sequence of vistas and features is ideally suited to this rate of movement. The width of the roads allow bicyclists to ride side by side, and to pass other bicyclists, pedestrians, equestrians, or carriages without discomfort or danger.

Consideration could be given to leasing of the garages at the Jordan Pond Gate Lodge and the Brown Mountain Gate Lodge to bicycle rental concessions. Parking areas would have to be developed at these areas to accommodate this, but it would make access to the carriage roads by bicycle much easier, and would transform the gate lodges into the major entry points to the carriage roads they were intended to be.

Bicycling represents the most harmonious, accessible, and cost-effective use of the carriage roads today. While the economics of scale limit the routes and flexibility of carriage and buckboard passengers, bicyclists may choose their route, and explore the carriage roads at their own pace. While the Park automobile roads become choked with visitors each season, the carriage roads remain relatively deserted. If properly restored and actively promoted, the use of these roads by bicyclists could help to relieve the pressure on the automobile roads and greatly enhance the visitors' experience.

Wheelchairs

The carriage roads, if properly restored, offer an exceptional opprotunity for people confined to wheelchairs to experience the extensive and varied scenery of the interior of Acadia National Park. Most of the carriage roads were designed at a gradient of less than 5%, which is comfortably negotiated by most wheelchair users. Some sections as steep as 7% may be appealling to those looking for a more challenging route. The width of the carriage roads make possible the safe use of them by wheelchair users in conjunction with bicyclists, equestrians, pedestrians and carriages. The beautiful scenery, great extent, diverse users, and historic significance combine to

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make the carriage road system a wonderful recreational possibility for those confined to wheelchairs. This use is predicated, however, upon the restoration of the surface of the roads to a smooth, hard condition which is suitable for wheelchairs.

Snowmobiles

A short section of the carriage roads along the east side of Eagle Lake is now open to snowmobiles for access to the Park Loop Road. This is a reasonable variance to the general prohibition of motorized vehicles on the carriage roads, but should not be extended to any other sections of the carriage roads.

Cross-country Skiing

Cross-country skiing offers the most appealing winter activity on the carriage roads (Figure CXX). These roads are considered ideal for this use by many cross-country skiers. The width of the roads, beautiful views--especially striking in the winter, absence of motor vehicles and gentle gradients make a cross-country skiing outing on the carriage roads particularly delightful. This activity is wholly appropriate for the carriage roads, and it encourages use of the Park during a season in which visitors may enjoy the grandeur of the island without the crowds encountered during the summer. The only deterrent to use of the carriage roads by large numbers of cross-county skiers is a somewhat unpredictable snow cover condition during the winter months. In spite of this, the winter use of the Park and cross-country skiiing on the carriage roads, in particular, is growing.

Walking/Hiking

As mentioned above, the scale and distances of the carriage roads do not make them the most appealing routes for many walkers. For many, however, these broad, smooth surfaces, free of motor vehicles, offer a fine alternative to the more arduous hiking trails in the Park. These roads have great appeal for older people, for groups of children who require supervision, for handicapped people, or anyone for whom a leisurely stroll has more attraction than a challenging hike. In addition, some visitors find the carriage roads a wonderful setting for running or jogging. The multiple use of these roads by bicyclists, carriages, equestrians and pedestrians should cause little conflict (if the road surface is restored and maintained), and may even be perceived as an attraction because of the variety and animation which does not occur on the walking trails.



Figure CXX. Cross-country Skiing on the Carriage Roads

Dog Sleds

The carriage roads have been used in the winter and summer (using sleds on wheels) for dogs sleds. Considering the low use of the carriage roads in the winter, the fact that the activity is non-motorized, and the general compatibility with other winter users, this use seems reasonable and acceptable. The summer use of the carriage roads for "wheeled" dog sled teams could cause conflicts with other users in the summer. As the carriage road use increases, the compatibility of dog sled teams with bicycling, carriages, and pedestrians should be carefully monitored. If conflicts arise, deference must be given to carriage and bicycle users which represent the most appropriate and numerous users of this resource.

CONCLUSION

The story of the building of the carriage roads of Mount Desert Island, a significant remnant of our road-building history, illuminates much about American social history in the early twentieth century, about the history of the National Park Service and of Mount Desert Island, and about the art and craft of road-building in this country.

A wealth of primary source materials has made it possible to reconstruct in detail the process by which the richest man in America helped accomplish, through the unique means at his disposal, the creation of this remarkable public recreational asset. No less interesting or valuable are the correspondence of the local Maine engineers, road builders, stone masons, and other workers who, in their letters to Rockefeller, reveal the details of the methods employed in the construction process.

Voluminous private papers, most notably the documents of the Rockefeller Archive Center and those in the personal collection of Mr. and Mrs. Charles P. Simpson, has enabled the authors to redress several widely held misconceptions regarding the carriage roads. The most striking of these is the declaration, seen in at least two publications and heard in untold conversations, that the roads were designed by "Frederick Law Olmsted, the designer of Central Park." This mistake obviously springs from the very minor role played by Olmsted's son, Frederick Law Olmsted, Jr.

A frequent assertion which the research for this report also contradicts is that there existed a close friendship between John D. Rockefeller, Jr., and George B. Dorr. While these men collaborated when their goals overlapped, their correspondence does not reveal a friendship beyond that. Dorr's letters to Rockefeller were cordial, expansive, and informative, but never familiar; Rockefeller's to Dorr were usually business-like, often terse, and sometimes peevish. Rockefeller, in fact seems to have gone to some lengths to avoid Dorr--dealing with his assistant, A. H. Lynam or his superiors in the National Park Service, sometimes without Dorr's knowledge. Charles E. Peterson's recollection that ". . . in a funny way they were rivals" seems most accurate.

A small correction, but one with important implications, regards terminology. The current Park literature and signage refer to Acadia's "Carriage Paths," whereas, they were not built, nor can they be maintained, as paths. They are *roads*, and their restoration, maintenance and use relate directly to this basic fact.

The carriage road system in Acadia National Park was not conceived nor executed as a secondary or ancillary road system, but as the primary means of access within the park. Rockefeller was convinced, in the early years of the automobile, that ". . . [i]t is not yet proved that automobiles will survive as pleasure vehicles in a proper sense. . . . [T]here is a return to horse-carriages for pleasure purposes."[477] As a result, he built 51 miles of carriage roads in the Park, while less than 35 miles of automobile roads were constructed in the same part of the Park (Mount Desert Island, east of Somes Sound).

Rockefeller was not alone in his conviction that carriage roads (or "horse roads", as he called them) were an appropriate means of access to the interior reaches of the Park. While Rockefeller and George B. Dorr had a "cautious" relationship (in the words of Charles E. Peterson), Dorr shared Rockefeller's view that the carriage roads were an enhancement to the Park, and worked tirelessly for their acceptance.

Although Rockefeller was wrong in believing that carriage driving would revive as a widely used form of public recreation, these roads do offer an exceptionally wide range of activities and means of access within the Park. Bicyclists, people in wheelchairs, pedestrians, equestrians, carriage passengers, and joggers could share these motor-free roads. In the winter, they are ideal for cross-country skiing, snow shoeing, and even dog-sled teams. While mixing bicycle, horse and pedestrian traffic is not generally recommended, the width of these roads, and their (properly restored and maintained) smooth, hard broken-stone surface would make them suitable for such diverse uses. At a time when the Park is looking for ways to accommodate the ever-growing numbers of visitors they offer an attractive alternative to the crowded motor roads. "Some day," Thomas Vint told Park Service Historian Freeman Tilden in the 1950s, "the spark that will lead the public to them will flash; and they will come into their own."[478]

Rockefeller worked toward the fulfillment of the concept for this system of motor-free roads for nearly thirty years, a task which superbly suited the combination of personal qualities and circumstances which he possessed. Fairfield Osborne describes the combination of these attributes which were necessary for Rockefeller's conservation work. They are directly applicable to the creation of the carriage roads:

> These things were not easily done. Vision alone was not enough. Wealth alone was insufficient. Concept of the plan as a whole, arduous attention

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[477] *An Auto-less Summer Resort*, 2.

[478] Tilden, "Park of Land and Sea," 11.

> to detail, and even passion for perfection, feeling for color and beauty, respect for working associates, talent for administration, patience and lastly, tolerance of criticism and even misunderstanding of purpose--all these qualities were brought into play, for all were essential to the fulfillment of the early vision.[479]

Of course, the roads were not built without controversy. The often conflicting values of conservation and access were at odds many times during the planning and construction of these roads. William W. Vaughan summed up the opposing views in 1930:

> And here perhaps is the place to say the three things that may be safely said about the many miles of roads, for horse-drawn vehicles only, which Mr. Rockefeller has built and is building, partly through his own lands and partly through the lands of Acadia Park.
>
> And the first is that they are greatly liked by the permanent inhabitants, because of the welcome work which these roads give, and by some of the older summer residents, who enjoy driving on them, and by the young in the saddle.
>
> And the second is that they are greatly disliked by very many persons, especially by the walking and climbing groups, because of the invasion of their beloved wildernesses, and because of the gashes which mar the sides of the mountains.
>
> And the third thing is that, a generation from now, these gashes will have been largely hidden by weathering of the rocks and by the growth of trees, and that these feelings will have been largely hidden by the years that will have flowed over them, and that these roads will be used by somebody in some way or another; and that the question, by whom, and how, is a question that rests on the knees of the gods; and there we can best leave it.[480]

These conflicting values of access and conservation were effectively addressed by Bishop William Lawrence, chairman of the committee who hired Charles W. Eliot, II, in 1926, and who opposed many of the carriage roads. He wrote to his friend, Judge L. B. Deasy in 1932:

> The beautiful Island of Mount Desert with its National Park is in the thoughts of hundreds of thousands who ten years ago had not heard of it. Everyone who comes here goes home to spread the news of its glories. . . .

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[479]Newhall, Prologue by Fairfield Osborne.

[480]Vaughan, 41-43.

> What can we lovers of this Island, the seat of a National Park, the most beautiful point on the Atlantic this side of Mexico, do to meet the conditions? We should like to shut our eyes to them but we have got to face them . . .
>
> Frankly, I hate to write this letter. I shrink from the changes that must come. I turn my eyes from the scarred mountain sides which only time will heal. I dread the increasing multitudes of trippers; I shall miss the informal rough roads with the unexpected vistas around their sharp curves. I am weary of smooth surfaces and suburban-like surroundings. If the road must come I have the fond hope (I refuse to think it a forlorn one) that some of the bridge and underpass architecture will give way to more appropriate forms. Our Alps are molded upon peaceful, quiet lines and we have no fear of a Napoleonic army crossing them. . . .
>
> With this said I am convinced against my own wishes that it is our duty as residents of this beautiful Island to make it as open as possible to the whole people. This is a National Park; it belongs to the Nation. Because we live here we have no right to restrict its benefits. The whole Nation, not only we, are supporting it. They have equal rights with us to its use. Millions will enter into the enjoyment of what thousands of us have hitherto delighted in. . . . [481]

While the carriage road system at Acadia National Park is the most personal and concrete manifestation of John D. Rockefeller, Jr.'s generosity to the National Park Service, it represents one of a long list of gifts to our National Parks. Harold A. Hubler, Superintendent of Acadia National Park, remarked at a memorial service for Rockefeller at Seal Harbor, in 1960, on Rockefeller's wide-ranging contributions in that regard. In particular, Hubler noted Rockefeller's support at Mesa Verde, Yellowstone, Grand Canyon and Yosemite National Parks; his undertaking "to save Jackson Hole for the people by acquiring it to give to the government as part of the Park;" and his gift of five million dollars to the fund-raising efforts at the Great Smoky Mountains National Park. Hubler concluded:

> In gathering together here in Seal Harbor to pay tribute to the greatness of John D. Rockefeller, Jr., we are almost within a stone's throw of that National Park that has known his admiration and love and helping hand for more than four decades. . . .
>
> Probably the one project in Acadia closest to Mr. Rockefeller's heart was the building of his . . . carriage road system to permit leisurely travel through the Park by horse and carriage--and free from interference from automobiles. These

[481] William Lawrence to L. B. Deasy, August 19, 1932.

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> roads--conceived, designed, and largely supervised by Mr. Rockefeller himself--offer some of the finest scenic vistas anywhere in the Park. They are unique in the National Park system and are in themselves a monument to Mr. Rockefeller's feeling for beauty and perfection. . . .[482]

In the restoration and care of the carriage road system at Acadia National Park, the National Park Service has the remarkable opportunity to at once restore an important historic resource, effectively enhance the visitors' experience, and honor the vision of the man who gave more to the National Park Service and Acadia National Park than any other private citizen in history.

[482]Harold A. Hubler, *A Great Conservationist,* (Comments at A Service In Remembrance and Appreciation of John D. Rockefeller, Jr., The Union Congregational Church, Seal Harbor, Maine, July 31, 1960).



Figure CXXI.

"But it was worth any hardship I suffered to see the Island in its winter garb.... A striking picture, more vivid than the gentler hues of summer." William W. Vaughan

APPENDIX

APPENDIX I

CHRONOLOGY

1604	Mount Desert Island discovered and named by Samuel de Champlain, September 6.
1688	Island granted to Antoine de la Mothe Cadillac by Louis XIV.
1823	First macadam road built in America.
1844	Thomas Cole comes to Mount Desert Island to paint. Is followed by a succession of "rusticators."
1858	Mechanical rock crusher invented.
1868	Steamboat service from Boston began.
1869	First use of steam road roller occurred in Central Park.
1873	Forest Hill estate purchased by John D. Rockefeller, Sr.
1874	John D. Rockefeller, Jr., born.
1883	Scenic railway built from shore of Eagle Lake to summit of Cadillac Mountain.
1895	Automobile patented.
	Cooksey Drive built in Seal Harbor.
1900	First quantity-production automobile factory built by Olds Company in Detroit.
	U.S. Census: 76,303,387
1901	Hancock County Trustees of Public Reservations organized by Charles W. Eliot to acquire and hold in public interest land on Mount Desert Island.
1907	Maine Legislature permits towns to bar automobiles.

1908	Nelson Rockefeller born at Seal Harbor.
	First gift of land to trustees; donated by Mrs. Eliza Homans of Boston.
	Theodore Roosevelt convenes Governor's Conference on Conservation.
1909	Automobiles admitted to Mount Desert Island (Tremont and Southwest Harbor).
1908-1910	William Welles Bosworth at work on Rockefeller's Pocantico Hills Gardens.
1910	John D. Rockefeller, Jr., purchased "The Eyrie."
	469,000 automobiles registered.
	U.S. Census: 91,972,266 (45.7% urban)
1913	16th Amendment (Income Tax) ratified.
	Automobiles admitted to Town of Eden (Bar Harbor).
	John D. Rockefeller, Jr., built first carriage road (Barr Hill) on Seal Harbor estate.
1914	William Welles Bosworth at work on Rockefeller's New York house.
	World War I begins in Europe, July 28.
	5,000 acres of land on Island tendered to Government as a national park by Hancock County Trustees.
1915	Plan for expansion of carriage road system developed.
	Trustees allowed Rockefeller to build on Reservations land.
1916	National Park Service established.
	Tract of Reservations land accepted by Government; proclaimed by President Wilson to be the Sieur de Monts National Monument (later Acadia National Park).
1916-1922	John D. Rockefeller, Sr., transfers approximately one-half a billion dollars to John D. Rockefeller, Jr.

1917 U. S. declares war on Germany, April 6.

Cobblestone Bridge built.

Gardiner-Mitchell Hill carriage road completed.

Stephen T. Mather, First Director of National Park Service.

1918 World War I ends.

Hancock County Trustees of Public Reservations deeds land to Federal government.

Rockefeller receives permission from Department of the Interior to build Asticou-Jordan Pond road.

Gardiner-Mitchell Hill-Jordan Stream Road completed.

1919 Little Harbor Brook bridge built.

Contract underway to build Asticou-Jordan Pond carriage road.

Clement finished Little Harbor Brook road.

Act of Congress, February 26, created Lafayette National Park, first National Park east of the Mississippi.

Prohibition becomes law.

1920 Construction of Asticou-Jordan Pond carriage road stopped because of opposition of group of summer residents.

Jordan Pond Dam bridge built.

Over 9,000,000 automobiles registered.

1921 Charles P. Simpson falls ill, is replaced by his son, Paul D. Simpson.

1922 Clement and Joy begin building the Jordan-Sargent Mountain road.

1923 Hemlock and Waterfall bridges under contract.

Motor road from Jordan Pond House to Eagle Lake Road under construction.

1924	Hemlock bridge built.
	Department of Interior approved roads in spite of opposition from Senator George W. Pepper.
	Permission granted from Hancock County Trustees of Public Reservations for carriage road west of Eagle Lake.
1925	Waterfall bridge built.
	Deer Brook bridge built.
1926	Chasm Brook bridge built.
	Hadlock Brook bridge built.
	Clement discharged after dispute with the Committee.
	Pearsall (Bosworth's office) working on drawings for Eagle Lake bridge.
1927	Hulls Cove carriage road construction.
	Rockefeller visits Williamsburg, Virginia for first time.
1928	Eagle Lake bridge built.
	Bubble Pond bridge built.
	Charles P. Simpson dies.
1929	Duck Brook bridge built.
	Horace M. Albright, Director of National Park Service.
1929-1933	Crash of 1929 leads to Great Depression with 15,000,000 people unemployed in 1933.
1930	Planning undertaken for Aunt Betty's Pond carriage road.
	Planning undertaken for Day Mountain carriage road.
	Construction on Aunt Betty's Pond and Day Mountain, and Bubble carriage roads
	Atterbury designs Eagle Lake Lodge.

1931	West Branch bridge built.
	Amphitheater bridge built.
	Cliffside bridge built.
	Work began on gate lodges.
	Cadillac Mountain Summit Road completed.
	Kebo Valley roads designed.
1932	Jordan Pond Road bridge built.
	Jordan Pond and Brown Mountain Gate Lodges completed.
1933	Stanley Brook bridge built.
	Arno B. Cammerer Director of National Park Service.
	National Industrial Recovery Act, Agricultural Adjustment Act, Civilian Conservation Corps, Tennessee Valley Authority passed.
1934	Gilmore Meadow culvert built.
1935	Construction on Aunt Betty's Pond, Day Mountain, and Bubble Pond roads completed.
	Beatrix Farrand ends major involvement with carriage roads.
	Works Progress Administration established, National Labor Relations Act, Social Security Act passed.
1937	John D. Rockefeller, Sr., dies.
1939	Property and gate lodges given by Rockefeller to Park.
	Newton B. Drury, Director of National Park Service.
	World War II begins in Europe, September 1.

1940	Triad-Day Mountain bridge built by Park Service.
	Day Mountain Summit road completed. Last section of carriage roads built.
	U.S. Census: 131,669,275 (56.5% urban)
1941	U. S. enters World War II, December 8.
1944	George Bucknam Dorr dies.
1945	World War II ends depression and gives enormous boost to economy.
1947	Fire burned much of Mount Desert Island; Rockefeller greatly involved in restoration efforts.
1951	Arthur E. Demaray, Director of National Park Service (8 months)
	Conrad L. Wirth, Director of National Park Service
1959	Beatrix Farrand dies.
1960	John D. Rockefeller, Jr., dies.
	Park Service assumes maintenance of carriage roads.
	U.S. Census: 179,323,125 (69.8% urban)
1970	U.S. Census: 203,235,298 (73.5% urban)
1980	U.S. Census: 227,255,000 (73.7% urban)

APPENDIX II

Presidents, Secretaries of the Interior, and National Park Service Directors

From 1913 - 1946

	President	Secretary of Interior	Director, National Park Service
1913	Woodrow Wilson	Franklin K. Lane	
1916			Stephen T. Mather
1920		John B. Payne	
1921	Warren G. Harding	Albert B. Fall	
1923	Calvin Coolidge	Dr. Hubert Work	
1928		Roy O. West	
1929	Herbert Hoover	Dr. Ray L. Wilbur	Horace M. Albright
1933	Franklin D. Roosevelt	Harold L. Ickes	Arno B. Cammerer
1940			Newton B. Drury
1945	Harry S. Truman		
1946		Julius A. Krug	

APPENDIX III

AUTOMOBILES

THE MOUNT DESERT TOWN MEETING

(Reprinted from Bar Harbor Life, August 23, 1913)

Now, glory hallelujah, hip, hip, and three times three,
Mount Desert town, of fair renown, from autos will be free,
In Eden Town they rage around, with horrid smell and soot,
And make Bar Harbor' streets unsafe for those who go afoot;
But Northeast and Seal Harbors are in Mount Desert Town,
And the autos in town meeting, have there been voted down.

The voters of Mount Desert, they one and all, came there,
In motor boats and buckboards, and some upon Shank's mare.
The anxious rusticators furnished transportation free
And with their wives and daughters came the voting for to see;
In fact so many summer folk attended at the hall
That very many voting men could find no seats at all.

The meeting opened solemnly, with Judge Knowles in the chair,
Who said he'd do his duty, and endeavor to be fair,
Then Stebbins of Seal Harbor, a summer man of note,
Who claims to live within the town, and thus obtains a vote,
Moved that the rusticator, although they had no right,
Should be allowed to talk upon the subject of the fight;
And as no one dissented, this was very quickly done,
And everyone was free to talk and then began the fun.

First, Kimball, of Northeast, who keeps the famous Hostelry,
Where Northeast's men and maidens meet in weekly revelry,
Read letters from some millionaires who wished a summer home
But would not patronize his house if autos did not come.
He said, if by their vote this day they kept autos away,
He'd close the Kimball House next year, and more he could not say.

Then Melcher, who to Northeast had come these many years,
Read the rusticators' protest and chronicled their fears
That if the auto was allowed to come within the town,
Its prestige would be soon destroyed — its business would run down.

Then Eliot, the grand old man, head of the Harvard clan,
Who's squeezed the world's best literature into a five-foot span,
Who knows all things there are to know, and keeps advice in store
And hands out all that you may ask, and sometimes even more,
Said that they'd kept his taxes down, which showed their common sense;
And if they'd keep the autos out, he thought 'twould be immense.

By tales of men who only came because autos were barred.
Then Stebbins, who's a canny man, countered on Kimball hard,
Then Dr. Edward Dunham — he of the gentle voice,
Whose courteous ways, and quiet deeds have long made Seal rejoice,
Opposed the auto nuisance and urged the voters there
To let Mount Desert always keep its charm beyond compare.

Then Rockefeller, Junior, with name of mighty power,
Who overlooks Northeast and Seal from out his lofty tower,
Spoke quietly, but forcibly, against the auto plan,
And showed, although a billionaire, he was a modest man.
Then Prichard, of Seal Harbor got up and said, "me too;"
And Dr. Minot of Northeast, whose Boston blood is blue,

And then uprose Charles Clement — the great and only one,
Who, in times past, had said he thought the auto ought to run:
But now he said he'd changed his mind — his thoughts he never hid,
He'd vote against the auto, though no other fellow did.

Then Grindle — great physician, their Solon wise and true,
Who gave them pills, and cured their ills, and helped make statutes too,
Called their attention to the fact that next to its pertaters,
The State of Maine should cherish most, its crop of rusticators:
That the town always had performed whate'er the latter wished,
And if it failed to do this now, it surely would be dished;
Besides he showed that auto cars though made for pleasure uses,
Could bring to town cheap labor, and other great abuses.

The voters now were saying, with an impatient note,
We've let these windy fellows talk — let's get to work and vote
Mount Desert men have level heads — they know a thing or two,
We did not need this tiresome talk to teach us what to do.

So out they turned, the summer folk, and when the count they wrote,
They'd kept the autos out of town by an enormous vote.
So glory hallelujah, hip, hip and three times three;
Mount Desert Town of fair renown, from autos will be free.

S. W. H.

Herbert Weir Smyth —
[illegible] of Harvard.

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APPENDIX IV

AN AUTO-LESS SUMMER RESORT

To the Voters, Cottagers, and Hotel Guests in the Town of Mt. Desert, present and to come:—

For seven or eight years past the question has been actively debated among the permanent residents of the Island of Mt. Desert whether their business interests would be promoted by the introduction of automobiles.

There are four towns on the Island,—Eden, including Bar Harbor in the northeasterly portion, Tremont and Southwest Harbor in the southwesterly portion; and between these lies, stretching from southeast to northwest, the town of Mt. Desert, which includes the villages of Somesville, Northeast Harbor, and Seal Harbor, and a large part of the most interesting scenery on the Island. Since the Civil War a large summer business has been built up on the Island, partly through the coming of hundreds of families who own or lease cottages for occupation during the summer months, and partly through the habitual resort of other hundreds of visitors to hotels and boarding-houses on the Island. Natives of the Island or of neighboring towns on the mainland have built almost all the cottages, shops, stores, stables, hotels, boarding-houses, and roads and bridges in the town. They carry on the hotels, boarding-houses, and tea-houses, and the provision stores, shops, and laundries, and raise the vegetables, fruits, flowers, milk, eggs, and poultry for which the summer visitors supply the market. The permanent residents get their living in large measure out of the needs and desires of the summer residents. This description is true of all the towns on the Island, except that the town of Tremont is the seat of an important shore fishing industry which lasts the year round, and that lobstering gives occupation to a moderate number of men during all the year except midwinter. There were formerly in the town of Mt. Desert considerable quarries which produced granite for building and paving purposes; but the high price of cut stone and the substitution of brick, asphalt, and tarred macadam for granite blocks as paving have almost destroyed this quarry business.

It is, then, the summer business which has caused the remarkable development of the Island's prosperity during the past forty years. If this prosperity is to be measured by the increase of population and of valuation, the town of Eden has

had the largest share of it, and the town of Tremont the smallest. The town of Mt. Desert has, however, enjoyed a steady gain with no significant fluctuations or periods of depression. The village of Northeast Harbor, with the adjoining territory called Asticou, has this summer (1913) a hundred and sixteen occupied cottages owned or leased by summer residents. The village of Seal Harbor has fifty-seven such cottages. Northeast Harbor has four good hotels, and Seal Harbor has two.

The summer population of Somesville, Northeast Harbor, and Seal Harbor is somewhat different from that of Bar Harbor or Newport. It consists chiefly of well-to-do, but not luxurious, people, who wish primarily to enjoy the healthful climate, rare scenic beauty, and quiet of the Island, and to practise the natural outdoor sports of such a place,—walking, riding, driving, tennis, golf, rowing, swimming, and sailing. Most of them are seeking a decided change from their urban or suburban life during the rest of the year. They are seeking relief from the noise, dust, hurry, and incessant social or business engagements of city and suburban life. A large majority of the summer residents are women and children, who value the freedom and security of the roads and trails and the simplicity of the social life.

The town of Mt. Desert has been fortunate in that the relations between the permanent residents and the summer residents have always been very friendly and sympathetic. These good relations have strongly promoted the prosperity of the town. The summer visitors recognize the fact that many of the advantages of the place and of the facilities for enjoying them are due to the enterprise and industry of the permanent residents, who have built hotels and cottages to rent, carried on all the trades needed at a summer resort, and established market gardens, though not enough of these. Only a very few of the owners of summer cottages have become voters in the town; so that the summer people are dependent on the permanent residents for the just and wise conduct of the town affairs, although it is the summer residents that pay the greater part of the taxes. They recognize that the voters and the selectmen have been just and fair in the assessment of taxes, in the laying out and maintenance of roads, culverts, bridges, and sidewalks, and indeed in all the town expenditures. In this important respect the voters of the town of Mt. Desert have been wise as well as just, for it is easy to destroy the prosperity of a summer resort by injustice in regard to taxes and local selfishness in making and spending appropriations.

Under these circumstances the voters of the town of Mt. Desert have had before them for several years past the question of admitting automobiles to the town. Under permissive State legislation the towns of Tremont and Southwest Harbor admitted automobiles four years ago. This year (1913) the town of Eden, which includes Bar Harbor, admitted them; but the town of Mt. Desert has never admitted them. On the 25th of July, 1913, a town meeting was called by the selectmen, at the instance of ten persons, who signed a petition for a meeting to consider, among

other articles in the warrant, an article which, if adopted, would have admitted automobiles to the town. The subject had been actively discussed among both the summer and the permanent residents for several weeks, and a public debate in which both sorts of residents participated took place at the town meeting. When the vote was taken, 292 voters declared themselves opposed to the admission of automobiles, while 18 favored their admission. The argument which prevailed at that meeting was briefly this:—"The prosperity of this town is chiefly due to the summer business. The summer residents now in the town are almost unanimously opposed to the introduction of automobiles, and it is fair for the voters to consider their wishes. But, further, if all the present summer residents prefer the place without automobiles, there must be in the cities and large towns of the United States many thousands of persons of like mind, who would select as a summer resort a beautiful and wholesome town in which they would be free from automobiles. The town of Mt. Desert can surely increase its present prosperity by meeting the wants of such people. Let us voters, then, declare as plainly and decisively as we can that we do not mean to have automobiles in this town."

Other considerations, however, contributed to the striking result. The Island of Mt. Desert is not a thoroughfare. It is not on the way to any other popular resorts. It is not within easy reach of any large city. Its roads are narrow, hilly, and winding, and they have no sidewalks. An automobile going twenty miles an hour would pass over all the feasible routes of the Island in four or five hours, and would then have gone two or three times over some of the roads. The existing roads on the Island could hardly be used by automobiles more than seven months out of the year, and would always be rough and dusty; and if the four towns of the Island should undertake to build proper automobile roads, taxes would certainly go up, while valuations might go down. It does not follow from the fact that automobiles are in cities and large towns convenient instruments for the quick transportation which enables a professional or business man to do more work in a day, children to get to a remote school more easily, and a family to meet more social engagements than they otherwise could, that the automobile is a desirable pleasure vehicle at a summer resort. It is not yet proved that automobiles are going to survive as pleasure vehicles in a proper sense. Since automobiles became so largely vehicles for traffic and business, there is a return to horse-carriages for pleasure purposes. When there is no hurry—as in a summer vacation—and no good object to accomplish by rushing over ten or a hundred miles of road in the shortest possible time, the function of the automobile becomes somewhat limited.

The voters of the town of Mt. Desert are obviously of the opinion that the town may most advantageously announce itself as a town free from automobiles, where summer visitors, whether cottagers or hotel guests, may be safe from the noise, dust, odors, and dangers which inevitably accompany the automobile. Great pains have been, and are, constantly taken to make and keep Northeast Harbor and Seal Har-

bor clean and wholesome. Thus the public water supplies are pure and can be kept pure, and the drainage systems for the villages have been carefully studied. The roads and trails are safe for women and children without escort. There has been no need of policemen by day or watchmen by night to keep the roads and trails safe. Automobiles would bring in new evils to be guarded against and repressed; and for such functions the present town government is not well adapted. The business interests of the town and the interests of the summer population alike indicate that automobiles should be excluded.

The considerations presented in this letter are not of a temporary nature. On the contrary, the tension of American life, already high, is likely to become higher as time goes on, with the telephone coming into commoner and more extensive use, and machines of many sorts quickening the rate of men's and women's work from morning till night. Therefore sensible, well-to-do people are sure to desire more and more to take their vacations, long or short, in freedom from the harassments and fatigues of their ordinary life. The town of Mt. Desert is therefore adopting a policy which is not only advantageous to-day, but will be more and more advantageous in the future. The auto-less health and pleasure resort is sure to be more and more in demand.

From Northeast Harbor.

JOSEPH H. CURTIS, Boston, Mass.
CHARLES W. ELIOT, Cambridge, Mass.
CHARLES H. FRAZIER, M.D., Philadelphia, Pa.
DAVID H. GREER, New York, N.Y.
RICHARD H. HARTE, M.D., Philadelphia, Pa.
JEROME H. KNOWLES
WILLIAM DRAPER LEWIS, Philadelphia, Pa.
JOHN S. MELCHER, New York, N.Y.
FRANK R. OBER, M.D.
HENRY PAREMAN, Boston, Mass.
ALVAH L. REED
L. A. WILSON

From Seal Harbor.

AMOS CLEMENT
ERNEST B. DANE, Brookline, Mass.
EDWARD K. DUNHAM, M.D., New York, N.Y.
F. H. MACOMBER
JAMES FORD RHODES, Boston, Mass.
JOHN D. ROCKEFELLER, Jr., New York, N.Y.
WILLIAM T. SEDGWICK, Boston, Mass.
HENRY VAN DYKE, Princeton, N.J.
W. H. WHITMORE

From Somesville.

GEORGE F. ARNOLD, Brookline, Mass.
R. L. GRINDLE, M.D.

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APPENDIX V.

To the Honorable Senate and House of Representatives in Legislature Assembled.

We, the undersigned, voters of the Town of Mount Desert, Hancock County, Maine, believing that any change in the present law, relating to the use of automobiles within the limits of said Town will be detrimental to the best interests of said town, hereby remonstrate against the bills now pending before said Legislature, namely, "An act permitting the use of Automobiles in the Town of Mount Desert" and "An act relating to the use of Automobiles in the Town of Mount Desert" and respectfully request that the law remain as enacted by the Legislature of 1913.

A. E. Clement
P. S. Kennedy
P. E. Lincoln
Alfred Stanley
A. M. Dyer
Lee F. Eddy
Samuel L. Dodge
I. L. Haynes
E. A. Pettee
J. C. McCrae
Fred A. Hoffman
H. C. Bracy
[illegible]
Geo. S. Eaton
Frank L. Peckham
[illegible]
[illegible]

APPENDIX VI.

SEVENTY-SEVENTH LEGISLATURE

SENATE NO. 319

In Senate, March 11, 1915.

Reported by Majority from Committee on Judiciary, and ordered printed under joint rules.

W. E. LAWRY, Secretary.

STATE OF MAINE

IN THE YEAR OF OUR LORD ONE THOUSAND NINE HUNDRED AND FIFTEEN

AN ACT permitting the use of automobiles in the town of Mount Desert.

Be it enacted by the People of the State of Maine, as follows:

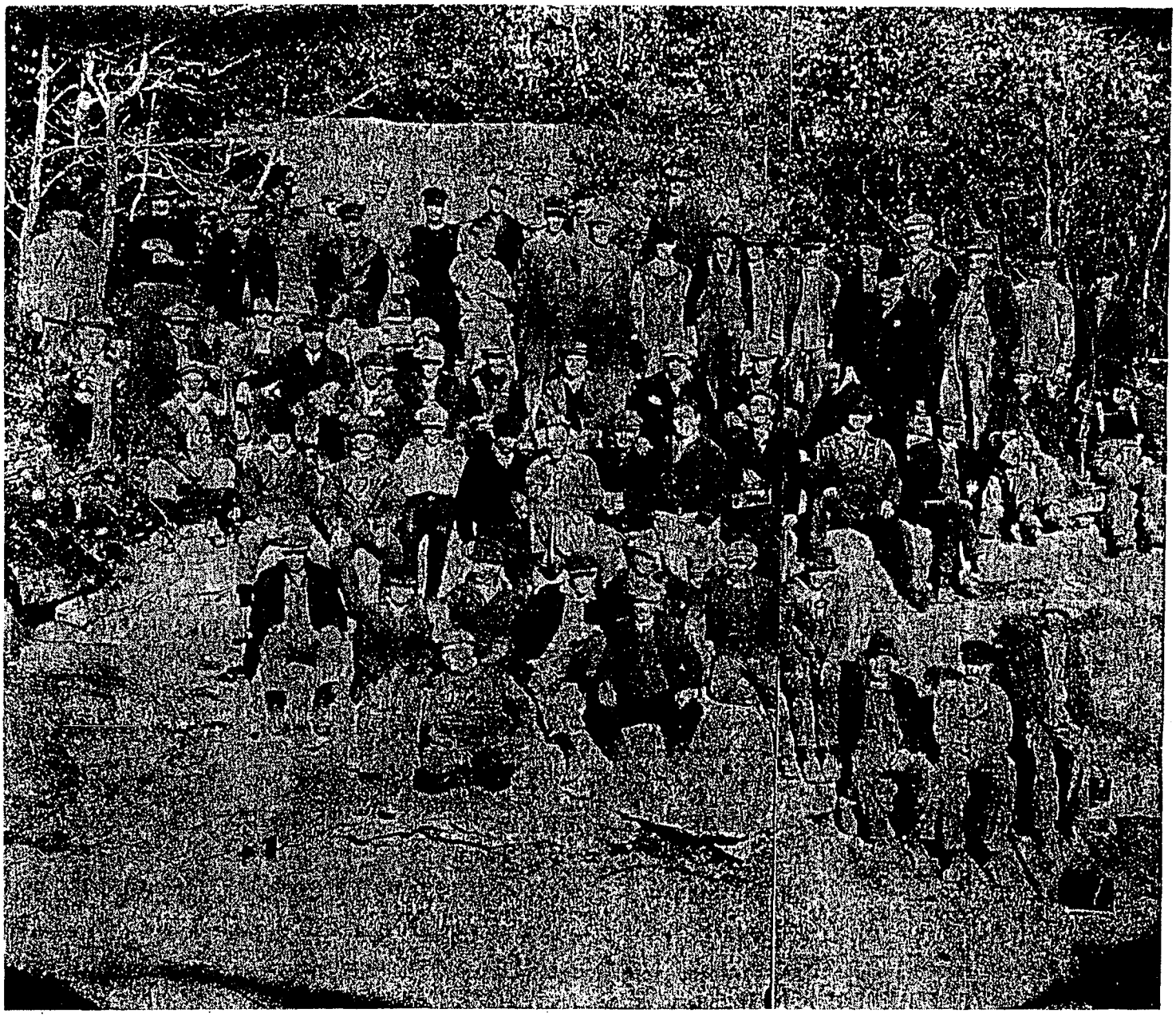
All acts or parts thereof prohibiting or restricting the use of automobiles or motor vehicles in the town of Mount Desert, on the island of Mount Desert, in the county of Hancock, are hereby repealed.

All by-laws and ordinances of said town of Mount Desert prohibiting or restricting the use of automobiles or motor vehicles on the town ways, streets or highways of said town are hereby declared void and of no effect.

APPENDIX VII. *Bar Harbor Times*, December 14, 1967

1. Walters G. Hill
2. Cliff R.
3. Bide Ruhadin
4. Sewell Brown
5. Bill Sawyer
6. Lyle Smith
7. Chester Rich
8. Manley Wilkson
9. Frank Brewer
10. Will Thorne
11. Burton Gray
12. Lawrence Enuif
13. Clarence Dow
14. Harry Davis
15. Nelson Mitchell
16. Burnell Salsbury
17. Sherry Salsbury
18. Linwood Richardson
19. Persy Goodwin
20. Dan Makingay
21. Aca Mashatt
22. Konssy Gratern
23. Edd Day
24. Bill Cordy
25. William Sawyer
26.
27. Del Murphy
28. Hank Connors
29. Cal Billington

Names received from Mrs. C. A. Marinke



THIS OLD PHOTO, property of Linwood Richardson of Town Hill, shows one of the road crews which built the first Mountain Road between the Eagle Lake Road and Bubble Pond. It was taken in 1926 about a quarter of a mile north of Bubble Pond. At least eight of the men in the picture are still living on MDI. They are Mr. Richardson, Walters Hill, the engineer, Burnell Salsbury, Jr., Percy Goodwin, Sewell Brown, William Sawyer, Ed Day, and Burton Gray.

APPENDIX VIII. *Bar Harbor Times*, January 25, 1968

Designer of carriage roads dies

The designer of Mt. Desert Island's well known carriage roads, Walters G. Hill, of Bar Harbor died Thursday in a Bangor hospital at the age of 79.

Born at Medicine Lodge, Kan, on Aug. 31, 1888, he was the son of Elwood and Letitia (Joy) Hill.

He attended Bar Harbor schools, graduating in 1907 from Bar Harbor High School. He also attended the University of Me. and was a member of Sigma Nu fraternity. During World War 1, he attended the Field Artillery Officers Training camp in Louisville, Ky.

After his discharge from the Army, he went to Canada to work for the Great Eastern Paper Co. as a forester and engineer. He had also worked as an engineer in Puerto Rico and Spain.

Locally, he had been employed by the late John D. Rockefeller Jr., and made the preliminary survey of the Summit Road here. With the late Paul D. Simpson, he also surveyed and superintended the building of the carriage roads on Mt. Desert Island.

Upon completing his work in Acadia National Park, the last being the Ocean Drive extension, he worked for the U.S. Army Engineers at Presque Isle, Limestone, and Bangor; and later for the Maine State Highway Commission, from which he retired at 70.

Hill had served as a Bar Harbor selectman and town councilor. In 1938 he became president of the Clark Coal Co. board of directors.

He was a member of the Bar Harbor Masonic Lodge, the American Legion and World War 1 Veterans Association, The 40 Hayseeders, the Maine State Employees Association, and the Maine Society of Engineers.

Surviving are his wife, Sylvia (Leland) Hill of Bar Harbor; one daughter, Mrs. Charles A. Marinke of Bar Harbor: one son, David; two grandchildren; a sister, Mrs. C.H. Richardson of Bar Harbor; and two nephews.

Funeral services were held Saturday at the McFarland Funeral Home with the Rev. Harold Symons officiating.

Burial was in the Ledgelawn Cemetery, Bar Harbor.

WORKING ON THE NEW GATE LODGES

Rockefeller Constructing Attractive Buildings at Seal and Northeast Harbors

Work, begun in late October, is now well underway on the foundations of two Gate Lodges, one at Northeast Harbor and the other at Seal Harbor, being built for John D. Rockefeller, Jr. of Seal Harbor and New York, which will be completed in June and which are designed for living quarters of those in charge of traffic on Mr. Rockefeller's road systems.

Contracts, it is stated, are for $75,000, but it is understood that the cost when complete of the two groups of buildings, with various appurtenances, grounds, etc., will amount to $150,000.

There are 35 men now employed in addition to the crew which, composed of Mr. Rockefeller's men, did the excavating. The architect is Grosvenor Atterbury (John Tompkins, Associated) of New York, nationally known. The general contractor is C. M. Smallidge of Seal Harbor and he will do the carpentering and painting while the lathing, plastering and masonry is in the hands of B. C. and Rae D. Graves of Northeast Harbor. Raymond Celli, of Florence, Italy, is the inspector in charge and is now with the project.

Everett Jordan of Seal Harbor is doing the heating and plumbing. The Tiling and sheet metal is by the Bangor Roofing Company. E. C. Ober of Northeast Harbor is in charge of all electrical work. A minor but interesting detail, as it applies to the cement work and the like, is the use of Eleaterite, a new material applied to walls and similar construction, which does away, it is stated, with dampness, staining and other weather and time effect on such work. Eleaterite, in New Engiand, is sold by John Lewis Bixby of Boston.

The lodges are to be of stone to the top of the first floor windows. The lumber used is to be cypress; and this with the granite, stone and the brick veneer, will make a combination of shape, structure and coloring to merge beautifully with the landscape. The roofs will be of dark reddish color, shaded and merging into a handsome effect. The whole plan of the lodges, each of which really represents not a one a single edifice but a group of uniquely lovely structures, is that they shall reproduce the vision of buildings which might have been built by the old French pioneers in the days when the Island was settled by the French long before the English came to Plymouth.

The houses will be of simple structure; but they are commodious and comfortable homes, nonetheless, with four rooms below, and with four chambers and tiled bathrooms above. There will be, in each Gate Lodge, an artesian well of the latest type with capacity for furnishing plenty of pure water at all seasons for household use. These wells have been dug by the Scribner Artesian Well Company of Bangor.

The granite and rock used in the construction are furnished by Mr. Rockefeller and it comes from his own land on Mt. Desert Island. For one project the brick is from Virginia and for the other from Holland.

In the Seal Harbor Gate Lodge which is the major piece of construction since the group there will include two gate houses, handsome little buildings, one with the clock and the other with the bell, octagonal, with high pointed roofs, is sounded the note of the Norman French. Flagged porch, leaded glass windows, chimney pots, and weather vanes, all carry out the simplicity, the beauty and the charm of the design.

The Lodges, beautiful as they are in design and carried out as they will be, to the letter, in construction which follows faithfuly every detail are not dependent for their beauty on their construction alone; for their location is a detail playing a big part in their unique attraction.

The Lodge at Northeast Harbor has no gate houses, but it is nonetheless attractive. It is situated on what was for years known as Solus Hill, now Pond Hill. Hadlock Pond is near. The Lodge there is situated at the entrance to what is known as the Acadia road system.

The Seal Harbor Gate Lodge is about 300 yards from the Jordan Pond House. It is but a short distance from the beautiful Acadia National Park motor road, a gift to the Government for the Park, from Mr. Rockefeller. The scenic setting is superb, just there. And there is the meeting of the Bubble Pond Road, the Jordan-Sargent Mt. Road and the Jordan Pond road.

The construction of these two lodges marks a step well considered in the development of the Rockefeller system and, incidentally but none the less surely, it marks a step in development of the whole Island and for the Park, since such beautiful structures must at its borders constitute unique possessions in which it shares.

APPENDIX X.

Typical "Road Notes" from Beatrix Farrand

ROCKEFELLER ROADS
November 11, 1934

A short drive on a cloudy afternoon showed a good many places where a very small amount of cutting would keep open certain vistas created one or two years ago. The drive, which Charles Miller and Mrs. Farrand took started from the Duck Brook Bridge, over the Hulls Cove carriage road, around to Paradise Hill and back to the Duck Brook Bridge, along the Marsh, thence returning to the Breakneck Ponds and so under the Eagle Lake bridge up the Aunt Betty's Pond road, up Aunt Betty's Pond brook, up Sargent, around Sargent and Little Brown, over the Amphitheater Road and back to the Stanley Brook Bridge planting.

The following notes were made in the course of this drive:

Hulls Cove Carriage Road

North of the Duck Brook Bridge, cherry and birch sprouts should be cut out in the first vista looking northeast over the bay.

Cherry sprouts should also be put out in the two vistas to the north of the first mentioned one.

A few sprouts should also be taken out of the first view of Witch Hole pond as seen from the road, as one approaches it from the southeast.

A group of poplar sprouts should be taken out of the southeast bay view as seen from Paradise Hill.

In the northeast view from Paradise Hill, a good young oak should be left but the other

oaks and the birches should be taken out, and this birch-sprout cutting should continue around the north loop.

Sprouts should also be taken out of the Paradise Hill vistas as seen from the west side from the loop.

It may not be possible to thin the sprouts on the north side of Witch Hole Pond as much as is needed. A good deal of cutting should be done in order to preserve at least some of the Pond views.

A few sprouts are also growing awkwardly in the vistas to Fawn Pond as seen from the east.

Sprouts are also to be taken out from the Hulls Cove carriage road looking south towards the mountains.

There are a good many sprouts which should be taken out to open up the marsh view in at least two places.

At the south side of Half Moon Pond, some young birches and maples should be cut.

Aunt Betty's Pond Road

At the hill top looking south to the mountain, a sugar pear should be taken out of the eastern vista and a small maple beyond it, as well as two small white pines and a spindley sugar pear.

In the west vista, between half a dozen and a dozen small spruces should be taken out as well as some intruding beech and maple sprouts.

A small maple should be cut out of the south of the road in the next west vista to the mountains. The vista lies approximately a hundred yards to the west of the last one described.

Further sprouts should be taken out of the view overlooking Sargent Mountain.

In the western vista, a few spindley maples should be cut out and in the next vista to the north or west, three thin ugly young maples should be cut.

At the south end of Aunt Betty's Pond, a few maples and small spruces should be cut out in order to keep the vistas open, and one or two dead limbs on the pines were also noted.

In the view looking out over the marsh and from the northwest of the marsh, an oak is to be limbed up and probably extend the vista eastward in order not to unveil the carriage road as seen from Sargent Mountain Drive. This vista might well be extended to eastward and allowed to close up on the western end.

Some more birches might be taken out on the east side of the marsh, as this is one of the loveliest views on the drive.

Perhaps a few taller spruces might be taken out from a few of the marsh views as seen from the south.

On the Sargent Mountain drive, east of the Chasm Brook Bridge, intruding sprouts should be taken out from the north side of the road. This is also true of several groups of sprouts west of the bridge.

Many more sprouts need to be cut on the

upper slopes of the Sargent Drive. It would be well if these could be done, but Charles feared that time might be lacking for this work.

Some of the northwest views from the Sargent Drive looking out over the sound are, in places, getting crowded too thickly with sprouts.

A few groups of birches on the northwest of Little Brown Mountain might be cut out, but bearing in mind that the concealment of the road and its parapets from the south, and the drive on the north of the island is essential.

On the Southwest side of Little Brown Mountain, a few bunches of birch should be cut out giving occasional openings towards Hadlock's Pond.

The two waterfalls at Chasm Brook and Waterfall bridge were at their best, foaming masses of white water, of much greater volume than Mrs. Farrand had previously seen. Five deer were noticed in the course of the drive.

Where the roadside spruces have been planted in monotonous rows, further thinning should be done, as much as time will permit, in order to take away from the monotony of the present nursery-like rows.

This thinning is especially advisable on what Charles and Mrs. Farrand call the "nameless" road, not far from Jordan's Pond.

At the Stanley Brook Bridge, further inspection showed how much the planting had improved the whole neighborhood. The pines have quite transformed the slopes, and big groups of sumachs near the bridge, cedars north of

the bridge and shrubs on the spaces between the trail, the bridle path and the large road have very much "furnished" the whole scheme. Mrs. Farrand feels, and thinks Charles agrees with her, that if it be possible to plant four maples north and south of the bridge (two on the north and two on the south) it would materially add to the attractiveness of the bridge arch itself. Sufficient root run should be provided for the four trees and this would probably mean cutting out a little on the west side of the road. Mrs. Farrand feels quite distinctly that this tree planting would be most desirable, as otherwise there is no way of veiling or framing the big arch.

Mr. Rockefeller will doubtless wish to look at the big yellow birch now sadly dying north of the bridge, which is growing on the promontory around which the brook turns an almost right angle.

At the southeast end of the bridge, it was suggested that two good redverried elder berries be planted, one accompanied with roses and the other with sweet fern or Diervilla.

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APPENDIX XI.

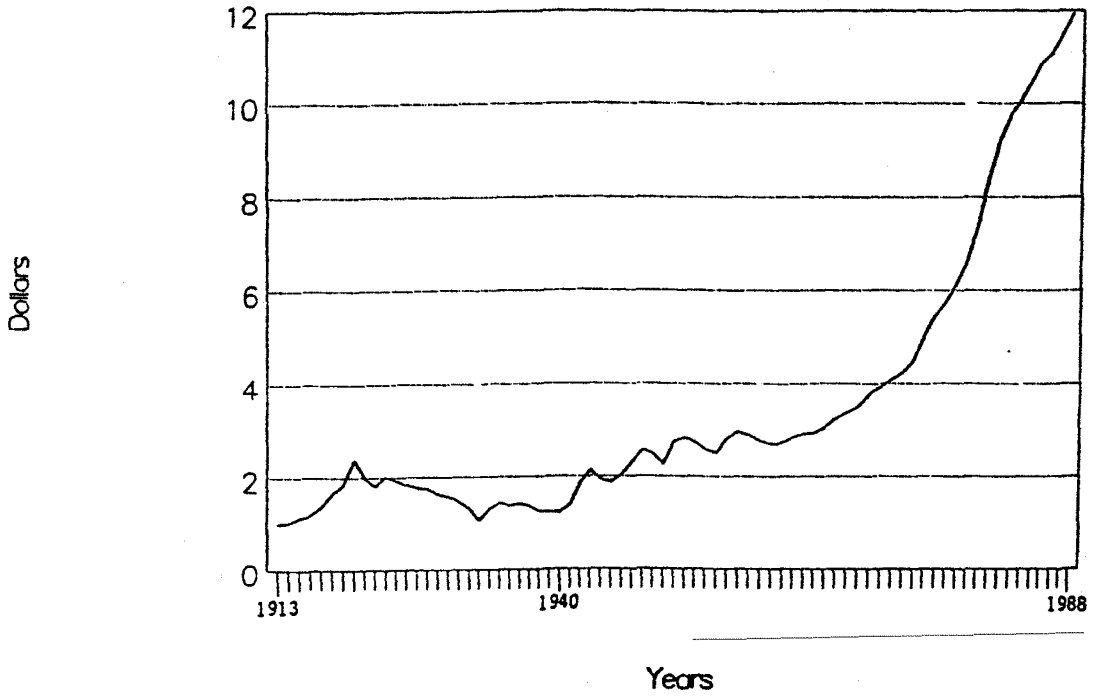
ROAD CONSTRUCTION COST INFLATION 1913 -- 1988

Year	1967= 100.0	1913= 1.000	Year	1967= 100.0	1913= 1.000
1913	29.6	1.000	1951	81.7	2.756
1914	30.2	1.020	1952	84.1	2.837
1915	33.5	1.130	1953	81.0	2.732
1916	35.5	1.197	1954	76.4	2.577
1917	40.7	1.373	1955	74.2	2.503
1918	49.2	1.660	1956	84.0	2.833
1919	54.5	1.838	1957	87.7	2.958
1920	70.8	2.388	1958	85.5	2.884
1921	58.7	1.980	1959	82.0	2.766
1922	53.5	1.805	1960	80.0	2.699
1923	59.6	2.010	1961	80.7	2.722
1924	57.1	1.926	1962	84.3	2.844
1925	54.3	1.832	1963	86.4	2.914
1926	52.2	1.761	1964	86.9	2.931
1927	51.5	1.737	1965	90.3	3.046
1928	48.1	1.622	1966	96.1	3.242
1929	46.6	1.572	1967	100.0	3.373
1930	43.3	1.461	1968	103.4	3.488
1931	38.8	1.309	1969	111.8	3.771
1932	30.9	1.042	1970	116.3	3.923
1933	38.8	1.309	1971	121.3	4.092
1934	42.4	1.430	1972	125.3	4.227
1935	40.7	1.373	1973	133.1	4.490
1936	41.9	1.413	1974	147.7	4.982
1937	40.1	1.353	1975	161.2	5.437
1938	36.8	1.241	1976	170.5	5.751
1939	36.6	1.235	1977	181.5	6.122
1940	36.1	1.218	1978	195.4	6.591
1941	41.1	1.386	1979	217.4	7.333
1942	55.0	1.855	1980	246.8	8.325
1943	63.1	2.128	1981	272.4	9.188
1944	57.1	1.926	1982	289.1	9.752
1945	55.1	1.859	1983	298.4	10.065
1946	60.1	2.027	1984	311.1	10.494
1947	68.3	2.304	1985	322.2	10.868
1948	76.4	2.577	1986	328.4	11.077
1949	73.7	2.486	1987	340.4	11.482
1950	66.6	2.247	1988	353.7	11.930

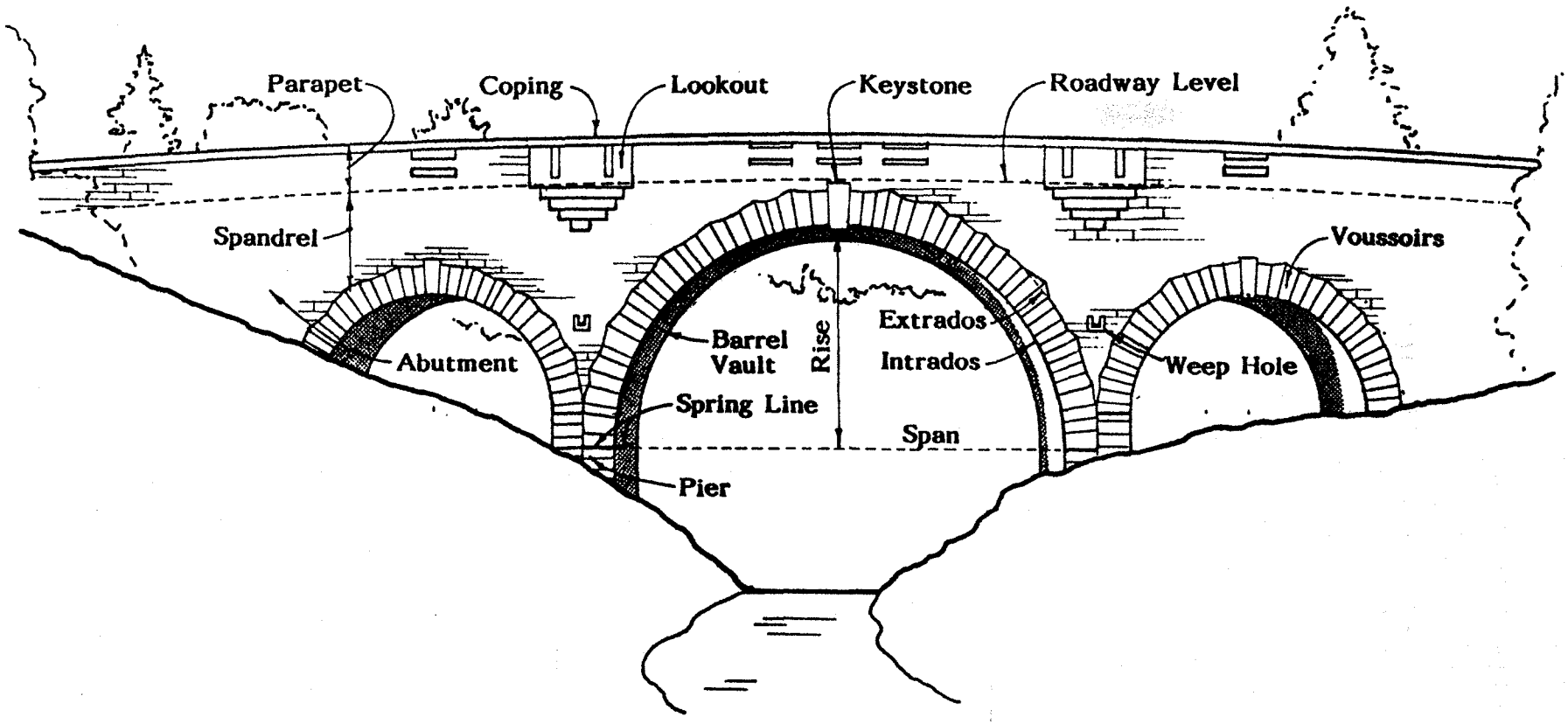
Sources: Bureau of Labor Statistics
1913 -- 1915 Average of Contractor Indexes
1915 -- 1988 Federal Highway Administration

Road Construction Cost Index

1913 = 1.00



Sources: Bureau of Labor Statistics
1913 -- 1915 Average of Contractor Indexes
1915 -- 1988 Federal Highway Administration

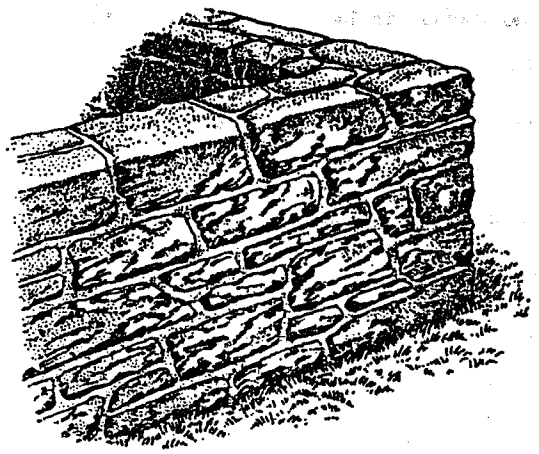


APPENDIX XII.

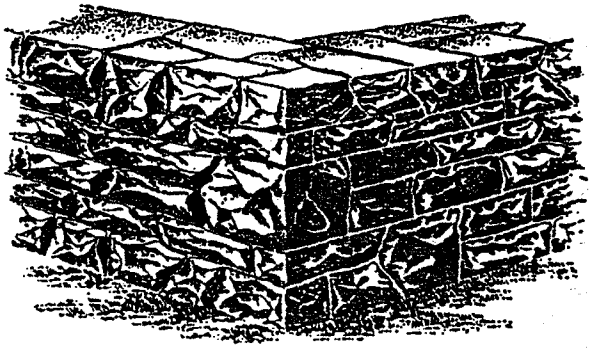
TERMINOLOGY FOR STONE BRIDGES

APPENDIX XIII.

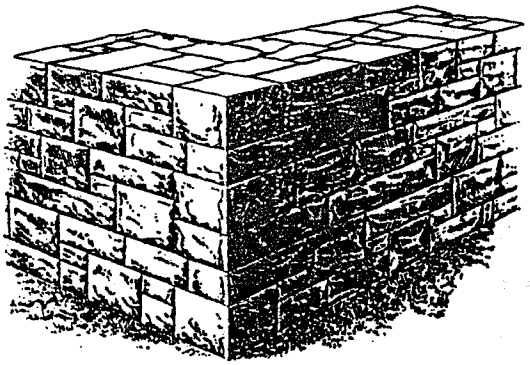
Stone Masonry Patterns



Rubble



Coursed Rubble



Broken Ashlar

APPENDIX XIV.

SPECIFICATIONS

for

a road at Seal Harbor to be built according to survey and plans made by C. P. Simpson, C.E., who is referred to hereinafter as the engineer and wherever the word "engineer" is used it refers to the chief engineer or his authorized assistants by whom all explanations and directions necessary for the satisfactory prosecution and completion of the work described in these specifications will be given.

INTERPRETATION OF SPECIFICATIONS

In case of ambiguity of expression in the specifications, or doubt as to the correct interpretation of the same, the matter shall be submitted to the engineer, whose decision shall be final.

OMISSIONS IN SPECIFICATIONS

Any work or materials that may have been accidently omitted in the description of the work, but which is clearly implied, shall be furnished by the contractor the same as if it had been specifically stated.

CONTRACTOR DEFINED

Wherever the word "contractor" is used it refers to and means the party or parties who shall have duly entered into contract with the owner to perform the work; his duly authorized agents or legal representatives.

NOTICE TO CONTRACTOR

Any written notice to the contractor which may be requisite under these specifications may be served on said contractor either personally or by mail, or by leaving the same at his last known place of residence.

PRESERVATION OF ENGINEER'S MARKS

All engineer's marks and stakes after location shall be carefully preserved without disturbance until permission for their removal or erasure shall be given, and every facility must be furnished for the staking out, etc. of all the work to be done under these specifications.

DISMISSAL OF INCOMPETENT PERSONS

Any incompetent person or persons who may be employed on the work shall be removed on the requisition of the owner or engineer; and no person so removed shall thereafter be employed upon any portion of the work.

SPIRITUOUS LIQUORS

Contractors are not to give or sell or suffer any one to give or sell or keep any ardent spirits on any part of the work or in any boarding house or building under his control.

QUALITY OF MATERIALS

All materials furnished and used under these specifications must be of the best quality of their respective kinds, free from any and all defects which in the judgment of the engineer may render them unfit for use. Rejected material must be at once removed from the works or conspicuously marked "condemned". If condemned material is used in any part of the work, the same shall be removed and replaced with materials of the quality required by these specifications.

RIGHT RESERVED TO ALTER DETAILS

The engineer, during the progress of the work, may, by giving written notice to the contractor, alter any of the details of construction in any manner that may be found expedient or suitable; such alterations shall not invalidate the contract, and the contractor must adopt and execute the same as if they were a part of the original contract, and at the completion of the work an allowance will be made for such alterations, etc., either for or against the contractor as the case may be, and the value of such alterations will be estimated by the engineer from the schedule of prices attached to the contract, or, should it not apply, the equitable amount will be estimated by the engineer whose figures the contractor hereby accepts as final.

CHARACTER OF ROAD

The road to be built shall be what is known locally as a rock filled road, with a top surface of clay and bank gravel, such as may be found in the vicinity of the work or the finer grades of crushed rock

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may be substituted for gravel. In general the road is to be of the same character as the Sea Cliff Drive and the Gardiner-Mitchell Hill-Jordan Stream Road, to which reference is made as a standard for road bed, retaining wall, gutters, etc. The road shall be built true to line and grade as established on the ground by the engineer or as shown on plans, with no humps, hollows, yanks or crooks, and the lines, particularly on curves, shall be true and even. All wet and low places shall be filled with rock.

WIDTH AND CROWN

The road shall be 16 feet in traveled width inside the gutters, fences or walls except where a greater or lesser width is specified, and will be crowned so as to be 8 inches higher in the centre than at the edges. This crowning to be even and to be made in the rock fill and verified before the top surface is put on. In placing the rock fill due allowance must be made for settling and wear during construction so that the crown of the road when finished shall be 8 inches. Where a greater width than 16 feet is shown on plans the crown shall be increased proportionately.

CLEARING

The land will be cleared to the width of 12 feet on each side of the center line where the road is a traveled widthof 16 feet, and each section must be entirely completed before grading is commenced. All stumps shall be pulled or grubbed out.

Brushwood, stumps, tree limbs, etc. must not be cast upon the adjacent land, but shall be formed into piles and burned; stumps and other material that will not burn, must be removed from the work and disposed of by the contractor to the satisfaction of the owner. All brush or trees accidently or otherwise thrown upon the adjacent lands must be taken off and disposed of as above described. All blasting where necessary shall be properly protected by dunnage.

CARE IN BURNING

Particular care must be taken in the burning of all brush and stumps so as not to scorch or injure growing trees. Any tree so scorched or injured must be taken down at the contractor's expense and disposed of.

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FOUNDATION

The foundation shall be of broken rock finished with at least 4 inches of small rock and to be crowned 8 inches from edge to center of road. Upon this will be put a light coating of fine screenings or coarse gravel sufficient to fill up the spaces between the stones so that the top dressing will not sift through.

FINISH SURFACE

Finish with 2 inches of gravel that will pass through a sieve of 1-1/2 inch mesh and one inch of clay as a binder; all to be rolled upon completion when wet with a roller not less than 2 tons in weight.

GUTTERS

Gutters should be built on each side of the road at least 2 feet in width and of sufficient depth to carry off water. Reference being made in this as in other respects to the gutters on the Sea Cliff Drive and the Bar Hill Road.

DRAINS AND CULVERTS

Culverts formed of stone or Acme or Sterling iron pipe at least 10 inches in diameter will be laid wherever directed by the engineer and will be protected at each end by retaining walls of stones or concrete built up to the level of the road. Wherever possible stone culverts of ample dimensions shall be used. If there is not sufficimnt depth, the iron pipe culverts shall be used and always of as large dimensions as possible. It is the purpose of this clause to assure ample drainage with openings so large as to reduce to a minimum the danger of stoppage with leaves, dirt or debris. A catch basin not less than 18 inches in the three dimensions shall be formed of flat rock, at the entrance to each culvert with its bottom at least a foot below the bottom of the culvert so as to form a receptacle for leaves and debris and prevent the stopping up of the culvert.

RETAINING WALLS

Retaining, slope, parapet and breast walls of dry stones will be constructed where directed. The stones for this kind of work must be sound, flat, bedded stones. No round or cobble stones will be allowed.

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Not more than one-third of the stones shall be one foot thick, and no stone shall be less than six inches thick or have a bed area of less than four feet. The stones shall be set horizontially on their largest bed and no bond shall be less than ten inches. Large stones of sufficient weight to hold fence posts shall be placed in the coping of these walls every 10 feet. The walls shall be built with a batter of 1-1/2 inches to one foot in height and shall be eighteen inches thick at the top. They shall be firmly bedded at the bottom and where set on sloping ledge, it shall be blasted out to make a footing and the bed stones secured in place by iron bolts if directed by the engineer.

BATTER

Care much be taken in the building of the retaining walls to allow for batter so that the top of the wall may align with the edge of the road as planned.

PAYMENTS

Monthly estimates shall be made during the progress of the work and payments to the amount of 85% thereof will be made, the retained percentage not being due or payable until the final completion of the work. The contractor shall, if required, exhibit signed pay rolls evidencing that all labor, teams and material used or employed on the work has been paid for in full.

PERSONAL ATTENTION

The contractor shall give his personal attention to the faithful prosecution of the work, shall not sublet the same or any part thereof without the consent of the owner, nor will he assign by power of attorney or otherwise any of the moneys payable under these specifications.

LIABILITY INSURANCE

It is distinctly agreed that the contractor shall carry Accident Liability Insurance in some good reliable company, the premium on such insurance to form a part of the costs under this contract. The contractor shall save the owner from and hold him harmless against all claims and suits based upon any real or alleged injury to persons (whether employes or otherwise)

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or property which may occur or which are alleged to have occurred by or on account of any act or omission on the part of the contractor, sub-contractors or their servants or agents, or which may occur or which are alleged to have occurred in connection with the work covered by this contract, from any cause whatsoever other than the act or omission of an employe of the owner who is not an agent, servant, workman or employe of the contractor or sub-contractors engaged in the performance of work in or about said road under this contract. And the contractor agrees to defend all such actions at his own expense, to pay all charges of attorneys, and all court or other expenses, and in the event of judgment being rendered against the owner in any such action, the contractor agrees to satisfy the same.

This agreement made the 25th day of September in the year one thousand nine hundred and eighteen by and between A. E. Clement of Mount Desert in the State of Maine, party of the first part, hereinafter designated the contractor, and John D. Rockefeller, Junior, of New York in the State of New York, party of the second part, hereinafter designated the owner,

WITNESSETH: That the contractor in consideration of the agreement herein made by the owner agrees with the said owner as follows:

Contractor shall and will provide all materials and perform all work for the construction of a road at Seal Harbor, Maine, as surveyed by C. P. Simpson, C.E., beginning at the Gardiner Road, running along the West side of Witchell Hill, crossing the Little Harbor Brook and to a point on the West side of the brook where the road makes a turn to go South and around Bear Hill. The road to be as described in the specifications hereinabove recited, which are hereby made a part of this contract. It is understood that the bridge across the Little Harbor Brook is not included in this contract but will be made the subject of a separate contract.

It is hereby mutually agreed between the parties hereto that the sum to be paid by the owner to the contractor for such work and materials as will be necessary to fully complete the road shall be at the average of $3. a running foot, and that such sum shall be paid by the owner to the con-

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tractor in current funds upon certificates of the engineer as hereinbefore provided.

It is further agreed that a letter dated September 24th, 1918, from the owner to the contractor, herewith attached, shall become a part of this contract, with the following additions to the second clause of said letter; namely that the 16 feet road shall end at Station No. 11, from which point the bridle path will continue to Station 24 on the West side of Harbor Brook; and the balance of the clause shall stand as it reads.

It is further mutually agreed between the parties hereto that in case it is necessary to erect a labor camp on any property adjacent to the work, it shall only be done with the consent of the owner and in such manner as may be approved by him, and that immediately upon completion of the work all traces of the camp shall be removed, and the property left in as good condition as it was found.

IN WITNESS WHEREOF, the parties to these presents have hereunto set their hands and seals the day and year first above written.

A. Pol Clement

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APPENDIX XV.

Memo from Charles O. Heydt to John D. Rockefeller, Jr.

Dimensions of Little Harbor Brook bridge and Gap Stowe bridge in Central Park

	Gap Stowe Bridge	Little Harbor Brook Bridge
Length from Post to Post	75'	
Width Between Posts	16'	
Width Between Centers	15'	
Coping Width	26"	24"
Wall	24"	22"
Height of Parapet at Post	3'	2½"
Height of Parapet at Center	4' 6"	3½"
Posts Offset		
From Inside	8"	7"
From Outside	18"	7"
Square Posts	54"	38"

APPENDIX XVI.

SPECIFICATIONS

for

a road at Seal Harbor to be built according to survey and plans made by C. P. Simpson, C.E., who is referred to hereinafter as the engineer and wherever the word "engineer" is used it refers to the chief engineer or his authorized assistants by whom all explanations and directions necessary for the satisfactory prosecution and completion of the work described in these specifications will be given.

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NOTICE TO CONTRACTOR

Any written notice to the contractor which may be requisite under these specifications may be served on said contractor either personally or by mail, or by leaving the same at his last known place of residence.

PRESERVATION OF ENGINEER'S MARKS

All engineer's marks and stakes after location shall be carefully preserved without disturbance until permission for their removal or erasure shall be given, and every facility must be furnished for the staking out, etc., of all the work to be done under these specifications.

DISMISSAL OF INCOMPETENT PERSONS

Any incompetent person or persons who may be employed on the work shall be removed on the requisition of the owner or engineer; and no person so removed shall thereafter be employed upon any portion of the work.

SPIRITUOUS LIQUORS

Contractors are not to give or sell or suffer any one to give or sell or keep any ardent spirits on any part of the work or in any boarding house or building under his control.

QUALITY OF MATERIALS

All materials furnished and used under these specifications must be of the best quality of their respective kinds, free from any and all defects which in the judgment of the engineer may render them unfit for use. Rejected material must be at once removed from the works or conspicuously marked "condemned". If condemned material is used in any part of the work, the same shall be removed and replaced with materials of the quality required by these specifications.

RIGHT RESERVED TO ALTER DETAILS

The engineer, during the progress of the work, may, by giving written notice to the contractor, alter any of the details of construction in any manner that may be found expedient or suitable; such alterations shall not invalidate the contract, and the contractor must adopt and execute the same as if they were a part of the original contract, and at the completion of the work an allowance will be made for such alterations, etc., either for or against the contractor as the case may be, and the value of such alterations will be estimated by the engineer from the schedule of prices attached to the contract, or should it not apply, the equitable amount will be estimated by the engineer whose figures the contractor hereby accepts as final.

From Station	1850 to 2200	350 ft.
" "	4500 to 5800	1300 ft.
" "	1400 to 1600	200 ft.
" "	3000 to 4500	1500 ft.
" "	5800 to 7000	1200 ft.
" "	7150 to 7650	500 ft.
" "	8150 to 8600	450 ft.
" "	8900 to 9850	950 ft.
" "	10200 to 10550	350 ft.
" "	9850 to 10200	350 ft.
" "	11360 to 11675	315 ft.
" "	11765 to 12050	285 ft.
		7750 ft.

the road to be built shall be what is known locally as a rock filled road with a top surface of clay and bank gravel such as may be found in the vicinity of the work or the finer grades of crushed rock may be substituted for gravel. In general the road is to be of the same character as the Sea Cliff Drive and the Barr Hill Road to which reference is made as a standard for road bed, retaining wall, gutters, etc. The road shall be built true to line and grade as established on the ground by the engineer or as shown on plans with no humps, hollows, yanks or crooks, and the lines, particularly on curves, shall be true and even.

From	Station	2200 to 3000	800 ft.
"	"	7000 to 7150	150 ft.
"	"	7650 to 8150	500 ft.
"	"	8600 to 8900	300 ft.
"	"	10550 to 11275	725 ft.
"	"	12050 to 13350	1300 ft.
"	"	1600 to 1850	250 ft.
			4025 ft.

the road shall be what is known as a good gravel road 18 ft. in width between the centers of the gutters, and a full 16 ft. in width of traveled road. All wet and low places shall be filled with rock and the road crowned a full eight inches. The road shall be built true to line and grade as established on the ground by the engineer or as shown on plans with no humps, hollows, yanks or crooks.

WIDTH AND CROWN

The road shall be 16 ft. in traveled width inside the gutters, fences, or walls except where a greater width is shown on plans, and will be crowned so as to be 8 inches higher in the center than at the edges. This crowning to be even and to be made in the rock fill

and verified before the top surface is put on. In placing the rock fill due allowance must be made for settling during construction so that the crown of the road when finished shall be 8 inches. Where a greater width than 16 ft. is shown on plans the crown shall be increased proportionately.

CLEARING

The land will be cleared to the width of 12 feet on each side of the center line, and each section must be entirely completed before grading is commenced. All stumps shall be grubbed out.

Brushwood, stumps, tree limbs, etc., must not be cast upon the adjacent land, but shall be formed into piles and burned; stumps and other material that will not burn, must be removed from the work and disposed of by the contractor to the satisfaction of the owner. All brush or trees accidantally or otherwise thrown upon the adjacent lands must be taken off and disposed of as above described. All blasting where necessary shall be properly protected by dunnage.

CARE IN BURNING

Particular care must be taken in the burning of all brush and stumps so as not to scorch or injure growing trees. Any tree so scorched or injured must be taken down at the contractors' expense and disposed of

FOUNDATION

The foundation shall be of broken rock finished with at least 4 inches of small rock and to be crowned 8 inches from edge to center of road. Upon this will be put a light coating of fine screenings or coarse gravel sufficient to fill up the spaces between the stones so that the top dressing will not sift through.

FINISH SURFACE

Finish with 2 inches of gravel that will pass through a sieve of 1-1/2 inch mesh and one inch of clay as a binder; all to be rolled upon completion when wet with a roller not less than 2 tons in weight.

GUTTERS

Gutters shall be built on each side of the road at least 2 ft in width and of sufficient depth to carry off water. Reference being made in this as in other respects to the gutters on the Sea Cliff Drive and the Bar Hill Road.

DRAINS AND CULVERTS

Culverts formed of stone, or Acme or Sterling iron pipe at least 8 inches in diameter will be laid wherever directed by the engineer and will be protected at each end by retaining walls of stone or concrete at least five feet in length built up to a level of the surface of the road. The contract price will include the building of forty-four culverts in all, as follows:

Station	1,400	1-8"	culvert	30 ft.	long
"	1,600	1-8"	"	18 "	"
"	1,800	1-8"	"	18 "	"
"	2,100	1-8"	"	18 "	"
"	2,400	1-8"	"	18 "	"
"	2,600	1-8"	"	18 "	"
"	2,800	1-8"	"	18 "	"
"	3,150	1-8"	"	18 "	"
"	3,475	1-8"	"	18 "	"
"	3,700	1-8"	"	18 "	"
"	4,100	1-8"	"	18 "	"
"	4,350	1-8"	"	18 "	"
"	4,650	1-8"	"	18 "	"
"	5,100	1-8"	"	18 "	"
"	5,400	1-8"	"	18 "	"
"	5,750	1-8"	"	18 "	"
"	6,050	1-10"	"	18 "	"
"	6,400	1-10"	"	20 "	"
"	6,800	1-8"	"	18 "	"
"	7,150	1-10"	"	18 "	"
"	7,250	1-10"	"	20 "	"
"	7,525	1-8"	"	18 "	"
"	7,650	1-8"	"	18 "	"
"	7,800	1-8"	"	18 "	"
"	8,200	1-8"	"	18 "	"
"	8,500	1-8"	"	18 "	"
"	8,750	1-8"	"	18 "	"
"	8,925	1-8"	"	18 "	"
"	9,350	1-8"	"	18 "	"
"	9,600	1-8"	"	18 "	"
"	9,825	1-8"	"	18 "	"
"	9,950	1-8"	"	18 "	"
"	10,250	1-8"	"	18 "	"
"	10,400	1-8"	"	18 "	"
"	10,700	1-8"	"	18 "	"
"	10,950	1-8"	"	18 "	"
"	11,100	1-8"	"	18 "	"
"	11,250	1-8"	"	18 "	"
"	11,650	1-8"	"	18 "	"
"	12,000	1-8"	"	18 "	"
"	12,350	1-10"	"	18 "	"

Station 12,575.	1-8" culvert	18 ft. long
" 13,150.	1-8" "	18 ft. "
" 13,250.	1-8" "	18 ft. "

Extra culverts if any to be paid for as follows: 8-inch pipe, 85¢ per foot; 10-inch pipe, $1.05 per foot; 12-inch pipe $1.20 per foot.

RETAINING WALLS

Retaining, slope, parapet and breast walls of dry stone will be constructed where directed. The stones for this kind of work must be sound, flat, bedded stones. No round or cobble stones will be allowed. Not more than one-third of the stones shall be less than one foot thick, and nostone shall be less than six inches thick or have a bed area of less than four feet. The stones shall be set horizontally on their largest bed and no bond shall be less than ten inches. Large stones of sufficient weight to hold fence posts shall be placed in the coping of these walls every 10 ft. The walls shall be built with a batter of 1-1/2 inches to one foot in height and shall be eighteen inches thick at the top. They shall be firmly bedded at the bottom and where set on sloping ledge, it shall be blasted out to make a footing and the bed stones secured in place by iron bolts if directed by the engineer.

BATTER

Care must be taken in the building of the retaining walls to allow for batter so that the top of the wall may align with the edge of the road as planned.

TIME OF COMPLETION

The work shall be prosecuted in such a manner as to complete it in accordance with the plans and specifications on or before June 1, 1917.

PAYMENTS

Monthly estimates shall be made during the progress of the work and payments to the amount of 85% thereof will be made, the retained percentage not being due or payable until the final completion of the work. The contractor shall, if required,, exhibit signed pay rolls, evidencing that all labor, teams and material used or employed on the work has been paid for in full.

BOND FOR FAITHFUL PERFORMANCE OF THE WORK

The contractor, if required by the owner, shall execute with his sufficient securities a bond in the sum of $_____ for the faithful performance of the work in accordance with the requirements of the specifications.

PERSONAL ATTENTION

The contractor shall give his personal attention to the faithful prosecution of the work, shall not sublet the same or any part thereof without the consent of the owner, nor will he assign by power of attorney or otherwise any of the moneys payable under these specifications.

LIABILITY INSURANCE

It is distinctly agreed that the Contractor shall carry Accident Liability Insurance in some good reliable Company, the premium on such insurance to form a part of the costs under this contract. The Contractor shall save the Owner from and hold him harmless against all claims and suits based upon any real or alleged injury to persons (whether employees or otherwise) or property which may occur or which are alleged to have occurred by or on account of any act or omission on the part of the Contractor, sub-contractors or their servants or agents, or which may occur or which are alleged to have occurred in connection with the work covered by this contract, from any cause whatsoever other than the act or omission of an employee of the Owner who is not an agent, servant, workman, or employee of the Contractor or sub-contractors engaged in the performance of work in or about said road under this contract. And the Contractor agrees to defend all such actions at his own expense, to pay all charges of attorneys, and all court or other expenses, and in the event of judgment being rendered against the Owner in any such action, the Contractor agrees to satisfy the same.

This agreement made the 9th day of June in the year one thousand nine hundred and sixteen by and between Alanson E. Clement

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APPENDIX XVII.

THE FUTURE OF MOUNT DESERT ISLAND

A REPORT TO THE PLAN COMMITTEE
BAR HARBOR VILLAGE IMPROVEMENT ASSOCIATION

BY

CHARLES W. ELIOT 2ND, LANDSCAPE ARCHITECT

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BAR HARBOR VILLAGE IMPROVEMENT ASSOCIATION
1928

and Chauncey D. Joy of Mt. Desert in the State of Maine, parties of the first part, hereinafter designated the contractors and John D. Rockefeller, Jr. of New York in the State of New York, party of the second part hereinafter designated the owner.

WITNESSETH: That the contractors in consideration of the agreements herein made by the owner agree with the said owner as follows:

Contractors shall and will provide all materials and perform all the work for the construction of a road at Seal Harbor Maine, as surveyed by C. P. Simpson, C.E., and known as the extension of the Gardiner Road and shown on profiles marked stations 1400 to 13350, prepared by C. P. Simpson, C.E. and described in the specifications hereinabove recited which are hereby made a part of this contract.

It is hereby mutually agreed between the parties hereto that the sum to be paid by the owner to the contractors for such work and materials shall be twenty-nine thousand four hundred and thirty- seven dollars and fifty cents ($29437.50) subject to additions and deductions as hereinabove provided and that such sum shall be paid by the owner to the contractors in current funds upon certificates of the engineer as hereinbefore provided.

It is further mutually agreed between the parties hereto that in case it is necessary to erect a labor camp on any property adjacent to the work, it shall only be done with the consent of the owner and in such manner as may be approved by him and that immediately upon completion of the work all traces of the camp shall be removed and the property left in as good condition as it was found.

IN WITNESS WHEREOF, the parties to these presents have hereunto set their hands and seals the day and year first above written.

A E Kilpatrick

Chas D Joy

John D Rockefeller Jr
By George L Stebbins

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Horse Carriage Roads

The extensive system of carriage roads constructed by Mr. John D. Rockefeller, Jr., and open to the public on horseback or in horse-drawn vehicles, whether on his private property or in the park, constitutes a second means of recreational enjoyment of the Island. The more leisurely speed of movement, the narrower right of way and the sharper curvature of road make this method of access more suited to intimate enjoyment of beauty with less destruction than in the case of automobile roads.

The horse roads already constructed form a rather complicated system in the southern part of the Island with more extensive branches around Sargent Mountain and north to the Eagle Lake Road. The use of these roads appears to be growing, but as yet is very slight. The inauguration last summer of a buckboard service is an encouraging sign of a possible increased use and of the development of a kind of activity which might be made a distinctive feature of the Park and Island. Just as in Cornwall, England, the thing to do is to go on a tally-ho, so some day at Mount Desert the buckboard may regain its former popularity.

The offer of Mr. Rockefeller to build more carriage roads in the vicinity of the Witch Hole, through the Bubble Pond Valley, and around the head of Eagle Lake has raised anew questions as to the desirable extent of the carriage road system in relation to the foot trail system and the wilderness areas.

The arguments in favor of more carriage roads are briefly these: (1) The roads make it possible for those who cannot or will not walk to see and enjoy a greater number and variety of the scenic beauties of the Island. (2) The roads are useful in the administration of the Park to control fire and poaching. (3) The roads, being open only to horses, horse-drawn vehicles and pedestrians, may encourage riding and driving in contrast to motoring. (4) The work involved in construction of more roads means

employment during the slack season for large numbers of persons on the Island. (5) The National Park Service considers itself morally bound to allow Mr. Rockefeller, to whom the Park is indebted for the motor road, to continue the construction of those horse-carriage roads which were approved by the Park Service in 1924 when the motor road was under discussion.

The arguments against more carriage roads are usually directed against specific projects but are based on the following theories: (1) That a carriage road, as a man-made object, destroys the wilderness character or solitude of the area through which it is constructed. (2) That the scars already made on the mountain sides will not cover for a generation and that no more should be added. (3) That a carriage road to the same point or along the same route as a foot trail mitigates the pleasure of walking because it destroys one of the reasons for walking,—to reach a point now otherwise inaccessible. It is contended that since walking is admittedly the best way to see and enjoy the Island, nothing should be done to discourage the walker. (4) That the very slight use of the existing carriage roads indicates no need of further construction at least until the value and usefulness of the existing roads are proven. (5) That although built for horse-drawn vehicles, the carriage roads are potential motor roads and that motoring on these roads would be not only dangerous to the motorist but destructive to the scenic values. (6) That the construction of too many roads will destroy the "scale" of the Island and Park; that the mountains are low though bold, and that a road by which you can quickly pass from end to end or ascend their heights will reduce, as a measuring stick, their apparent size. (7) Finally the opponents of more roads quote from the "Official Policy Governing National Parks" previously referred to, and which includes a statement that "the over-development of parks and monuments by the construction of roads should be zealously guarded against."

A basis for a general plan has been suggested which, if adopted by the Park Service, would safeguard "Wilderness Areas" and allow a small amount of additional road construction in connection with "Centers."

APPENDIX XVIII.

BAY MOUNTAIN SUMMIT ROAD.

Estimates for completing road from end of 1938 construction to Southern and Northern Summits.

From present end of construction to Southern Summit.

Excavation and Grading	$1100	
Surfacing	100	
Coping	220	
Finishing	120	
		$1540

Loop around Southern Summit.

Excavation and Grading	$2100	
Retaining Walls	2000	
Culverts	75	
Coping	200	
Surfacing	150	4525
		$6065

From Southern Summit to Northern Summit.

Clearing and Grubbing	$ 330	
Excavation and Grading		
Earth	220	
Rock	8800	
Retaining Walls	930	
Culverts	240	
Coping	790	
Surfacing	440	
Finishing	330	
		12080
Total		$18145

APPENDIX XIX.

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OLMSTED BROTHERS
LANDSCAPE ARCHITECTS
BROOKLINE·MASSACHUSETTS

FREDERICK LAW OLMSTED
JAMES FREDERICK DAWSON
PERCIVAL GALLAGHER
EDWARD CLARK WHITING
HENRY VINCENT HUBBARD

TELEGRAMS
REDONDO BEACH
CALIFORNIA

WESTERN OFFICE

Eureka, California,
July 11th, 1930.

PALOS VERDES ESTATES
CALIFORNIA

(Typed from Mr. Olmsted's Manuscript
July 14th, 1930.)

Mr. J. D. Rockefeller, Jr.,
26 Broadway,
New York, New York.

Dear Sir:

I beg to submit the following report in regard to certain proposed horse-and-carriage roads on the Island of Mt. Desert, planned by your engineers but all reviewed on the ground by me and in a few places relocated in accordance with suggestions by me.

These roads cannot be considered intelligently except in the light of a reasonable conception of the purposes and desirable future condition not only of these roads but of other parts of the system of such horse roads which you have had under construction for many years past. My conception, which I believe to be substantially in harmony with your own, is that in appearance the roads should ultimately take on much the aspect of some of the old wood-roads untraversed by motor vehicles, wheel tracks and hoof marks on a sylvan ribbon of grass and low ground cover, although kept free from excessive encroachment of underbrush and systematically made easier, safer, and pleasanter for driving on with horse-drawn vehicles and even for riding on horse-back than is apt to be the case with old logging roads in rough topography. Some of the older of the roads of the system built for you have already attained or closely approached this ideal, but many of them as yet fall short of it in appearance, partly because of certain details of construction or maintenance which I believe could be improved upon, but mainly because they are yet too new and especially because they have been subjected and are now being subjected to a very considerable use by automobiles.

Their use by automobiles is mainly of two sorts, both very difficult to control in such a way as to permit the desired adaptation of the roads to their proper purposes. One of these is the use of the roads, after their completion, by trucks engaged in repairs and in the construction of other roads and in forestry work and by automobiles carrying men engaged in such continuing work. The other is the unauthorized, indeed the strictly forbiddom, use of the roads by the automobiles of those who find sufficient convenience or pleasure in using them to disregard the prohibition. The latter use is reported to be, and very apparently is, extensive.

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I am convinced that satisfactory progress in adapting these"horse-roads" to their proper function, and in bringing them to an appearance thoroughly suitable for that function, can be made only if these two difficulties are dealt with systematically and adequately.

I believe this involves two things which are troublesome but must be squarely faced. On the one hand it means that, in general, so far as it is necessary for vehicles to continue to traverse these roads for repairs or construction work or forestry work, horse drawn vehicles must be provided and maintained for such work, including, where necessary, horse drawn "barges" or stages for the transportation of workmen; probably supplemented, where distances are great, by the definite assignment of one or more pieces of road as definite "service roads", permanently intended for use by motorized work cars, leading in from a public highway to a distributing terminal point beyond which it will be physically impossible for motors to pass, and physically shut off from connection with the horse-roads proper. On the other hand it means that the system of horse-roads proper must be made impassable for unauthorized motor cars. They can obviously be made inaccessible to motor cars except at a limited number of points. Each of those points can be controlled, and should be controlled, in either one of two ways: One is an ordinary gate with an attendant constantly on watch, except when it is locked for the night or the season; simple but involving a large labor cost. The other is a special type of barrier, impassable by any ordinary automobile with its very low clearance between the wheels but readily passable by horses and by any ordinary types of horse drawn vehicles, which have much higher clearances under the axles. Some experimenting may be necessary to develop the right type of barrier, but I am quite sure it can be done because I have several times encountered roads, readily passable by horse drawn vehicles, which because of the deepness of the wheel tracks below the tops of intervening obstacles could not be negotiated by an automobile without several hours labor on a stretch of a comparatively few feet.

Assuming, then, some such complete and effective exclusion of motor cars from the "horse-road" system proper, the horse roads can, without serious difficulty, be made to serve very delightfully three purposes of large aggregate importance in an area like that of the Acadia National Park and similar adjacent lands: (1) driving in horse drawn vehicles in narrow, winding woodland roads in beautiful and varied scenery, completely free from the annoyance and even the dread of meeting motor cars a pleasure so real and so extraordinarily rare today that systematic provision for it with opportunity provided for people to hire the horses and rigs may reasonably be expected to develop into one of the most unique attractions of the Park and of the Island; (2) horseback riding on safe routes of easy gradient supplementing a system of narrow and often steep horse trails to places more difficult of access, an attraction less unique but of large and growing importance; (3) walking on pleasant routes of easy gradient as a supplement to the paths intended exclusively for pedestrians available at least until such time as the use of the roads by carriages and horses may become too great for their use by pedestrians as well.

For these purposes it is desirable to keep the gradient of these ways, except as an occasional very short steep pitch may be desirable in fitting them to the topography, not exceeding a maximum of five per cent. The alignment may be as irregular and occasionally within certain limits as abrupt, as topographic irregularities suggest. Indeed it is perhaps a fair criticism of some of the "horse-roads" built for you in the past that the smoothness of curvature is in some places rather too suggestive of a motor-road, or of the rather sophisticated and smooth-flowing roads which landscape architects and engineers were wont to build in city parks and private estates in the days before the automobile, rather than of the pleasantly accidental-seeming yet thoroughly practicable and convenient woods-roads which one associates with wild areas likes these. As to width, I believe it unlikely that the numbers of carriages using these roads will be so great that it will be necessary to provide uniformly, and throughout their entire length under all topographic conditions, the full width of sixteen feet necessary for two carriages to pass easily without slowing up. Indeed, as already stated, I conceive these roads as showing, in the main, when they have become mellowed with time, a single pair of wheel tracks, out of which meeting carriages would turn on the herbage of the "shoulders" in order to pass each other. And where heavy grading would be required to make the full width of sixteen feet traversable on the occasion of such meetings I should not hesitate to reduce the width of the graded roadbed merely taking care to provide "turn-outs" ample for safe passing with sufficient frequency and so related to any bends in the road that there would always be a good passing place ahead of both drivers when they come in sight of each other.

It is with such ideas as the above in mind that I have examined and approved the locations for the horse roads now in question.

The most important of these is a unit leading from the proposed center for riding and driving activities at the north end of Eagle Lake toward Bar Harbor and past Great Meadow. It climbs to the north shoulder of Great Pond Hill on a fairly direct line, through pleasant scenery and on good grades, passing under the present park motor road. Thence it descends through the woods on a five percent grade to Kebo Brook, follows close to the brook until it approaches the open land of the Golf Course, and then runs easterly, just well within the woods. At the north point of Kebo Mountain it is for a short distance rather closely approached by the proposed motor road, but remains below and north of it and pretty well screened from it. One branch leads eastward to the Harden Farm Road a short distance south of Cromwell Harbor Road and just north of the Cemetery. This branch will be useful chiefly to those going between Bar Harbor and the Eagle Lake region on horse back or by horse-drawn carriages. The other branch turns south, to the west of the Cemetery, and then southwest, crossing the little ravine north of Red Rock Spring on a bridge under which the park motor road also will pass. From there the horse road swings across the northeast corner of the open grassland commanding the fine views toward the Gorge and Champlain Mountain and Great Meadow

SHL

Hill, and follows just within the edge of the woods west of that grassland to enter the present Hemlock Road at the northern end of the hemlocks. It is proposed to use that road just as it is through the hemlocks, obliterating its present northern connection across the swampy land to the Harden Farm Road and closing it to automobiles. It is a very beautiful road, admirable adapted to use by horses but dangerously narrow and crooked for automobiles, and its charm would be lost if it were widened and made safe for automobiles. A short distance north of the Sieur de Monts Spring, after passing the hemlocks, it is proposed to discontinue the present road using its line for a path from a suitable hitching place to the Spring, and to carry the horse road eastward, to the north of the Spring area, mainly on lines already cleared, with a connection across the park motor road and the public highway into the existing horse trails in the Robin Hood Park area of the National Park.

The horse road unit above described will serve to connect the entire system of horse-roads radiating from Eagle Lake pleasantly and easily and directly with the vicinity of Bar Harbor, and with the Great Meadow and Sieur de Monts Spring region and the horse trails in the eastern lobe of the National Park; it will traverse some very beautiful characteristic and varied scenery, and it will not have any appreciable effect upon that scenery.

The second unit is suggested in order to make possible an alternative route between Eagle Lake and Red Rock Spring, longer and involving much more climbing than the first, but offering certain impressive views that cannot be obtained from that or from any other horse road, especially the sweeping northwestward and northeastward views from high up upon the shoulders of Great Pond Hill. This is done by rising up to and crossing under the present park motor road at a point between the branch motor road to the summit of Cadillac Mountain and the new park motor road which is proposed to be built around the north end of Great Pond Hill to the Great Meadow. It would keep well above the latter and well separated from it but commanding similar distant views before descending into the woods on the east slope of Great Pond Hill. By a short rise it would pass over the saddle between Kebo Mountain and the Flying Squadron and thence descend northeasterly to join the first unit a little to the northwest of Red Rock Spring. I had some misgivings at first as to whether the last mentioned portion of this road might not make a scar on the east face of Kebo Mountain objectionably visible from the Great Meadow side, but I found upon study that this danger is avoidable, and that the whole project is a desirable one, although less important than the first unit.

The third horse-road unit is one that was proposed several years ago but was set aside because of opposition which then developed to it. It lies mainly within the Amphitheatre. I have carefully examined all that part of its course and more cursorily the short connection from the point where it leaves the Amphitheatre valley (below the cliffs on the south ridge of Jordan Mountain) to the

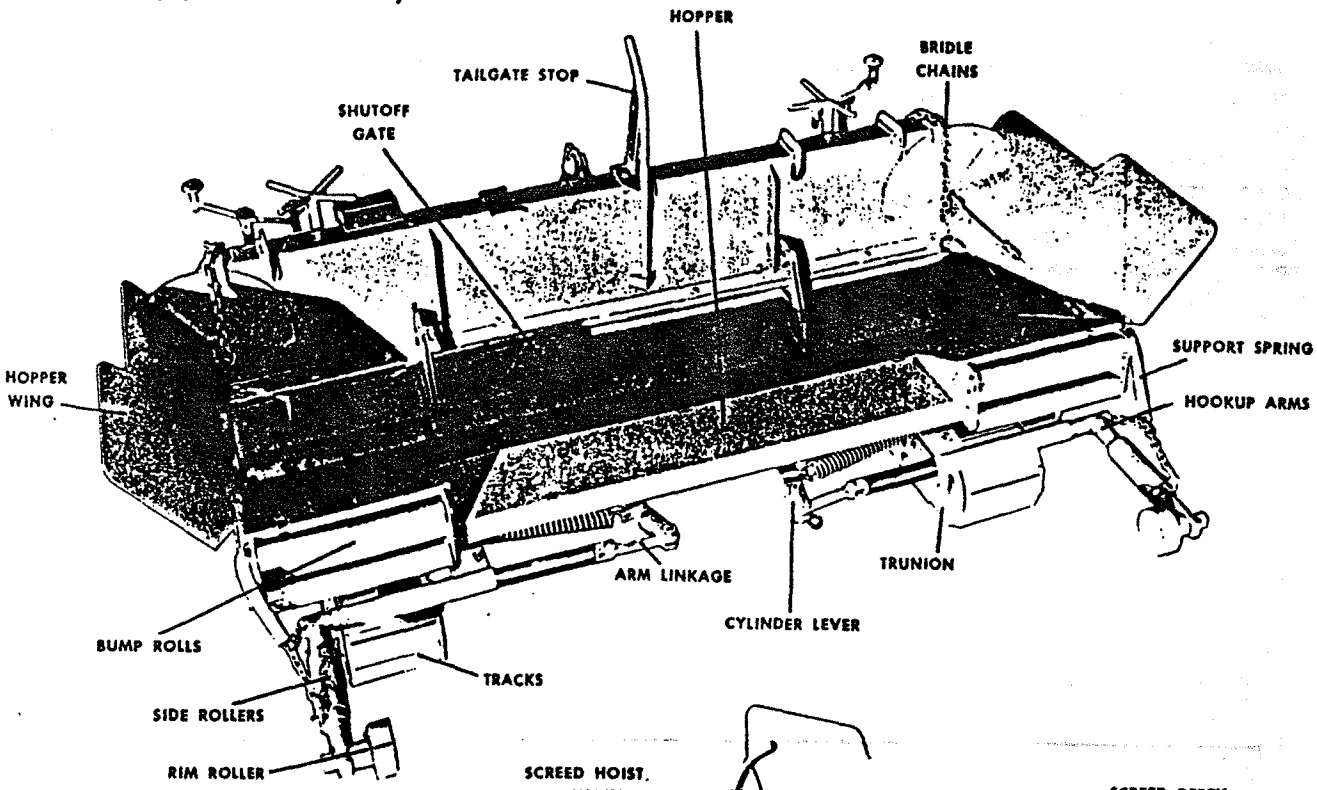
horse-road southwest of Jordan Pond. It would afford in itself a beautiful ride and drive, distinctive, among other things, for traversing the upper edge of a nearly pure stand of yellow birch on the lower western side of the Amphitheatre, very impressive from within at the season when I saw it, and also for overlooking from among the thinner and smaller growth on the east side of the valley both the widespread foliage canopy of the Amphitheatre and the seaward views to the south. It would also afford a shorter connection than at present and on much easier grades between the horse roads east and west of the Jordan Mountain and Sargent Mountain mass. If the construction of such a road would mar or disturb the great unbroken sweep of sylvan landscape which the Amphitheatre now presents as seen from many points around it I should, notwithstanding these advantages, definitely oppose its introduction; but I satisfied myself that with reasonable care in managing the details of construction no such deplorable result would occur. I believe, therefore, that sooner or later a horse road of the type I have discussed ought to be built here.

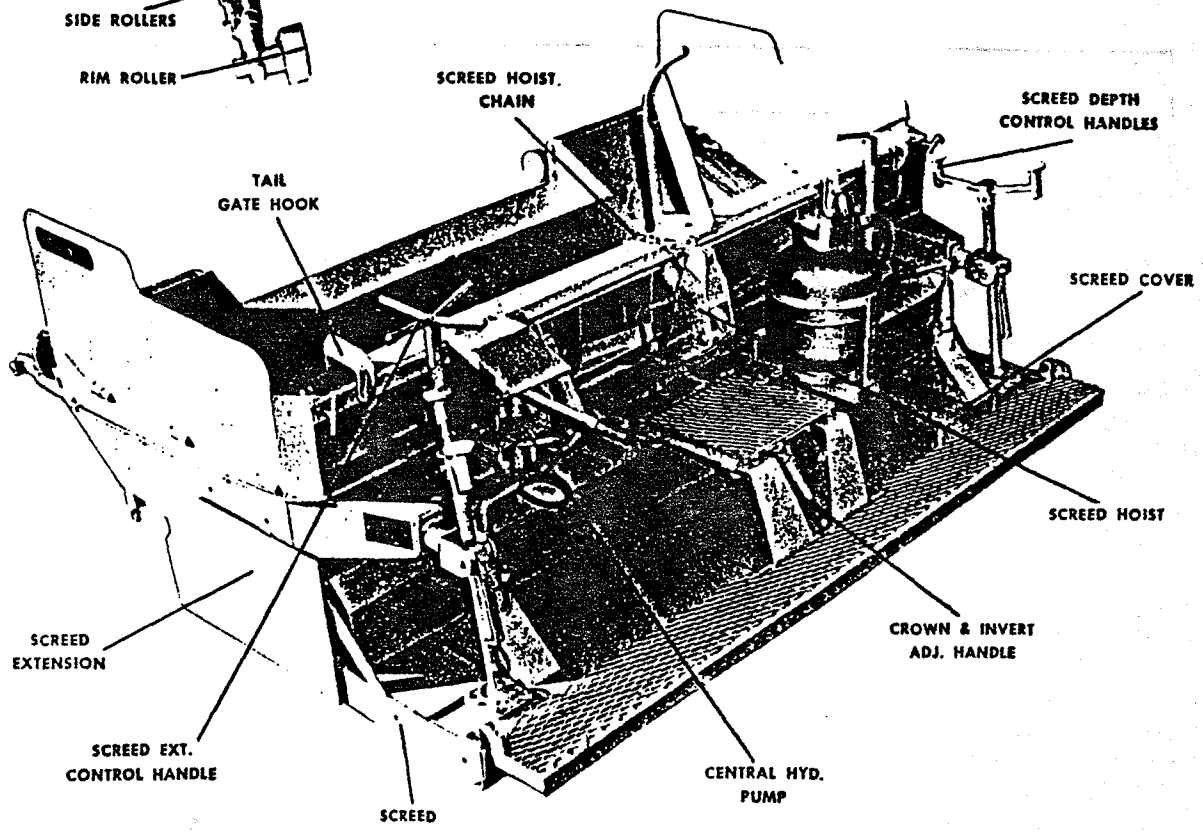
Respectfully submitted,
Frederick Law Olmsted
Frederick Law Olmsted

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APPENDIX XX.

The Layton Track Paver is designed to lay asphalt, base rock, and other aggregates economically, and to maintain the high standards of quality paving set down by the contractors of our country.





APPENDIX XXI.

Materials & Research Division
Hancock Plant

Harold MacQuinn, Inc.
Ellsworth, Maine

SIEVE ANALYSIS DATA SHEET

TIME _____ DATE 7-30-87 (SAMPLED)

SAMPLE NO. _____ TEST NO. _____ MATERIAL SAMPLED 3/8" Crusher Dust PROJ. NO. _____

PROCESS CONTROL ☐ ACCEPTANCE ☐ INDEPENDENT ASSURANCE ☐ TOWN _____

SAMPLED BY D. Focca BRIDGE NAME or NO. _____ PROJECT PHONE _____

PROJECT RESIDENT _____ MAILING ADDRESS _____

CONTRACTOR _____ SUB-CONTRACTOR _____ SUPPLIER _____

SOURCE: PLANT Mac Quinn LOC. Hancock PIT _____ LOC. _____

SAMPLE TAKEN FROM: ROADWAY ☐ STATION _____ (OFFSET-FT) LT. ☐ ℄ ☐ RT. ☐ DEPTH B.E.G. or ELEV. _____ LANE ___

PIT ☐ TRUCK ☐ TRUCK NO. _____ STOCKPILE ☐ CRUSHER BELT ☐ PLANT ☐ RR CAR ☐ DISTRIBUTOR ☐

CONCRETE AGGREGATE ☐ BITUMINOUS AGGREGATE ☐ OTHER _____

COARSE SERIES — CLASS ___ CONCRETE

SIEVE SIZE	C.A.1 TEST NO. ___ WEIGHT RETAINED	WT. PASS. % RET.	% PASSING	C.A.2 TEST NO. ___ WEIGHT RETAINED	WT. PASS. % RET.	% PASSING	BLEND C.A.1 %	C.A.2 %	C.A.3 %	TOTAL % PASS	SPECS.
6"											
4"											
3"											
2"											
1 1/2"											
1 1/4"											
1"											
3/4"											
5/8"											
1/2"											
3/8"											
1/4"											
NO. 4											
NO. 8											
PAN DRY		CONVERSION FACTOR ___				+PAN					
PAN WET											

TARE NO. ___ WET TOTAL WEIGHT ___

WET INITIAL WEIGHT ___

LOSS-GAIN OF WEIGHT ___

WATER CONTENT (FINE SERIES)

TARE & WET SOIL ___
TARE & DRY SOIL ___
WEIGHT OF WATER ___
TARE WEIGHT ___
WEIGHT OF DRY SOIL ___

TARE + DRY SOIL UNWASHED	
TARE + DRY SOIL WASHED	
DIFFERENCE	
+ PAN	
TOTAL	

WEIGHT of WATER / WEIGHT of DRY SOIL = ___ = ___ WATER CONTENT

COARSE FRACTION CORRECTION-WATER

WEIGHT OF PAN (WET)
WEIGHT OF PAN (DRY) = PAN WET / 1+W.C. = ___ = ___

WEIGHT OF WATER IN PAN ___
TOTAL WEIGHT OF SAMPLE WET ___
WEIGHT OF WATER IN PAN ___
CORRECTED TOTAL WEIGHT ___

MEETS SPECIFICATIONS YES ☐ NO ☐

TESTED BY D. Focca COMPUTED BY D. Focca
CHECKED BY ___ DATE TESTED 7-30-87

FINE SERIES — TEST NO. ___

SIEVE SIZE	WEIGHT RETAINED	WT. PASS. % RET.	% FINER BY WEIGHT FINE	% FINER BY WEIGHT TOTAL	SPECS. % PASS
3/8"*				100	
1/4"				81	
NO. 4*				64	
8*				42	
10				39	
16*				30	
20				26	
30*				23	
40				20	
50*				18	
60				16	
100*				13	
200				9.6	
PAN					

COLOR PLATE NO. ___

700 - SUM* / 100 = F.M.* ___ (2.3 to 3.1)

DRY TOTAL WEIGHT ___
DRY INITIAL WEIGHT ___

SET NO. ___

550

APPENDIX XXII

Estimate for One-Mile Typical Section of Carriage Road Reconstruction

Task	Unit	No.	Unit Cost	Amount
Preliminary pruning				
Truck and driver	hr.	40	25	1,000
5 man crew with pole saws, chain saws, and chipper	hr.	40	140	5,600
Repair foundation				
Material (ledge rock)	c.y.	100	5	500
Backhoe	hr.	40	40	1,600
6 Laborers	hr.	40	90	3,600
Pull outside edge in w/ grader	hr.	8	50	400
Shape and roll	hr.	8	50	400
Repair or replace middle layer				
Material (1" minus, 2" thick)	c.y.	500	8	4,000
Dump truck (6 yard)	hr.	40	30	1,200
Water truck	hr.	40	30	1,200
Grader	hr.	40	50	2,000
Roller (3-5 ton vibratory)	hr.	40	50	2,000
Repair or replace surface layer				
Material (3/8" minus, 2" thick)	c.y.	500	12	6,000
Dump truck (6 yard)	hr.	80	30	2,400
Water truck	hr.	80	30	2,400
Grader	hr.	80	50	4,000
Roller (3-5 ton vibratory)	hr.	80	50	4,000
Repair stone ditch-lines, culverts breast walls and retaining walls				
Backhoe	hr.	80	40	3,200
Compactor	hr.	80	25	2,000
2 Masons	hr.	160	60	9,600
Re-set coping stones				
Small crane	hr.	80	50	4,000
Flat-bed truck	hr.	80	30	2,400
2 Laborers	hr.	80	30	2,400
Supervisor	hr.	20	30	600
Field engineering 2 men w/ transit	hr.	60	80	4,800
	Sum			71,300
	15% Contingency			10,695
	Sub-total			81,995
Research, design and construction inspection @ .07				5,740
	Total			$87,735
	Say			$90,000.00
Cost per lineal foot				$17.05

APPENDIX XXII.

Acadia National Park — Carriage Roads

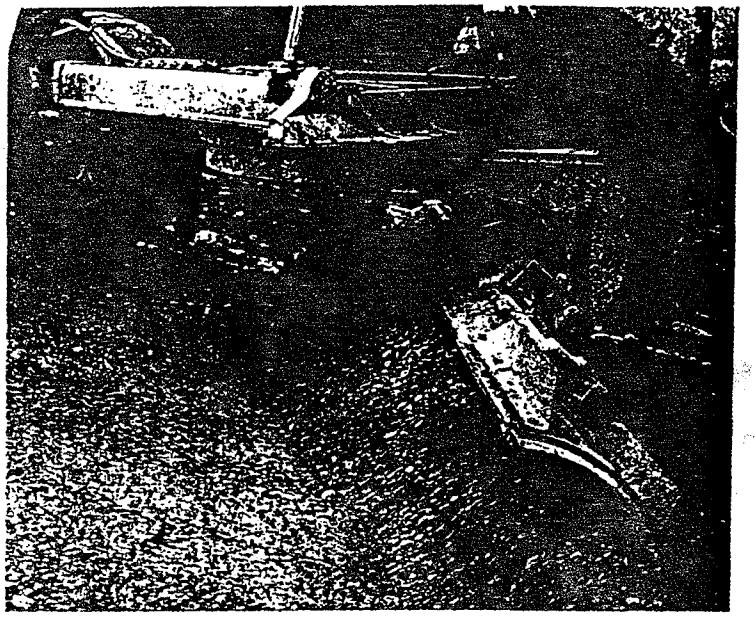
Maintenance Costs--January, 1914 to July, 1919, Adjusted for Inflation:

Year	Est. % Comp.	Est. $/yr.	Est. Miles	Infla. Factor	1913 =1.00	1988 =1.00	1988 per mi.	1988 mi./yr.	1988 x 51 mi.
1914	10	109.08	0.63	1.020	106.94	1,275.85			
1915	30	327.25	1.88	1.130	289.60	3,454.96			
1916	50	545.42	3.13	1.197	455.65	5,435.96			
1917	70	763.59	4.38	1.373	556.14	6,634.80			
1918	90	981.75	5.63	1.660	591.42	7,055.62			
½ 1919	100	564.23	6.25	1.838	306.98	3,662.25			
		$3291.32	6.25 mi.		$2,306.74	$27,519.45	$4,403.11	$800.57	$40,828.85

Reprinted from January, 1986 ROADS & BRIDGES

Forest Service gets drop on dust with suppressant

Dusty Arizona roads were heavily used by public; surface treatment retards dust during most arid period of year



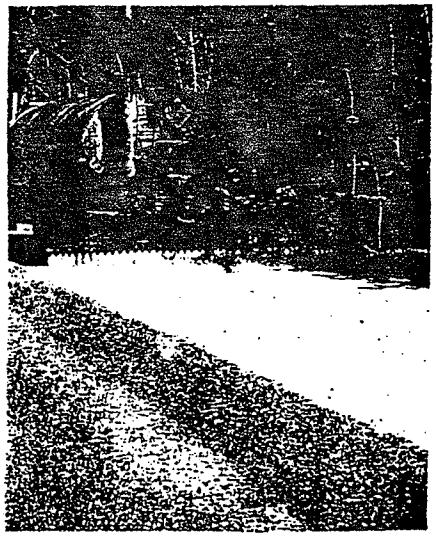
Prep work involved blading to shape and crown.

The Apache-Sitgreaves unit of the National Forest Service in Arizona recently quelled a dust problem on some of its most heavily traveled public roads by using a dust suppressant.

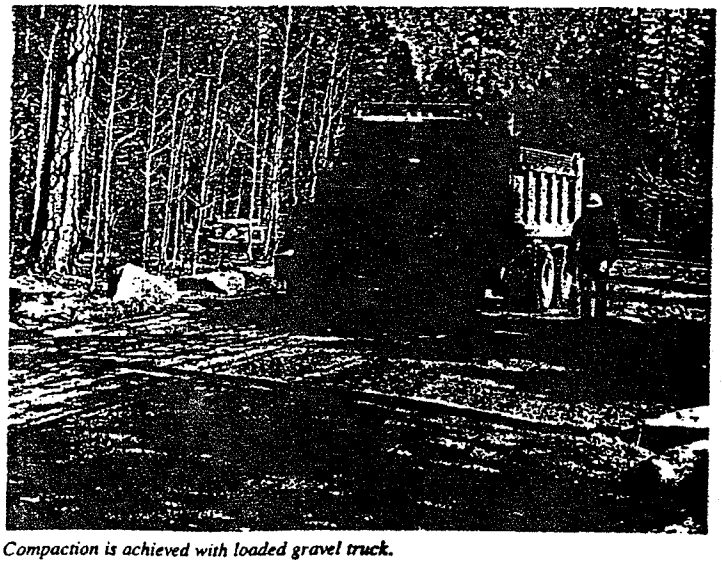
Application required regrading and final compaction by Forest Service forces, and distribution by truck by the contractor, Arizona Refining Co. of Phoenix.

The project involved three miles of intertwining dirt roads serving a heavily used campground in the forest service unit. The campground draws campers from as far as Los Angeles (750 miles); its 139 sites are 90% filled during season and are overused on holidays.

Harold Ward, director of operations and maintenance, Springerville Ranger District, consulted with Gary Christensen, maintenance foreman of the 1.2-million-acre Apache Engineering Zone, which includes Ward's district. They chose to use a dust retardant, a cold water emulsion of petroleum resins that is used to hold down dust on



Moistened surface absorbs suppressant.



Compaction is achieved with loaded gravel truck.

highway shoulders, playgrounds and other environmental sites.

However, the soil composition of the 20-ft-wide roadways within the campground presented a special problem. It contained mostly fine-grained silty clay to which cinders had been added to strengthen the surface. This combination of materials had proved its worth as a surfacing material, although a dusty one. But would it take to the addition of a dust palliative?

First step was an evaluation of roadway conditions and soil types. Christensen examined the soils with an eye to determining preparatory work technique, application and dilution rates, and degree of final compaction.

Preparation work by the Forest Service District involved crowning the roads to provide drainage and extend performance life. In doing this work, Christensen took care to make sure that the top 2 in. would be left in a loosened, moist condition.

During the blading operation, a water wagon applied moisture to the roads in order to facilitate penetration by the dust retardant and ultimate compaction of the entire loosened depth.

Next step was to determine dilution and application rates. The first was important because the action of the dust suppressant depends on its ability to agglomerate the fine particles of road surfaces. It was important that the "mat" effect thus achieved be the right surface composition for the type of vehicular traffic that the road would sustain.

Tests showed that a dilution rate of 1:4 (agent to water) would achieve this result. Determining application rates would require a number of tests due to the convoluted pattern of the roadways.

More testing followed. Three applications were involved, unusual for three miles of roadway.

Application rates were determined as follows:

- *General rate*, 1 gsy in two applications.
- *Loops*, rate cut back to 0.6 to 0.75 gsy, also in two applications.
- *Road junctions*, 1.5 gsy because of the tendency for traffic to be heavier in these spots. Again the material was applied twice.

Under Christensen's supervision, Forest Service personnel bladed and shaped the top 2 in. of the three miles of roads, then moistened them, as planned, prior to application of the dust retardant by the contractor.

Using a standard distributor truck, the contractor applied the agent, diluted 1:4, at the previously established application rates.

At the end of the work, a ¼-mile section leading to the entrance of the campground received an application at the regular rate, 1 gsy in two passes. In all, 35,000 gal of diluted material were applied.

After the final application, the Forest Service crew wheel-rolled the treated roadways in order to compact the soils. Compaction was performed with an end-dump truck loaded with approximately 15 tons of gravel.

The dust retardant performed, according to Ward, especially during the driest period, the month of June—which had previously been the dustiest. □

APPENDIX XXIV.

ACADIA NATIONAL PARK
Bar Harbor, Maine

Bicycling at Acadia

In studying the possibilities of bicycling in Acadia National Park, let us assume for the moment that there is a sufficiently large group that would cycle and get down to the vital task of creating the actual trails and routes. Later we can discuss the possibilties of patronage of the cycle trails, the costs of cycling and the results of 40 miles of wheeling which I participated in.

I entered into the experiment with the vague knowledge that there was extensive bicycling in Europe, especially in the English countryside, and in other areas such as Bermuda, also that there were such things as bicycle trains in this country, and recent efforts at creation of bicycle trails in large municipal parks, especially in New York, and considerable cycling on college grounds. But my most personal tie with the sport goes back to pictures of my parents in cycling habits and their stories of Sunday bicycle parties before the days of New Departure Brakes and two-speed bicycles. Those parties were large gatherings and bicycling was "the thing to do".

Those parties couldn't have taken place on other than country roads. Probably an occasional gravel surface was encountered, but more often dirt or clay. The picture must have been one of small country roads on one-cart width with two well-packed wheel tracks. There were plenty of hills that had to be pushed over, thick dust to plow through and horse-drawn traffic to contend with. In all, a duplication of similar circumstances found in England and Bermuda today, and more to the point, a duplication of circumstances existing at Acadia in the form of our present carriage road system. Adaptation of this system to present day use seems as simple as getting the carriage road wheel tracks packed down.

The packing is a problem of devising a method of carriage road maintenance that would artificially accomplish the smoothed wheel tracks which were naturally a part of the old country road. Those roads were traveled daily by horse and buggy or team and wagon. What tended to keep the roads smooth for bicycles was the fact that in the case of horse and buggy the horse used the center of the road and in the case of a team, the horses walked slowly in the wheel tracks and the accumulative rolling of the buggy and wagon wheels kept the two wheel tracks smooth.

In present usage, there are few buggies on the carriage roads to make wheel tracks and no teams with wagons. And then there is the more predominant usage of certain portions of the system by horsemen who in no case improve the roads for bicycles. The only compensations are that fast-moving horsemen who are the ones most apt to dig up a road are inclined to travel single file. This is only a meager compensation and of course the more predominant amateurs traveling in groups wander all over the road.

But with all this apparent source of roughening the roads with resultant inconvenience to the cyclist, I found through the coincidence of traveling the roads in the fall when dual-tired repair trucks were using certain sections of the system that only a few trips by such a truck smoothed the wheel tracks so that cycling surfaces were available. In very few portions of the system did I find loose gravel or sand that was devoid of binding material. Actually, one could not ask for better binding gravel with which to work on in order to create satisfactory tracks for a bicycle. I admit that I ran onto very rough sections of road in traveling around Eagle Lake and the Witch Hole Pond section, but of course two stables send riders out on this part of the system and from appearances I doubt if any grading or dragging of these roads had been done since last spring. The material is there, however, and a brush drag and an occasional rolling by a dual-wheeled truck would make excellent cycling. On another loop which I started on from Bubble Pond and followed in a southerly direction around Pemetic Mountain, there had apparently been little usage by horsemen and in addition fall travel by trucks and here I found no discouragement whatsoever to hamper the cyclist. Portions on the east side of the Long Pond loop were very smooth and enjoyable due to the smooth wheel tracks, and in other areas such as the loop around Sargent Mountain where apparently neither trucks or horses had frequented the roads, I found particularly good cycling. I rode over about five miles of the truck trail system on the west side of the Island where only trucks are used and found some very good wheeling. The difference on the truck trails, however, is that they are not surfaced with as great a depth of screened gravel and encountered some large stones in the wheel tracks as well as some pock marks and corduroy. The carriage roads are remarkably devoid of any stones larger than would pass through one-inch screen and these are so well bound together by finer material as not to be noticeable.

I believe it is evident from the approach that I made towards a solution of accomplishing cycle trails on the Island that I regarded the carriage roads as being only a step removed from cycle trails. Another point to mention is that I felt no appeal for the idea of actually paving a portion, i.e., three or four feet on one side of the carriage roads or for the idea of constructing a cycle trail system in addition to the existing motor roads, truck trails, foot trails and carriage road system already existent.

Do you not agree that a solution which allows the carriage road system to develop into the small country roads that it was apparently intended to do, is worth striving for and is more apt to meet with the approval of the individuals closely associated with accomplishment of the system.

Would not the tar surfacing of three or four feet on one side of the carriage road system give the road section a lop-sided appearance and in addition lay us open to the suggestion of tarring the whole surface?

Moreover, if the maintenance of the carriage roads with the purpose of reverting to the old country road for the benefit of both cyclists and horsement proves workable on one section of the system, would we not have accomplished a simple means of expanding on the idea? Or vice versa, if the experiement did not prove worth while could we not rightly say that we had in no way destroyed or disrupted the system?

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As to creating a cycle trail system separately from the other travel ways in the Park, I feel that the costs would be out of proportion to the recreational value created, having in mind (1) that about six miles of trail means only an hour's cycle travel; (2) that the cycle system would have to parallel, cross and recross the other systems; (3) that the best views and alignment possibilities are already taken, and (4) that in many cases, while attempting to secure cycle trails of questionable value, we would no doubt detract in many ways from carriage roads and foot trails of proven value.

Surfaces for the cyclist to travel on are not the only problem to be considered, although I can well imagine that they are the greatest factor in limiting bicycle travel on the Island. The matter of road grades logically follows consideration of road surfaces. My personal experience allows me to say that I do not regard the grades encountered on the carriage road system to be in any degree detrimental to their usage by cyclists if one uses a light-weight bike that is low geared. If you will look at your Montgomery Ward catalog you will notice that the nicest looking bicycle models, i.e., the "Torpedo Class" with all the trimmings, including lights, double bars where only one is necessary, baggage carriers and big round juicy balloon tires, weigh from 54 to 68 pounds. That's the kind I used the first day, but being 35 years old, weight 195, and not having used my second wind more than twice a year for the last ten, I perused the catalog a little closer and found that there was such a thing as a light-weight English type two-gear bike that weighted from 24 to 30 pounds, no balloon tires, a good springy seat, and generally minus every unnecessary contraption. Equipped with this knowledge, I was able to rent on the following day a 30-pound bike without the two gears but at any rate with two more cogs in the rear cog wheel.

Consequently, having a bike that was meant for the road and not the show window, I was able to keep my pushing time on the 8.6 mile trip shown as route D on the enclosed map to one hour thirty minutes, and on the 11.3 mile trip shown as E to two hourse twenty-five minutes. I believe that with a two-gear bike and adequate road surfaces, there are but very few and short stretches of the carriage road system that could not be navigated by wheel. However, that is only one side of the question, since we must consider that a mixed party of various ages and cycling abilities would probably adapt their efforts to keeping the party together. This would tend to increase the amount of bike pushing. But no harm done - a slower party helps relieve the strain of continuous cycling, helps take the kinks out of one's muscles and gives the group plenty of opportunity to look around. These probable capabilities of travel by groups leads me to suggest that ten or twelve mile trips which could actually be negotiated in two hours is about the maximum that should be attempted by a group in the course of a full afternoon's schedule.

Actually, I was surprised that as much park territory could be visited by cycle in such short spaces of time. The questions of road surface and grade somehow took all my attention. Then it dawned on me that I was actually covering by wheel in the space of a few hours the same distances that had required a day's travel when I had visited them on foot. One of the most gratifying thoughts is that the carriage road country is more or less a world in itself, one that an individual is apt to visit only once or twice

in a lifetime if he traveled by foot, (this is no mistatement because there are many natives who have never been on the carriage road system) and here, by means of cycling, was a means of visiting in the system at will.

It is this apparent ease with which I could traverse a large part of the system which substantiated my belief that no idea of building separate cycle trails should be harbored, nor, as well, any idea of paving a portion of the existing road system.

One of the principle conclusions to be drawn from this data on timing is that cyclists who wanted to see the carriage road country would not relish confinement to one loop of five or six miles as represented in the Witch Hole Pond or Eagle Lake loops. My first though was that such might be the solution but I soon became imbued with the idea of exploring more and more of the carriage roads.

The 11.64 miles represented in the combined Witch Hole Pond and Eagle Lake loops, the 8.61 miles in the Pemetic Mountain - Jordan Pond loop and the 11.36 miles in the Sargent Mountain - Jordan Mountain loop thus assumed in my mind the status of typical half-day trips that the cyclist could take in normal doses.

A day's wheeling would cost the individual $.75 for bicycle rental, and a party of 20 could rent bicycles at the rate of $.50 per day. A horseman would have to pay from $1.00 to $1.50 an hour and if he had the horse eight hours his costs for rental would be from $8.00 to $10.00. Even if we granted the horseman the benefit of the doubt and conceded rental at the rate of $.75 an hour, his costs are still $8.00 per day.

My own limited experience with horses and bicycles prompts me to hazard the guess that the amateur cyclist, as compared with the amateur horseman, would in two days' travel, cover twice the distance at one-twelfth the cost, feel 50% better and 100% more satisfied than the horseman, but the proof of the pudding is in the eating and you are encouraged to censor my estimates.

I can not resist making three confessions - two regarding horses and the other, bycyles, which may help to clarify the reason for my opinions. I spent several summers working on a farm and had occasion many times to travel by sulky, buggy and spring wagon. The equine object of my affection on such occasions was a gib long-legged black mare named "Lady", and a headstrong thing with callouses at the bit as big as knuckles. She was full of spirit and managed to keep the reins taut and traces hanging. Finally, one day after being a party to pulling the buggy over about a mile of country road by means of my arms, the reins and her calloused mouth, the situation became in my mind a question of whether I was man or mouse. To give myself the benefit of the doubt, I began seesawing on the reins and with good results until I made the belated discovery that I had brought the front of the buggy up against her legs. Well, she proceeded to kick the front out of the buggy and I beat a hasty retreat up and over the back of the seat. Eventually I got her stopped so I always considered the event a draw. This is confession number one by the amateur horseman.

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A year later, same amateur, same farm and same horse, found me preparing to carry out the mission of traveling twelve miles to learn when the thrashers would arrive at our farm. This time, I chose the saddle and started off. I couldn't seem to jibe with her trotting so I had to let her out occasionally. At that, everything went well on the way over although I had had enough of "wild west" by the time I arrived. I completed my task. On the way back I wasn't having much success holding her in to a walk with the result that for several miles either on the trot, on the canter or in the gallop, I was slowly and joltingly coming to the conclusion that I'd be better off walking when one of the stirrup straps broke and I ended up with one leg and both arms twined around the mare's neck and she headed, as it were, for the rhubarb. This is confession number two by the amateur horseman.

As to the other side of the picture, which I was at first prompted to cover up, I had an experience with my bike which perhaps in the relating will relieve horsemanship of some of the shadow of doubt which i have thrown upon it. At least it gives horseman an opportunity to say "I told you so".

I refer to the fact that after two days' successful wheeling and an encouraging start of five miles on my third day's plan for cycling eleven miles around Sargent Mountain, I was brought up short with the discovery that I had sheared the rear cog wheel of my bike off the axle by stripping the threads that held the two together. I was six miles from my car, on the top of Sargent Mountain with a supposedly useless bicycle by virtue of the loss of means to peddle forward or brake on the down slopes.

Even so, as you may note from my log, I made the trip in the average time of five miles per hour. The grades ahead of me were, for the most part, all down hill and after walking and taxiing my bike about a quarter of a mile down grade in a state verging on embarrassment, I devised a brake for the crippled bike. A three-pronged brushy birch sapling with one prong out short and hung over the left peddle which I used as a drag served to make the return trip only a matter of coasting and guessing as to the grade and distance that lay hidden beyond each succeeding bend in the road. So much for the confessions of the amateur cyclist.

Regarding the classes and numbers of people who would use the carriage roads for bicycling, I will have to indulge in pure guesswork but I will include the statistics from which I draw my conclusions so that you can form your own opinions from them as well.

Generally speaking a sport like cycling is meant only for those who know the exhilaration and gratification resulting from struggling on to their second wind. The people who will struggle on to this point are akin to those who enjoy cold showers and I think we are most apt to find them in the organized groups made up in park campgrounds and municipal outing clubs. These are the people who may have to struggle to pull down their roll top desks but who will then jump in their cars to join a group that is headed for an all-day trip up and down some mountain side. There is something in the psychology of group activities that seems to bring out all that is actually in the most of us. As part of a group individual are apt to plunge in first and then ask the questions of how and why afterwards.

An expenditure of money will stop them but not an expenditure of energy. A loss of pride will drive them on but not a loss of companions. So we have to work with as one large class the individuals of the organized group, the game chaps who can whoop it up at a football game for two or three hours in the worst kind of weather but who wouldn't last two quarters if they had the bleachers all to themselves.

This group has never been introduced to bicycling at Acadia but has heard that horses cost $1.50 an hour. I feel that this group is ripe for the plunge.

Of the 380,000 people who visit Acadia in a year, 60,000 are contacted by the Ranger Naturalist in relation to the following organized groups.

24	Automobile Caravans	890 people
48	Hiking Trips	1155 "
37	Boat Trips	1785 "
38	Campfire Programs	7192 "
43	Outside Lectures	4898 "
	Cadillac Mountain	26819 "
	Thunder Hole	14250 "
	Office	260 "
1	Sportsman. Show	1500 "

Of this list of groups, the hikers probably represent the most likely potentiality as related to organized cycling. In the two months of July and August 48 hikes take place at the rate of about five hikes a week with an average attendance of 24 people. Two of the weekly hikes might conceivably become bicycle parties and on the basis of the average attendance, total 400 to 500 people in a season. This amounts to one person out of every 7600 that visit the park and one person out of every 7.5 people who inhabit the campgrounds, the campground population during the year amounting to 3760 people.

We do not have any statistics as to the recreational preferences of the people who visit Acadia but in an effort to secure a cross-check on the estimate just made regarding the potential number of cyclists, it seems fair to use the statistics collected by the Forest Service in the White Mountains in order to secure a fairly accurate devisor for estimate purposes.

The two sets of statistics printed below cover all the recreational activities in their relative preferential standing and in their relation to actual participation. From these two lists I have marked with asterisks seven groups which I regard as sporting classes that would be interested in cycling. Then from the total percentages represented in the seven groups in each list I have secured the average group percentage and I go on the the assumption that the cycle enthusiasts represent such an average group.

From the preferential column number one I find that the seven groups amount to 22.85 per cent of the total and that the average per centage is 3.2.

From the actual participation columns I find that the seven groups amount to 3.3 per cent of the total and that the average per centage is 0.5.

SLO

Using this latter figure in relation to Acadian attendances, i.e., (.005 X 380,000) 1900 cyclists per year become a possibility. Therefore, we have the two estimates of 400 to 500 cyclists as against 1900 cyclists.

Recreations enjoyed with indication of preferences by percentages:

		First	Second	Third
1.	Camping	37.32	12.70	9.93
2.	Motoring	13.58	19.53	6.39
3.	Swimming	10.41*	19.49	14.87
4.	Boating	2.29*	4.63	4.40
5.	Fishing	6.74	12.28	6.22
6.	Hunting	3.24	8.08	4.18
7.	Hiking	6.31*	6.32	8.58
8.	Pack trips	1.00*	0.36	1.34
9.	Horse back	1.22*	1.85	1.93
10.	Winter sports	3.64	3.64	7.49
11.	Nature study	0.90*	1.07	3.23
12.	Picnicking	3.14	5.55	9.68
13.	Rest and relax	1.73	2.16	7.61
14.	Playground	0.72*	0.59	1.14
15.	Campfire entertainment	0.85	7.02	3.41
16.	Other recreations	7.01	0.73	9.60

We find that the activities of users are as follows (using travel figure of 3,710,037):

		New Hampshire	Maine	
1.	Passing through	662,645	75,491	
2.	Sight seeing	2,488,428	98,157	
3.	Boating	2,594*	0	.0007
4.	Camping	36,528	378	
5.	Fishing	6,661	726	
6.	Hiking	76,872*	1,751	.02
7.	Hunting	652	476	
8.	Nature studies	4,792*	45	.0013
9.	Pack trips	0*	0	.0000
10.	Picnicking	44,692	531	
11.	Riding	100*	0	.00003
12.	Swimming	40,523*	762	.011
13.	Sports games	533*	0	.00014
14.	Winter sports	62,317	151	
15.	Other	100,865	0	
				.03319

Another group which would be expected to contribute some cyclists would be the Outing Club of Mt. Desert Island. It has a membership of about 100 people. The average number of members in attendance at scheduled parties such as roller skating, ice skating, hikes, skiing, etc., is about 30. It is safe to estimate that three such parties might be scheduled during a summer season, totalling 90 people. In addition to this, casual cyclists

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of the native population might average in time 20 a week or 180 for July and August. Native use of the trails is therefore estimated at 200 to 300 individual trips as a possible contribution. There are 8000 natives on the island so the total cyclist group over the summer amounts to three per cent, i.e. (250 to 8,000).

The summer colony swells the population to about 24,000 people. The additional 16,000 might be figured to contribute three per cent as cyclists and thus a figure of 480 individual trips is added to the estimate.

The following in a summary of potential use of bicycle trails on a minimum, maximum basis.

Tourists	400 to 1900
Natives	200 to 300
Summer Colony	300 to 500
Totals	900 to 2700

The following leg of my travels on the carriage road system concluded the data which I have gathered with the purpose of helping to determine the policy that is to be established in relation to cycling at Acadia. I advocate a policy of permitting joint use of the carriage roads by cyclists and horsemen by means of a program of progressive adaptation to bicycle travel of sections of this system in direct relation to the popularity attained, beginning with one carraige road circuit approximately ten miles in length.

A. Witch Hole Pond Loop:

Distance, 5.90 miles. Time, 1 hour, 10 minutes.

A.M.	
9:20	Start. Firm but rough surface due to horses.
9:40) 9:43)	Pushed bike on account of grade. The footing was firm and fairly smooth in the tracks.
9:50) 9:55)	Pushed bike on account of grade and some degree of loose gravel.
10:00) 10:10)	Rest period.
10:20) 10:22)	Rest after pumping up grade.
10:32	Return.

In general, travel surface was firm to hard and quite consistently rough. Very few loose gravel areas were encountered.

Scenery is ideal, and ranges from distant mountain and ocean views to intimate vistas of woods, ponds and small heaths amidst an entirely wooded setting. The wheeling could be made excellent with proper maintenance. Equipped with a light two-speed English type bike, this section could be peddled from one end to the other.

SLT

B. Eagle Lake Loop:

Distance, 5.68 miles. Time, 1 hour, 10 minutes.

P.M.

1:15 Start - road extremely rough.

1:30) Pushed bike, due to loose gravel, roughness and grade.
1:40) Travel surface changed to an ideal smoothness where repair trucks had traveled over the roads and made wheeling a pleasure.

1:55) Rest at the halfway mark. Down grade since 1:40.
2:00)

2:00) Pushed bike due to loose gravel, general roughness
2:02) and grade.

2:10) Rest - wheeling rough and tiresome due to hoof marks.
2:12) Grade practically zero.

2:25 Return. Last stretch extremely rough due to proximity to riding stables.

This route could be peddled all the way with proper vehicle and good road surface.

The scenery varied from lake and mountain views to the seclusion of deep woods. Five deer were encountered.

C. Long Pond Loop

Distance, 3.7 miles. Time, 40 minutes.

P.M.

3:00 Start. Ideal wheeling along east side of pond due to road smoothing by work trucks.

3:02 Chased a red fox up the road.

3:05) Pushed bike due to grade. Surface good.
3:10)

3:15) Push and rest. Fine view down Long Pond.
3:17)

3:40 Return.

D. Pemetic Mountain - Jordan Pond Route.

Distance, 8.61 miles. Time, 1 hour, 30 minutes.

A.M.

9:35 Start. Surface fine due to work trucks.

9:40) Push. Surface good.
9:42)

9:57) Rest at point overlooking Wild Wood Fram.
10:00)

10:05) Watched three deer 100 to 150 feet off road. An
10:10) approaching work truck scared them back into woods.

10:20) Pushing bike along Jordan Pond. This section could be wheeled
10:25) if smooth. However, the trucks had successively smoothed the the road surface and then worked it into corduroy. Enjoyed the opportunity to work the kinks out of my legs and view the scenery at a walk.

10:30) Discovered a red fox hunting the road shoulder for rodents. He
10:35) was less than 100 feet away as I later paced the distance and apparently did not see me or get my scent because I watched him until I got tired of waiting to be discovered.

10:40) Pushed bike due to roughness and losseness of surface. However,
10:41) the lighter bike that I used enabled me to cut the pushing distance in half.

10:45 Stirred up four deer.

11:05 Return.

This was the best trip so far due to good road surfaces and improved type of bicycle used. The scenery was great and included distant mountain and sea views, the large expanse of Jordan Pond, the overhanging Jordan Cliffs and deep woods.

E. Sargent Mountain - Jordan Pond Loop.

Distance, 11.36 miles, Time, 2 hours, 25 minutes.

A.M.

8:50 Start.

8:55) Pushed bike. The surface is loose and rough due to repeated
9:00) churning by horses from nearby stables.

9:05) Pushed bike. The surface was loose and rough.
9:08)

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9:20) Rest. Great seaward view. Long Pond in the central distance
9:22) and many islands off shore.

9:24) Rest. Was surprised what grades could be pumped.
9:26)

9:48) Rest. Now at north end of Upper Hadlock Pond. Road surface
9:50) now smooth because horses do not appear to frequent this section of road.

10:10) Have attained top of rise and am looking over Somes Sound.
10:12)

10:13 I discover I have sheared the rear cog wheel off the axel. This means no gears and no brakes.

10:25 Would hate to be caught pushing a bike down hill.

10:30 Have now devised a brake from bushy birch sapling which I use as a drag to regulate speed down hill. Clear sailing ahead.

11:15 Return.

B. L. Breeze,
Resident Landscape Architect.

BLB:NEA

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APPENDIX XXV

List of Sources

American Institute of Architects

American Society of Landscape Architects

Bar Harbor Historical Society

Central Park Conservancy

Department of Interior Library

Dumbarton Oaks Library

Ms. Deborah Dyer, Bar Harbor, Me.

Fenton, Chapman, Fenton, Smith & Kane

Jefferson-Madison Regional Library

Library of Congress

Maine State Archives

Maine State Law Library

Mrs. C. A. Marinke, Bar Harbor, Me.

Mr. Joe Minutolo, Bar Harbor, Me.

National Archives

National Commission on Fine Arts

National Park Service
North Atlantic Regional Office
Library at Harper's Ferry, W. Va.
Acadia National Park Headquarters
Blue Ridge Parkway

New York Public Library

Rockefeller Archive Center

Seal Harbor Library (Debbie Burch)

Mr. and Mrs. Charles P. Simpson, Seal Harbor, Me.

University of Virginia Libraries

GLOSSARY OF BRIDGE TERMINOLOGY

ABUTMENT. Substructure supporting the end of a span, sometimes including a portion for retaining or supporting the approach embankment; for a masonry bridge, the structural component is composed of solid masonry or masonry-faced concrete and it counteracts the lateral thrust of the arch.

ARCH. A structure which carries loads by producing vertical and horizontal components at its supports. Specific types adapted to bridge construction derive their names from the shape of the curve, the support conditions, or the type of construction.

ARCH BARREL. The barrel vault portion of the structure, visible on the intradosal plane, which forms the basis of the bridge superstructure; an arch ring which extends the width of the structure.

ARCH RIB. Arch ring used in unfilled and open spandrel arch construction for reinforced concrete bridges.

ARCH RING. The outer course of stone or brick, forming the basis of the arch structure, visible on the elevation as the voussoirs.

ARRIS. Sharp edge produced by two edges meeting.

ASHLAR. Masonry composed of hewn blocks, with edges worked square and surfaces dressed, laid in horizontal courses with vertical joints.

BALUSTRADE. A concrete or stone railing system which includes rails and balusters (vertical members); serves as protection for vehicles and pedestrians at the edge of a bridge.

BEAM. A structural member which receives and transmits stresses induced by externally applied loads, deriving its strength from the development of internal bending or flexural stresses; the member can be supported at its ends or at intermediate points.

BEARING. Portion of bridge which seats superstructure to substructure; sometimes refers to a device at the ends of beams which is placed on top of the substructure (pier or abutment) and upon which the beam rests. They can be fixed or expansion bearings.

BEARING SEAT. Top of masonry substructure supporting bridge bearing.

BELT COURSE. A horizontal band of masonry, generally narrower than other courses, extending across the facade of a structure; may be flush or projecting.

BROKEN RANGE MASONRY. Masonry in which courses are not continuous throughout the wall.

BUTTRESS. A bracket-like wall, projecting from or built against another wall, to reinforce it; buttress strengthens or stiffens wall and may be integral with it or built against it.

CANTILEVER. A structural member which projects beyond its supporting wall or column and is supported at one end only.

CAPSTONE. Topmost stone of a masonry column, or one of a series forming the upper course of the parapet.

CENTERING. Temporary structure which supports the masonry while the arch ring is being constructed.

CLOSED SPANDREL WALL. A masonry or concrete wall which encloses the fill material within the body of the bridge superstructure.

COMPRESSION. Type of stress involving pressing together.

CONTINUOUS SPAN. A superstructure designed to extend continuously over one or more intermediate supports.

COPING. Topmost course of a masonry wall or pier.

CORBEL. Projecting course or portion of masonry serving a structural ornamental function.

CORBELLED ARCH. Masonry arch built by uniformly projecting courses from each side, each course projecting slightly outward from the one below, until they meet at the crown; no arch action is produced; also called a false arch.

COURSED RUBBLE. Masonry consisting of roughly dressed rubble (unsquared stones) laid in deep, approximate courses.

DECK. The portion of a bridge which provides direct support for vehicular and/or pedestrian use.

DRAFTED STONE. Stones on which the face is surrounded by a chisel draft with the surface inside left rough.

DRESSED STONE. Stone that has been worked to the desired shape and to a finished face. The finished surface may be worked in a wide variety of treatments.

ELLIPTICAL ARCH. An arch in which the intrados is part of an ellipse.

EFFLORESCENCE. White deposit on brick, stone or concrete masonry brought to the surface by moisture in the masonry.

EXTRADOS. The curve defining the surface of the arch ring which bounds the outer extremity of the voussoirs.

FALSE ARCH. See corbelled arch.

FALSEWORK. A temporary wooden or metal framework built to support a structure during its construction and until it becomes self-supporting.

FILL. Material, usually soil, used to raise or change the surface contour of an area, to construct an embankment, or to be placed within a stone or concrete arch bridge.

FIXED ARCH. An arch which, if fixed against rotation at both its supports, may be built of stone or concrete.

FLOOR BEAM. A horizontal member located transverse to the bridge axis.

FOOTING. The enlarged lower portion of a substructure, which distributes the structure load either to the earth or to supporting piles. Generally found below the surface of the ground and not visible.

FOUNDATION. Supporting portion of structure upon which the substructure rests.

GIRDER. Any large beam, especially if built of steel plates, which acts as primary support, usually receiving loads from floor beams and stringers.

HINGED ARCH. An arch which is supported by a pinned connection either at each end support (two-hinged) and/or a pin located near mid-span.

HUMPBACK. A descriptive term applied to bridges in which the deck and/or parapet are curved and peak at the mid-point; the crest is created by grades beginning at the approach roadways from both directions and terminating at the bridge mid-point; also known as a camelback.

INTRADOS. Curve defining the interior surface, or underside, of the arch.

JOINT. The space between individual stones in a stone masonry bridge usually filled with mortar; in concrete bridges, a division in the continuity of the concrete, produced in predetermined locations during construction.

KEYSTONE. The central stone of an arch ring, located at the crown of the arch.

LAGGINGS. Temporary formwork composed of ribs connected by narrow planks which support the arch intrados temporarily during construction of the bridge arch.

LATERAL BRACING. The bracing portion of a structure perpendicular to its longitudinal axis, intended to resist lateral movement and deformation resulting from wind and lateral vibration.

LIVE LOAD. An external load such as traffic which is applied to a bridge; may also accompanied by vibration or movement affecting its intensity.

MASONRY. A general term applied to structures built of stone, brick, and concrete, known correspondingly as stone, brick or concrete masonry.

MULTI-CENTERED ARCH. Arch in which the intrados is defined by two or more arcs of differing radii.

OBELISK. A monumental, tapered masonry shaft, ornamental in nature, usually monolithic and terminating in a pyramidal tip.

ONE-HINGED ARCH. See Hinged Arch.

OPEN SPANDREL WALL. An unfilled spandrel where the arch ring receives its load through interior spandrel walls, ports, columns or transverse walls.

PARAPET. A low wall along the outside edge of a bridge deck which extends longitudinally along the bridge. Sometimes ornamental in appearance, its purpose is to prevent vehicles and pedestrians from falling off the edge of the bridge. Usually, balustrades are considered an ornamental type of parapet.

PIER. Stone, concrete, brick, steel or wood structure which supports the ends of the superstructure spans of a multiple span bridge at an intermediate location between its abutments.

PILE. A linear member driven into the earth to carry loads through weak soil strata to a depth capable of supporting the structure and its applied loads; may be timber, steel, concrete, or composite material.

PITCH-FACED STONE. Stones on which the arris is clearly defined by a line beyond which the rock is cut away to give an edge which is approximately true.

PLINTH COURSE. Course forming the base of abutments, piers, parapets, or retaining walls, and projecting beyond the face of the structure.

POST. Sometimes used synonymously for "column". located perpendicular to the bridge deck; may be structurally functional and resist compressive stresses, or ornamental in nature.

PYLONS. A large monumental post usually marking the portal to a bridge or forming part of gateway.

RANGE MASONRY. Masonry in which a course is the same thickness throughout.

RANDOM MASONRY. Masonry which is not laid in courses.

REINFORCED CONCRETE. Concrete designed to incorporate steel reinforcing bars which supply tensile strength to the structure; unreinforced concrete is known as plain concrete, and consists of mass concrete which can resist compressive stresses only.

RIB. Projecting member supporting a curved shape or panel, sometimes ornamental.

RISE. Vertical distance between the highest part of the intrados and the plane of the spring lines.

RUBBLE. Masonry composed of unsquared stone, in unworked condition, varying in size.

QUARRY-FACED STONE. Stones in which the faces are left untouched as they come from the quarry.

SEGMENTAL ARCH. Arch in which the intrados is less than a semi-circle.

SIMPLE SPAN. Bridge span supported at its end and restrained at the supports only against vertical movement; ends are free to rotate.

SKEW BRIDGE. When the longitudinal axis of a bridge is not perpendicular to the substructure.

SKEW ANGLE. Acute angle between the longitudinal axis of the bridge and the axis of the substructure.

SKEWBACK. The inclined surface or joint upon which the end of the arch rests.

SPANDREL. The area between the extrados and the roadway.

SPANDREL WALL. Wall built on an arch, in the spandrel area, to contain spandrel fill and/or support the floor system and applied loads.

SPRING LINE. Inner edge of the skewback; horizontal, transverse line along the face of an abutment or pier where the intrados begins.

SQUARE STONE MASONRY. Stones which are roughly squared and roughly dressed on beds and joints; three subdivisions of this category are quarry-faced stone, pitch-faced stone and drafted stones (see corresponding entries).

STRUT. A general term applying to a member acting to resist compressive stress.

SUBSTRUCTURE. The abutments, piers and related components built to support the spans of a bridge superstructure.

SUPERSTRUCTURE. Portion of a bridge structure which primarily receives and supports live loads and in turn transfers them to the substructure.

SUSPENDER. Vertical rod connecting a member at one end and the bridge floor system at the other, transferring loads from the road to the main structural member.

TENSION. Type of stress involving an action which pulls apart.

THREE-HINGED ARCH. See Hinged Arch.

TIE. A member, usually a rod or bar, which functions to resist tension.

TIED ARCH. An arch in which the lateral thrust is resisted by horizontal ties connecting the ends of the arch ribs.

TWO-HINGED ARCH. See Hinged Arch.

UNCOURSED RUBBLE. Masonry composed of unsquared stones laid without any attempt at regular courses.

UNSQUARED STONE. Stone which is used as it comes from a quarry, without other preparation other than the removal of very acute angles and excessive projections.

VOUSSOIRS. Bricks or truncated wedge-shaped stones comprising an arch ring.

WING WALLS. The retaining wall extension of an abutment intended to retain the side slope materials of an approach roadway embankment.

GLOSSARY OF ROAD TERMINOLOGY

ALIGNMENT. The projected line along which a road is designed *or* is built.

BACKFILL. Earth or other material used to replace material removed during construction, such as in pipeline and culvert trenches and behind retaining walls.

BASE. The artificial foundation on which the wearing "coat" of a pavement rests.

BINDER. The screenings, or soil, used to bind a macadam road together.

BOX CULVERT. A small culvert with an opening of rectangular shape. Originally such culverts had rubble masonry sidewalls for the sides, cobble pavement for the bottom and slabs of stone ("coverstones"), resting on the sidewalls, for the top.

BREAST WALL. A wall designed to support the natural grade above a cut section.

BROKEN STONE. Stone that has passed through a rock crusher. When it has not been screened into different sizes, it is called "run of crusher," or "crusher run". The smallest size, generally 1/2" or 1/4" down to dust is called "screenings".

CATCH BASIN. A receptable, with a sediment bowl or sump, for diverting surface water to a subsurface pipe.

CENTER LINE. The survey line in the center of a road, or similar project.

CIRCULAR CURVE. An arc of constant radius common to two tangents.

COMPACTION. The densification of a soil by a mechanical process.

CONTOUR LINE. An imaginary line, or its representation on a map, following all points at the same elevation above or below a given datum.

CROSS-SECTION. Transverse profile of the roadway.

CROWN. The arch or camber of the surface of a road or street; the transverse profile of a roadway.

CULVERT. A waterway under a roadway, smaller than a bridge.

CUT SECTION (or cut). That part of the ground surface which, when graded, is lower than the original ground.

DATUM. A horizontal reference plane used as a basis for computing elevations.

ELEVATION. (a) The altitude relative to a given datum. (b) A scale drawing of the upright parts of a structure.

EMBANKMENT. The volume of material *deposited* on the original ground surface or above the subgrade.

EROSION. Detachment and movement of soil or rock fragments by water, wind, ice and gravity.

EXCAVATION. The volume of material *removed* below the original ground surface.

FILL SECTION (or fill). That part of the ground surface which, when graded, is higher than the original ground.

FOUNDATION. The base which supports wearing coat of a pavement.

GRADE. The rate of percent of rise or fall of the longitudinal profile of a road. A 1% grade means a rise of 1 foot vertical in 100 ft. horizontal. Grade is also a verb, meaning to excavate or fill to grade lines.

GRADER. A "road machine" having a steel blade for levelling, scraping or "drifting" earth.

GRADE SEPARATION. A bridge separating roadways.

GRADIENT. The degree of inclination of a surface, road, or pipe, usually expressed in percent.

GRADING. Modification of the ground surface by cuts and/or fills. Fine or finish grading is light or thin grading to finish a prepared earth surface.

GUTTER. An artificially surfaced and generally shallow waterway, usually provided at the sides of a roadway for carrying surface drainage.

INLET. An arrangement for conveying surface water to an underdrain.

INTERSECTION. An at-grade junction of two or more roads.

MACADAM. A pavement made of graded sizes of broken stone held together by the mineral colloids of the stone.

METAL. The broken stone used for macadam; often called "road metal".

OUTLET. Point of water disposal from a stream, river, lake, tidewater, or artificial drain.

PAVEMENT. A floor-like covering built upon the soil to form a firm, unyielding roadway for wheeled vehicles and animals. Every pavement has three functions to perform: (1) Distributing concentrated wheel loads over the earth subgrade: (2) Roofing the earth subgrade so as to prevent its saturation with water, and (3) Giving a hard, clean, smooth (but not slippery) surface that reduces friction. Pavements generally consist of two parts, (a) a "base" which performs the function of distributing the wheel load, and (b) a wearing coat which sheds rain and provides a durable, smooth surface.

PLAN. The proposed horizontal alignment.

PROFILE. The line of intersection of a vertical plane with the earth's surface; ordinarily applied to the longitudinal profile of the ground over which a road is to be built. The transverse profile is the cross-section.

RADIUS. The distance from an arc to a common perpendicular point; the ground distance from a compass point to the curve.

RAVEL. When the stones of a macadam road are displaced by traffic, it is said to "ravel".

RETAINING WALL. A wall built to support an embankment.

RUNOFF. That part of precipitation carried off from the area on which it falls. Also, the rate of surface discharge of the above. (The ratio of runoff to precipitation is a coefficient, expressed as a decimal.)

SCREENINGS. The fine product of a rock crusher usually from dust up to 1/2" to 3/4" in size.

SHAPING. The process of giving the final finishing to a subgrade, including the rolling of the subgrade.

SHOULDER. The portion of roadway between the edge of the hardened wearing course and the ditch or embankment.

SLOPE. The face of an embankment or cut section. Any ground whose surface makes an angle with the horizontal plane.

SLOPE STAKE. A stake set to mark the toe of a "fill" (embankment) or the top outer edge of a "cut" (excavation).

SPIRAL CURVE. A curve of gradually decreasing radius beginning at a point on the tangent and ending at a circular curve.

SUBGRADE. The graded surface of the soil upon which a pavement rests.

SUPERELEVATION. The rate of rise of the outside edge of pavement to compensate for centrifugal force of a moving vehicle.

TANGENT. A straight road segment connecting two curves.

TELFORD. A pavement consisting of a base, or "bottoming" of large stones set on edge, supporting a wearing coat of ordinary macadam.

VERTICAL CURVE. A parabolic curve connecting two vertical tangents; usually a curve on a profile.

WATERSHED. Region or area contributing to the supply of a stream or lake. (Also drainage basin or catchment area.)

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