

SYRACUSE UNIVERSITY



3 2911 03498290 0

PROCEEDINGS of the 8th Annual Meeting

New York - New Jersey Division

Association of
AMERICAN
GEOGRAPHERS



Hofstra University Interlibrary Loan



Caniano, William - librwtcAXINN

TN: 213491 Lending Library: SYB

Title: Proceedings of the annual meeting. Patron would like to borrow volumes for 1967-1971.

Author:

Due Date: 4/1/2014 Pieces: 4

Volume 1 of 4.

West
13-14

Vol. I

ILL Office Hours: Monday - Friday, 8am - 5pm

Phone: 516-463-5946

<http://illiad.hofstra.edu/illiad/Axinn/>

SYRACUSE
UNIVERSITY

E. S. BIRD LIBRARY

PROCEEDINGS OF THE

EIGHTH ANNUAL MEETING

of the

NEW YORK-NEW JERSEY DIVISION

ASSOCIATION OF AMERICAN GEOGRAPHERS.

NEW YORK - NEW JERSEY
DIVISION.

Held at the

U.S. Military Academy

West Point, N.Y.

October 13-14, 1967

Volume I

April 1968

Published by the Division

Price \$2.50

FOREWORD

This initial volume of the Proceedings . . . represents a new publishing venture for the Division. It is intended to place promptly in the hands of the membership the record of the annual meeting of the Division. Hopefully, through this new vehicle, papers presented at the meeting will reach a broader audience and become a matter of permanent record.

These Proceedings . . . include the program of the Eighth Annual Meeting, held October 13-14, 1967 at the U.S. Military Academy at West Point, together with the roster of Divisional officers for 1966-67 and 1967-68. It also includes the full text of thirteen of the papers presented at the meeting. It does not include, however, the two informal reports by Preston E. James on the activities of the High School Geography Project and of the Commission on College Geography.

Papers appearing in this volume underwent relatively little editorial alteration. All were retyped onto Multilith masters and the Editor stands responsible for any errors introduced through retyping. Certain of the papers were re-cast by their authors for written presentation. In general, it was possible to provide the space requested for line-copy illustrations. However, budgetary constraints prohibited the use of half-tone illustrations that would have been necessary to do justice to Herman Friis's paper which was designed for oral presentation along with a series of colored slides. The system of numbering illustrations was to prefix the figure number with the initial of the author's surname. Thus, Fig. P1 refers to the first map in Major Palmer's paper. Statements or opinions expressed in the Proceedings . . . are the responsibility of the authors and do not necessarily reflect the views of the Division. Lastly, the Editor wishes to express his appreciation to Mrs. James K. Farrell who did an unusually conscientious job of retyping the papers and to Capt. Waino E. Arvo, Jr. for his assistance in re-touching the maps.

Richard E. Dahlberg
Editor

G
56
A88

8th

PROGRAM OF THE EIGHTH ANNUAL MEETING

of the

NEW YORK-NEW JERSEY DIVISION, ASSOCIATION OF AMERICAN GEOGRAPHERS

1967

Held October 13-14, 1967
at U.S. Military Academy
West Point, New York

Friday, October 13, 1967

Information Booth opens in lobby of U.S. Hotel Thayer, 12:00 Noon

Guided tours of U.S. Military Academy leaving from Visitors
Information Center, LTC Ebner directing, 1:30-4:30 p.m.

Registration, 5:00-9:00 p.m.

Call to Order, North Auditorium, Thayer Hall, 7:00 p.m.

Richard E. Dahlberg, Chairman

Welcome

Colonel C. R. Broshous, Professor, Department of
Earth, Space and Graphic Sciences, U.S. Military
Academy

Session A, North Auditorium, Thayer Hall, 7:15-9:00 p.m.

West Point and the Military in Geography

Chairman: Donald W. Meinig, Syracuse University

"West Point, the Geographic Key to the Continent"

Major Dave R. Palmer, U.S. Military Academy

"Highlights of the Geographical and Cartographical Contributions
of Graduates of West Point with a Specialization as Topographical
Engineers Prior to 1860"

Herman R. Friis, National Archives and Records Service

"The Role of the U.S. Army in the Colonization of the
Trans-Mississippi West: Kansas 1823-1861"

LTC John Garver, U.S. Military Academy

Coffee Break: 9:00-9:20 p.m.

M09D80

Session B, North Auditorium, Thayer Hall, 9:30-10:40 p.m.

Geography and Education

Chairman: Douglas R. McManis, Teachers College,
Columbia University

"Geographic Education for the Non-Major"

Major Todd P. Graham, U.S. Military Academy

"Systems Theory and Education of the Geographer"

Richard Symanski, Syracuse University (Presented
by Lakshman S. Yapa, Syracuse University)

"Report on the High School Geography Project"

Preston E. James, Syracuse University

"Current Activities of the Commission on College Geography"

Preston E. James, Syracuse University

Saturday, October 14, 1967

Information Booth opens in lobby of U.S. Hotel Thayer, 8:30 a.m.

Registration, 8:30-9:30 a.m.

Session C, Room 102, Thayer Hall, 9:00-11:00 a.m.

Contributed Papers

Chairman: Robert A. Muller, Rutgers University

"A Cartographic Analysis of Changing Student Hinterlands
of the S.U.N.Y. Colleges of Arts and Sciences"

Joseph W. Brownell and William R. Stanley,
S.U.C. Cortland

"The Federal Watershed Program in New York State:
An Examination of Some Controversial Aspects"

Joseph H. Butler, S.U.N.Y. Binghamton

"Military and Political Geography of the Israeli-Syrian
Boundary Dispute"

John S. Hauptert, S.U.N.Y. Buffalo

"The Importance of Manufacturing to the Counties of the
Hudson River Basin"

John Volkert, Hudson River Valley Commission

Session D, Room 104, Thayer Hall, 9:00-11:00 a.m.

Contributed Papers

Chairman: Leonard Zobler, Barnard College,
Columbia University

"Soil Morphologic Environments and Their Significance to
Land Use Patterns on the Allegheny Plateau and the Erie
Plain in Southwestern Erie County, New York"

Jon P. Amato, S.U.C. Buffalo

"The Variation of Vegetation from Place to Place"

David de Laubenfels, Syracuse University

"Development of a Unified Model of the Climate-Soil-
Vegetation Relationship"

LTC John E. Fox, U.S. Military Academy

"A Method of Establishing Agricultural Regions in the
Lake St. John Lowland of Quebec, Canada"

Nicolay P. Timofeeff, S.U.N.Y. Binghamton

Business Meeting, North Auditorium, Thayer Hall, 11:00-11:30 a.m.

Parade on the Plain, 12:00-12:30 p.m.

Lunch, 11:00 a.m.-1:00 p.m.

Field Trips, 1:30-5:00 p.m.

Geology Field Trip

LTC K. R. Ebner, U.S. Military Academy
Kemble Widmer, N.J., Department of Conservation
and Economic Development

Hudson River Development Trip

Major C. C. Thudium, U.S. Military Academy
John Volkert and Hal Schneider, Hudson River
Valley Commission
Charles Lohrfink, Consolidated Edison Company

Urban Geography Trip

Major J. H. Jones and Donald F. Clark, U.S. Military
Academy
Barry Benepe, City Planning Director, Newburgh
Helen V. Gearn, City Historian, Newburgh

A. H. Mitchell, Executive Director, Chamber of
Commerce, Newburgh
John Stillman, Director, Urban Renewal, Newburgh

Cocktails and Buffet, Red Room, West Point Army Mess,
6:00-8:00 p.m.

OFFICERS AND APPOINTEES OF THE DIVISION: 1966-67

Chairman: Richard E. Dahlberg, Syracuse University

Vice-Chairman: LTC Wesley C. Smith, U.S. Military Academy

Secretary-Treasurer: Theodore W. Kury, S.U.C. Buffalo

Newsletter Editor: Theodore W. Kury

Program Committee: R. E. Dahlberg, LTC W. C. Smith,
T. Kury, and George McDermott, S.U.C. Cortland

Local Arrangements Committee (Eighth Annual Meeting):

Chairman: LTC John E. Fox

Registration: Major Gordon B. Rogers

Field Trips: LTC K. R. Ebner

Special Maps: LTC K. R. Ebner

Displays: Major Donald W. Reeves

Logistical Coordinator: LTC Arthur L. Erickson

Facilities: Major Gerald D. Tebben

Transportation: Major Edward K. Wintz

Buffet: Major Harry J. Hubbard

A special note of gratitude is extended to Mr. William Van Zetta,
Executive Officer, Department of Earth, Space and Graphic Sciences,
and to his staff for their wholehearted cooperation in supporting
the efforts of the Local Arrangements Committee.

OFFICERS AND APPOINTEES OF THE DIVISION: 1967-68

Chairman: LTC Wesley C. Smith, U.S. Military Academy

Vice-Chairman: Theodore W. Kury, S.U.C. Buffalo

Secretary-Treasurer: George W. Carey, Teachers College,
Columbia University

Councillor, A.A.G.: Edwin H. Hammond, Syracuse University

Newsletter Editor: George W. Carey

Proceedings . . . Editor: Richard E. Dahlberg, Syracuse
University

Program Committee: LTC Wesley C. Smith, Theodore W. Kury,
and Howard Flierl, S.U.N.Y. Albany

30

GARVER, LTC John
The Role of the U.S. Army in the Colonization
of the Trans-Mississippi West: Kansas 1833-
1851

34

GRAHAM, Major Todd P.
Geographic Education for the Undergraduate
Non-Major

35

SYMANSKI, Richard
Systems Theory and Education of the Geographer

34

BROWNELL, Joseph W., and STANLEY, William R.
A Cartographic Analysis of Changing Student
Interlands of the S.U.N.Y. College of Arts
and Sciences

34

BUTLER, Joseph H.
The Federal Watershed Program in New York State:
An Examination of Some Controversial Aspects

TABLE OF CONTENTS

	Page
FOREWORD	ii
PROGRAM	iii
OFFICERS, 1966-67	vi
OFFICERS, 1967-68	vii
Papers Presented	
PALMER, Major Dave R.	1
West Point, the Geographic Key to the Continent	
FRIIS, Herman R.	10
Highlights of the Geographical and Carto- graphical Contributions of Graduates of West Point with a Specialization as Topographical Engineers Prior to 1860	
GARVER, LTC John	30
The Role of the U.S. Army in the Colonization of the Trans-Mississippi West: Kansas 1823- 1861	
GRAHAM, Major Todd P.	54
Geographic Education for the Undergraduate Non-Major	
SYMANSKI, Richard	65
Systems Theory and Education of the Geographer	
BROWNELL, Joseph W., and STANLEY, William R.	74
A Cartographic Analysis of Changing Student Hinterlands of the S.U.N.Y. Colleges of Arts and Sciences	
BUTLER, Joseph H.	94
The Federal Watershed Program in New York State: An Examination of Some Controversial Aspects	

	Page
HAUPERT, John S.	104
Military and Political Geography of the Israeli-Syrian Boundary Dispute	
VOLKERT, John	117
The Importance of Manufacturing to the Counties of the Hudson River Basin	
AMATO, Jon P.	132
Soil Morphologic Environments and Their Significance to Land Use Patterns on the Allegheny Plateau and the Erie Plain in Southwestern Erie County, New York	
DE LAUBENFELS, David J.	142
The Variation of Vegetation from Place to Place	
FOX, LTC John E.	152
Development of a unified Model of the Climate-Soil-Vegetation Relationship	
TIMOFEEFF, Nicolay P.	186
A Method of Establishing Agricultural Regions in the Lake St. John Lowland of Quebec, Canada	

WEST POINT, THE GEOGRAPHIC KEY

TO THE CONTINENT

Major Dave R. Palmer
U.S. Military Academy

The obvious choice of topics for a teacher of history to select when he is addressing teachers of geography, who happen to be visiting the Military Academy, is self-evident. He should talk about the interrelationship of history and geography, somehow weaving in the story of West Point-- and that is what I plan to do.

History has to do with the element of time, geography with the element of space. Actions of mankind take place in the two dimensions of space and time. To understand why men have done the things they have done one must know both dimensions. To illustrate my point, I will use as an example the role of West Point in the American Revolutionary War.

First, though, to be sure we all start with the same background of knowledge, let me quickly describe the fortress which was known as West Point in the War of Independence.

The Hudson River was navigable by the largest ships of the day almost to Albany. Smaller vessels could sail beyond that city. At one place only was the Hudson narrow enough to permit land forces to hinder the royal fleet-- right here in the Hudson Highlands. After several months and some very expensive and bitter lessons, the Americans decided to block the river at West Point. A sailing ship, to pass, would have to tack around a right angle turn in an area of tricky tides and changing winds. Losing speed, it would be snagged on a great chain stretched across the river. Cannon from batteries near the water and from a fort on the overlooking promontory would then batter it into helplessness (Fig. P1). To protect those works from an attack from the rear a ring of forts was built on the next higher layer of hills to the west, and to protect those, a second ring was erected even farther out. Those forts, by the way, are still in existence today. Links from the great chain are preserved at the Military Academy and remnants of the main

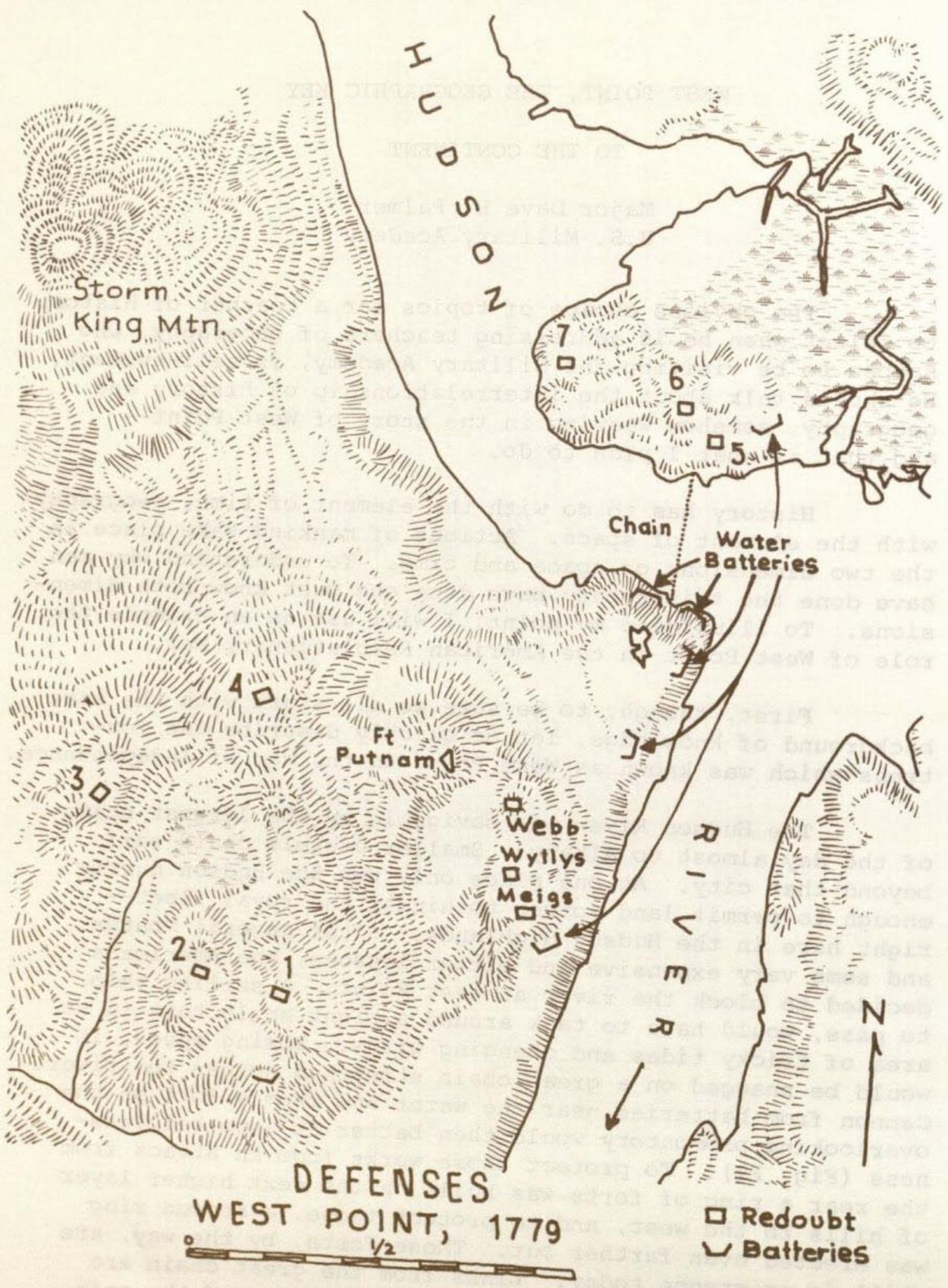


Fig. P1

fort, named originally for Benedict Arnold but changed after his treason, can also be seen.

Evidence abounds that the British thought capturing West Point was crucial to the fulfillment of their plans. Even before the outbreak of actual fighting at Lexington and Concord, Lord Dartmouth, Secretary of State for the colonies, decided that a large military and naval force operating on the Hudson River would be able to defeat any rebellion. In that same year, Henry Clinton drew up a plan to take the Hudson and Sir William Howe claimed that British occupation of the Hudson would be decisive in the war. Fate would give both of those generals a chance later to attempt to seize the river.

British leaders were not alone in their thinking. The Commander-in-Chief, George Washington, stated categorically that the loss of West Point "would prove fatal" to the patriot cause. In a joint report, five of his most trusted generals--Nathanael Greene, Henry Knox, "Mad" Anthony Wayne, George Clinton and Alexander McDougall--wrote that holding the Hudson River was absolutely essential and warranted any expense. The Americans began to look upon West Point as the "Gibraltar of America." Benedict Arnold, the hero turned traitor, had hardly been fitted for his new, red, British uniform before he informed the English authorities that, if they hoped to beat Washington, they must take West Point.

Well, so much for what people said and wrote. The test of what they actually believed is in their actions, not their words.

In 1776 the British plan for the conquest of America was to take the line of the Hudson by a two-pronged invasion. One pincer landed in New York to work up the river while the other was to penetrate from Canada. They were stopped in the north by the desperate actions of Benedict Arnold with a home-made fleet on Lake Champlain; in the south by incredible inefficiency on the part of the British General, Sir William Howe.

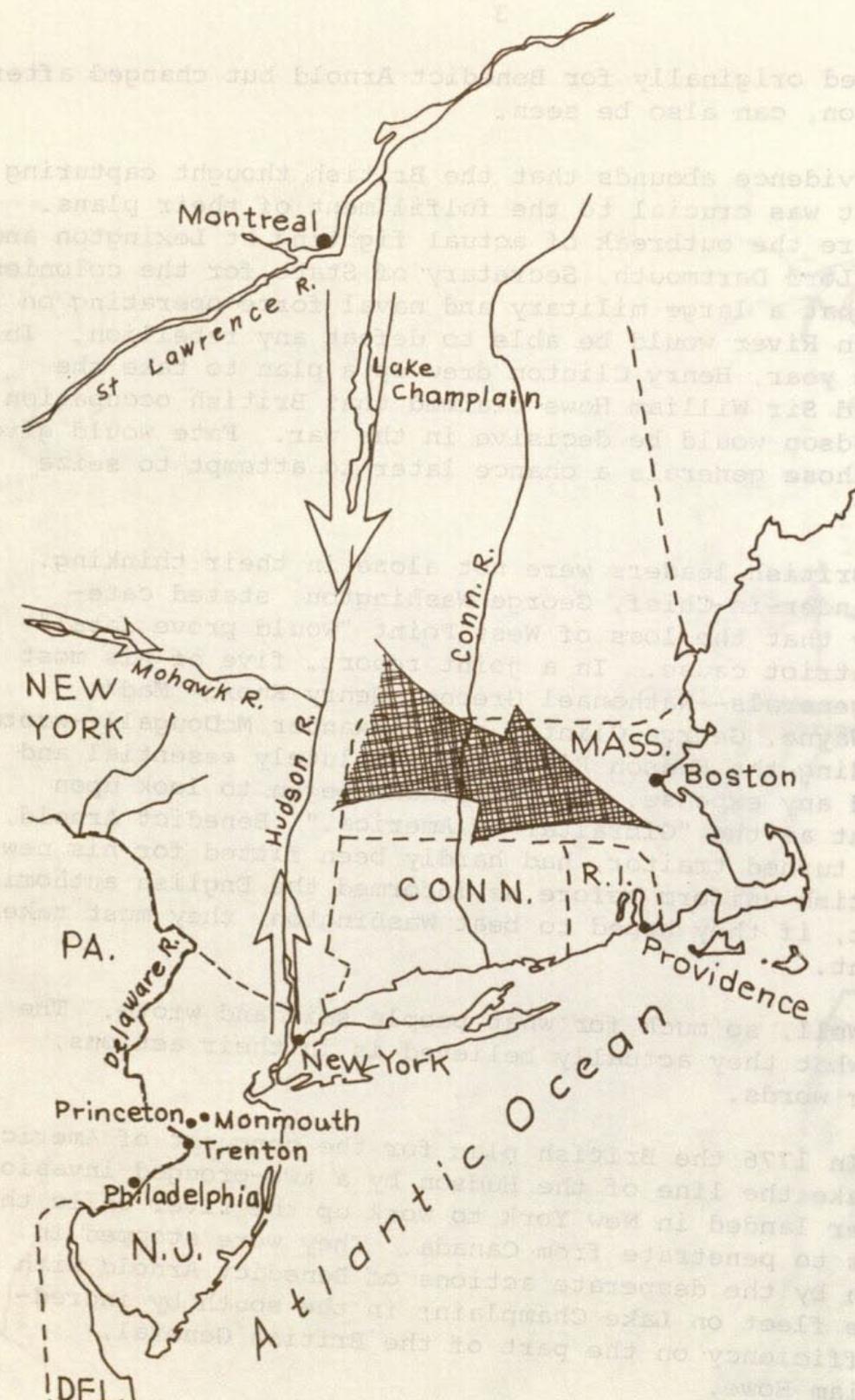
A year later, in 1777, the forces of George III made their greatest effort of the war. The royal plan was to launch a three-pronged invasion (Fig. P2) with the objective being, once again, seizure of the Hudson River. General John Burgoyne would use the Lake Champlain route and attack from

four, named originally for Benedict Arnold but changed after his treason can also be seen.

Evidence shows that the British thought capturing West Point was crucial to the British plan. Even before the outbreak of actual fighting at Lexington and Concord, Lord Dartmouth, Secretary of War for the colonies, decided that a large military force would be needed to capture the Hudson River and to take it to New York City. In that same year, Henry Clinton, the British commander in chief, and Sir William Howe, the British commander in chief in the field, decided to attempt to seize the river.

The British leaders were also concerned about their thinking. The Commander in Chief, George Washington, decided to go to the patriot camp. In a letter to the patriot camp, he particularly mentioned that the patriot camp was a trusted general, Anthony Wayne, that holding West Point was a vital point, the hero of the Battle of Red Bank, and the patriot camp was a trusted general, Anthony Wayne, that holding West Point was a vital point.

In 1776 the British plan was to take the line of the Hudson River from Canada to New York City. One plan was to penetrate from Canada to New York City. Another was to penetrate from Canada to New York City. The British plan was to take the line of the Hudson River from Canada to New York City. The British plan was to take the line of the Hudson River from Canada to New York City.



AMERICAN REVOLUTIONARY WAR
CAMPAIGN OF 1777
 original Plan

50 0 50 100

Fig. P2

Canada, a smaller force of redcoats and redskins would stream down the Mohawk, and Sir William Howe would push up the Hudson. Once again the plan was defeated by a combination of Benedict Arnold's inspiring leadership and unbelievable British blundering.

In 1779, an attempt to attack from New York City was thwarted when "Mad" Anthony Wayne recaptured Stony Point with a night-time bayonet charge and English reinforcements failed to arrive from Europe.

Then, in 1780, the British came closest to success. Frustrated militarily, the King's generals turned to ungentlemanly tactics. They attempted to buy West Point from its commander at the time, Benedict Arnold. But that special providence which always seemed to favor the patriots was with them once more. Arnold was uncovered at the very last moment. West Point remained in American hands.

On the other side of the ledger, the Americans applied themselves diligently, sometimes desperately, to retain West Point and the control of the Hudson River. The very first positive act of the Continental Congress was to order forts constructed along the river to block the passage of British ships. Work began in the summer of 1775--before the fight at Bunker Hill--and continued throughout the war. Precious cannon and more precious money were poured into the defenses. Washington always attempted to keep the Continental Army either at West Point or close enough to reinforce the garrison there. He himself used West Point as headquarters for many months. It is significant to note that, although he delegated great authority to his subordinates in every other endeavor, he personally kept a tight, centralized control over all activities at the fortress. Such a small matter as the daily menu for the soldiers could not be altered without prior approval from the Commander-in-Chief. It goes without saying that every time the English threatened to come up the Hudson, American reaction was violent and immediate.

I think we can safely say that both sides in the War of Independence sincerely believed that West Point was a strategic center which held one of the keys to victory or defeat. In both word and deed, they said so.

So far, what I have reported is fact--"history" if you will. But the true historian isn't satisfied to stop

there. He also wants to know why. Why was West Point a strategic center? What made it so all-important? And to know that, he must first know the geography of the area. Not the geography as it is today, but as it was then, 190 years ago.

Being a layman in things geographical, I can get away with making my own oversimplified definition of geography. Basically, it is the science of the earth and its life. It entails both a description of earth surface forms and a study of the distribution of plant and animal life, including man and his industries.

Taking that latter portion first, let us go back in time and examine the Thirteen Colonies in 1775 (Fig. P3). The population of America was concentrated in a large arc stretching 1,300 miles along the coast from Boston to Savannah. The vast regions inland were inhabited mainly by squirrels with only Indians and a few trappers to keep them company. It is interesting to note that fewer people lived in all the Thirteen Colonies than live today in the Borough of Brooklyn: about two and one-half million. The geographical center of the population was somewhere in northern New Jersey, not far from West Point. Importantly, the Hudson River very nearly formed the center line of the colonies--half the population lived to the east of the water course in New England.

One other point must be mentioned with regard to population--Indians. The fearsome Mohawks lurked in upper and western New York State. They were held at bay during the war only because our military forces could move freely up the Hudson to defend the frontiers. Loss of the river route would have left them free to ravage the frontier settlements without fear of retaliation.

That is the distribution of people, but my definition also mentions distribution of industries. America was not an industrial country, but the bulk of such manufactured items as it did produce came from New England. Furthermore, most of the imports from friendly European powers made port in New England. By way of example, 90 per cent of the gunpowder fired by the patriots was shipped from France. Food production was also generally divided by the Hudson. Meat came from the east while flour came from New York, New Jersey, and Pennsylvania. Connecticut cattle, for instance, kept the Continental Army from starving at Valley Forge.

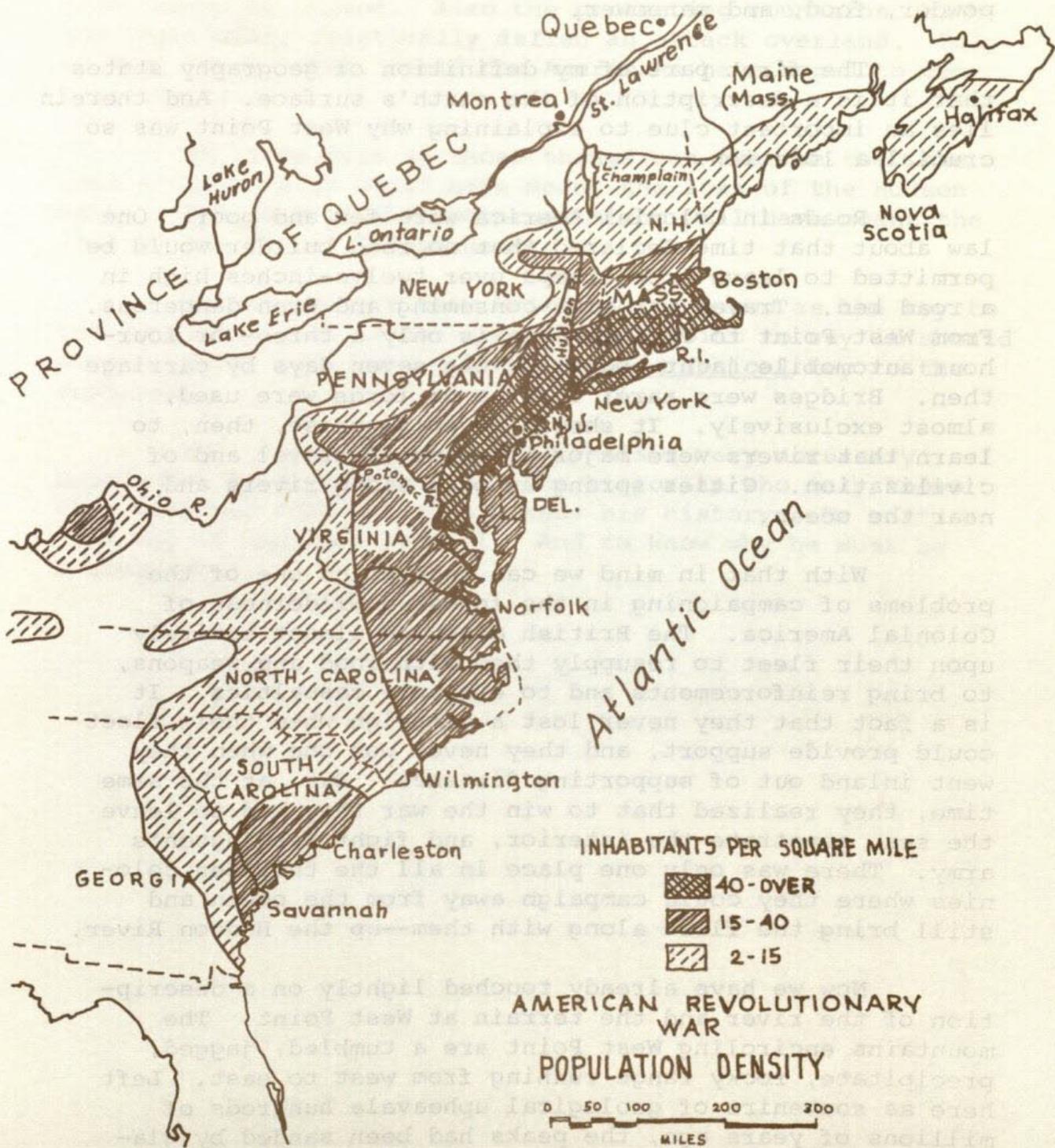


Fig. P3

If the British had taken the line of the Hudson, they would have split the Americans, preventing them from supporting one another. The frontiers would have been opened to Indian depredations. Finally, redcoats could have effectively interdicted Washington's supplies of clothing, weapons powder, food, and manpower.

The first part of my definition of geography states that it is a description of the earth's surface. And therein lies an important clue to explaining why West Point was so crucial a location.

Roads in Colonial America were few and poor. One law about that time declared that no road builder would be permitted to leave tree stumps over twelve-inches high in a road bed. Travel was time-consuming and even dangerous. From West Point to Philadelphia is only a three- or four-hour automobile jaunt today; it was seven days by carriage then. Bridges were rare; ferries or fords were used, almost exclusively. It should be no surprise, then, to learn that rivers were major arteries of travel and of civilization. Cities sprang up only along rivers and near the ocean.

With that in mind we can understand one of the problems of campaigning in the forested wilderness of Colonial America. The British depended almost entirely upon their fleet to resupply them with food and weapons, to bring reinforcements and to evacuate casualties. It is a fact that they never lost a campaign when their fleet could provide support, and they never won one when they went inland out of supporting distance. But, at the same time, they realized that to win the war they had to leave the sea, penetrate the interior, and fight Washington's army. There was only one place in all the thirteen colonies where they could campaign away from the ocean and still bring the fleet along with them--up the Hudson River.

Now we have already touched lightly on a description of the river and the terrain at West Point. The mountains encircling West Point are a tumbled, jagged, precipitate, rocky range running from west to east. Left here as souvenirs of geological upheavals hundreds of millions of years ago, the peaks had been sanded by glaciers, eroded by wind and water, and eventually covered with trees. They represented formidable barriers to an eighteenth century army. For that matter, I would not

relish fighting in them even today. The Hudson River slices the granite ridges in a beautiful, narrow, twisting, picturesque gorge about twelve miles long. Elsewhere the river is straight and broad--too straight and broad to have been obstructed. At West Point, however, the narrow, crooked river could be closed. Also the protecting mountains, high and foreboding, practically defied an attack overland. Only at West Point, then, could the Americans have hoped to control the river.

It is as sure as those things can ever be that the loss of West Point would have meant the loss of the Hudson River. And loss of that waterway might well have meant the loss of the War of Independence.

During the war West Point became known as the key to the continent. It is not stretching a point to say it should more properly have been called the geographical key to the continent.

Your discipline--geography--is a very necessary supplement to mine--history. The historian who only knows what happened does not really know his history. He must know why it happened as well. And to know why he must be a geographer.

--Editor

(1) The administrative history and the development of the curriculum in the United States Military Academy at West Point are as complex as they are fascinating. The role of

For the most complete source of published information on the history of the United States Military Academy, see Edward C. Boynton, History of West Point, and Its Military Importance During the American Revolution (New York, 1883), 402 pp., maps, Richard W. Denny, Men of West Point: The First 150 Years of the United States Military Academy (New York, 1911), 146 pp., maps, George W. Gilliam, Historical Register of the Officers and Graduates of the

HIGHLIGHTS OF THE GEOGRAPHICAL AND CARTOGRAPHICAL
CONTRIBUTIONS OF GRADUATES OF THE U.S. MILITARY
ACADEMY WITH A SPECIALIZATION AS TOPOGRAPHICAL
ENGINEERS PRIOR TO 1860

Herman R. Friis
Director, Center for Polar Archives
The National Archives
Washington, D.C.

Prepared at the invitation of the Program Committee, this paper was written to accompany the projection of thirty-five slides. Unfortunately it was not possible to reproduce the slides in these Proceedings. To supply the reader with a knowledge of the place of the slides in the oral presentation, the numbers in parentheses in the following pages are inserted at the appropriate places to show when the slides under discussion were first shown on the screen. A list of the slides appears at the end of this paper. All of the maps and other graphic illustrations referred to and exhibited as slides in the oral presentation are in the National Archives where they may be consulted and photographic copies may be purchased by request of the Cartographic Branch.

--Editor

(1) The administrative history and the development of the curriculum in the United States Military Academy at West Point are as complex as they are fascinating.¹ The role of

¹For the most complete source of published information on the history of the United States Military Academy, see Edward C. Boynton, History of West Point, and Its Military Importance During the American Revolution (New York, 1863), 408 pp., maps; Richard E. Dupuy, Men of West Point; The First 150 Years of the United States Military Academy (New York, 1951), 486 pp., maps; George W. Cullum, Biographical Register of the Officers and Graduates of the

geography, as we now practice it, during the first half century or so of the Academy's history was surprisingly elementary and perhaps even fanciful. Indeed, during the first half century geography appears to have been a step-child of history and ethics which were taught by the Chaplain. Your query by now must be "How then did the engineer graduates do such a masterful job of geographical description and cartographic delineation?" The answer is perhaps not so simple, but it appears safe to conclude that each graduate had been skillfully taught and had mastered the English language, the elements of field observation, the fundamentals of the physical sciences, and the art of graphic portrayal. This is immediately evident to those of us who have read their reports and their maps.

Let us review the highlights of the geographical and cartographical contributions of some of the graduates of the U.S. Military Academy who became topographical engineers and who were so intimately responsible for the development of this profession to its position of full international reputation by the decade spanning the mid-nineteenth century.²

U.S. Military Academy, 2 vols. (New York, 1868); Military Academy, West Point, Annual Report of the Superintendent, 1853/54 to date (Washington, 1854 to date); Military Academy, West Point, The Centennial of the United States Military Academy at West Point, New York, 1802-1902, 2 vols. (Washington, 1904), maps; Military Academy, West Point, The Sesquicentennial of the United States Military Academy; An Account of the Observance, 1952 (West Point, 1952), 245 pp.; and Military Academy, West Point, Annual Report, Board of Visitors, 1824/25 - 1921/22 (Washington, 1825 - 1922).

²For additional references see Herman R. Friis: (1) "A Brief Review of the Development and Status of Geographical and Cartographical Activities of the United States Government: 1776-1818," Imago Mundi, (2) "Cartographical Activities of the Federal Government in the Southeastern United States: 1776-1865," The Southeastern Geographer, Vol. VI (Chapel Hill, N.C., 1966), pp. 41-57, (3) "The Image of the American West at Mid-Century (1840-1860): A Product of Scientific Geographical Exploration by the United States Government," The Frontier Re-examined, ed. by John F. McDermott (Urbana, Ill., 1967), pp. 48-63, and (4) "Highlights of the First Hundred and Fifty Years

In our discussion we shall rely entirely on the official textual and cartographic records of the Topographical Bureau and the Military Academy that are in the National Archives.³ We have divided our discussion into four parts

of Surveying and Mapping and of Geographical Exploration of the United States by the Federal Government, 1776-1880," Surveying and Mapping, XVIII, No. 2 (April-June, 1958), 186-206. For lists of representative cartographic and related graphic records, see Herman R. Friis: (1) "Geographical Exploration and Topographic Mapping by the United States (1777-1952), a Catalog of an Exhibit," National Archives Publication, No. 53-2 (Washington, 1953), 52 pp.; and (2) "Federal Exploration of the American West before 1880, a Catalog of Exhibit," National Archives Publication, No. 64-6 (Washington, 1963), pp. 1-32.

³For excellent examples of these documents, see especially in Record Group 77, Records of the Office of the Chief of Engineers, particularly those of the Office of the Chief of Engineers Relating to Internal Improvements, and the Topographical Bureau and successor divisions, in the National Archives in Washington, D.C.

For an excellent source, see in the annual reports of the Secretary of War and of the Superintendent of the Military Academy published by the Senate and the House of Representatives as official documents in the Congressional Serial Set (1817 through 1865), and in the American State Papers, Vols. I through XXXVIII. The manuscript official version of the documents are in the Legislative Branch of the National Archives. For detailed finding aids to these manuscript records, see Buford Rowland, Handy B. Fant, and Harold E. Hufford, "Records of the United States House of Representatives, 1789-1946," Preliminary Inventory, No. 113, the National Archives (Washington, D.C., 1959), pp. 1-292; and Harold E. Hufford and Watson G. Caudell, "Records of the United States Senate (1789-1946)," Preliminary Inventory, No. 23 (Washington, D.C., 1950), pp. 1-284.

A large number of the manuscript, annotated and printed maps of the Office of the Chief of Engineers are in the Cartographic Branch in the National Archives.

For an extensive record of the administration of the United States Military Academy, see Records Relating to the United States Military Academy (1812-1867), in Record Group 94, Records of the Adjutant General's Office in the National Archives.

which reflect the principal historical periods of the growth and development of topographical mapping and related geographical description by military engineer officers.

The Pre-Academy Period: 1776-1802

(2) General George Washington's knowledge of terrain, gained through his years of practical school in surveying, mapping and geographical exploration gave him full appreciation of the need of accurate landscape description and of cartographic information. As commanding general of our army during the Revolutionary War he was immediately and painfully aware of this vital source of intelligence. Repeatedly he implored the Congress for assistance in finding qualified personnel, and admonished it for lack of funds to hire good men.

By the spring of 1776 he was able to report in his letter from New York to a Committee of Congress in Philadelphia that

. . . I accordingly have the pleasure to enclose you Colonel Gridley's report of the Harbour and Works of New London, with the several Plans he has taken, which appears to be accurate and well done. . . .⁴

This record among the Papers of the Continental Congress in the National Archives is one of the earliest official maps of the federal government. It was prepared by a competent engineer-surveyor, Colonel Gridley.

(3) More than two years had elapsed since Washington entered upon his duties before the Congress authorized him to employ and attach to his staff personnel qualified to make maps. On July 25, 1775, the Continental Congress resolved

⁴For a copy of the map, see Papers of the Continental Congress, Item 60, in the National Archives, pp. 418-19. For correspondence with Colonel Richard Gridley, see John C. Fitzpatrick (ed.), Writings of Washington (Washington, D.C. 1931), Vol. IV, pp. 504, 521-22 and 528-29; Vol. V, pp. 109-110. Letter from Richard Gridley to George Washington, dated Boston, December 9, 1776, ALS, 2 pp., Manuscript 1420, in the Boston Public Library.

That General Washington be empowered to appoint Mr. Robert Erskine, or any other person that he may think proper, geographer and surveyor of the roads, to take sketches of the country, the seat of war, and to have the procuring, governing, and paying the guides employed under him. . . .⁵

In this resolution is perhaps the first official authorization by the federal government of a mapping agency; that is, a Geographer-Surveyor and assistants to Washington's headquarters staff. Robert Erskine accepted the position and entered upon his duties July 27, 1777. During his tenure of office there were issued more than 130 different manuscript maps. Thomas Hutchins, a former British officer of considerable cartographic skills, was appointed geographer of the southern army.

(4) During his three years as Geographer and Surveyor General to the Continental Army, Erskine built up a small corps of surveyors, among whom Simeon De Witt, his successor on December 15, 1789, was perhaps the most famous. Interestingly, one of De Witt's last official acts apparently was the preparation of a map from his notes of a survey of ". . . Stephen Moore's Land at West Point in October 1783."

(5) With the termination of hostilities in 1783 and the nearly complete dissolution of the army, the small body of geographer-surveyors attached to the General Staff returned to civilian duties. The Land Ordinance of 1785 created the office of the Geographer of the United States. Thomas Hutchins, the sole Geographer of the Army in 1784, was appointed Geographer, or perhaps more correctly, Surveyor General of the United States. Practically all of his duties were surveys for the orderly disposition of the vast Public Domain.

During the first several decades following the Treaty of Peace in 1783, large numbers of people migrated into and settled the fertile valleys and woodlands of the considerable area extending westward into the broad Mississippi Valley. Commercial and manufacturing centers evolved, especially at

⁵This resolution is in the Journals of the Continental Congress, 1774-1879 (Washington, D.C., 1907), Vol. VIII, p. 580. The manuscript original is in the National Archives.

strategic sites among the Atlantic seaboard. Maritime and overland commerce grew to an unprecedented volume and required the improvement of navigation of rivers and harbors and the development of a network of roads. International, state, and territorial boundaries had to be surveyed, measured, and marked. Canals, post and stage roads, and harbors so essential to the favorable development of commerce and communications and the movement of goods and people, had to be planned and constructed. But the federal government was without a central body of qualified surveyors and topographers. With a few exceptions these numerous different internal improvement projects were accomplished by civilian personnel. One of the most outstanding of these was astronomer-surveyor Andrew Ellicott of Lancaster, Pennsylvania. An example of his many boundary surveys is that shown in his manuscript map of the "West Boundary of the State of New York . . . in 1790. . . ."

(6) Fortified sites and circumjacent areas were surveyed and mapped. Extant copies of these maps and plans reveal much about the cartographic techniques of this period, as for example the colorful map of "Fort Johnston & part of the town of Smithville, N.C., 1802," prepared by the civilian surveyor J. Bruff.

The U.S. Military Academy and the Beginnings
of a Topographical Corps: 1802-1816

(7) The legal existence of the Military Academy as a permanent institution dates from March 16, 1802, when the Congress gave the President (Thomas Jefferson) the authority to establish a Corps of Engineers and stated ". . . that the said corps when so organized shall be stationed at West Point, in the State of New York, and shall constitute a military academy." It is important to note here that the Engineer officers, such as Captain William A. Barron, Major Jonathan Williams, and Captain Jared A. Mansfield, who were among the early administrators of the Academy, were well qualified as topographical engineers. President Jefferson personally selected Mansfield. We should emphasize here that geography as a special subject apparently was not a formal part of the program until about 1816.

Of the 151 graduates of the Academy through 1816 some 15 or 10 per cent became prominent as topographical engineers and had important roles in the development of the Topographical Bureau. Among these the most important

were John J. Abert, John Anderson, John R. Bell, Benjamin L. E. Bonneyville, Samuel McRee, Joseph G. Totten, and Joseph G. Swift.

The first graduate of the Academy was Joseph G. Swift (1802) who by the end of the War of 1812 had become Chief of Engineers and was instrumental in laying the ground work for a centralized topographical corps. An early example of his cartographic work is his manuscript of survey of Fort Johnston and environs prepared in 1811.

(8) Among the Records of the Office of the Topographical Bureau is a "Sketch View of the Countries South West of Lake Huron . . ." prepared by J. Stephenson, a young teenager in the employ of William Tatham, for the Secretary of War in 1814. One can only hope that this was his last official map and that the War Department was more curious than serious about this cartographic marvel of geographical inconsistency.

(9) In 1813, during our war with Great Britain, Congress authorized the appointment of eight topographical engineer officers and eight assistants whose duties were carefully described in detail, most important of which were geographical description and cartographical delineation. One of the most proficient of these officers was Joseph G. Totten, tenth graduate of the Academy. Major Totten's "Plan of the Country in the Neighborhood of French Mill" in New York in December 1813, is an excellent example of the maps produced by these officers.

(10) The following year (1814) a topographical-hydrographical map was made of the Elizabeth River in Virginia, a tributary to Chesapeake Bay into which the British fleet had traveled with so little interference. This map quite probably was made by Sylvanus Thayer, a graduate of the Academy in 1808, and its Superintendent from 1718-1833.

(11) One of the principal post-war activities was a comprehensive survey of our northern frontier. Majors John Anderson and Isaac Roberdeau were responsible for this activity during 1815-1816. One of their maps is entitled a "Sketch of Crown Point . . . from Actual Survey, November 1815." Topographic details, especially vegetation, relief, and culture, are shown.

(12) An excellent example of contemporary survey field notes and subjoined maps prepared by Academy graduates during this period are those prepared by Lieutenant Isaac E. Craig covering his survey of the area of and circumjacent to Fort Montgomery near Plattsburg, New York, in October 1816.

The U.S. Military Academy and the Evolution
of the Topographical Bureau: 1816-1838

(13) In 1816, work was inaugurated upon a system of fortifications and topographical surveys of the eastern seaboard and the Gulf coast. A Board of Engineers for Fortifications was organized in November 1816, with the French engineer officer General Simon Bernard as assistant engineer in charge. Members of the Board included engineers officers Colonel T. R. Armistead, Colonel Joseph G. Swift, and Major William McRee of the Engineers. This program was the first systematic topo-hydrographic survey by the War Department and some thirty sheets of Survey were completed. Abert, Kearney, Hartman Bache, and John LeConte, graduates of the Academy, played a leading role. Major James Kearney's map of the entrance to the Chesapeake Bay made during the summer of 1818 is a representative example.

(14) The Topographical Engineers were included with the Topographical Bureau established in the Engineer Department in Washington City in 1818. It was of course natural that those cadets in the Academy who had proficiency and an interest in topographical work should seek an assignment to the Topographical Bureau. Coincidentally, Sylvanus Thayer, Superintendent of the Academy, inaugurated a comprehensive course of instruction in military and topographical engineering. One of his first and outstanding pupils was Cadet George W. Whistler, father of the famous portrait painter, James Albert McNeill Whistler. Cadet Whistler's unmistakably great talents were expressed in this colored manuscript map of West Point in 1818.

(15) Shortly after his graduation from West Point, Lieutenant Whistler was appointed to the Topographical Bureau and, with Lieutenant William G. McNeill, made extensive topographical surveys in New England. Significantly, their talents were expressed in this very early example of the comparative values of the contour versus the hachure, using Salem Neck, Massachusetts, for the type study.

(16) The high quality of early cartographic work showing bathymetry by graduated tints was accomplished by Lieutenant Augustus Canfield, an Academy graduate of 1822, in his large-scale typo-hydrographic map of St. Andrews Sound, Florida in 1826.

(17) It is possible that the excellent large-scale topographic ". . . Map of that part of the Public Land at West Point, under the Jurisdiction of the United States by T. [heophilus] B. Brown U.S. Army, 1826," was made by him as a cadet at the Academy, for he earned his commission that year.

(18) One of the principal activities of the Topographical Engineers during the period 1818-1843 was their assigned responsibility for internal improvements, such as those for rivers and harbors, canals, roads, and railroads. In the large-scale topographic map of the harbor of Sandy Bay, Massachusetts, surveyed in 1829 for example, all four of the engineers, Lieutenants Hartman Bache, William M. Boyce, James R. Irwin, and Augustus J. Pleasonton, were recent graduates of the Academy. A large proportion of the Academy graduates in the Topographical Bureau and later the Corps were active in the nationwide internal improvements program which has continued in variant forms to the present day.

(19) Lieutenant Colonel John J. Abert, on January 31, 1829, was ordered to Washington to succeed the late Isaac Roberdeau as Chief of the Topographical Bureau. Abert had graduated from the Academy in 1811 and during all of the time to 1829 had served in a wide variety of activities, had achieved considerable recognition for his topographical engineering abilities, and had accomplished about as much survey field work as anyone. He was eminently well-fitted for these responsibilities. An example of one of his maps is a "Plan of Part of Rhode Island about 3 miles North of Newport . . ." surveyed in 1820.

(20) The role of the Topographical Bureau in the exploration of the American West was very large. The considerable volume of reports, observations and maps that are in the National Archives are the best single source of information on the evolution of the geographical landscape. We do not have time here to more than mention this and to show a few examples.

The first scientific expedition by the federal government west of the Mississippi River was led by Major Stephen H. Long in 1819-1820. It surveyed much of the northern Plains region. Three recent graduates of the Academy, Lieutenants John R. Bell, John D. Graham, and William H. Swift, accompanied the expedition and prepared reports and kept journals. One of the principal products of the expedition was a detailed terrain map of the area of the United States east of the Rocky Mountains of which this is of the area including Missouri.

(21) A complementary military force under Colonel Henry Atkinson marched overland to Council Bluffs far up the Missouri in 1819. During the next year or so they built the Engineer Encampment, one of the first military bases west of the Mississippi River. It served as quarters for the Long Expedition and for the supporting garrison of troops. Lieutenant Andrew Talcott, just graduated from the Academy, accompanied the troops and prepared a map of the encampment in 1820.

(22) The search for the headwaters of the Mississippi River, initiated by Lieutenant Pike in 1805 was successfully concluded by Lieutenant James Allen of the class of 1829, attached to the exploring expedition of Henry Schoolcraft, successfully mapped the headwaters in 1832, ". . . delineating in his fieldbook all the bends of the river precisely as they occurred."

(23) During the 1830's there were numerous survey field parties in the wide-sweeping plains area between the Mississippi River and the Rocky Mountain barrier on the west. A primary objective of these expeditions was to obtain accurate topographic information and to plot the basic hydrographic pattern. The resultant information carefully preserved in the Topographical Bureau files served as a fundamental source for the maps that were so essential to the leaders of the great westward migrations that began in the 1840's. An example is Lieutenant Washington Hood's map showing the routes of traverses by parties under Colonel Dodge in 1833 and 1834. Lieutenant Hood had graduated from West Point some five years earlier.

The Role of Academy Graduates in the Corps
of Topographical Engineers: 1838-1860

(24) Throughout the 1830's Lieutenant Colonel Abert actively urged the formation of a Corps of Topographical Engineers. After much persuasion and ample proof of the competencies of his associates in the Topographical Bureau, Abert was successful. On July 7, 1838, Abert was appointed Colonel in charge of the new Corps and was given rather generous opportunity to develop it in accordance with his rather full plans. Abert was well aware of the American Destiny and the Westward Movement and quickly charted the way for a systematic, planned exploration and mapping of the American West. Abert served as director of the Corps until his death in 1863.

(25) The key to initial scientific geographical exploration of the West was the availability of accurate knowledge of the composition and arrangement of the primary physiographic features, especially the passes and the inter-fluves. By 1840 the principal breaks in the Rocky Mountain Front leading into the interior were well, though not accurately, known. An excellent example of the detailed cartographic information on one of these passes, South Pass, is the relief map by Captain Washington Hood (1827). Hood was a topographical engineer officer and he compiled it from survey notes and sketch maps in the military headquarters office in Independence, Missouri, in 1839. Subsequently, the famous Oregon and Mormon Roads, across which so many emigrants moved, wound their wearying way through this pass enroute to the West Coast.

(26) A second transcontinental route to the Pacific coast led from Fort Leavenworth in eastern Kansas to San Diego, California, by way of El Paso, Texas. In 1846-47, Lieutenant William H. Emory (1831) conducted a reconnaissance along this route, which included collecting and identifying materials in the natural sciences, observing weather and climate and astronomical and geographical phenomena, and mapping the terrain. The principal results of this survey were expressed as a series of overlapping sheets of the route, together comprising a large-scale topographic map. An example of elegance of cartographic delineation is shown on this portion of sheet 26 of Emory's final manuscript compilations of the entire route of survey.

(27) On his 1845-46 expedition, Lieutenant John Charles Fremont had as his topographers Lieutenants James W. Abert (1842) and William G. Peck (1844). Their principal assignment was to survey and map the riverways, especially the Canadian River, leading into the southern Rocky Mountains. From their field notes and sketches they compiled this manuscript map. You will observe here the great emphasis on the careful plotting of the water courses and the adjacent terrain.

(28) In 1850 the Washington office of the Corps compiled and published a two-sheet relief map of "the United States and their Territories Between the Mississippi and the Pacific Ocean," based on the most authentic information available in the files of the federal government. Most of the usable information consisted of maps and field survey reports of engineer officers and others that were on file in the archives of that agency, a few, a very few representative examples of which we have just discussed. It was, of course, immediately obvious that most of the West in 1850, especially beyond the Rocky Mountains, was inadequately explored and erroneously known. There is little question but that this map pointed up the needs for and ushered in a new era of intensive exploration and mapping by the Corps of Topographical Engineers.

During the decade of the 1850's the Federal government initiated a major program of systematic exploration and mapping of the West. This program included especially (1) exploration to determine accurately the precise location, extent, and composition of the primary landform features; (2) exploration and surveys of the principal river systems; and (3) exploration and surveys for civilian and military transportation. During the decade of the 1850's most of these explorations and surveys were the responsibility of a large number of recent graduates of the United States Military Academy, many of whom established their reputations by their accomplishments in the West. We do not have time here to name them and to enumerate their accomplishments, but I can assure you that the number is legion.

(29) The call for a transcontinental railroad between the Mississippi River and the Pacific, a whisper in the 1830's, a promise and a hope in the 1840's, became a national issue of formidable proportions by the early 1850's. By now the question was not so much shall a

railroad be constructed; rather, it was how and where. In 1853, Congress authorized the Secretary of War to undertake a systematic survey along each of four east-west routes from the Mississippi River to the Pacific Ocean to determine the best, most practicable route for a railroad. A fifth route was to be run in California.

(30) In order to achieve the prescribed goals the Secretary of War wisely established an Office of Explorations and Surveys, which became in effect a kind of detached office of the Corps of Topographical Engineers. Operating out of this office were the several field parties. Although the primary objective of each party was to prepare accurate large-scale detailed topographic maps and profiles of the belt of terrain astride the prescribed route of survey, each party also was to observe, record, and report on the total geographic landscape through which the surveys were run. An excellent example of one of the many manuscript compilations of sectional topographic maps covering these routes is a "Map of the Survey of the Passes in the Sierra Nevada in 1853. . . ."

(31) Perhaps the single most important product of these extensive field surveys and office activities directed to the publication of the scientific results of the geographical explorations was the compilation of an accurate two-sheet landform "Map of the Territory of the United States from the Mississippi to the Pacific Ocean" on a scale of 1:3,000,000 or about one inch to fifty miles. Here, indeed, was a new and accurate map that became a datum upon which to revise periodically as more correct and detailed information was received. This map was the product primarily of the professional skills of Lieutenant Gouverneur K. Warren, a graduate of the Academy in 1850.

(32) The principal published product of these explorations was a thirteen-volume document comprising a large number of descriptive reports, maps, colored and black-and-white lithographs of landscape views, and archaeological, ethnological, and geological subjects, profiles and cross sections, tables of statistics, and other graphic materials. These volumes and the cartographic, graphic and textual records constitute a primary source of information about the physical and cultural landscapes of the West extant in the decade of the 1850's. One of the many colored lithographic views of the landscape included in these

volumes is that of "Sheyenne River." Recent graduates of the Academy played the leading roles in administration, field work and office compilations. For example, Captain A. A. Humphreys was in charge of the Office and the program, and Lieutenant Warren was his immediate assistant. Others included John W. Gunnison (1837), Edward G. Beckwith (1842), John Pope (1842), John G. Parke (1849), Amiel W. Whipple (1831), Joseph C. Ives (1852), Robert S. Williamson (1848), and Henry L. Abbot (1854).

(33) During the summers of 1854-1857 Lieutenant Warren was ordered to duty on the northern Great Plains to survey and to map the riverways and the intervening surface features. He accomplished a prodigious amount of pioneering detailed topographic mapping. One of these surveys in 1855 included the Dakota Territory. From his field survey notes he compiled several large topographic maps of the region.

(34) Shortly after completing a full day's work on the Great Plains in 1857 he pitched his tent for the night and proceeded to his usual systematic recording of his notes in his journal. Perhaps without knowledge of the perpetuity of his records and in a moment of reflective relaxation he sketched for us this memorable scene of yet another activity in the life of an engineer-topographer, bug-catching.

(35) Most of the emigrants following the California Trail through the Humboldt River maze of alkaline-silted valleys of the Basin Range Province between Utah and California succored the finding of a more hospitable environment and a more direct route. In 1858 and 1859, Captain James Hervey Simpson (1832), a topographical engineer officer, directed a detailed reconnaissance for and discovered a more favorable route south of the much-traveled California Trail. With his official manuscript report, one of the first accurate on-the-spot scientific appraisals of the geographical features and natural resources of the region, Simpson includes eight beautiful landscape views in water color. An excellent example of these sketches is that of "Carson Lake from the East, Sierra Nevada in the distance."

(24) In this brief resumé we have described a few, a very few, of the many notable contributions to the history of geographical exploration and surveying and mapping by graduates of the United States Military Academy at West Point. Here indeed is a rich heritage. Surely it is not presumptuous

of us to conclude that we had in the United States during the period 1816-1863 a select corps of topographical engineer officers, graduates of the Academy, who indeed collectively constituted an unnamed but nonetheless apparent Corps of Geographers. Indeed, much of the success of this Corps and the high quality of professional performance were the products of the genius of Colonel John James Abert, as teacher, administrator, and, I believe, professional geographer, and of the meticulous practical training received in the graphic portrayal of landscape given in the United States Military Academy at West Point.

DESCRIPTIVE LIST OF SLIDE ILLUSTRATIONS

The following is a descriptive list of color and black and white slide (2- × 2-inch) illustrations used in the paper. The slides are arranged by number and in the order of their showing in the paper. All of these slides except number 3 are reproductions of records or reference items in the National Archives. Slide 3 is a reproduction of a manuscript map in the Robert Erskine Collection in the New York Historical Society, New York City. (RG 77) indicates that the item is in the Records of the Office of the Chief of Engineers in the National Archives in Washington, D.C.

- Slide 1: View of the National Archives Building from south of the Constitution Avenue entrance, Washington, D.C. 8- × 10-in. glossy print. Official National Archives photograph.
- Slide 2: [Map of New London, Connecticut harbor and entrance prepared by] Colonel Gridley [ca. June 1776]. Scale one inch to sixty rods. 15- × 19-in. Manuscript map in color on paper. Papers of the Continental Congress, Item 60, pp. 418-20.
- Slide 3: [Portion of the road survey from Ridgefield to Stony Hill on a map of Northern New Jersey by Robert Erskine, ca. 1778.] Large scale. Manuscript map on paper. Robert Erskine Papers in the New York Historical Society, New York City.

- Slide 4: "A Map of Stephen Moore's Land at West Point . . . Oct. 1783 . . . Surveyed by S. De Witt, Geogr. . . ." Scale 20 chains to an inch. 8- × 11-in. Manuscript map on paper. Papers of the Continental Congress in the National Archives, Item 60, p. 439.
- Slide 5: Map of the "West Boundary of the State of New York . . . in 1790 . . . by Andrew Ellicott, in 1790 . . ." Large scale. 24- × 35-in. Manuscript map on paper. Records of the General Land Office (RG 49), Bdy 51.
- Slide 6: Map and plan of "Fort Johnston & Part of the Town of Smithville, N.C., 1802" by J. Bruff. Scale ca. sixty feet to one inch. 19- × 27-in. Manuscript map in color on paper. (RG 77), 62-26-C.
- Slide 7: [Map of Fort Johnston and Environs, North Carolina, prepared probably by Joseph G. Swift, in 1811.] Scale sixty feet to one inch. 19- × 27-in. Manuscript map on paper. (RG 77), 62-26-a.
- Slide 8: "Survey of the Countries South and West of Lake Huron by Thomas Forsyth done at St. Louis the 20 Dec. 1812 and brought in by General Clark, copy from the original in possession of William Tatham by T. Stephenson, March 18, 1812." Scale ca. one inch to thirty-five miles. 25½- × 23-in. Manuscript map in color on paper. (RG 77), US 123.
- Slide 9: "Plan of the country in the Neighbourhood of French Mill," in New York in December 1813, by Joseph G. Totten. Scale one-eighth mile to one inch. 22- × 21-in. Manuscript map in color on paper. (RG 77), D28.
- Slide 10: [Map of the lower Elizabeth River in Virginia about 1814 probably by Sylvanus Thayer.] Scale ca. 1200 feet to one inch. 39- × 25½-in. Manuscript map on paper. (RG 77) G2-1.

- Slide 11: "Sketch [map] of Crown Point . . . from Actual Survey, November 1815 [by John Anderson and Isaac Roberdeau]." Large scale. 27- × 39-in. Manuscript map in color on paper. (RG 77) 154-43-8.
- Slide 12: [Survey of the area of and circumjacent to Fort Montgomery near Plattsburg, New York in October 1816; p. 4 of Lieut. Isaac E. Craig's survey field notebook.] Large scale map. 9- × 13-in. Manuscript notations in ink on paper. (RG 77) 7-0-3.
- Slide 13: "Map showing . . . Reconnoitering of Chesapeake Bay, . . . 1818, . . . James Kearney." Scale 2 miles to one inch. 26- × 35½-in. Manuscript map in color on paper. (RG 77), G4-4.
- Slide 14: "Map of West Point . . . State of New York, . . . by Cadet George W. Whistler, 1818." Scale 200 feet to one inch. 26- × 39-in. Manuscript map in color on paper. (RG 77), 32-7-B.
- Slide 15: "Defence of Salem 1822, Plan of Salem Neck, George W. Whistler and William G. McNeill." Scale 12 miles to one inch. 15- × 29-in. Manuscript map on paper (RG 77), 18-11.
- Slide 16: "[Map of Saint Andrews Sound, Florida] M.8. Surveyed by Order of Lieut. Col. Perrault, 1826, Drawn by Lieut. Canfield." Scale 450 yards to one inch. 29- × 44½-in. Manuscript map in color on paper. (RG 77), L18.
- Slide 17: ". . . Map of that part of the Public Land at West Point, under the Jurisdiction of the United States by T. [heophilus] B. Brown, U.S. Army, 1826." Scale 216 feet to one inch. 17- × 23-in. Manuscript map on paper (RG 77), 32-8.
- Slide 18: [Map of] Sandy Bay, Massachusetts . . . Surveyed in 1829 [by Hartman Bache and others]." Scale one mile to 12 inches. 25- × 38-in. Manuscript map in color on paper. (RG77), B45-1.

- Slide 19: "Plan of Part of Rhode Island about 3 miles North of Newport . . . Surveyed by Major J. J. Abert . . . [1820]." Scale one mile to four inches. 24- × 26-in. Manuscript map in color on paper. (RG 77), C14.
- Slide 20: ". . . Map of the Country situated between the Meridian of Washington City and the Rocky Mountains. Exhibiting the Route of the Late Exploring Expedition Commanded by Major Long [1819-20]." Scale 36 miles to one inch. $54\frac{1}{2}$ - × $48\frac{3}{4}$ -in. Manuscript map in color on paper. (RG 77), US. 62.
- Slide 21: "Map of the Missouri Bottom . . . [showing the Engineer Cantonment, 1820, by Andrew Talcott]." Scale ca. $\frac{1}{2}$ mile to one inch. Manuscript map in color on paper. (RG 77), 131-17.
- Slide 22: "Map of the Route and Country, pursued over by an Expedition into the Indian Lands, in 1832, to the Sources of the Mississippi by Lieutenant James Allen. . . ." Scale ca. eight miles to one inch. $22\frac{1}{2}$ - × 15-in. Manuscript map on paper (RG 77), Ama 98.
- Slide 23: "[Map of the] Western Territory [showing the routes of traverses by parties under Colonel Dodge, in 1833 and 1834]." Scale 20 miles to one inch. 21- × 36-in. Printed map in color on paper. (RG 75), Map 1502.
- Slide 24: "[Colonel] J[ohn] J. Abert." No date but ca. 1860. Lithographic print on paper. 7- × 9-in. Print in custody of Herman R. Friis.
- Slide 25: "Map Exhibiting the practicable passes of the Rocky Mountains . . . Wash[ington] Hood, Capt. T. Engrs., 1839." Scale 40 miles to one inch. 18- × 23-in. Manuscript map in color on paper. (RG 77), US 110.
- Slide 26: [Portion of sheet 26 of Lieutenant William H. Emory's survey of the route from Fort Leavenworth to the Pacific coast, 1846-1847.] Scale 1:600,000. $24\frac{1}{2}$ - × $37\frac{1}{2}$ -in. Manuscript map on paper. (RG 76), Mexican-United States Boundary Survey, Sheet 9.

- Slide 27: "Map Showing the Route Passed by the Exploring Expeditions to New Mexico and the Rocky Mountains . . . J. W. Abert and W. G. Peck, . . . 1845-1846." Scale 34 miles to one inch. 12- × 28½-in. Manuscript map on paper. (RG 77), Misc. 21-1.
- Slide 28: North half of a shaded relief map of "The United States and Their Territories Between the Mississippi and the Pacific Ocean . . . 1850," [By the Topographical Bureau]. Scale 44 miles to one inch. Dimensions of full map 47- × 42-in. Printed map on paper (RG 77), published record set.
- Slide 29: "Principal Routes of Surveys and Explorations for a Railroad from the Mississippi River to the Pacific Ocean: 1853-1857," by Herman R. Friis, shown on a U. S. Geological Survey base map of the United States. Scale 1:7,000,000. 20- × 22-in. Annotated printed map in color.
- Slide 30: "Map of Passes in the Sierra Nevada . . . , Lieut. R. S. Williamson, U. S. Top. Engrs . . . 1853." Scale 1:240,000. 34½- × 25¼-in. Manuscript map in ink on paper. Records of the Office of the Secretary of the Interior (RG 48), Pacific Railroad Surveys, Routes in Southern California.
- Slide 31: "Map of the Territory of the United States from the Mississippi to the Pacific Ocean . . . , 1853-57, . . . Gouverneur K. Warren. . . ." Scale 50 miles to one inch. 45- × 47½-in. Printed map on paper. Records of the Secretary of the Interior (RG 48), Pacific Railroad Surveys, General Map.
- Slide 32: "Shyenne River." A lithographic print (Plate IX) with the General Report of the Surveys between the 47th and 49th Parallels by Isaac I. Stevens in volume 12 (1) op. p. 58 of the Reports on Explorations and Surveys for Pacific Railroads. 11½- × 8¾-in. Printed lithographic reproduction with color wash.

- Slide 33: "[Map of the] Reconnaissances [sic] in the
Dacota Country by G. K. Warren, Lieut. Topl.
Engrs. USA . . . , 1855." Scale 1:600,000.
37- x 62-in. Manuscript map on paper.
(RG 77), Q57.
- Slide 34: "'Bug-catching,' self-sketch in survey field
notebook. Explorations by Lt. Warren 1857
Meteorology by Mr. Carrington." $6\frac{1}{2}$ - x 4- x $\frac{1}{2}$ -in.
* Manuscript notebook on paper, bound. (RG 77),
Q579, No. 53.
- Slide 35: "Lake Bigler from the East (Sierra Nevada) . . .
Explorations of Captain J. H. Simpson in Utah,
1859, Plate IX." $11\frac{1}{2}$ - x 24-in. Landscape sketch
in water color on paper (RG 77), Misc. 120-8.