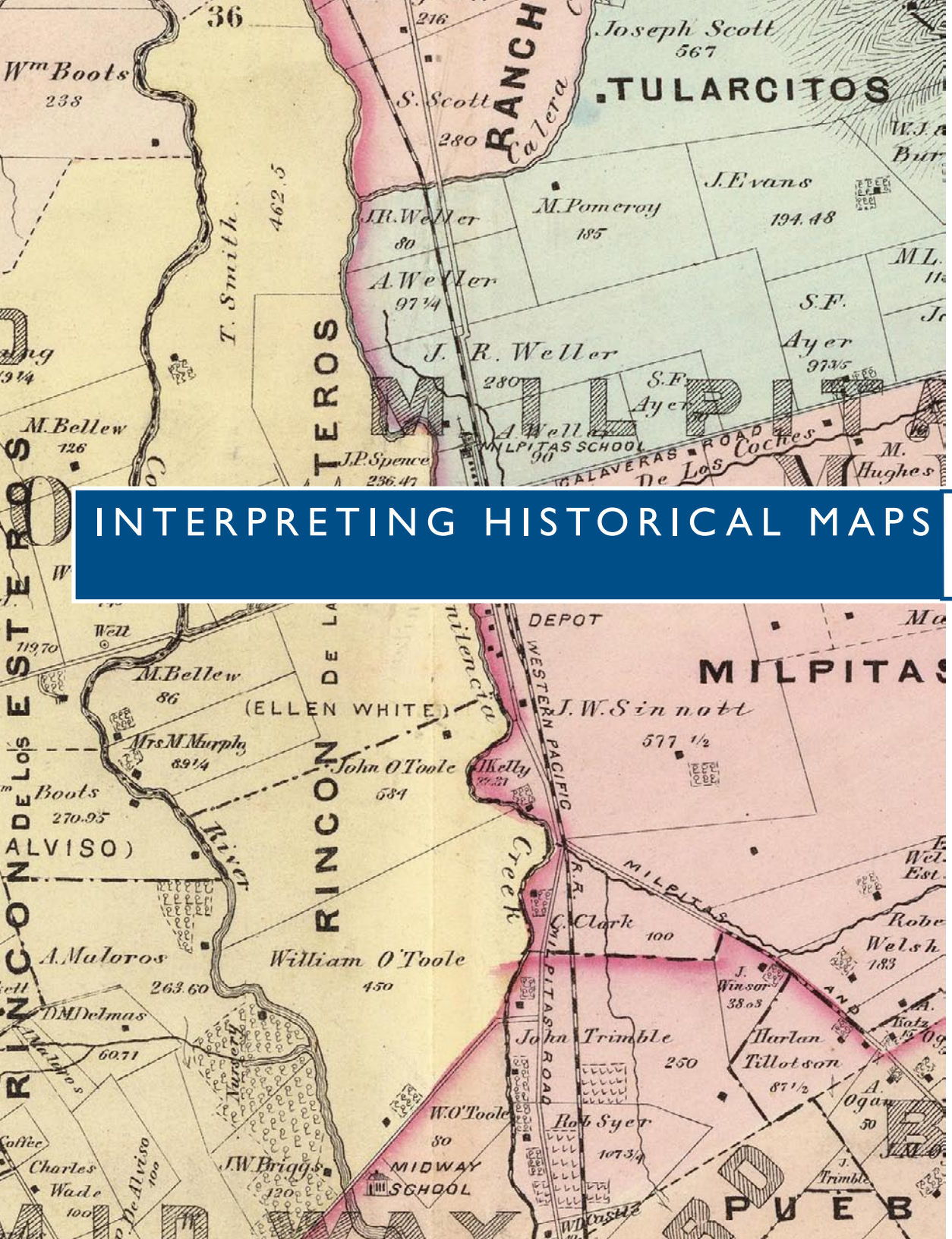


INTERPRETING HISTORICAL MAPS

to Reconstruct Past Landscapes in the Santa Clara Valley

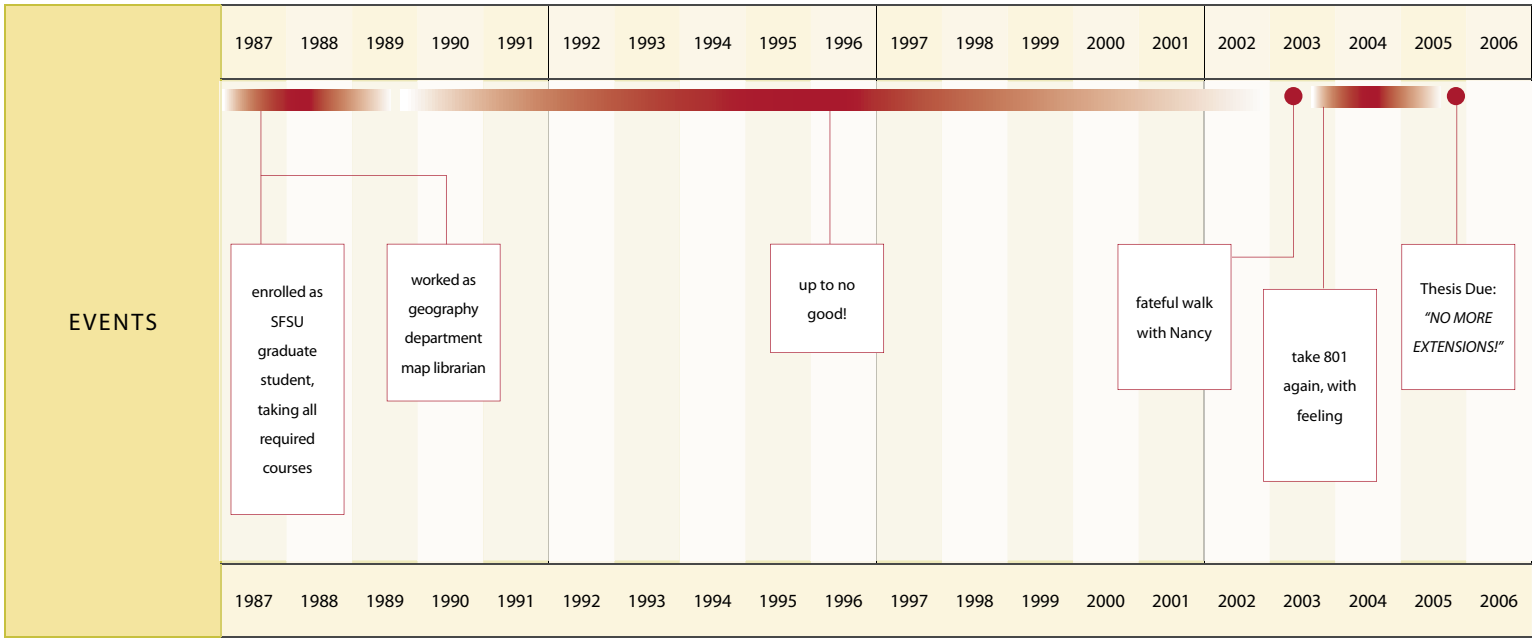
Ruth Askevold

18 November 2005

Or How to Spend 18 years Putting Off

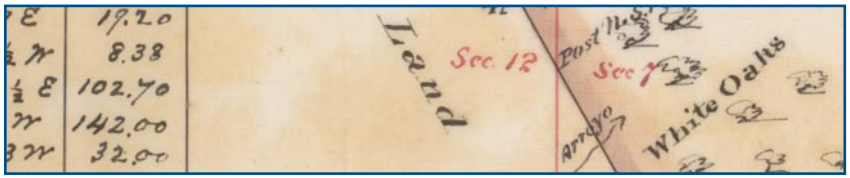
WRITING A THESIS

GRADUATE SCHOOL | TIMELINE 1987 - 2005

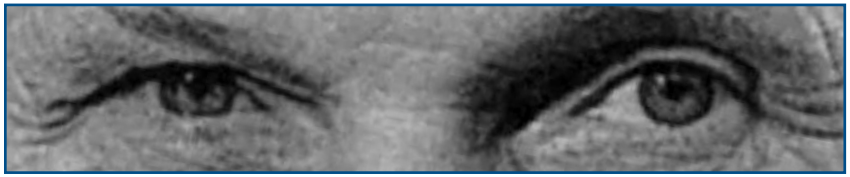


DON'T LET THIS HAPPEN TO YOU!

INTERPRETING HISTORICAL MAPS *to Reconstruct Past Landscapes in the Santa Clara Valley*

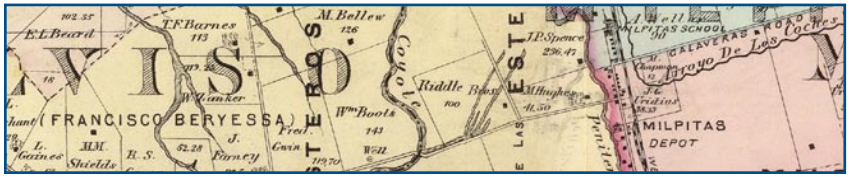


introduction and background



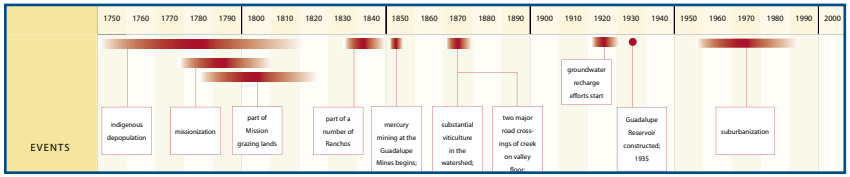
theoretical framework

methods & materials

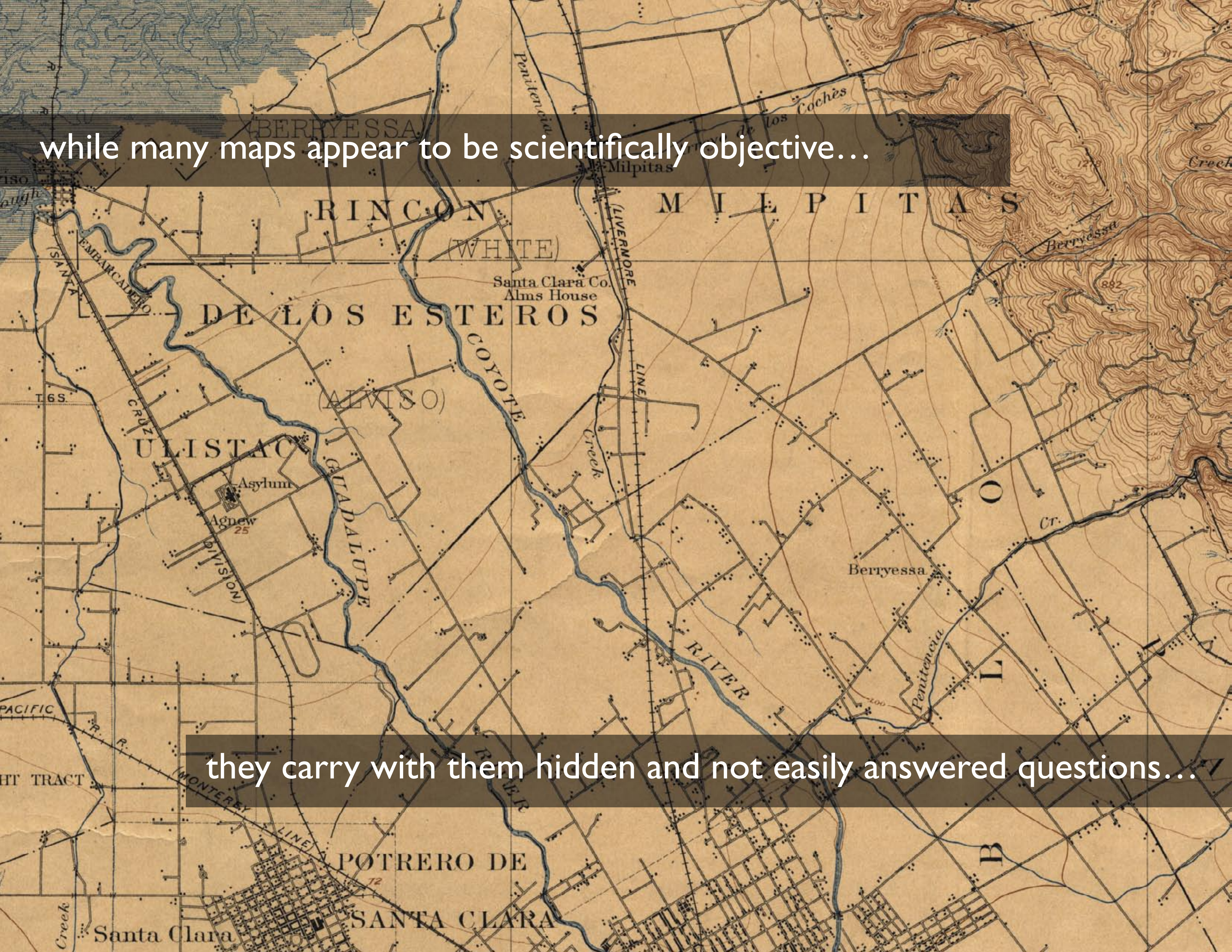


study area

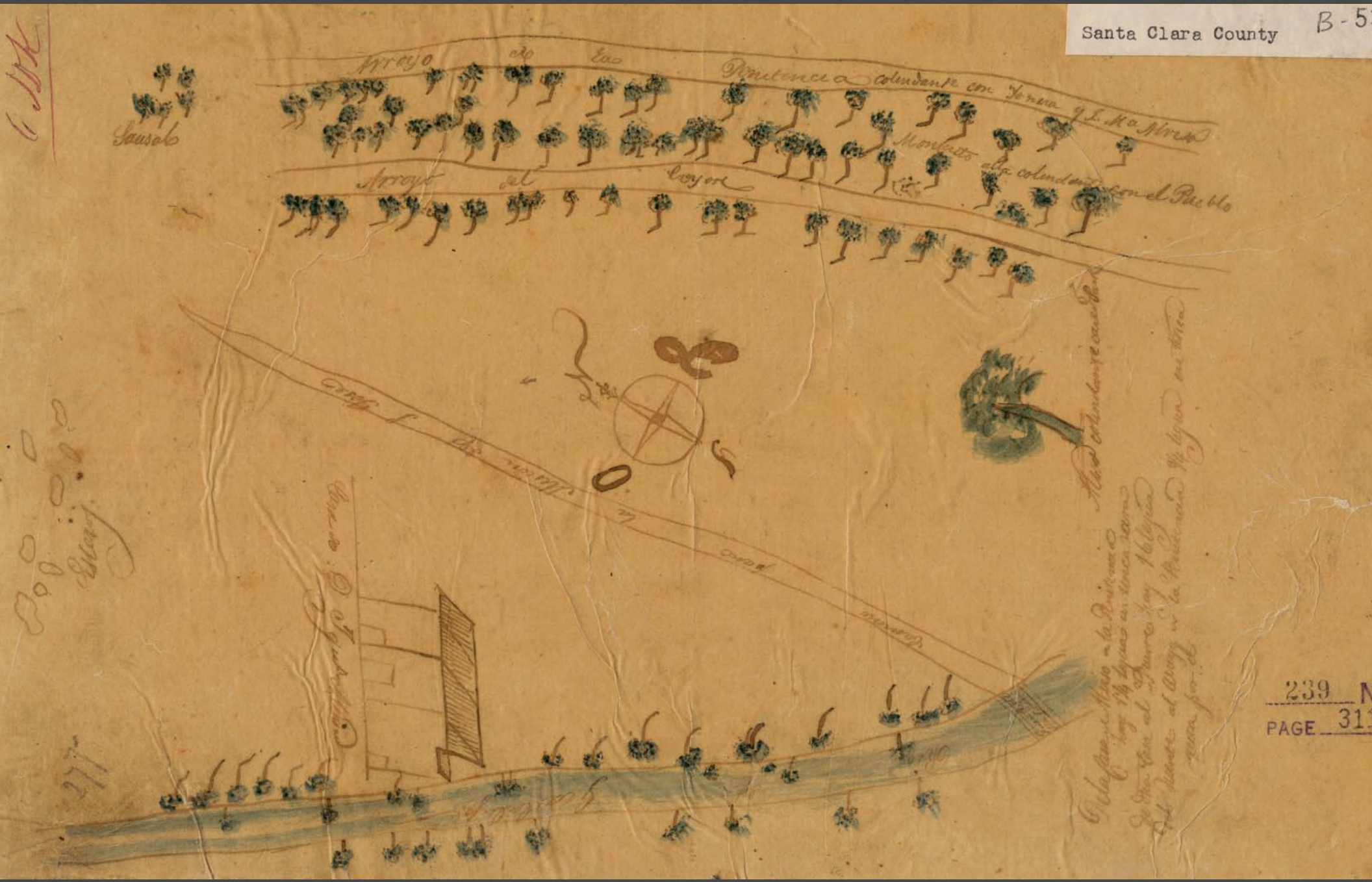
results of research



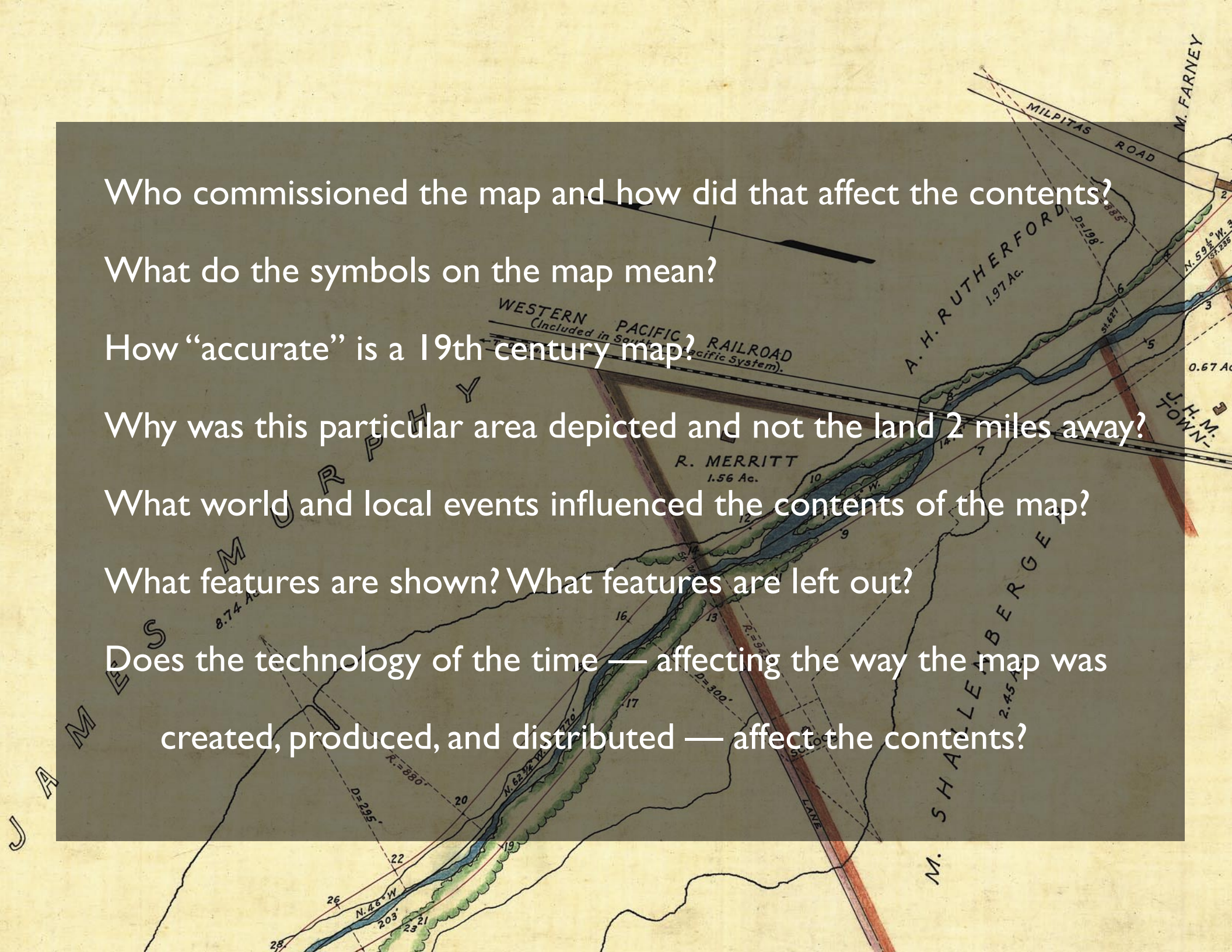
conclusions & avenues for further research


while many maps appear to be scientifically objective…
they carry with them hidden and not easily answered questions…
(BERRYESSA)
de los Coches
Milpitas
RINCON
MILPITAS
(WHITE)
(LIVERMORE
LINE
Santa Clara Co.
Alms House
DE LOS ESTEROS
EMBARCADERO
COYOTE
(ALVISO)
T.6S.
CRUZ
ULISTAC
Asylum
Agnew
DIVISION
GUADALUPE
Creek
Berryessa
Berryessa
Cr.
RIVER
Penitencia
PACIFIC
R. R.
MONTEREY
LINE
POTRERO DE
SANTA CLARA
Santa Clara

other maps don't even look like maps…



and require different interpretation skills…



Who commissioned the map and how did that affect the contents?

What do the symbols on the map mean?

How "accurate" is a 19th century map?

Why was this particular area depicted and not the land 2 miles away?

What world and local events influenced the contents of the map?

What features are shown? What features are left out?

Does the technology of the time — affecting the way the map was created, produced, and distributed — affect the contents?

Historical maps provide a wealth of environmental data for science-based historical ecology

Historical maps are unlike other scientific data – no error bars, no methods paper, no controlled transcects

Historical maps are either misused or under utilized

THESIS QUESTIONS

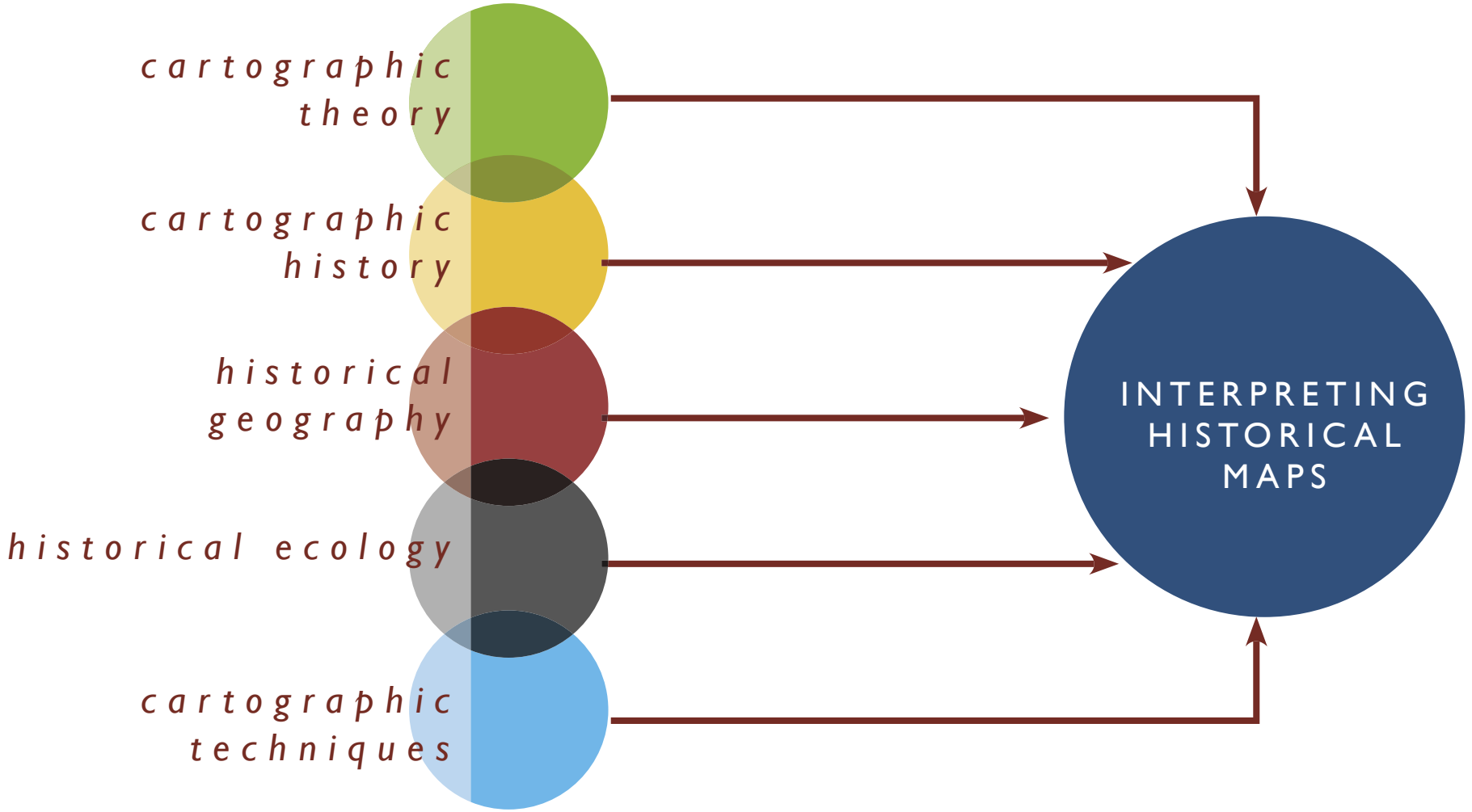
Does understanding the context of a historical map improve its usability in reconstructing a past landscape?

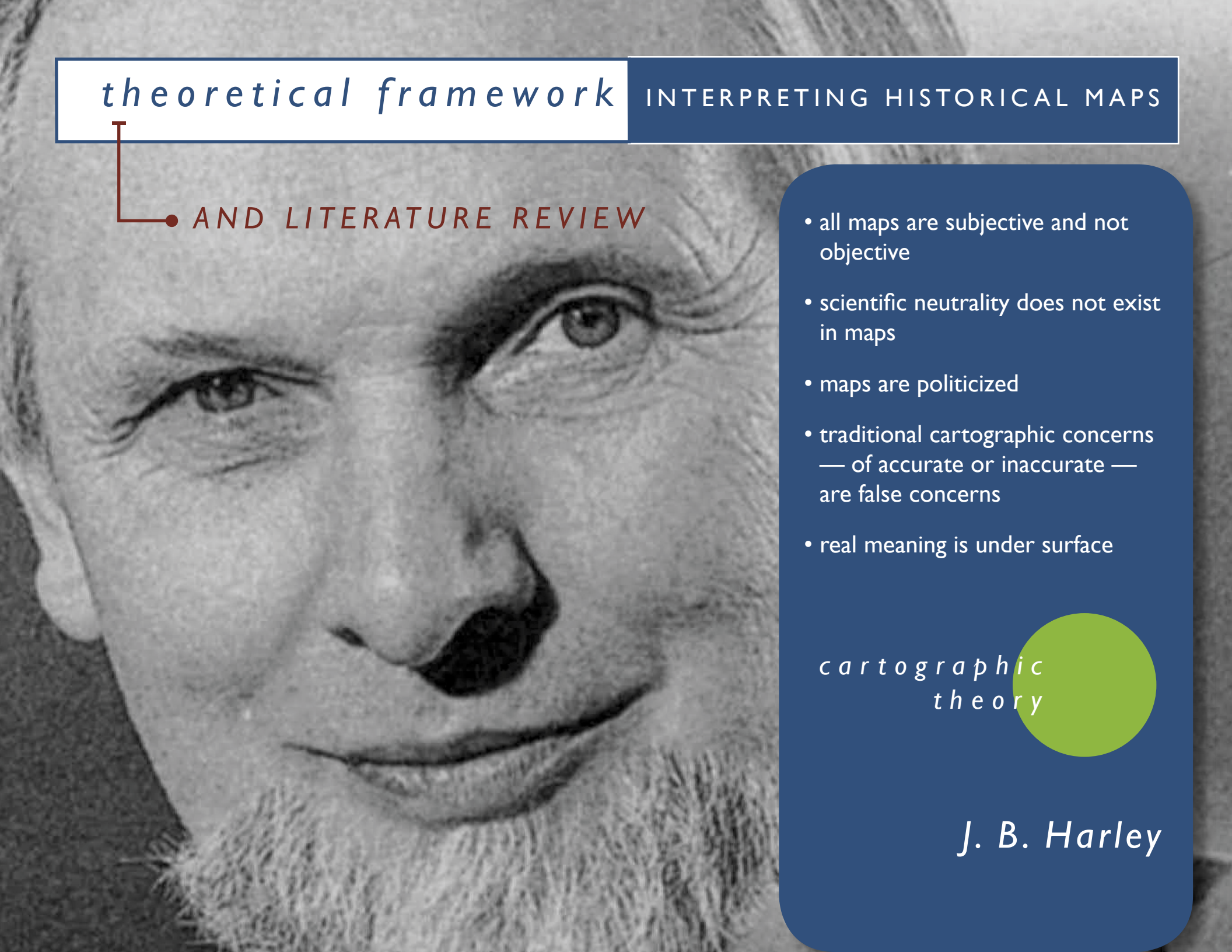
Can historical maps be successfully used without placing them in context?

How can the use of historical maps be improved?

theoretical framework INTERPRETING HISTORICAL MAPS

AND LITERATURE REVIEW





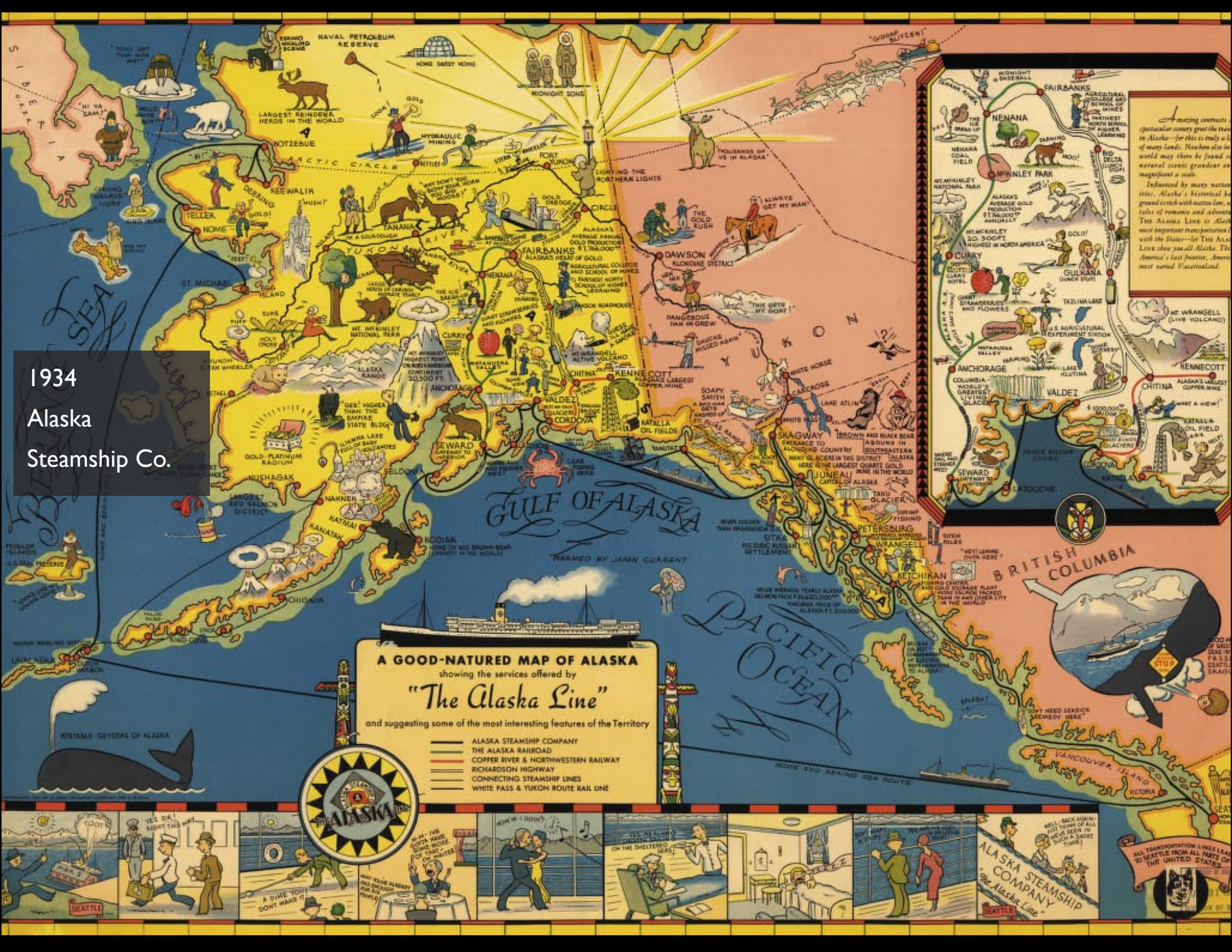
theoretical framework AND LITERATURE REVIEW

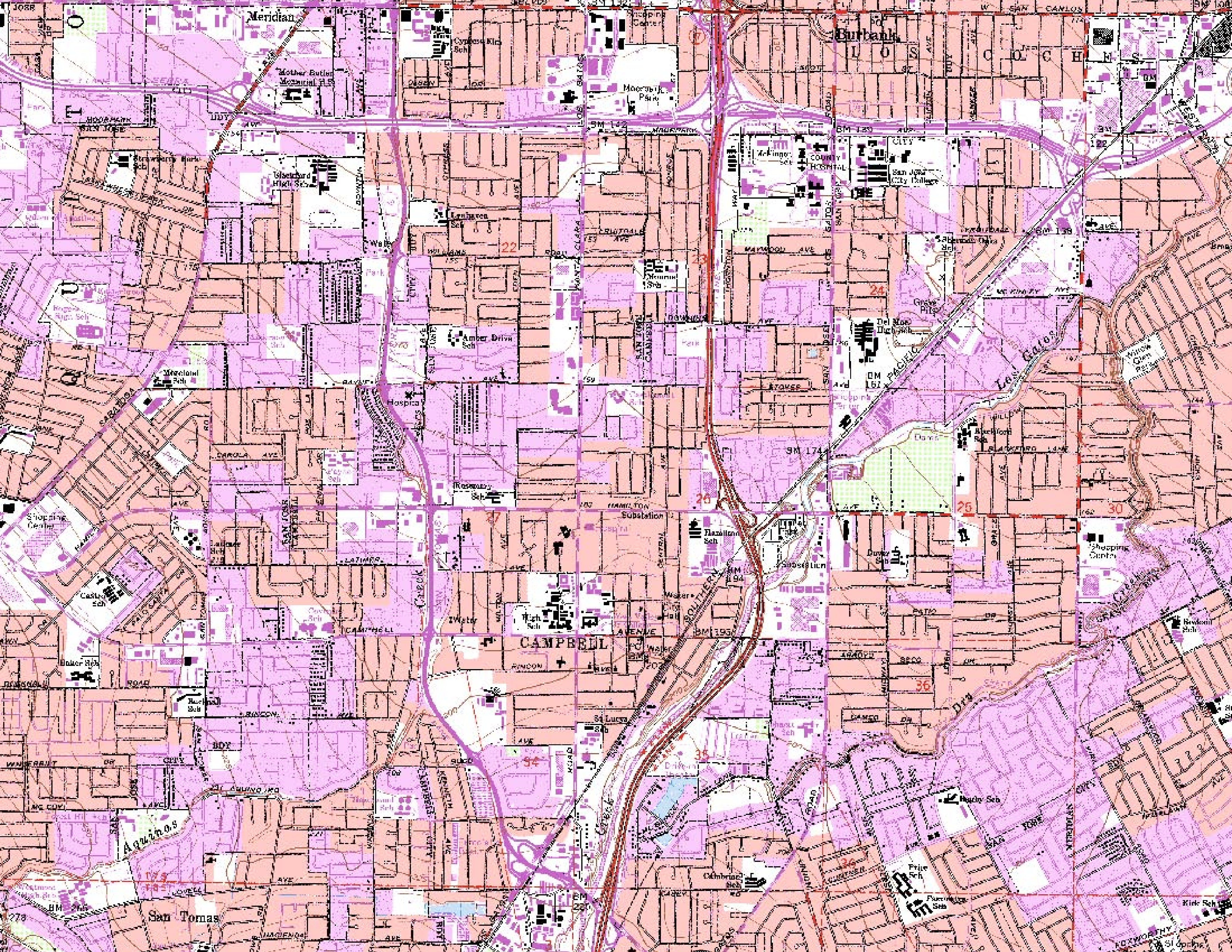
INTERPRETING HISTORICAL MAPS

- all maps are subjective and not objective
- scientific neutrality does not exist in maps
- maps are politicized
- traditional cartographic concerns — of accurate or inaccurate — are false concerns
- real meaning is under surface

cartographic theory

J. B. Harley


1934
Alaska
Steamship Co.
A GOOD-NATURED MAP OF ALASKA
showing the services offered by
"The Alaska Line"
and suggesting some of the most interesting features of the Territory
ALASKA STEAMSHIP COMPANY
THE ALASKA RAILROAD
COPPER RIVER & NORTHWESTERN RAILWAY
RICHARDSON HIGHWAY
CONNECTING STEAMSHIP LINES
WHITE PASS & YUKON ROUTE RAIL LINE
GULF OF ALASKA
PACIFIC OCEAN
BRITISH COLUMBIA
YUKON
SIBERIA
NAVAL PETROLEUM RESERVE
LARGEST REINDEER HERDS IN THE WORLD
ARCTIC CIRCLE
KOTZEBUE
NOME
TELLER
KEEWALIK
FAIRBANKS
ALASKA'S HEART OF GOLD
DAWSON
KLONDIKE DISTRICT
CIRCLE
FORT YUKON
TANANA
NENANA
MT. McKINLEY NATIONAL PARK
CURRY
ANCHORAGE
ALASKA RANGE
MT. WRANGELL ACTIVE VOLCANO
CHITINA
KENNECOTT
ALASKA'S LARGEST COPPER MINE
VALDEZ
CORDOVA
SEWARD
GATEWAY TO INTERIOR
SELDOVIA
NUSHAGAK
LARGEST RED SALMON DISTRICT
NAKNEK
KATMAI
KANATAK
KODIAK
HOME OF BIG BROWN BEAR
CHIGNIK
UNALASKA
DUTCH HARBOR
PRIBILOF ISLANDS
U.S. SEAL PRESERVE
PORTABLE GEYSERS OF ALASKA
SKAGWAY
GATEWAY TO KLONDIKE COUNTRY
WHITE PASS
CARCROSS
LAKE ATLIN
JUNEAU
CAPITAL OF ALASKA
TAKU GLACIER
PETERSBURG
WRANGELL
SITKA
HISTORIC RUSSIAN SETTLEMENT
KETCHIKAN
FISHING CENTER AND COLD STORAGE PLANT
VANCOUVER ISLAND
VICTORIA
HOME AND BERING SEA ROUTE
WARMED BY JAPAN CURRENT
LATOUCHE
KATALLA OIL FIELD
PRINCE WILLIAM SOUND
MT. WRANGELL (LIVE VOLCANO)
MIDNIGHT SONS
HOME SWEET HOME
ESKIMO WHALING SCENE
HYDRAULIC MINING
LIGHTING THE NORTHERN LIGHTS
THOUSANDS OF US IN ALASKA
"I ALWAYS GET MY MAN"
THE GOLD RUSH
DANGEROUS DAN McGREW
"THIS GETS MY GOAT!"
"GEE! HIGHER THAN THE EMPIRE STATE BLDG!"
GOLD-PLATINUM RADIUM
GIANT STRAWBERRIES AND FLOWERS
MATANUSKA VALLEY
LARGE HERDS OF CARIBOU MIGRATE YEARLY
YUKON STERN WHEELER
"MUSH!"
"HEEP!"
"HI YA SAM!"
CARVING WALRUS IVORY
"I'M A SOURDOUGH"
"WHY DON'T YOU BATHE YOUR DOG SOMETIMES?"
"GIDDAP BLITZEN!"
"I'VE GOT TWO MEN HOT!"
"SOAPY SMITH GETS WINGED UP"
"SNUCKS MISSED AGAIN"
"BROWN AND BLACK BEAR ABOUND IN SOUTHEASTERN ALASKA"
"WHERE SEAL AND WALRUS MEET"
"HEY! LEMME OUTA HERE!"
"SORT NEED SEASICK REMEDY HERE"
"SPLASH!"
"BELIEVE IT OR NOT! CONGRESSMEN OF EASTERN REPRESENTATIVES TO ALASKA"
"WHAT A VIEW!"
"ALL TRANSPORTATION LINES LEAD TO SEATTLE FROM ALL PARTS OF THE UNITED STATES"
ALASKA STEAMSHIP COMPANY
"the Alaska Line"
SEATTLE
ALASKA LINE
Amazing contrasts ... spectacular scenery greet the tra... to Alaska—for this is truly a l... of many lands. Nowhere else on... world may there be found s... natural scenic grandeur an... magnificent a scale.
Influenced by many nation... ities, Alaska's historical ba... ground is rich with native lore, ... tales of romance and adventu... The Alaska Line is Alask... most important transportation l... with the States—for The Alas... Line shows you all Alaska. Th... America's last frontier. Ameri... must travel Vacationland.



Meridian
Burbank
Cypress Elm Sch
Shopping Center
Mother Butler Memorial H S
Moorpark Park
MOORPARK
Strawberry Park Sch
Blackford High Sch
McKinney Sch
COUNTY HOSPITAL
San Jose City College
Lynhaven Sch
Amber Drive Sch
Moreland Sch
Hospital
Rosemary Sch
HAMILTON
Substation
Hazelton Sch
Latimer Sch
Castro Sch
High Sch
CAMPBELL
Creek
Baker Sch
RINCON
Del Mar High Sch
PACIFIC
SOUTHERN
Los Gatos
Blackford Sch
Willow Glen Park
Shopping Center
Dry
Aquinas
San Tomas
Bagby Sch
Cambrian Sch
Price Sch
22
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36


1988 TIJUANA 1988 MEXICO 1988

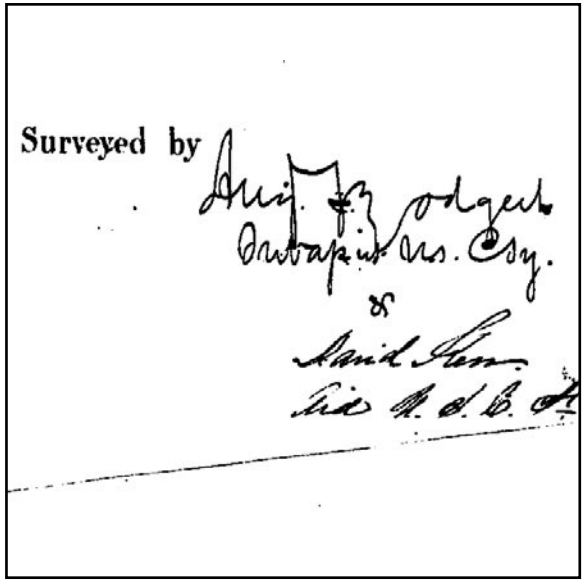

1988 TIJUANA 1988 MEXICO 1988

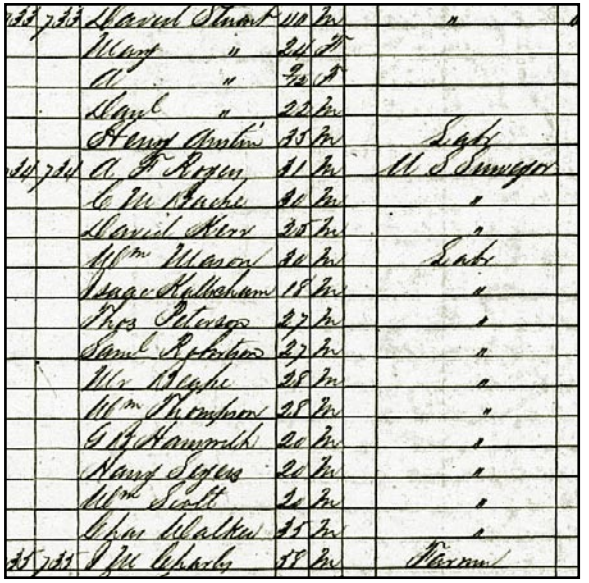
Odöck
Viderhout
Duerle
Drongene
Eeke
Swinarde
Heverge
Aßenede
Dortel
Bochoute
Biervliet
Colijns plaet
Brouwershaven
Zirckzee
Bommenee
Dreyschor
Elsdyck
Wisse kerck
Goes
Baerlant
Cloetinge
Biesclingen
Cappelle
Viane
Oostduvelant
Herkinge
Somerdyck
Ternuse
Gent
Tzas
Saffelare
Axele
De Honte
Deßelberg
Melle
Bavegem
Laerne
7. Eeken
Hoerbeke
Moere
Wettere
Exarde
Hoßenesse
Yrsick
Cruninge
S. Martensdyck
Nieutonge
Ouwe tonge
Äyghem
Lokeren
Steken
Weerde
Poortvliet
Lede
Beerlere
Sinay
A
Hulst
Namē
Romerswale
Ooltkens plaet
Aelst
S. Gillis
Appels
Tolen
Beßele
Saftingen
Bat
Steebergen
Dedermonde
Moßee
Tilro
Vraçene
Bergen op zoom
Willemstat
Temsche
Scheldt flu.
Aßche
Melsen
Callo
Wouda
Opdorp
Rupelmōde
Lillo
Hogerheyd
Rosendael
Roßem
Eyke
Borch
Ordam
Calvort
Hoboken
Putten
Nyspen
Oudenbosch
Wemmele
Impde
Willebroeck
ANTWERPEN
Rucveen
Vilvorde
Berchem
Merxem
Westdorp
Sevebergen
Reedt
Schooten
Loer
Battsel
MACHELEN
Op de locht
Loenhout
Sūdert
Hage
B
Diegem
Lier
R
De hoydōck
A
Breeda
Meede
Noßegem
Hevere
Hulle
S. Lenard
Hoochstraten
S. Geertrudenberg
Meerbeeck
Putte
Keßel
Rikevorßel

17th century Belgium representing world power, unity, strength

CONTEXT: ***person, time, technique, comparison***

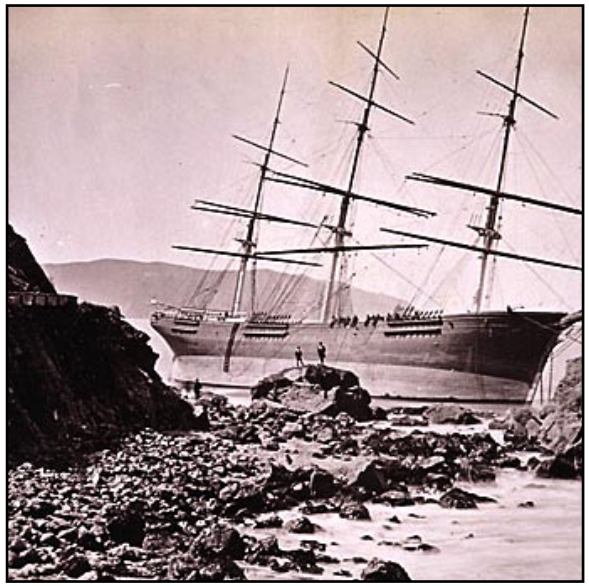
Context of
person / entity





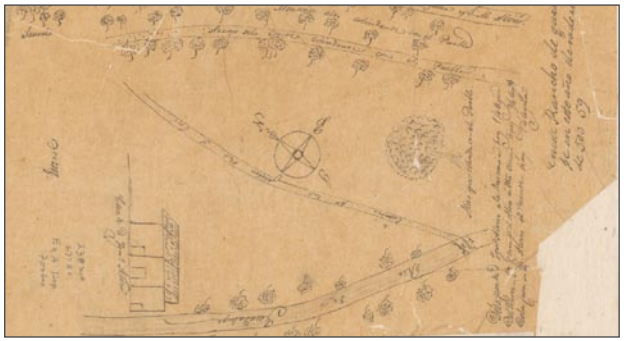
Context of

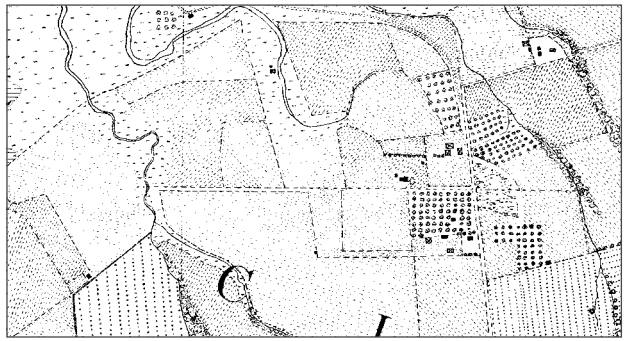
time (social, political, and economic)

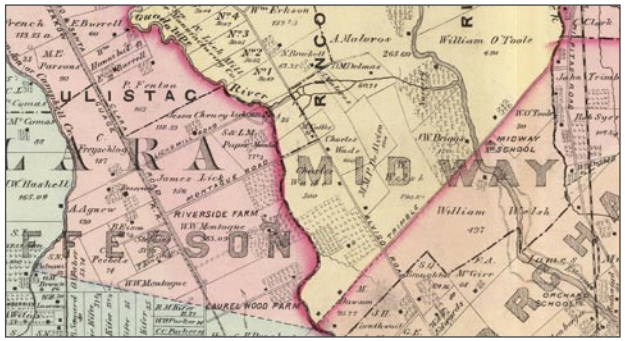


Context of

technique used to create map and print map



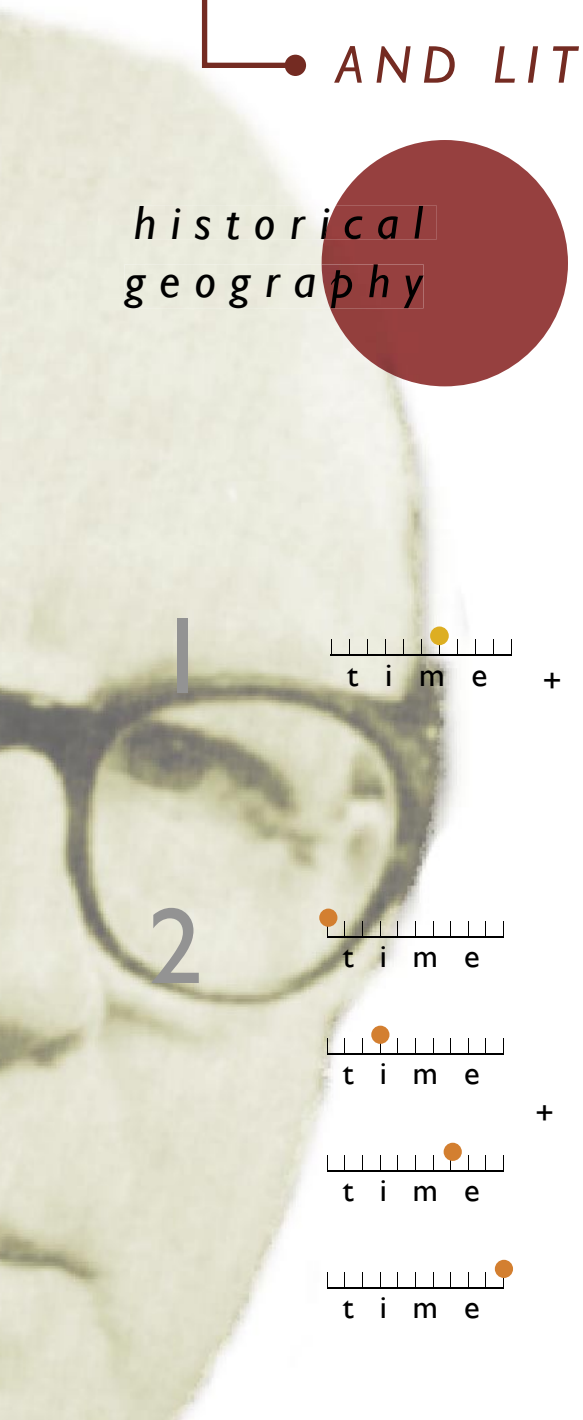




theoretical framework

INTERPRETING HISTORICAL MAPS

AND LITERATURE REVIEW



historical geography

space time

George Marsh
Ellen Churchill Semple
Carl Sauer
Derwent Whittlesley
H. C. Darby
Wilbur Zelinsky
Carville Earle
Derek Gregory
Anne Knowles
Don Mitchell

1

time + space = cross section

similar to a regional study but of a period in the past

2

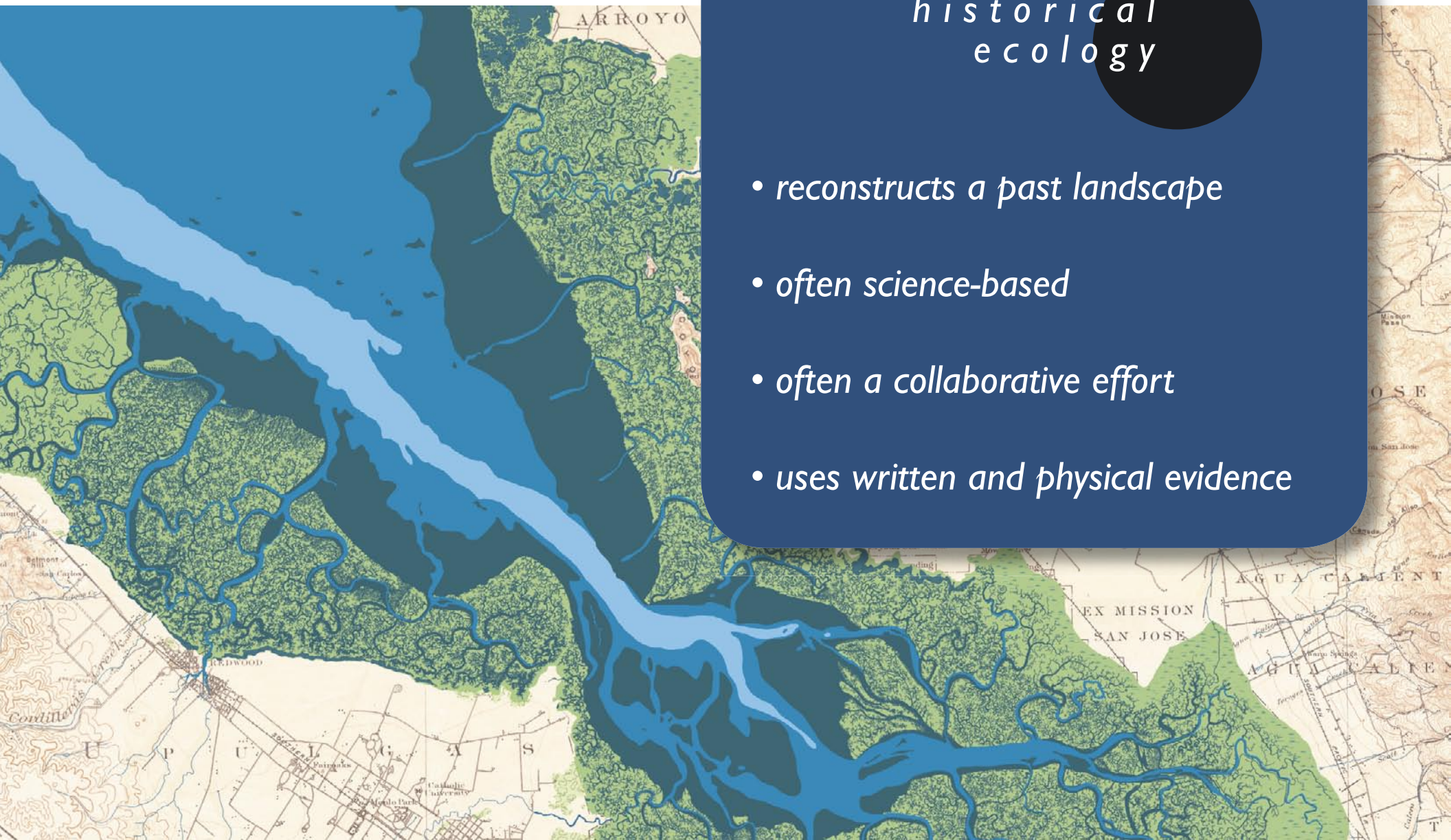
time
time
time
time

+ space = sequent occupance

used to study how changes in culture affect environment

theoretical framework & LITERATURE REVIEW

INTERPRETING HISTORICAL MAPS

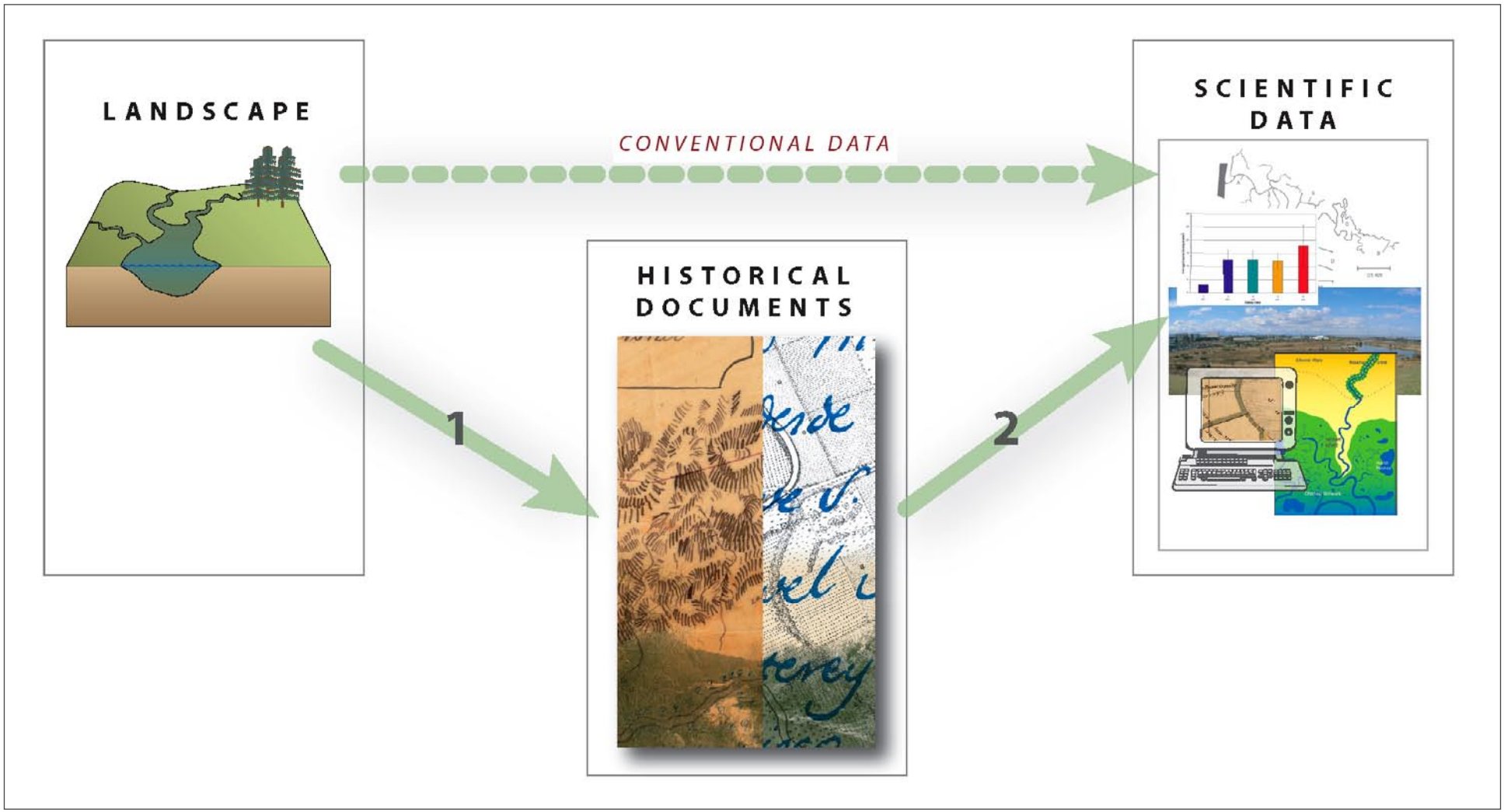


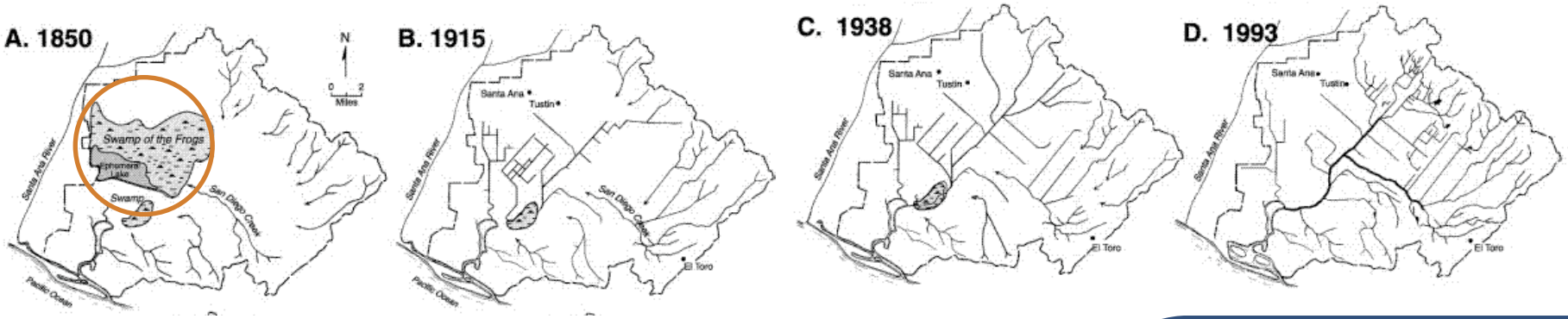
historical ecology

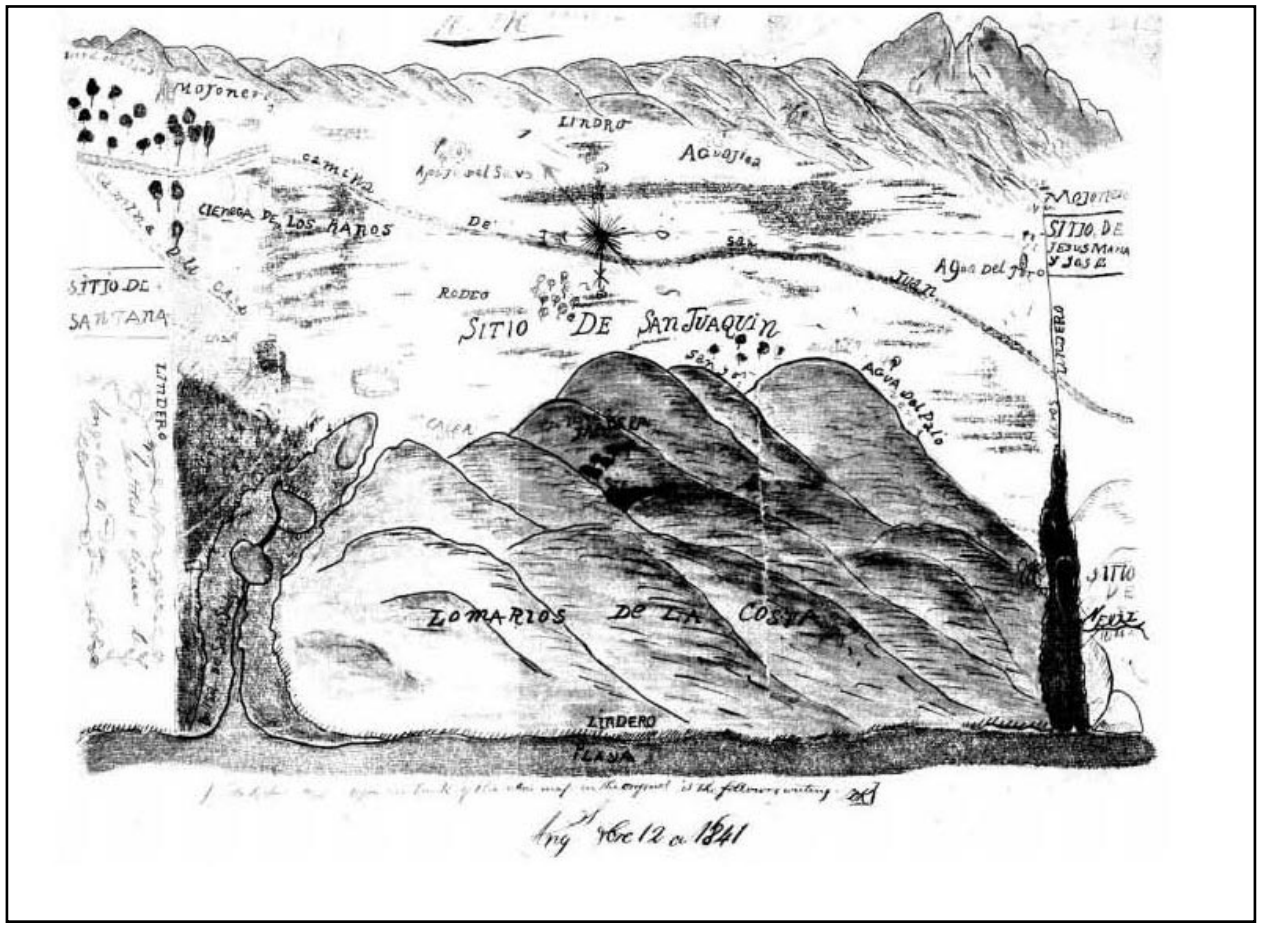
- reconstructs a past landscape
- often science-based
- often a collaborative effort
- uses written and physical evidence

theoretical framework INTERPRETING HISTORICAL MAPS

Scientists use inductive logic, based on direct observations,
while historians use tend to use a deductive reasoning,
in which events of the past can be used to deduce broader patterns







historical ecology

Stanley W. Trimble

San Diego Creek

Historic and Hydrographic and Hydrologic Changes in the San Diego Creek Watershed, Newport Bay, California.

Journal of Historical Geography, 2003

uses written and physical evidence

historical ecology

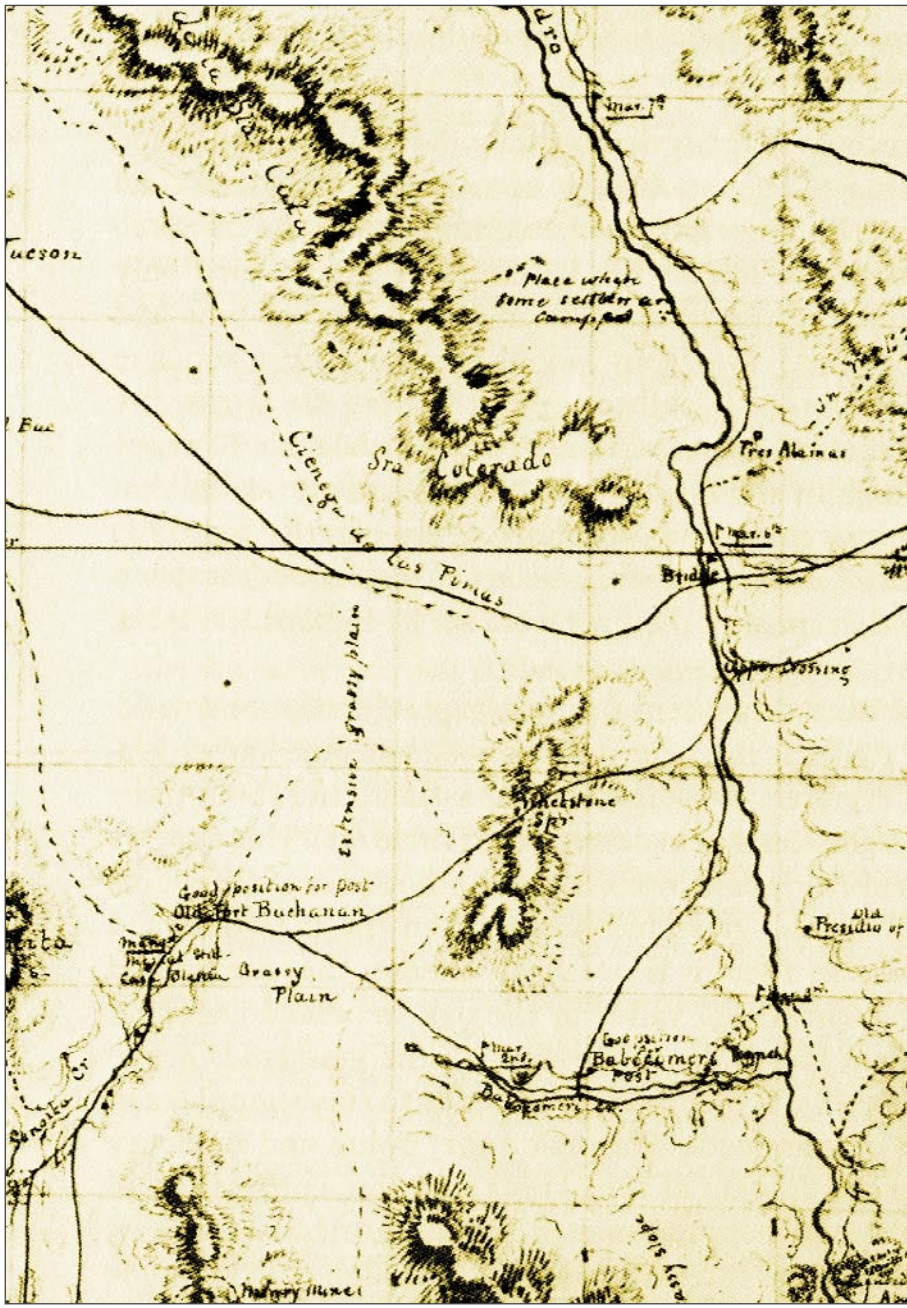
Conrad Bahre

A Legacy of Change: Historic Human Impact on Vegetation of the Arizona Borderlands, 1991

uses written and physical evidence

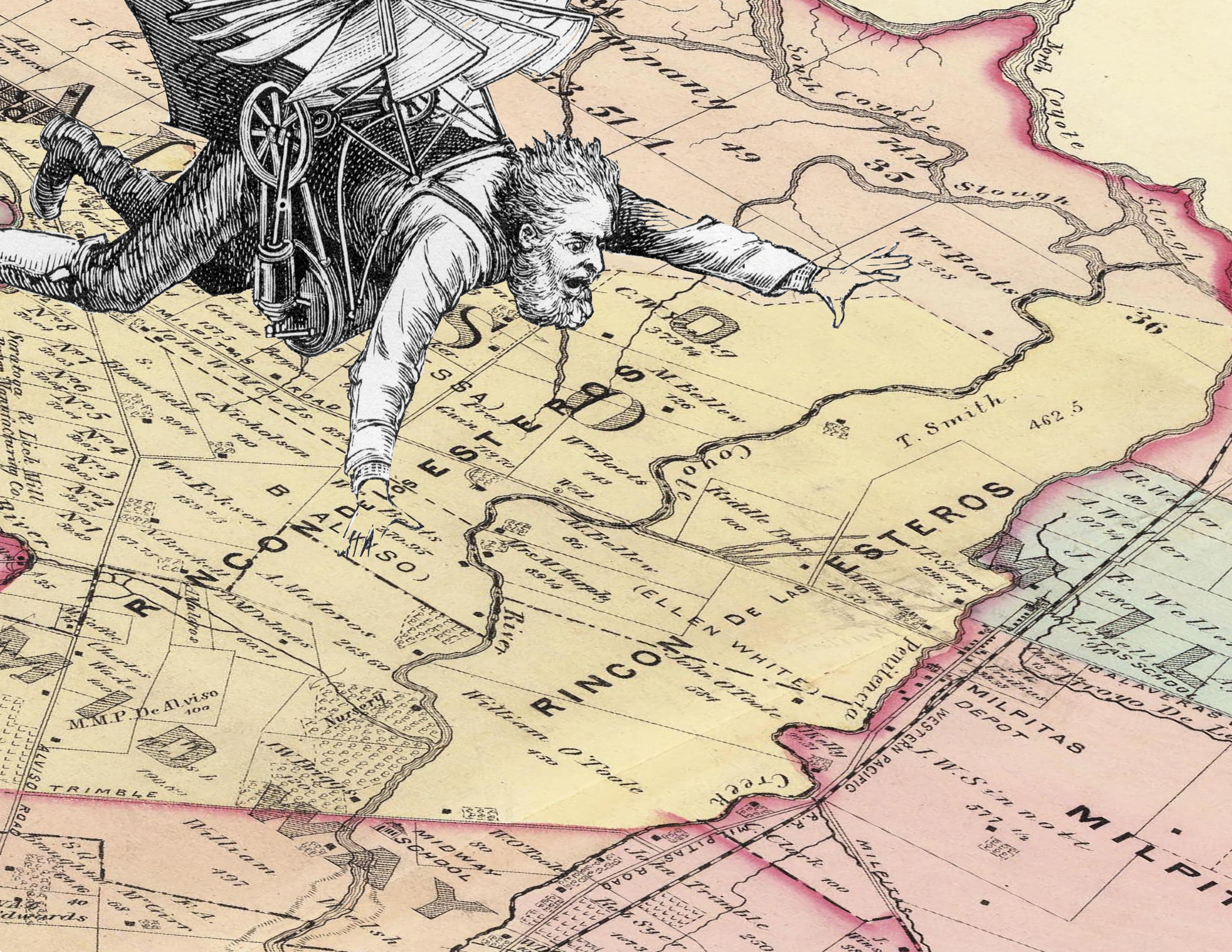
explorer's journals
maps
newspapers
photographs & rephotographs

[landscape paintings, local histories, court cases, climate data, survey accounts]



STEPS

- determine study area
- acquire historical maps & archival graphics
- research the making of individual maps
- compare the maps to each other
- develop conclusions


RINCON DE LOS ESTEROS
(ALVISO)
RINCON DE LAS ESTEROS
(ELLEN WHITE)
MILPITAS
MILPITAS DEPOT
WESTERN PACIFIC R.R.
MILPITAS ROAD
MIDWAY SCHOOL
CALAVERAS SCHOOL
South Coyote Slough
North Coyote Slough
Coyote River
Penitencia Creek
T. Smith
462.5
M. Bellew
Wm Boots
William O'Toole
John O'Toole
Mrs M. Murphy
M.M.P. De Alviso
Nursery
TRIMBLE
ALVISO ROAD
J. R. Weller
A. Weller
J. W. Sinnott
Charles Wade
G. Nicholson
John W. Meads
A. Malone
Wm Erikson
36
35
49

Coyote Creek: the study area

Coyote Creek: the study area

NATIVE AMERICANS

landscape at this time often seen as pristine

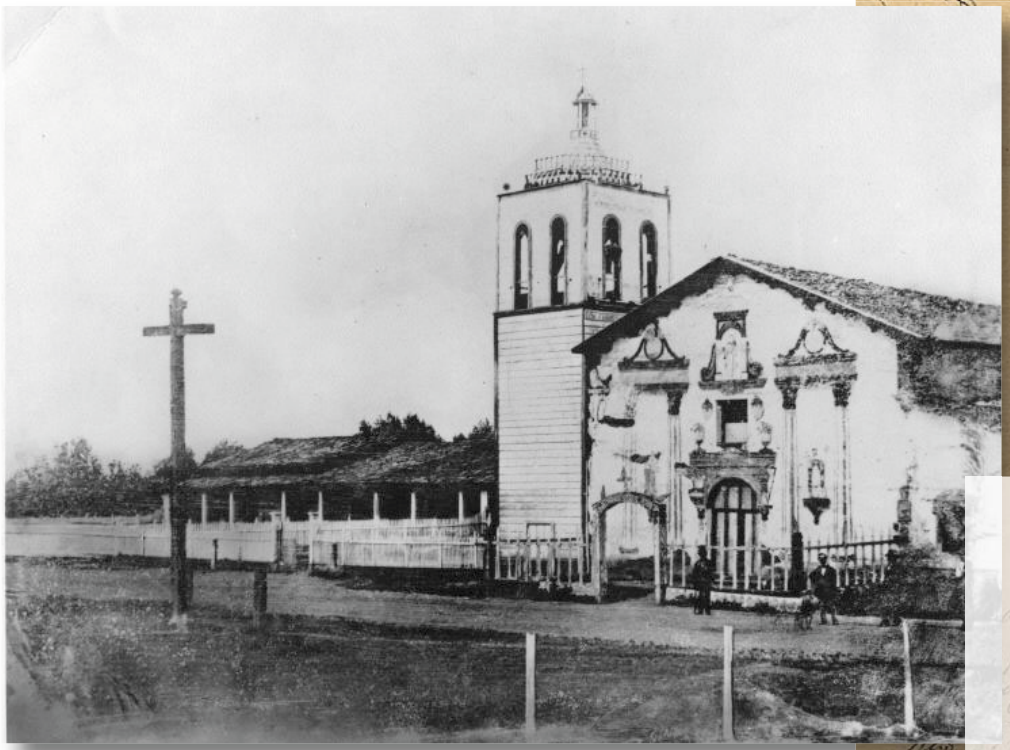
but landscape was actively managed for acorns, salmon, shellfish, mammals

fire management practices shaped the valley

population reduced by disease brought by Spanish

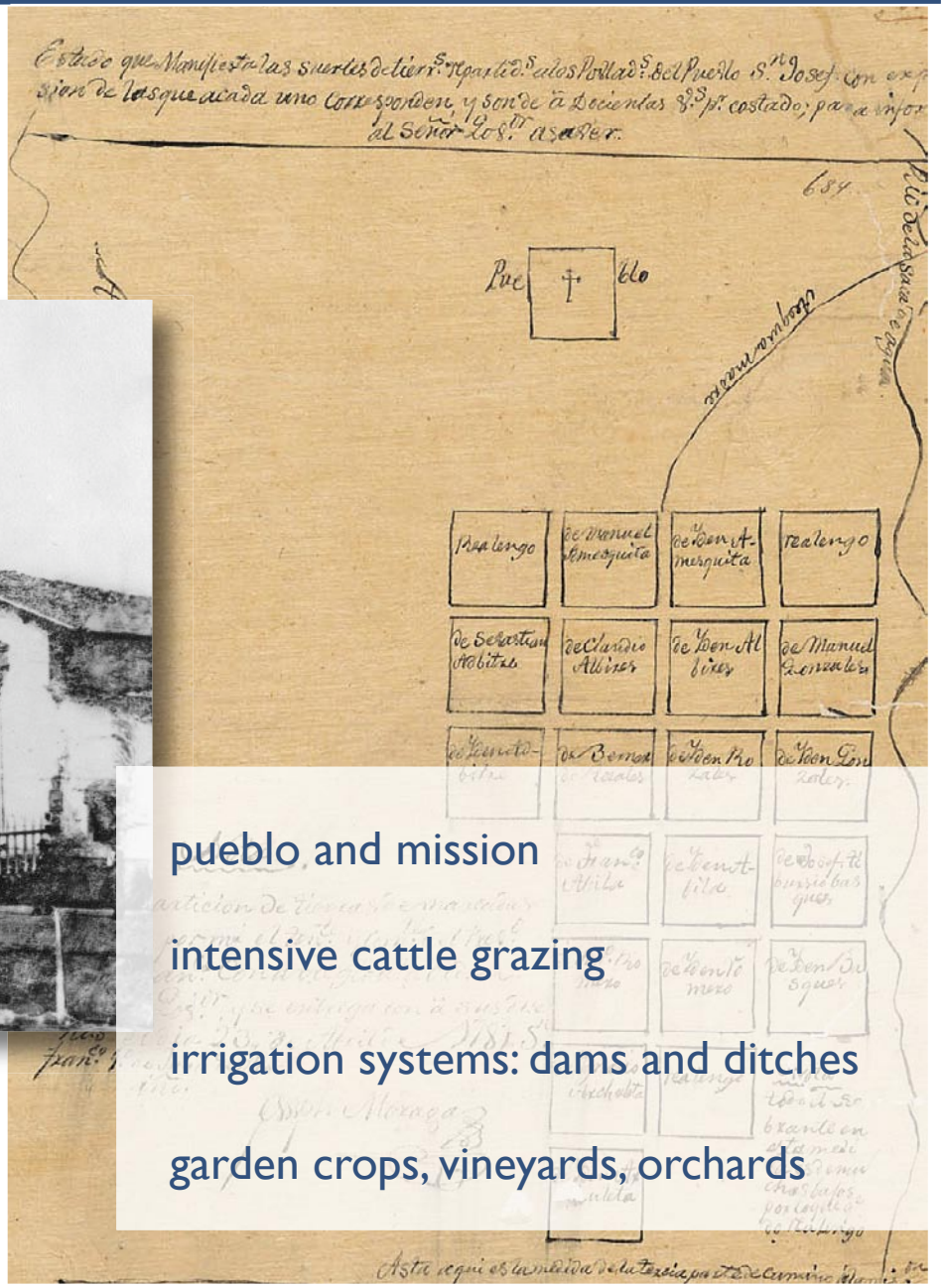
Coyote Creek: the study area

SPANISH PERIOD: 1769-1821

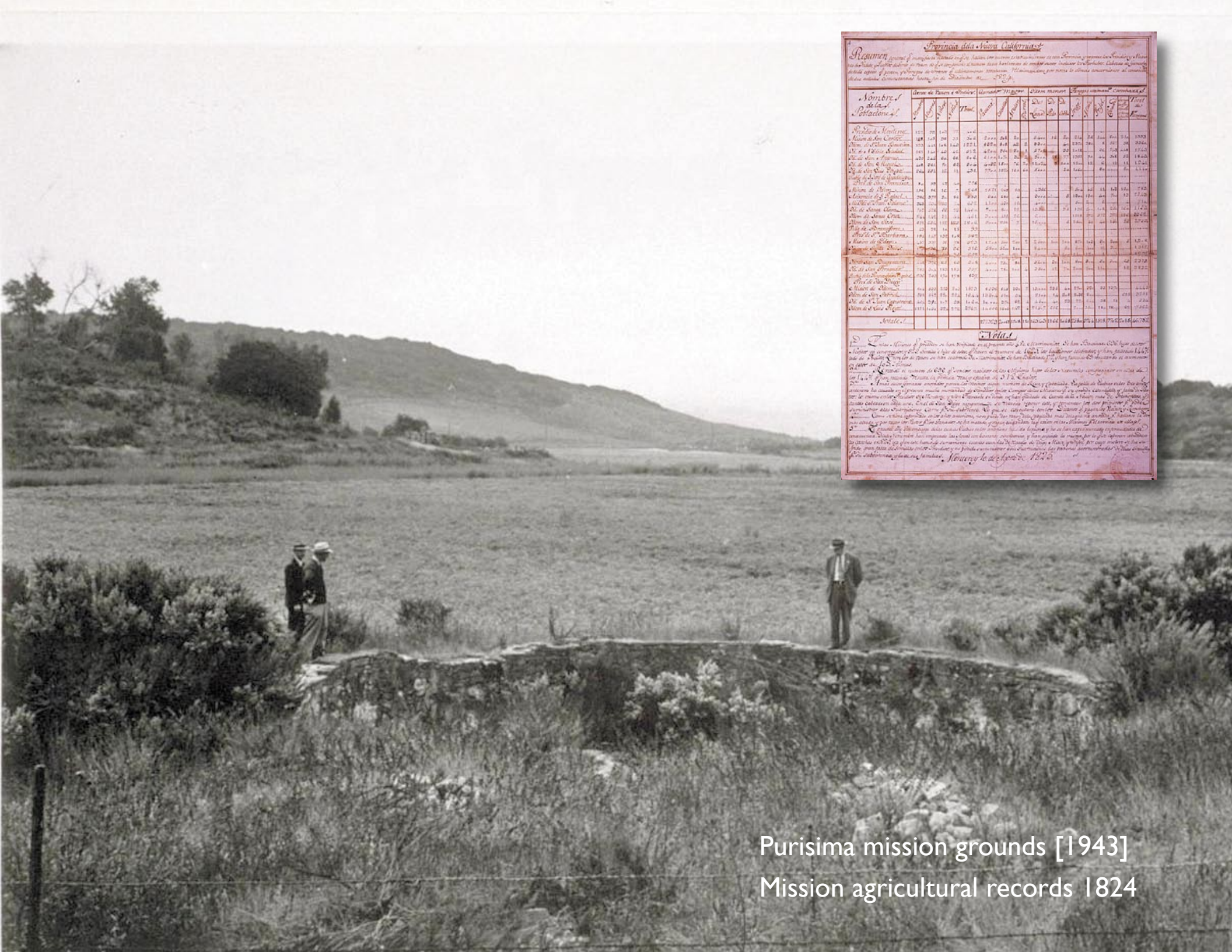


1851 San José Mission circa 1870,

San José Pueblo map



- pueblo and mission
- intensive cattle grazing
- irrigation systems: dams and ditches
- garden crops, vineyards, orchards



Purisima mission grounds [1943]
Mission agricultural records 1824

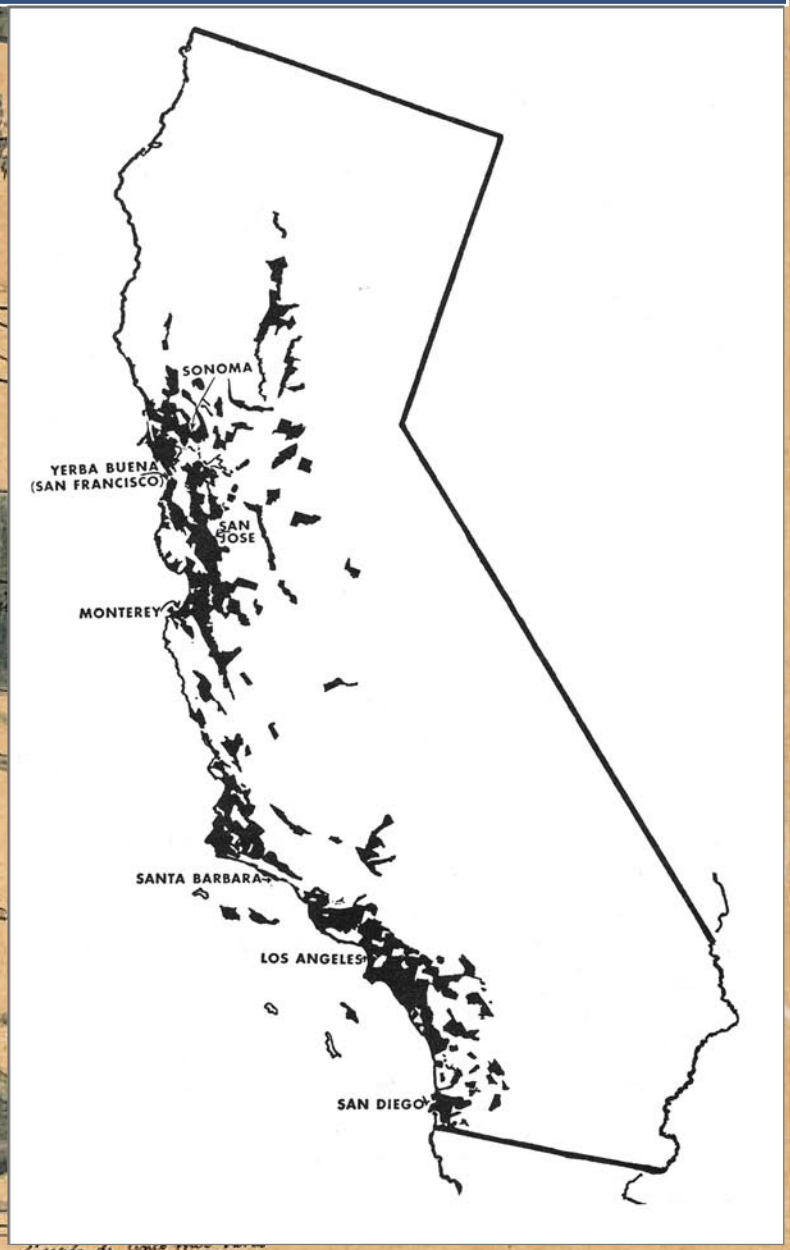
Coyote Creek: the study area

MEXICAN PERIOD: 1821-1849

often seen as quiet period before Gold Rush & Americans

but Mexico increased foreign trade and economic activity

allowed individuals to own land through the form of land grants



Deseño del Rancho de San Juan Bautista.

Coyote Creek: the study area

INTERPRETING HISTORICAL MAPS

EARLY AMERICAN PERIOD: 1849-1930s

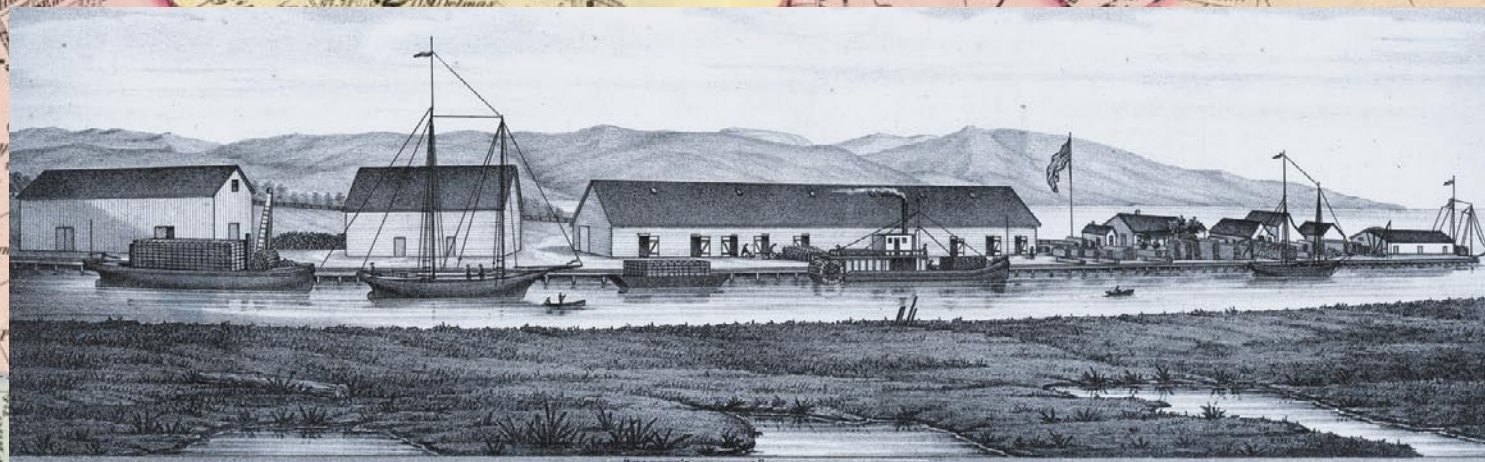
water was primary transportation

deepwater channels ex. through mudflats

entrepreneurs established landings

shipped grain, fruit, vegetables, lumber

landings lost importance after railroads



Alviso

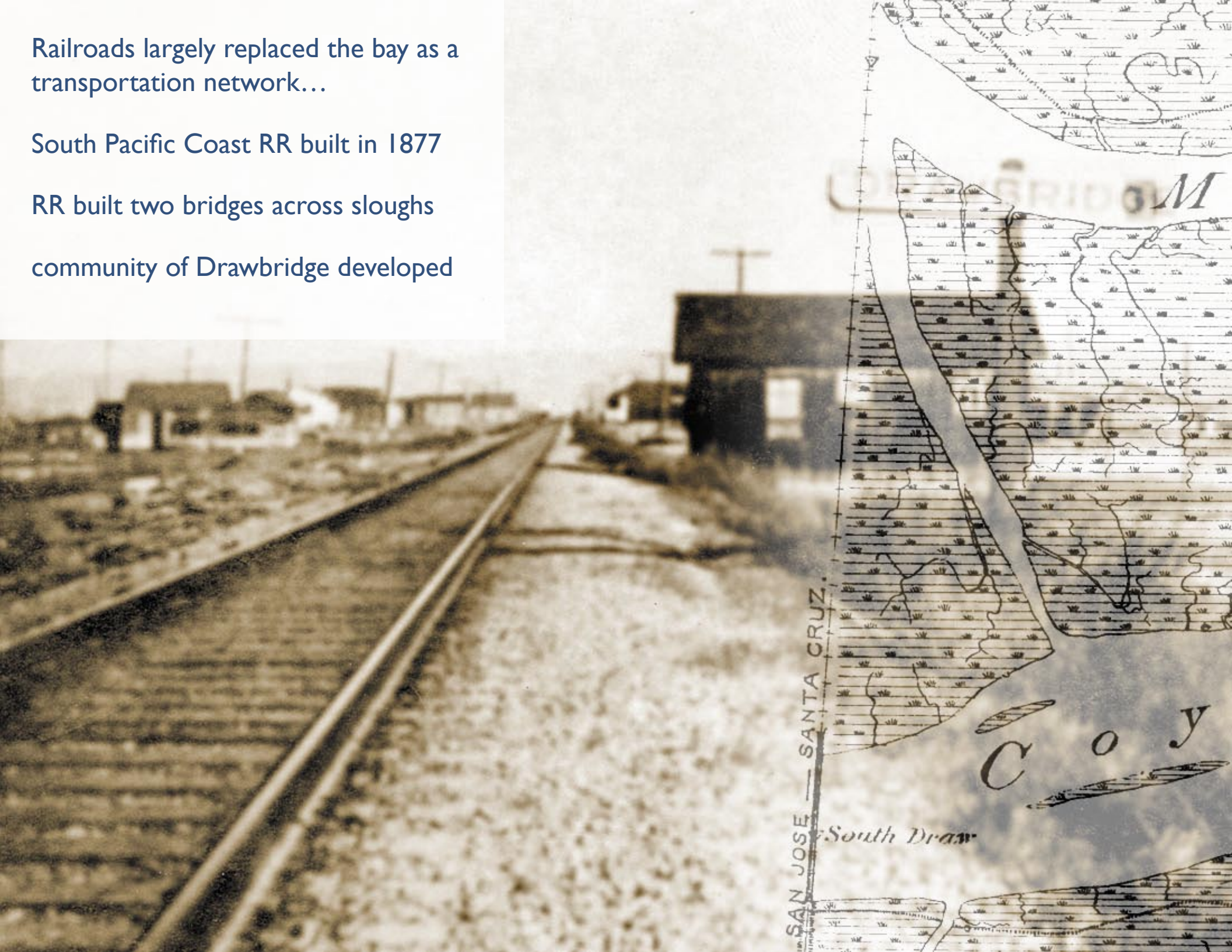
1856

Railroads largely replaced the bay as a transportation network…

South Pacific Coast RR built in 1877

RR built two bridges across sloughs

community of Drawbridge developed




1905

farming for profit

crops not just cattle

wheat farming after 1870

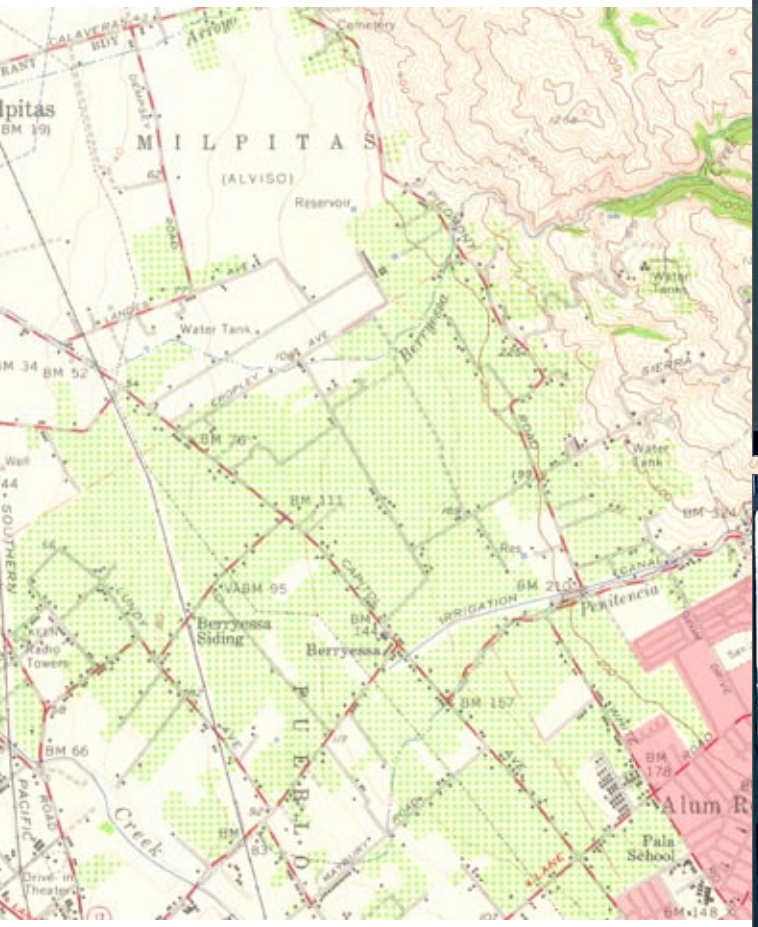
orchards, strawberries, vineyard

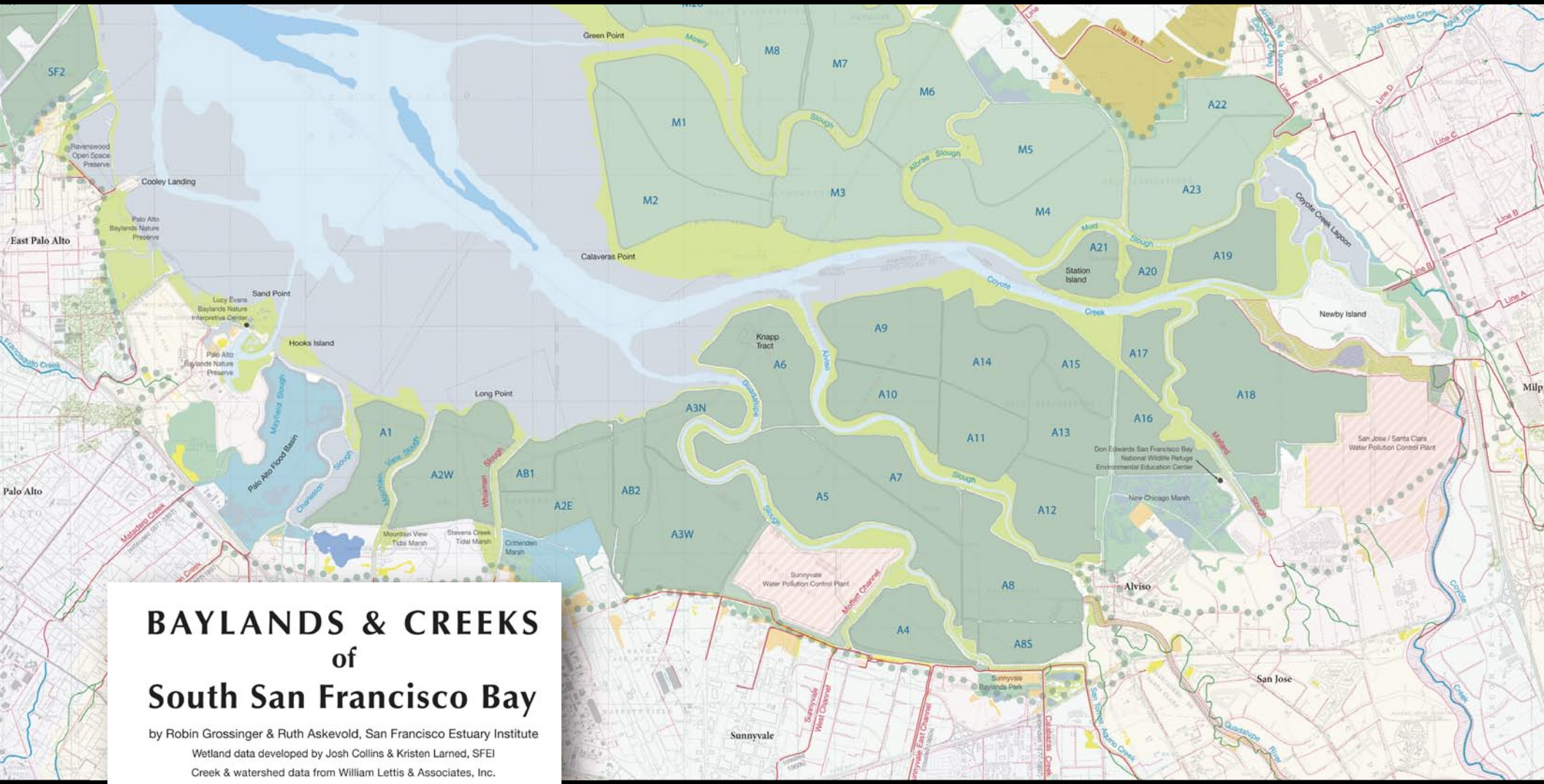
1910

Coyote Creek: the study area

INTERPRETING HISTORICAL MAPS

AMERICAN PERIOD: 1940s-present





BAYLANDS & CREEKS
of
South San Francisco Bay

by Robin Grossinger & Ruth Askevold, San Francisco Estuary Institute

Wetland data developed by Josh Collins & Kristen Larned, SFEI

Creek & watershed data from William Lettis & Associates, Inc.

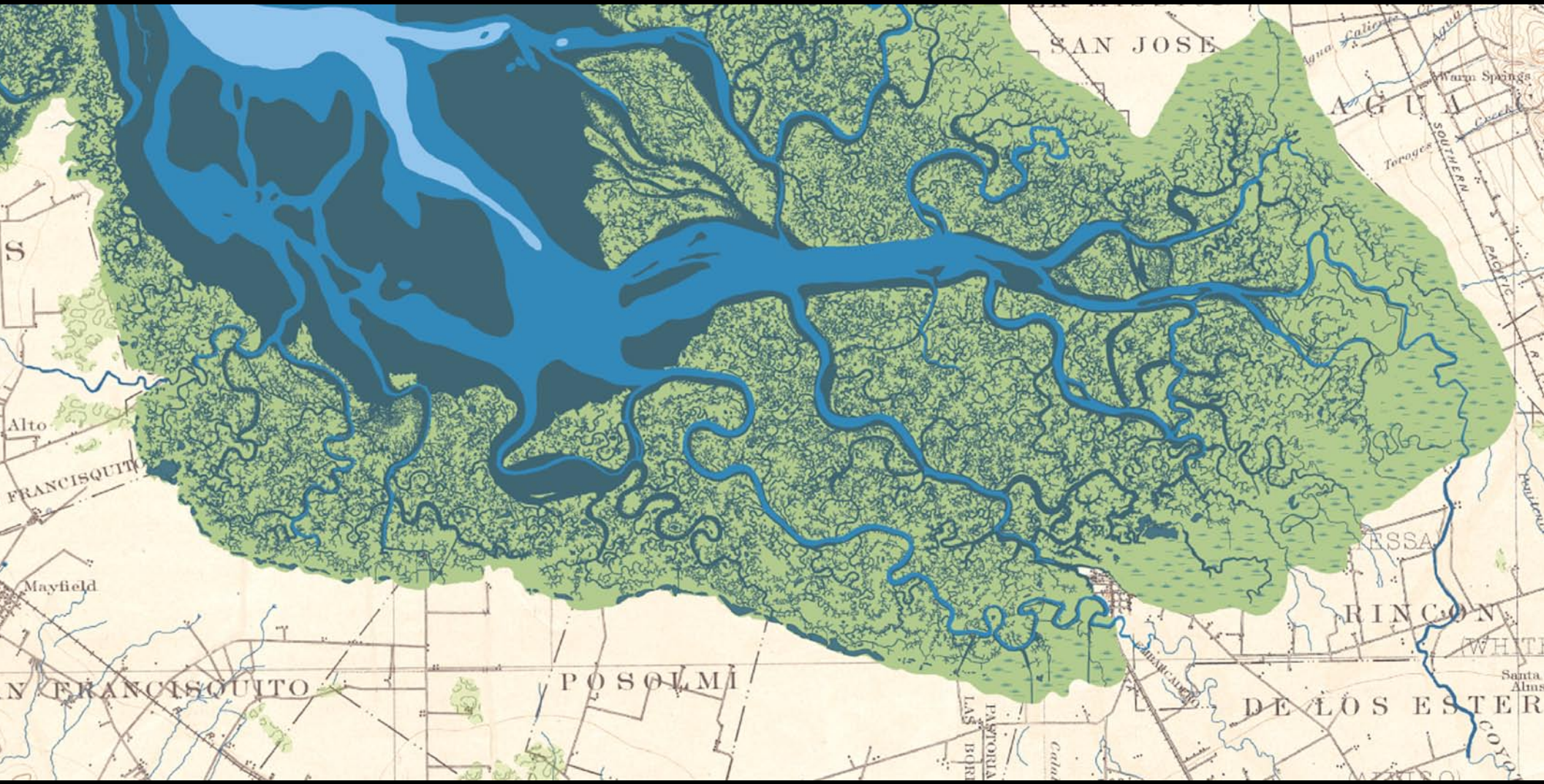
PUBLISHED BY

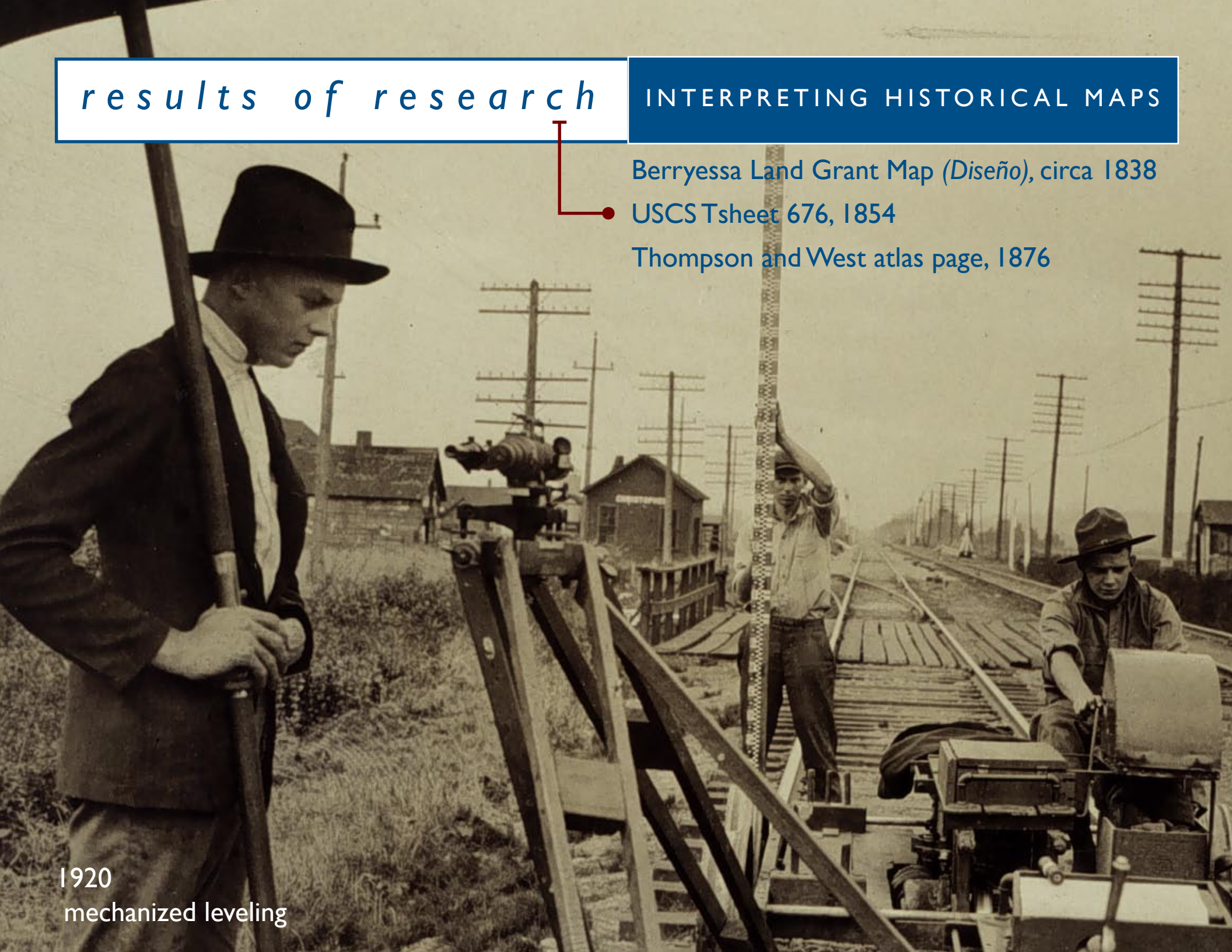
Oakland Museum of California

1000 Oak Street, Oakland, CA 94607

www.museumca.org/creeks

2005


SAN JOSE
Warm Springs
Alto
FRANCISQUITO
Mayfield
POSOLMI
RINCON
DE LOS ESTER



results of research

INTERPRETING HISTORICAL MAPS

Berryessa Land Grant Map *(Diseño)*, circa 1838

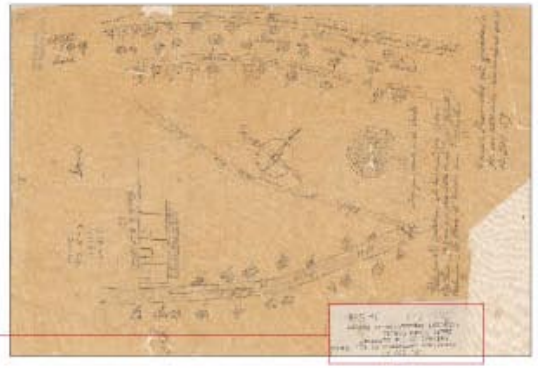
USCS Tsheet 676, 1854

Thompson and West atlas page, 1876

1920
mechanized leveling

Diseño of Rincon de los Esteros, circa 1838

FIGURE 6.1-A. *DISEÑO* OF *RANCHO RINCON DE LOS ESTEROS*, CIRCA 1838



TECHNOLOGY: PEN AND INK COPIES

Diseños were hand-drawn and not printed. When more than one map was needed, pen and ink copies were drawn, though the duplicate might vary in features, placement, and coloring. Above, the copy contains mostly the same features but color is not applied as it has been to the map to the right.

SOCIAL CONTEXT

After United States took control of the area, former Mexican citizens who had been granted land were required to prove their ownership by presenting the Land Commission with all documents associated with their original land grant, including the *diseño* that was created when the land was originally petitioned. The typewritten note affixed to the original map identifies it as part of the "Francisco Berreyesa et al, Clmt" for the "Rincon de los Esteros" in 'Santa Clara County'. The copy, top right, affixes the identifying note on the opposite side of the map, probably to prevent covering up the Guadalupe River. The Land Commission kept copies of all material, now archived at the University of California's Bancroft Library.

SOCIAL CONTEXT & TECHNOLOGY: WORDS

Features are identified with hand-written descriptions, place names, and notations identifying the owners of specific houses.

SOCIAL CONTEXT

The *diseño* was used to establish land tenure through a complex system of petitions and approvals. Boundaries were loosely defined, and sometimes the edge of one rancho overlapped another. These differences were easily resolved where land was a plentiful commodity but became more difficult to settle as land values grew. *Diseños* were often considered inaccurate, misleading, and probably contrived by American surveyors (Arbuckle 1986,55).

TECHNOLOGY: SYMBOLS

Diseños represent the world as both a plan view, as if looking down from above, and in profile, where objects are seen from the side. The land grant maps employ pictograph–or images that have a likeness to the original object–such as the trees and house. Pictographs are in contrast to symbols on maps, in which a legend is needed to interpret the sign; the symbol is selected arbitrarily and does not resemble the original object (Casey 2002,143).

INTERPRETING HISTORICAL MAPS

- *Diseños were part of Mexican land grant system*
- *US required that the land grantees prove their claims were legitimate before a Lands Commission.*

- *Berryessa family grant: 4500 acres between Guadalupe River and Coyote Creek*
- *Northern boundary -- marked by a series of ponds marked 'esteros' a problem*
- *US courts allotted only 1800 acres*

results of research

INTERPRETING HISTORICAL MAPS

difficult to reconcile with modern maps

- *no scale*
- *no legend*
- *no title*

Diseño: Technology [map-making]

results of research

INTERPRETING HISTORICAL MAPS

Diseño: Technology [map-making]

- *made by individuals*
- *made to satisfy the requirements of a complex real estate transaction*
- *freehand drawings, probably made by*

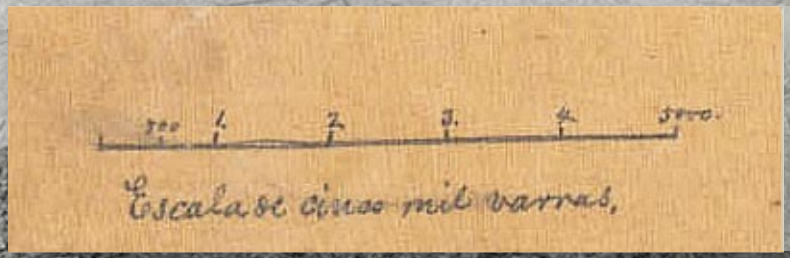
1. *author standing at a central point and sketching in the features seen in all directions, or*
2. *the boundary was measured by two men on horseback; both holding one pole connected by a rope fifty varas long (about 137.5 feet)*

results of research

INTERPRETING HISTORICAL MAPS

Diseño: Technology [map-making]

land measured by a fanega



vara = 33 inches
vara = 33. 5 inches?
vara = ?

poco más o menos
[a little more or less]

Diseño: Technology [printing]

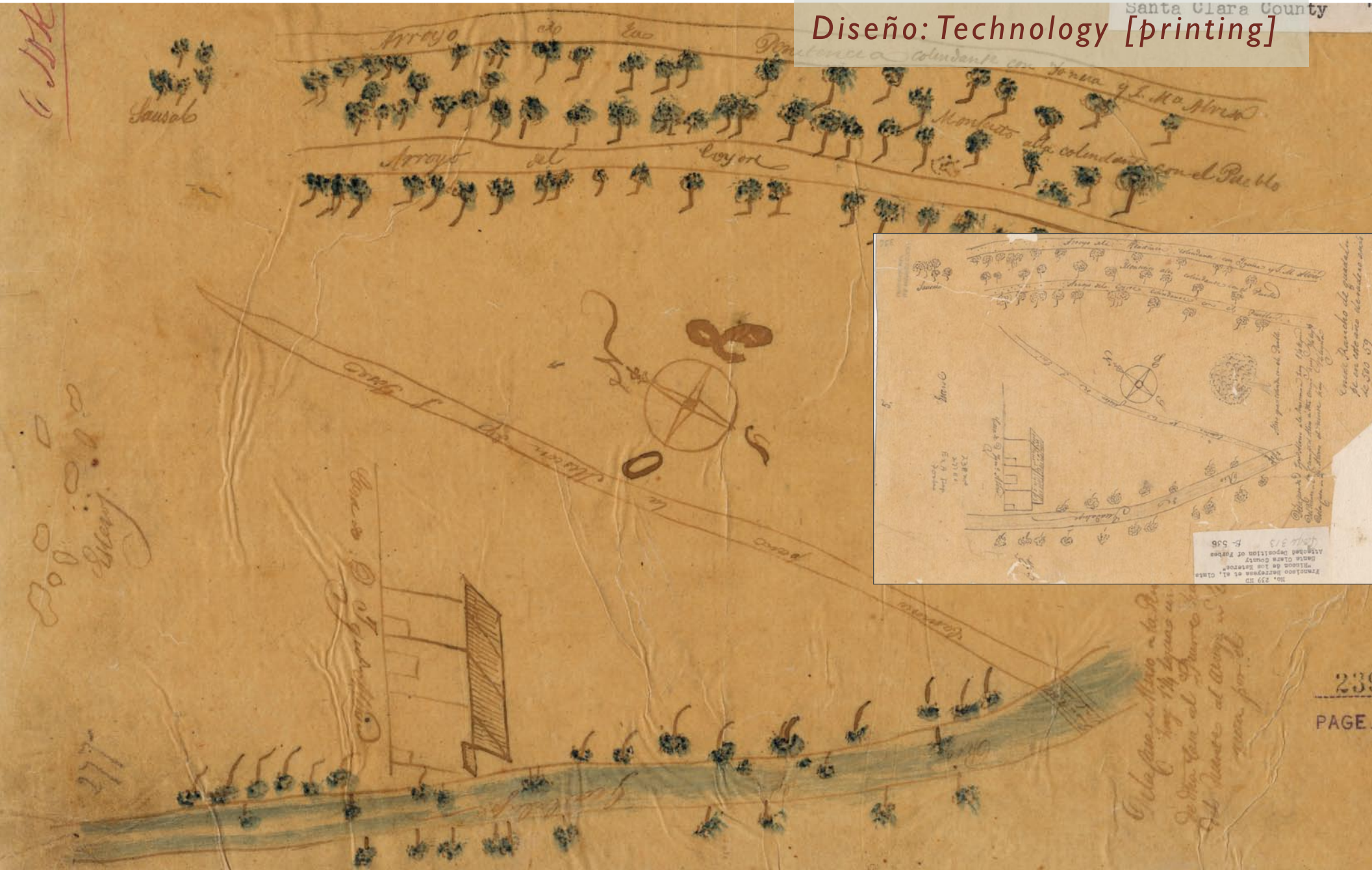
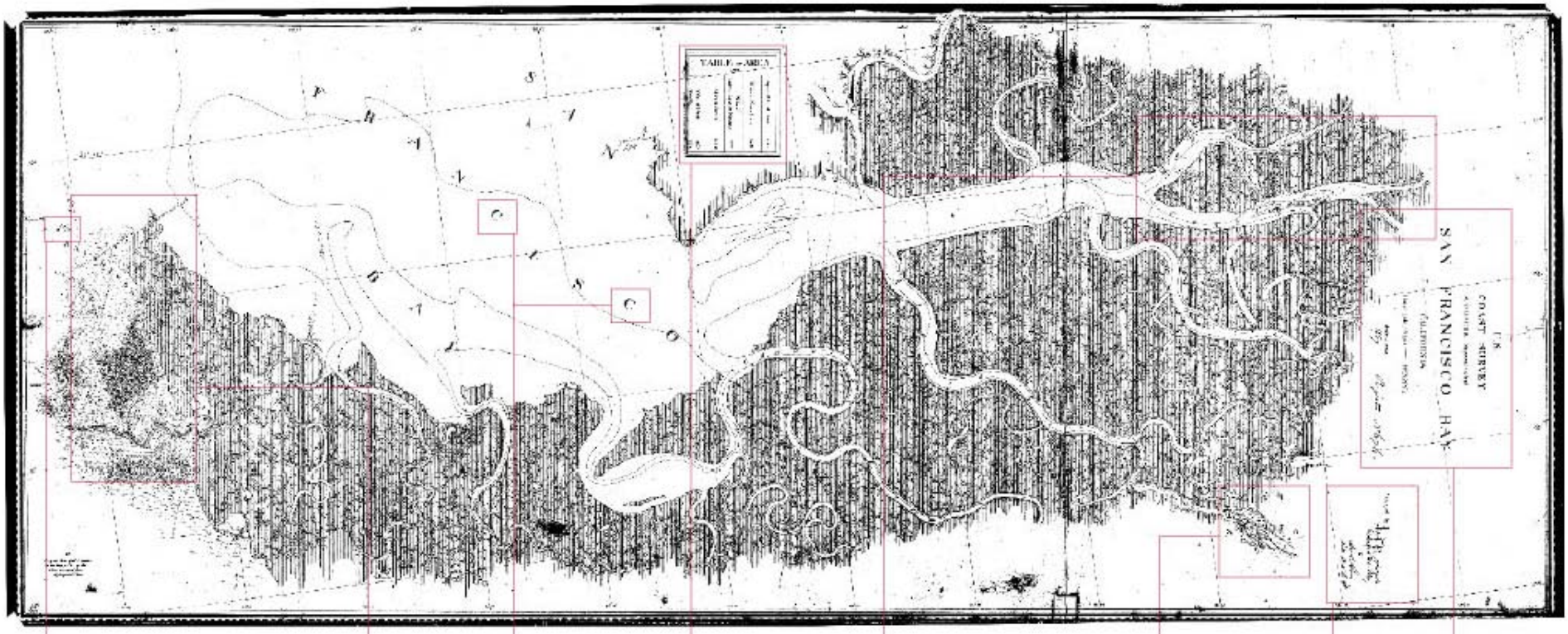


FIGURE 7.1-A. U.S. COAST SURVEY TOPOGRAPHIC MAP SHEET No. 676, 1857



TECHNOLOGY: MAPPING

The dot within a circled marked as 'East Base' depicts a primary baseline corner, used to establish accurate distances and locations on the map. In a larger sense, it ties T-sheet 676 to the other sheets in the series and, ultimately to the triangulation baselines connecting the entire continent.

TECHNOLOGY: MAPPING

The Coast Survey's topographic sheets often contained detail about non-tidal features. Shown here is the early Ravenswood landscape, with rudimentary roads, field lines and fences, houses and outbuildings. The Coast Survey symbology used to depict these features—hatches, dashed lines, and solid rectangles—was not yet consistent, and varies from map to map.

SOCIAL CONTEXT

The surveyors have summarized their work in a *Table of Area Et'c*, noting various totals for surveyed miles of shoreline, creeks, ponds, and the miles of roads surveyed.

TECHNOLOGY: ENGRAVING AND PRINTING

Coast Survey maps were printed from engraved copperplates. Each letter form was engraved separately, resulting in slight variations, as can be seen in the two letter 'C's selected here.

SOCIAL CONTEXT

The survey of 1857 depicts the intricate relationships between various wetland features, including the broad Mud and Coyote Sloughs, small sinuous channels, mud banks (representing low tide), pannes, and tidal marsh.

SOCIAL CONTEXT

Though the U.S. Coast Survey's primary mission was to map navigable waterways, landings such as Alviso were so integrated into the surrounding tidelands that they were often portrayed in great detail.

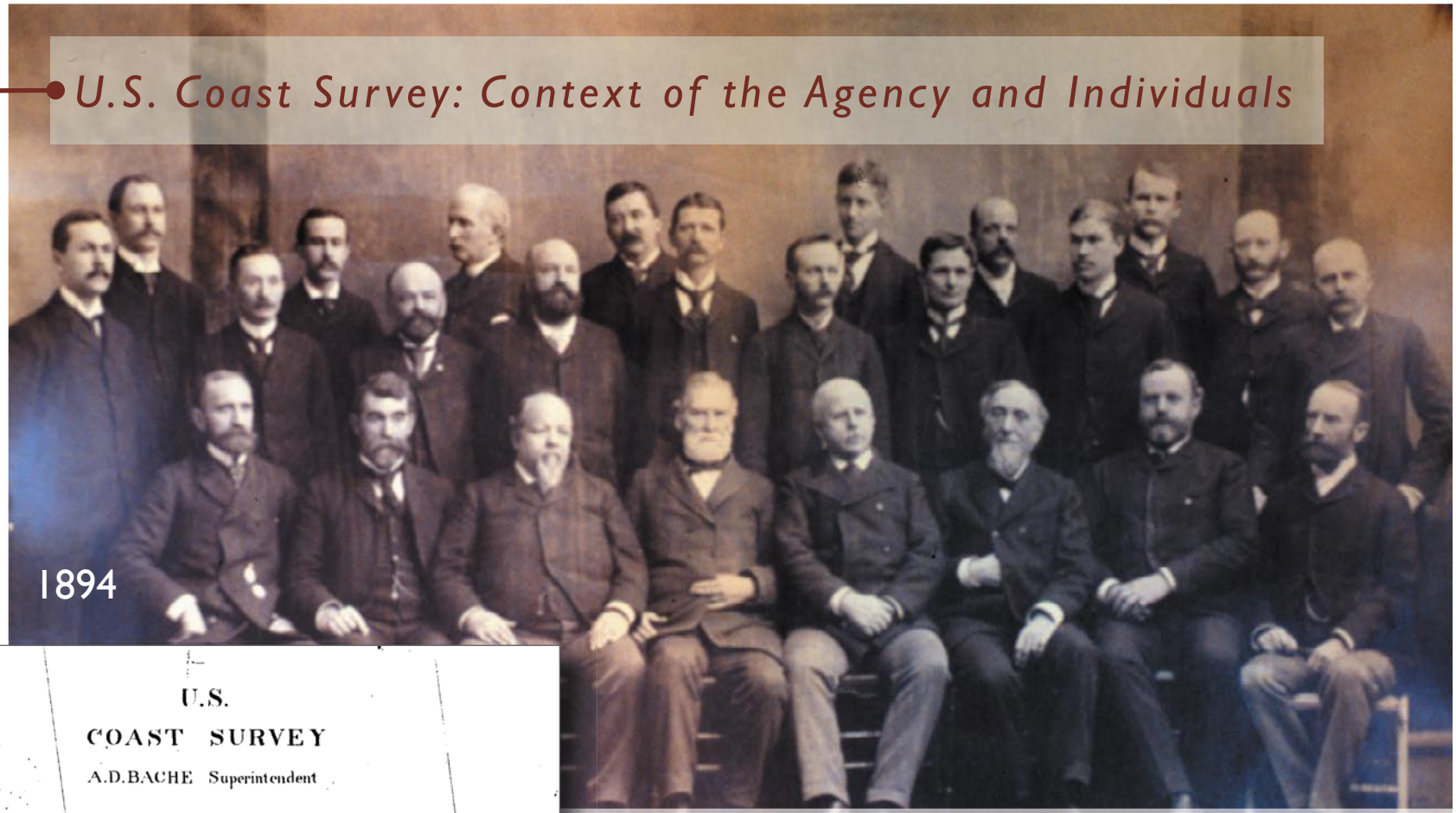
THE CARTOGRAPHER

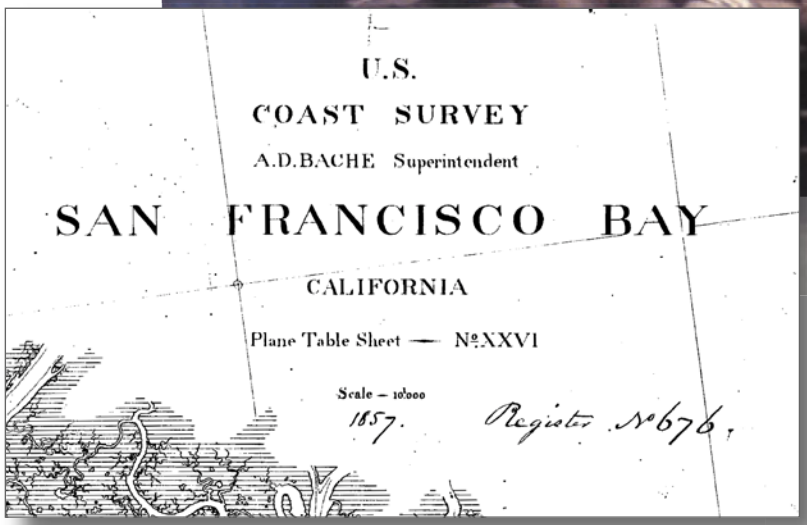
The signatures of the surveyors who measured the sloughs and marshlands in 1857—'August Rodgers & David Kerr, Aid U.S.C.S.'—are barely legible.

THE AGENCY

The title area identifies not only the agency responsible for the map but also the superintendent of the Coast Survey, the area mapped, identifying sheet numbers, scale, and date.

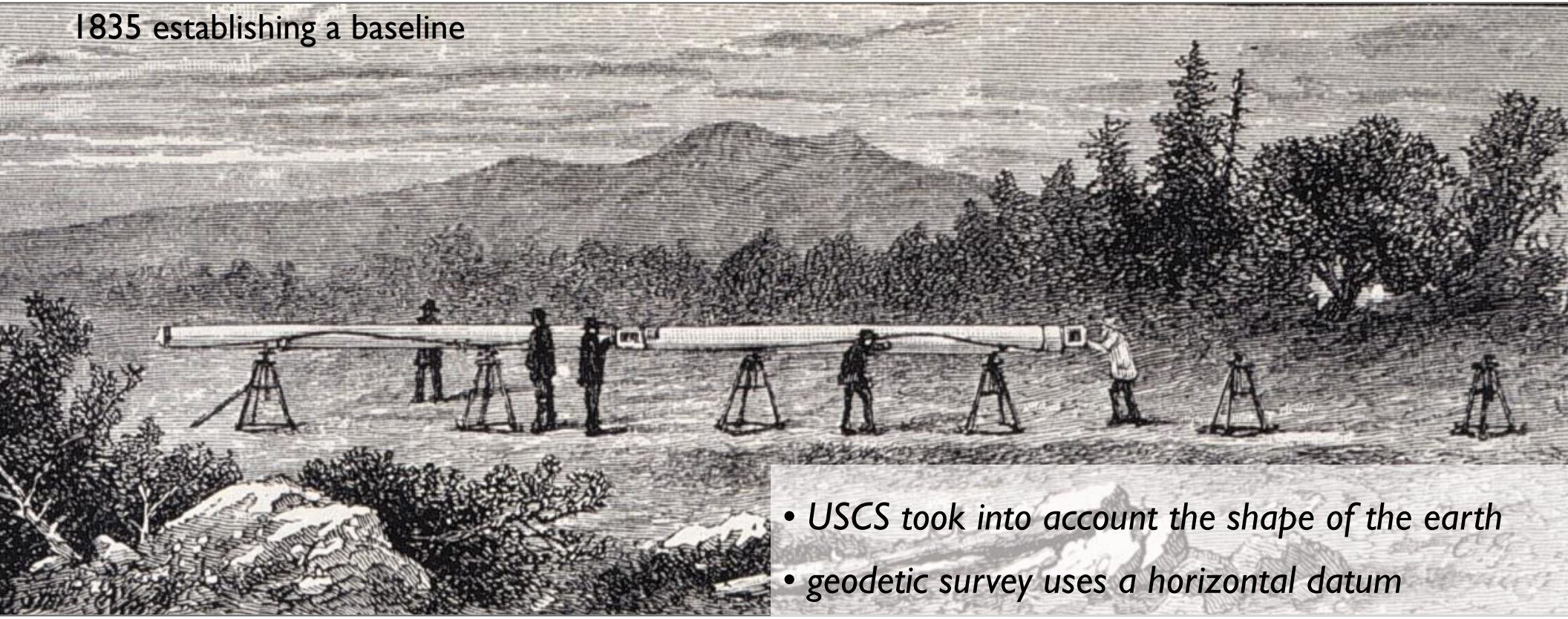
U.S. Coast Survey: Context of the Agency and Individuals





- agency established in 1807 for safe navigation
- Congress was ambivalent in funding CS
- Coast Survey employees were scientists
- individuals had impact on final product

U.S. Coast Survey: Technology [Geodesy and Plane Table Mapping]

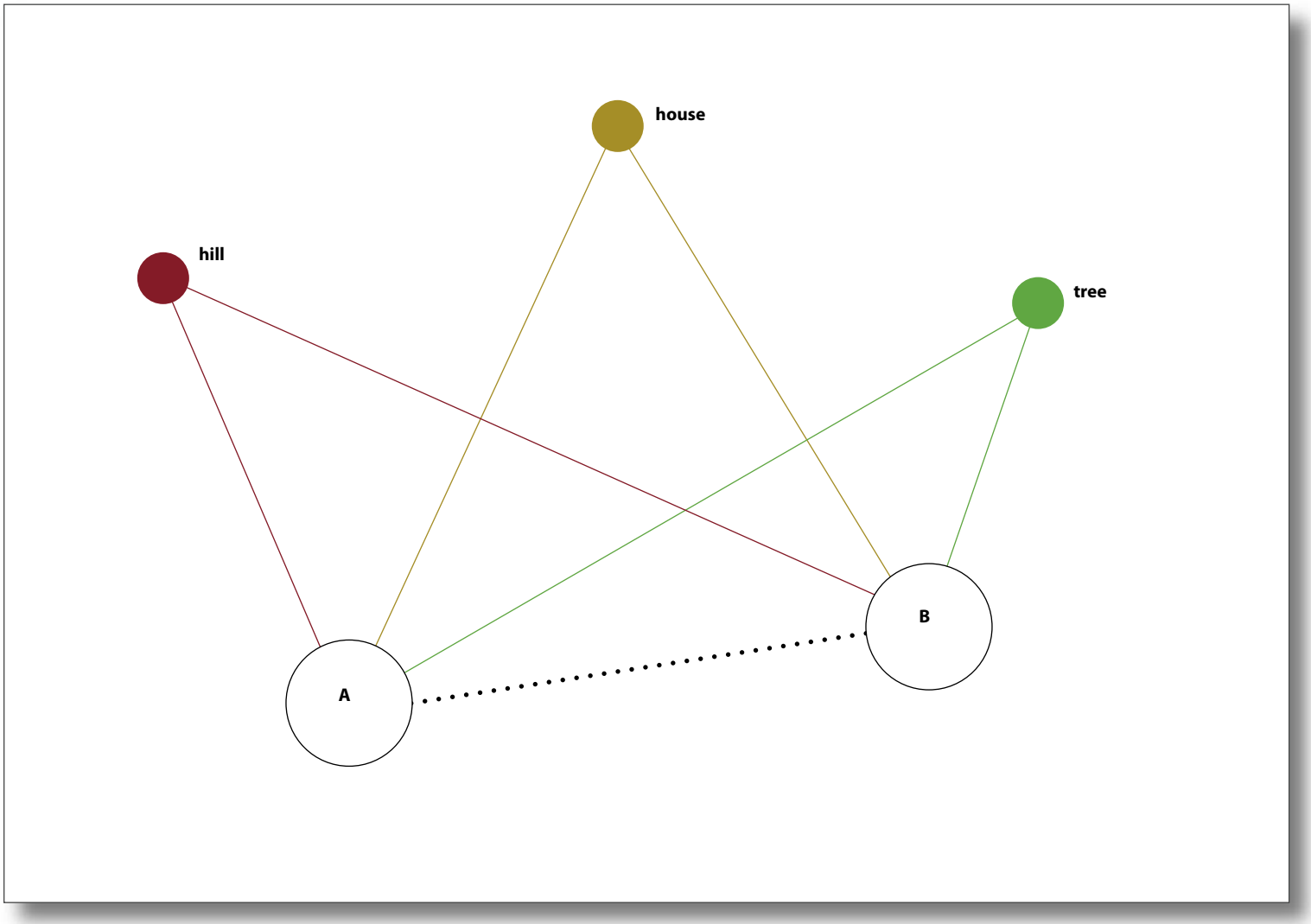


1835 establishing a baseline

- USCS took into account the shape of the earth
- geodetic survey uses a horizontal datum and all other positions are tied to a single point
- used plane table mapping
- means adjacent surveys can fit together

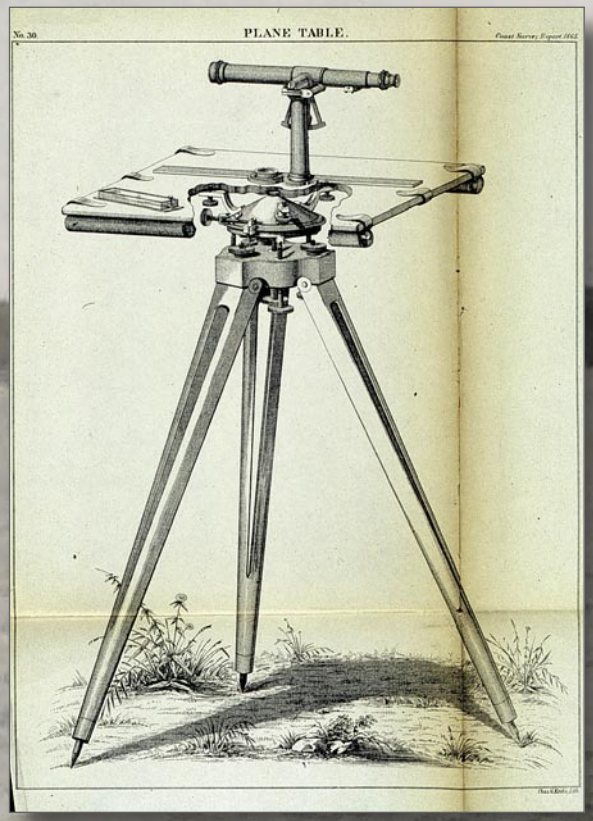
U.S. Coast Survey: Technology [Geodesy and Plane Table Mapping]

U.S. Coast Survey: Technology [Plane Table Mapping]

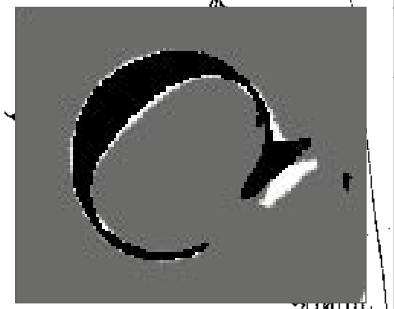


Example of plane table mapping. The surveyor would place the plane table directly over a triangulation station (A) and locate the second triangulation station through the alidade (A to B). From station A, the surveyor would use the alidade to draw lines to the features to be mapped (such as the hill, house, and tree, above). Then, moving to station B, the surveyor would draw lines to the same features, creating a triangle. Triangulation operates on knowing the length of one side of a triangle—the distance between A and B). The angles of the other sides of the triangle are measured, and then the lengths of the other sides are computed.

U.S. Coast Survey: Technology [Geodesy and Plane Table Mapping]



U.S. Coast Survey: Technology [Printing Processes]



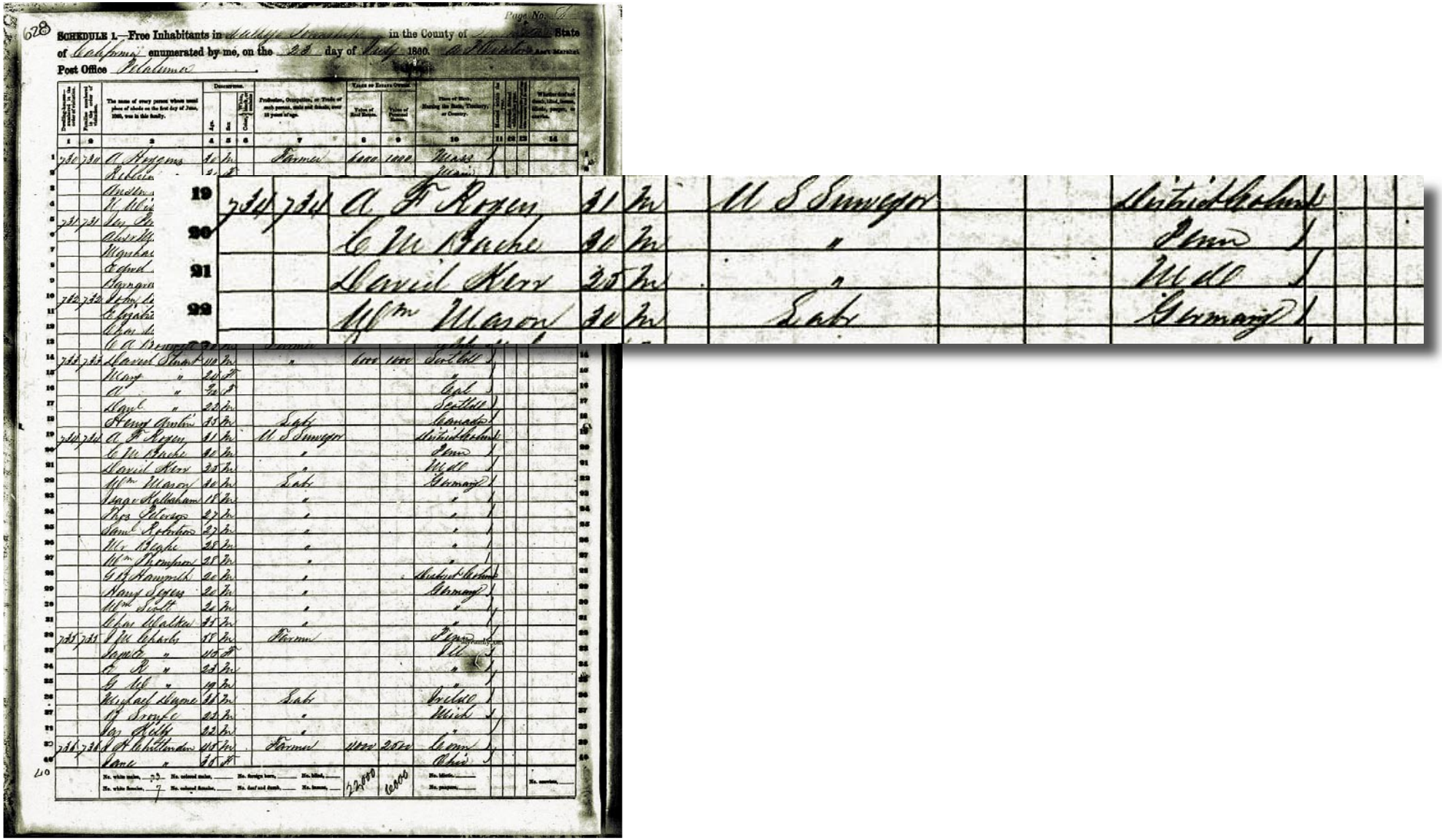
- printed on printing presses
- map-making and printing jobs separate
- Coast Survey controlled entire process
- engraved on copper plates
  - use sharp tools to incise the surface of the plate
  - coat surface of plate with ink
  - place damp printing paper on top
  - run it through the press (rollers)
  - next print? start all over...

Surveyed by

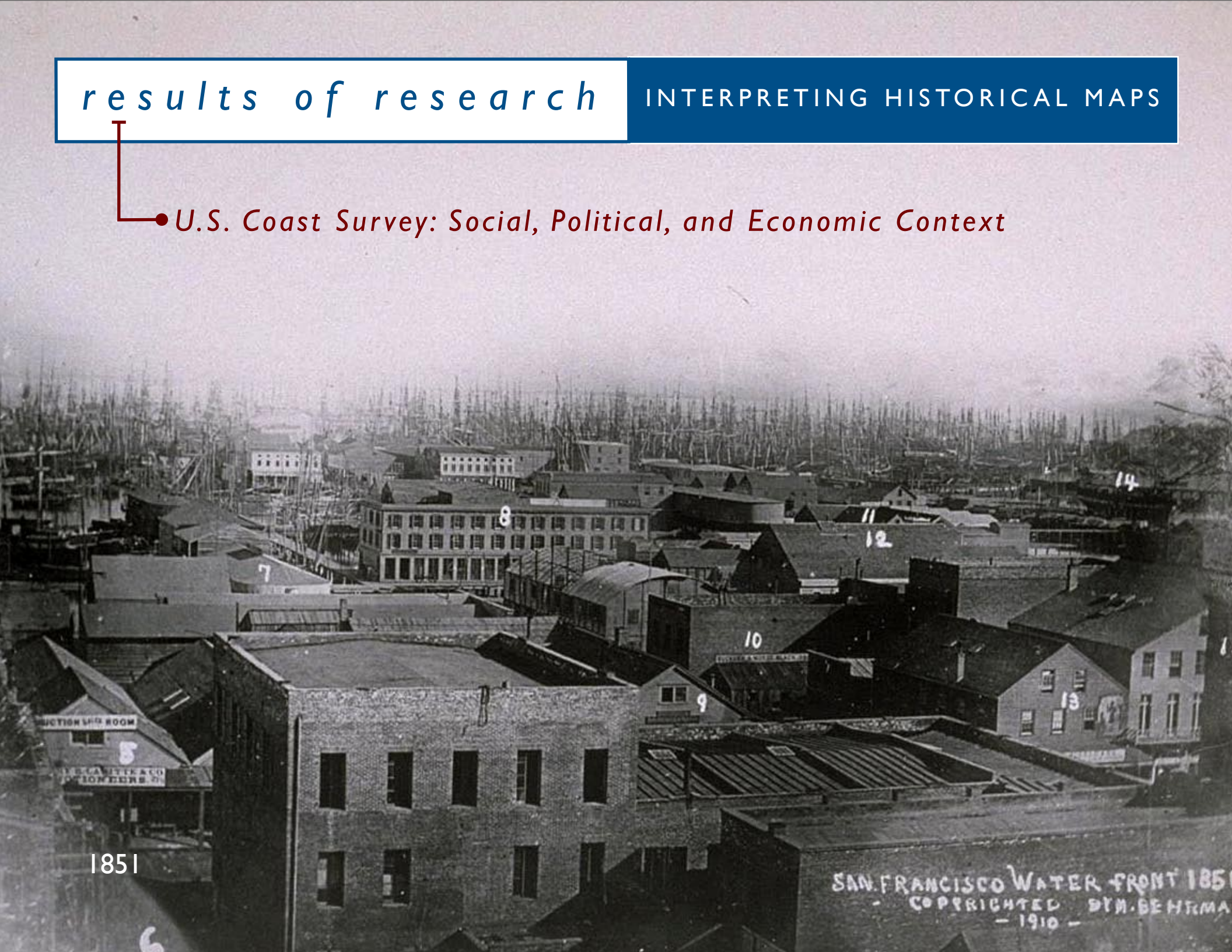
In order to secure the largest result in field work practicable within the season, a second party was organized by Sub-Assistant Rodgers, and placed in charge of Mr. David Kerr, who had served as aid for several years in the topographical party, and previously the triangulation party engaged in the work on San Francisco Bay.

(U.S. Coast Survey Annual Report 1857).

U.S. Coast Survey: Context of the Agency and Individuals



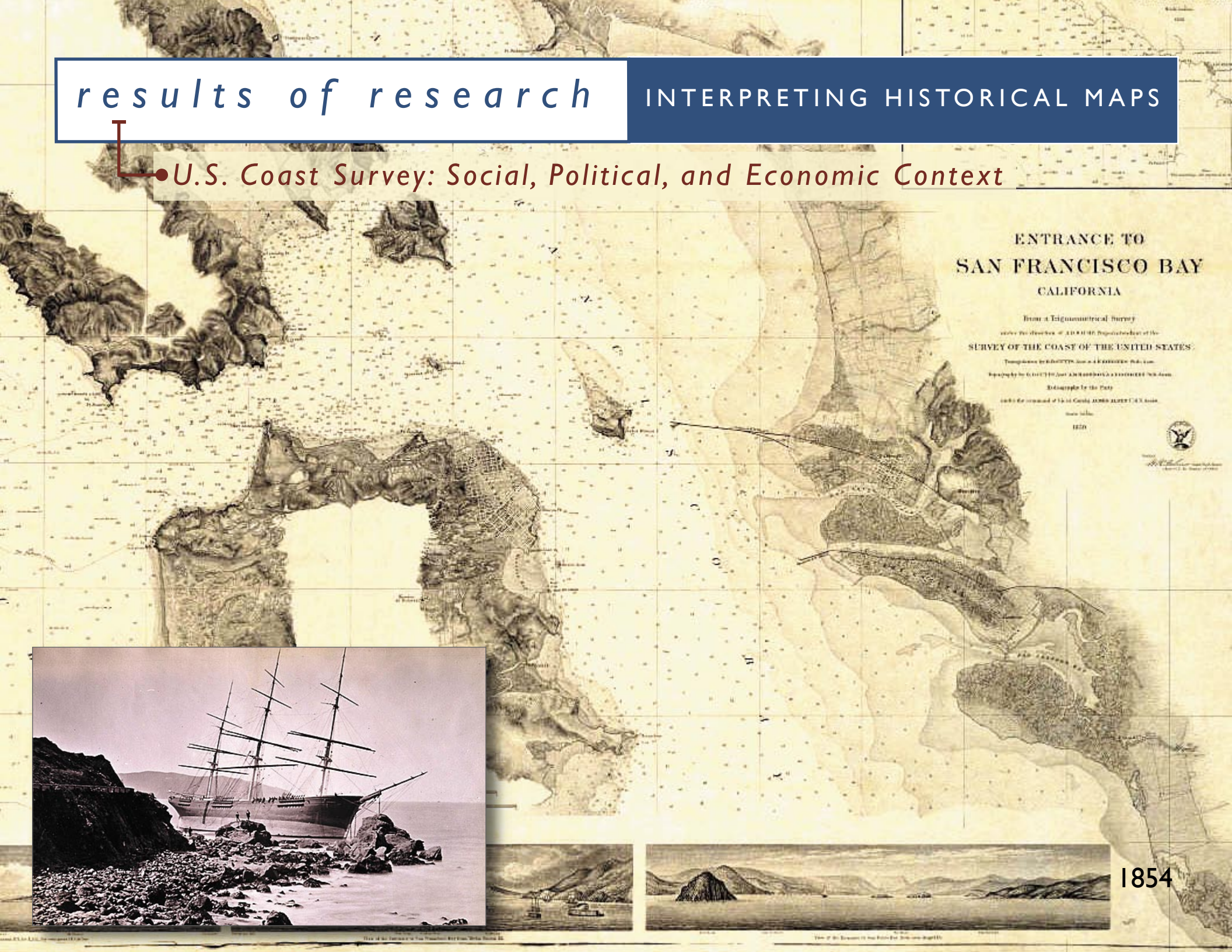
U.S. Coast Survey: Social, Political, and Economic Context



results of research

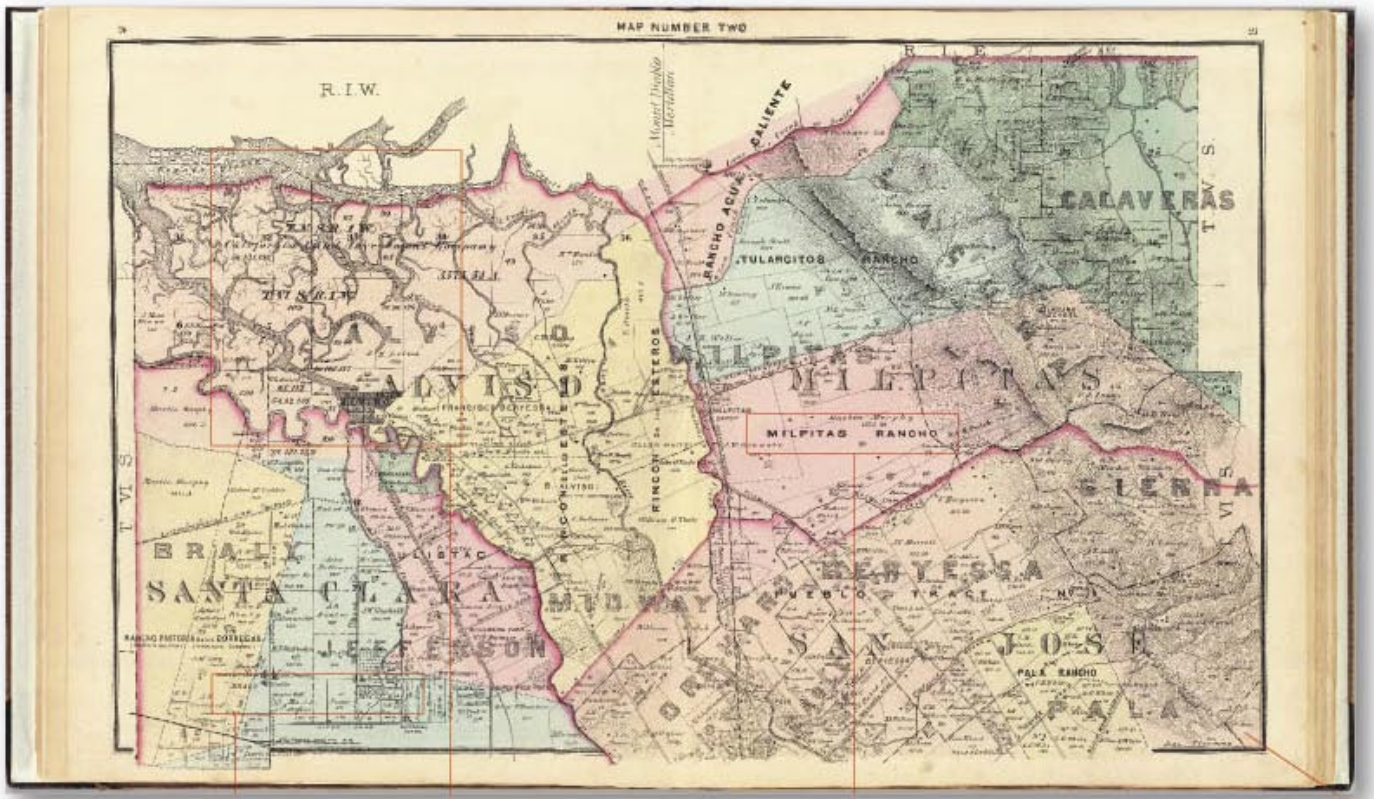
INTERPRETING HISTORICAL MAPS

U.S. Coast Survey: Social, Political, and Economic Context



Thompson and West, atlas page, 1876

FIGURE 8.1-A. MAP NUMBER TWO, FROM THOMPSON AND WEST SANTA CLARA ATLAS, 1876



TECHNOLOGY: MAPPING

Thompson and West county atlases borrowed heavily from existing cadastral surveys to build their maps. The ownership lines on this maps were probably copied from the plat maps created by the county surveyors, though natural features were probably sketched in as an agent for Thompson and West rode in a buggy from place to place (Guedon and Fisher 1976, Preface).

SOCIAL CONTEXT:

The map turns its back on the tidal marshes, which frame the top of the map but do not intrude on the largely agricultural activities of the valley south of the bay. Alviso's importance as a landing has already come and gone, and the railroads crossing the map now move agricultural products to San Francisco for shipping.

SOCIAL CONTEXT

Owning land in Europe signified power and wealth. Land was plentiful in the United States, though much of the prime land in the area was already taken through the Mexican land grants. By 1876, most of the original Mexican land owners had sold their land to speculators and squatters. The resulting pattern of ownership is imposed on top the land grants, shown in contrasting colors with the land grant name in capital letters.

THE AUTHORS

The title page identifies Thompson and West as the authors of the atlas, operating their business from San Francisco. A small note on the bottom right of the page identifies "Thos Hunter Pr Phil." as the printer, located in Philadelphia. The casual reader might assume that Thompson and West themselves compiled, drew, and published the atlas after personal examinations and surveys, but the preface thanks several of the county's surveyors (A.T. and Charles Herrmann, J.H. Peiper, and J. Comb) and credits H.S. Foote, a local journalist, for writing the history of the county (Thompson and West 1876, preface).

TECHNOLOGY: HAND COLORING

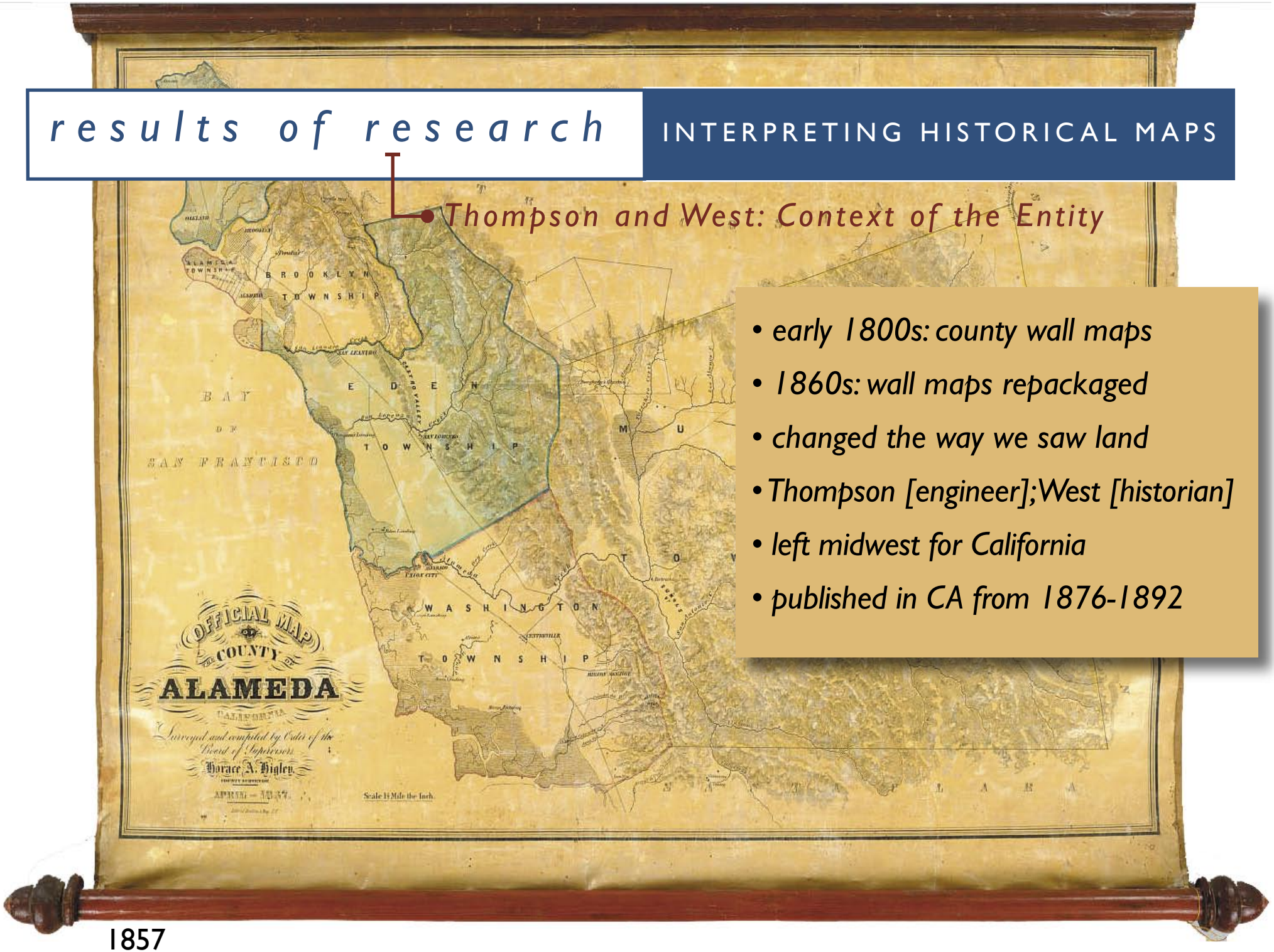
The maps were engraved on lithographic stones but the color was applied by hand (Rumsey 2005). Darker red wash separates the county wards—San José, Milpitas, Alviso, etc.—while the broader colors indicate land grant boundaries.

results of research

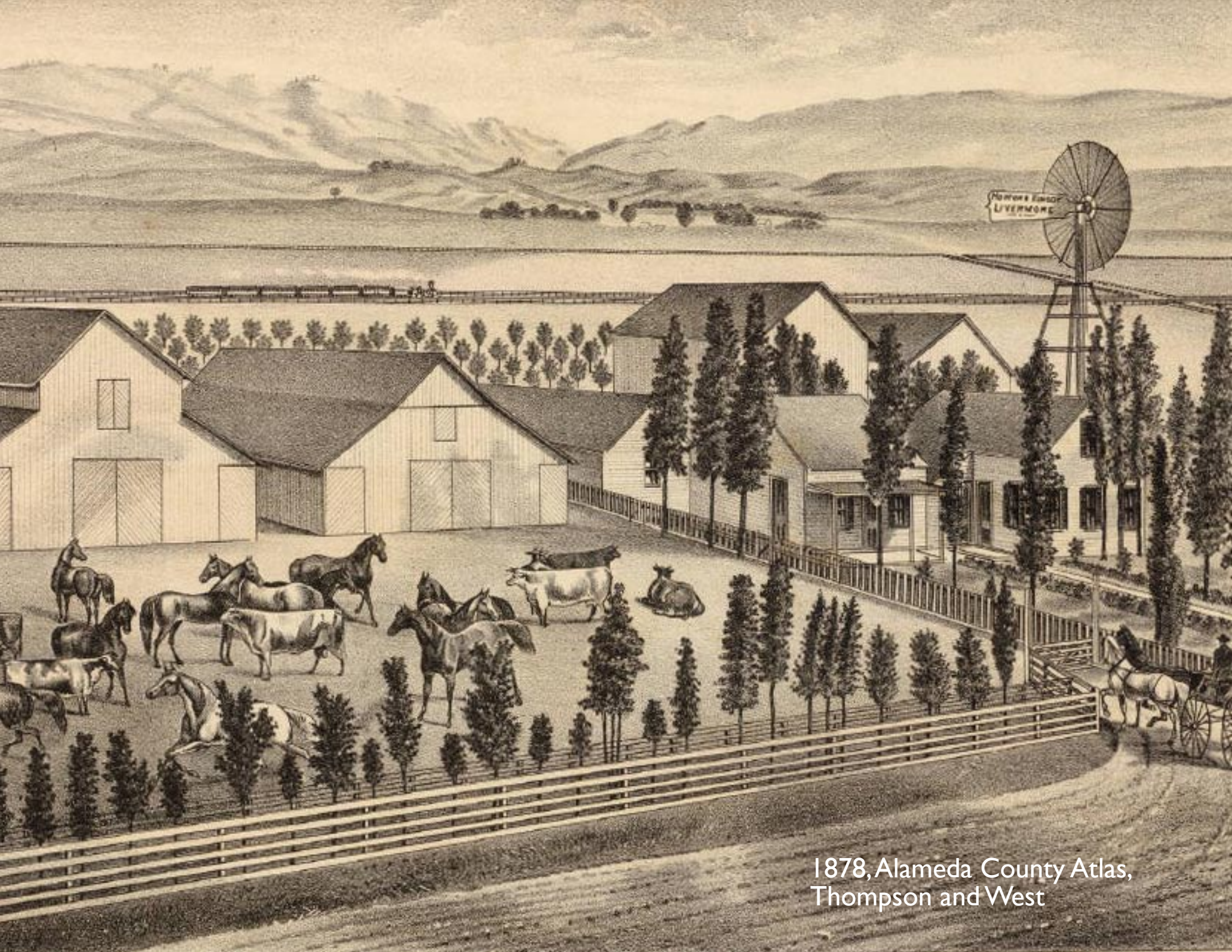
INTERPRETING HISTORICAL MAPS

Thompson and West: Context of the Entity

- early 1800s: county wall maps
- 1860s: wall maps repackaged
- changed the way we saw land
- Thompson [engineer]; West [historian]
- left midwest for California
- published in CA from 1876-1892



1857



1878, Alameda County Atlas,
Thompson and West

Thompson and West: Social, Political, and Economic Context

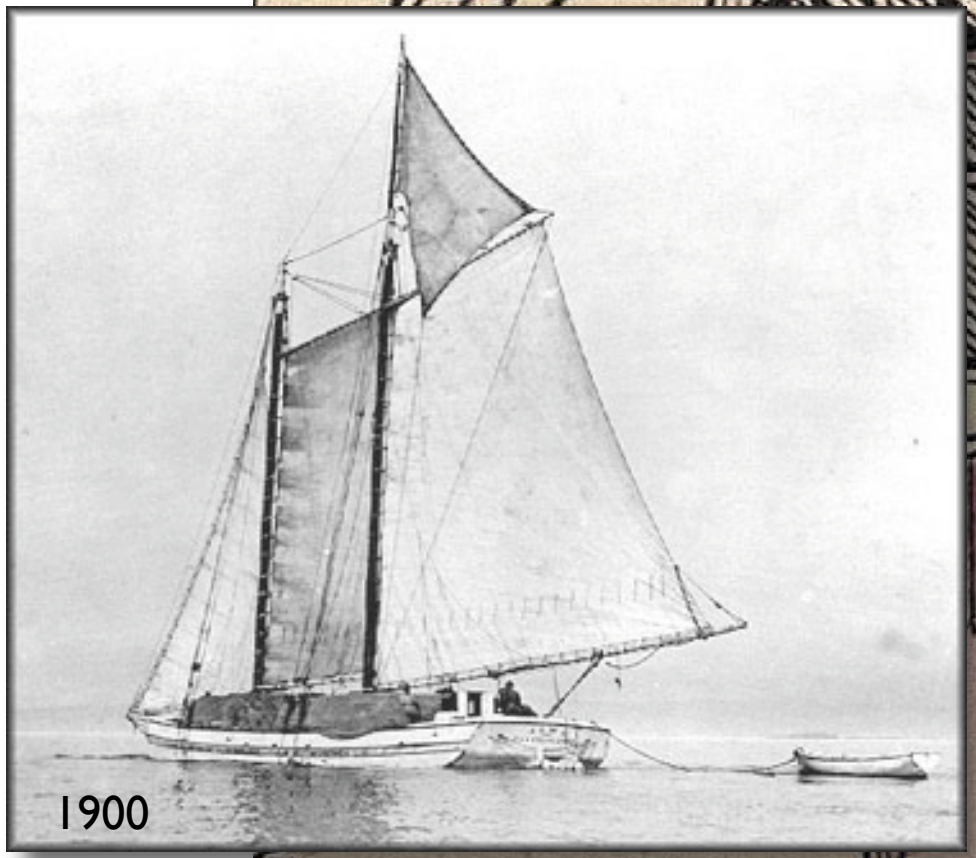
Changing pattern of land ownership

Average size of farm in 1880 was 213 acres; Mexican land grants were one sq. league (4,500) acres.

Rincon de los Esteros land grant was 4,427 acres. By 1876, 40 farms occupy the same land.

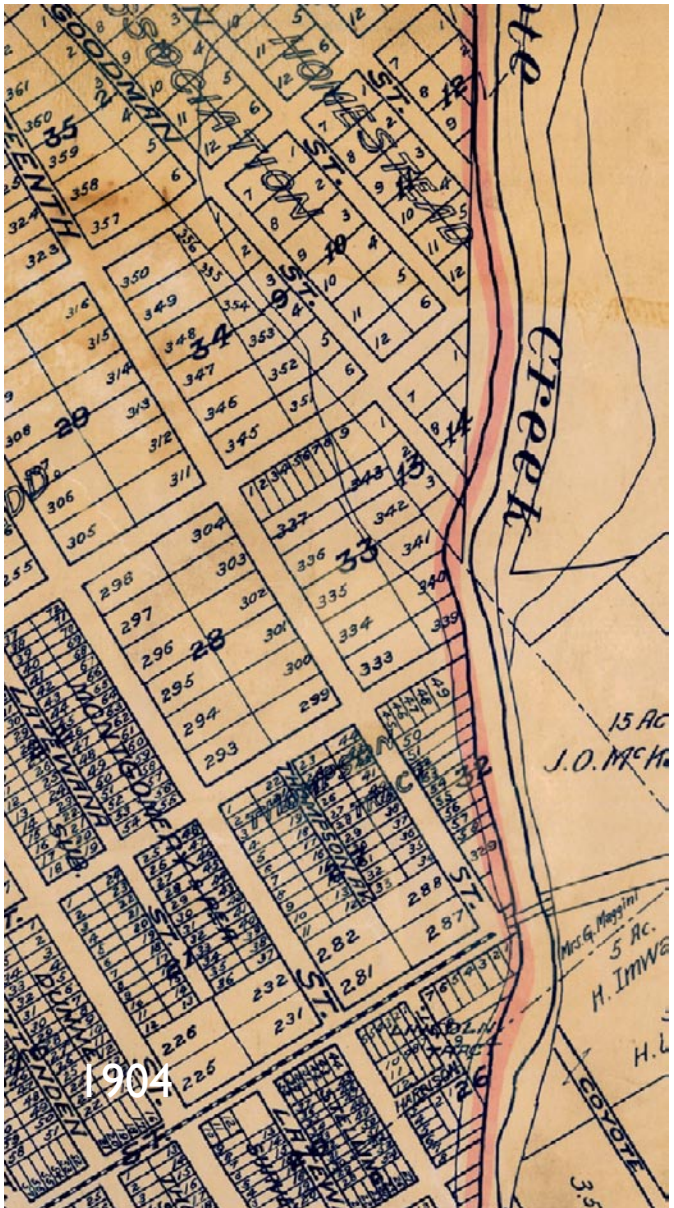
Thompson and West: Social, Political, and Economic Context

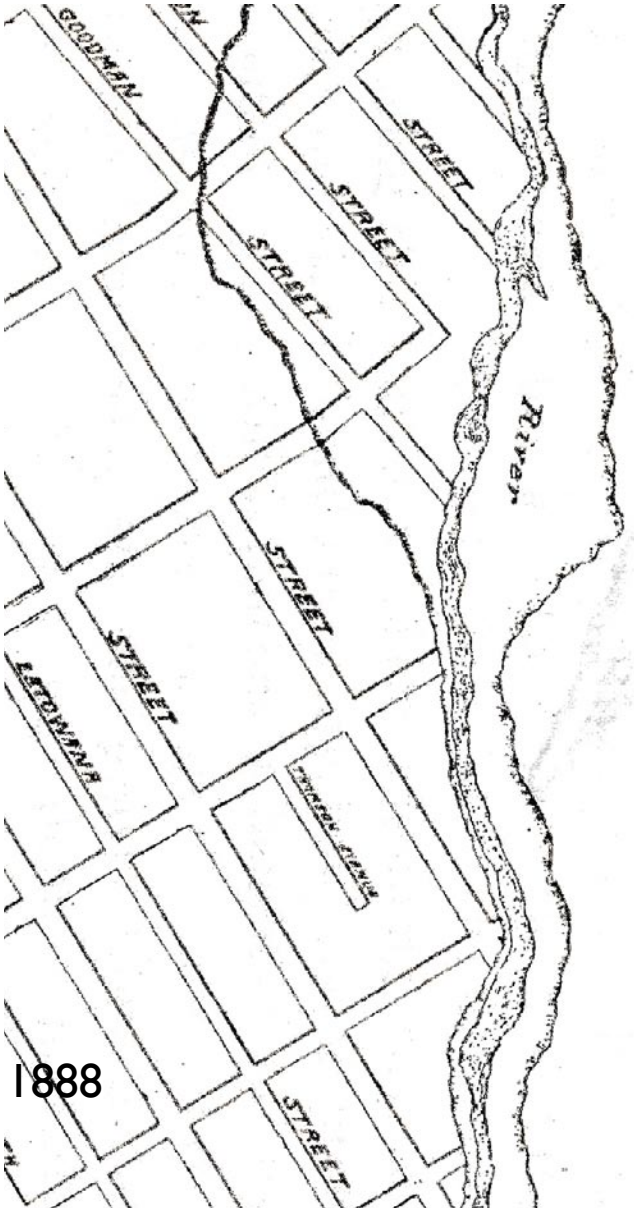
Changing transportation: scows and railroads



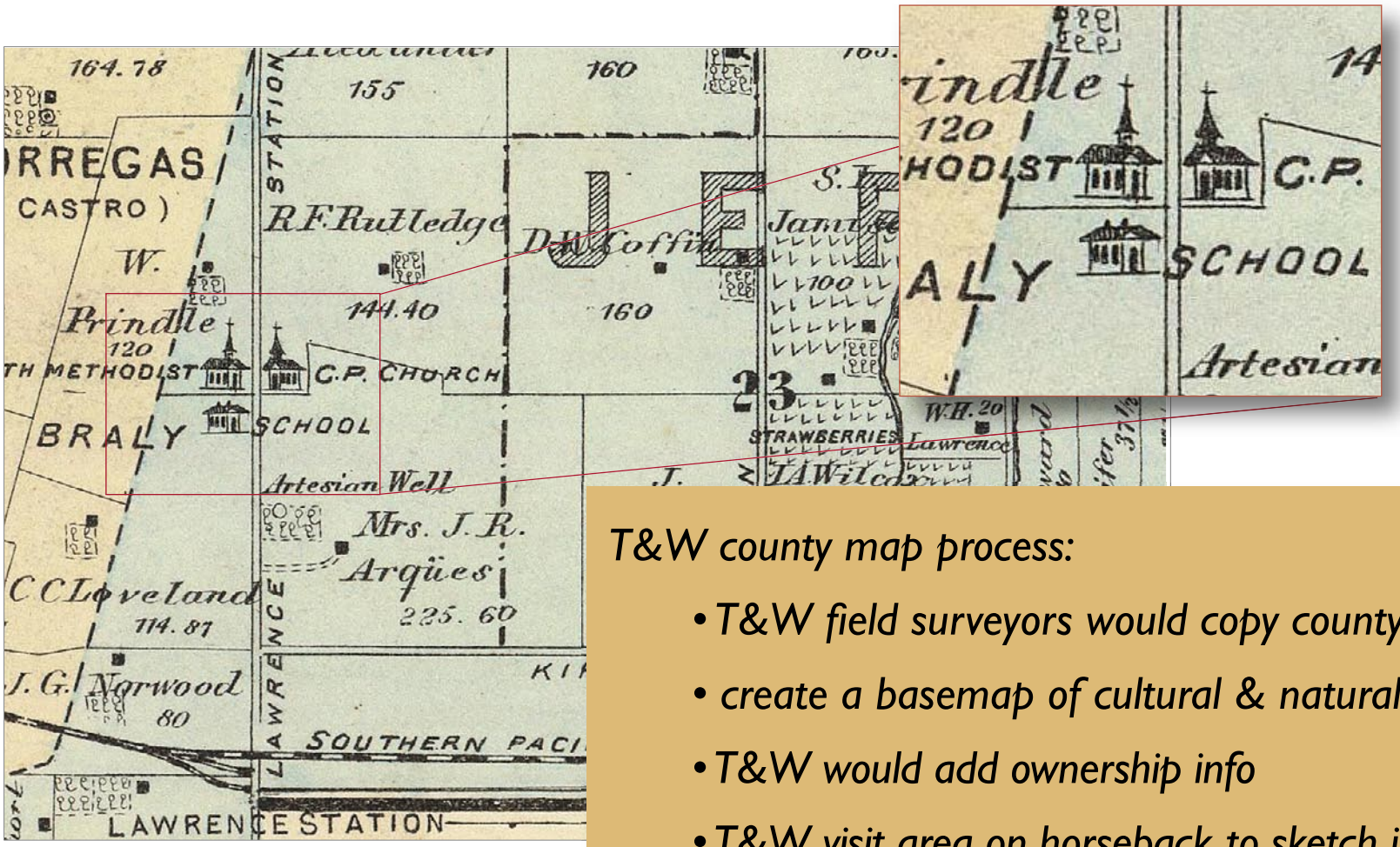
1900

Thompson and West: technology [compilers not map-makers]





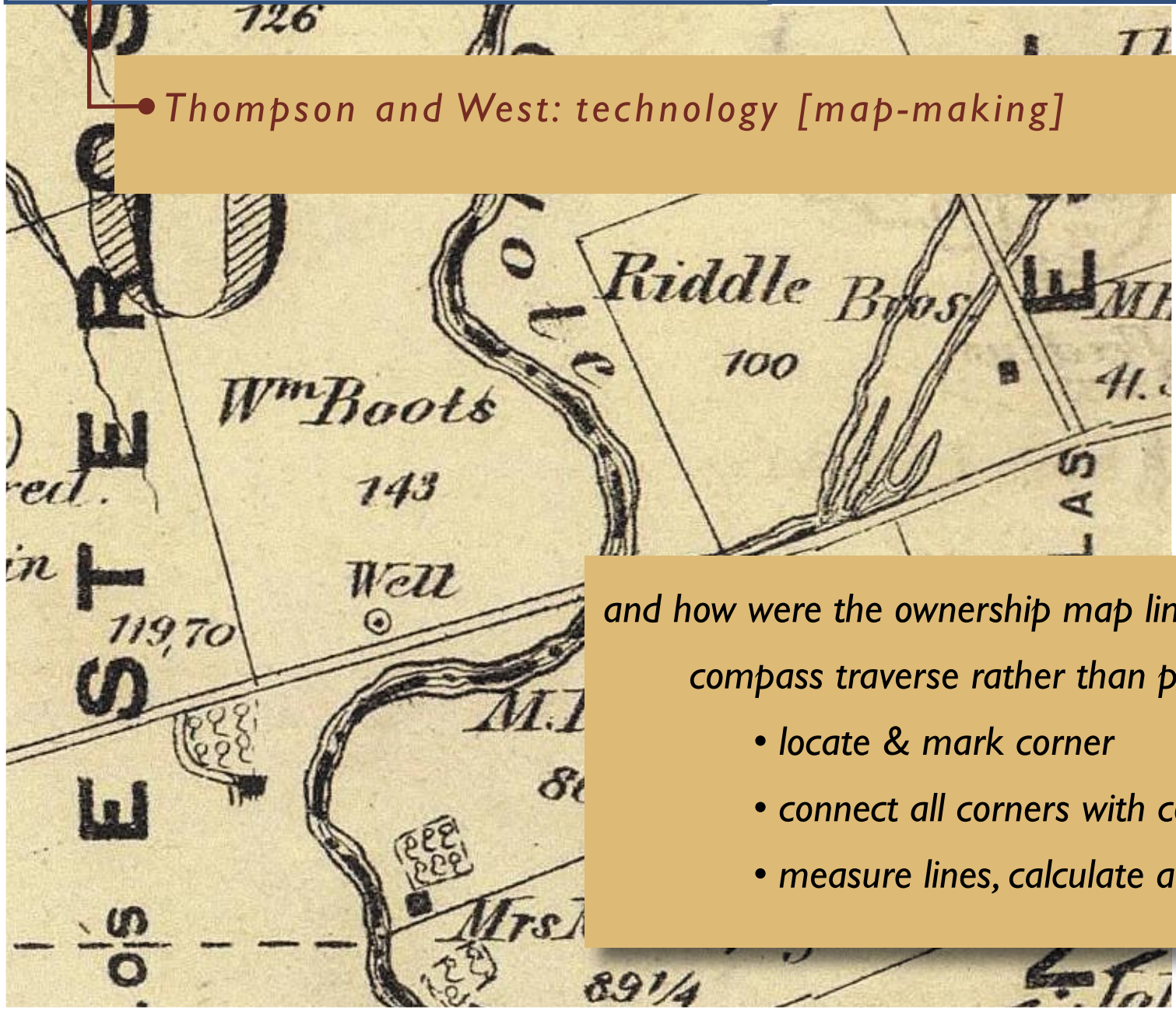
Thompson and West: technology [map-making]



T&W county map process:

- *T&W field surveyors would copy county plat maps*
- *create a basemap of cultural & natural features*
- *T&W would add ownership info*
- *T&W visit area on horseback to sketch in details*

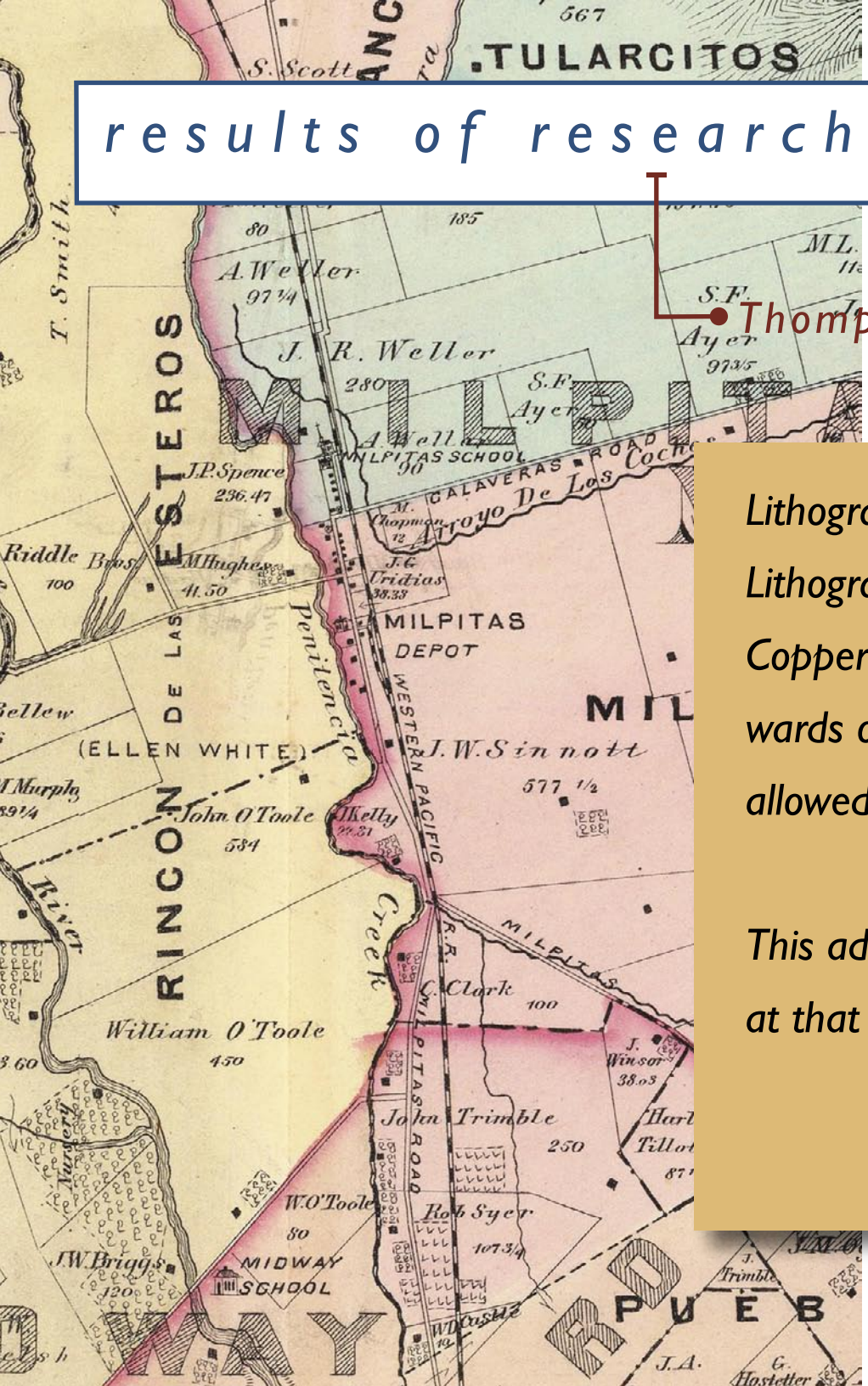
Thompson and West: technology [map-making]



and how were the ownership map lines created?

compass traverse rather than plane table survey

- *locate & mark corner*
- *connect all corners with compass direction*
- *measure lines, calculate acres*



Thompson and West: technology [printing]

Lithography vs copperplate

Lithography was cheaper and easier to print from Copperplate required the image be incised backwards onto the plate but new advances in lithography allowed the image to be drawn directly…

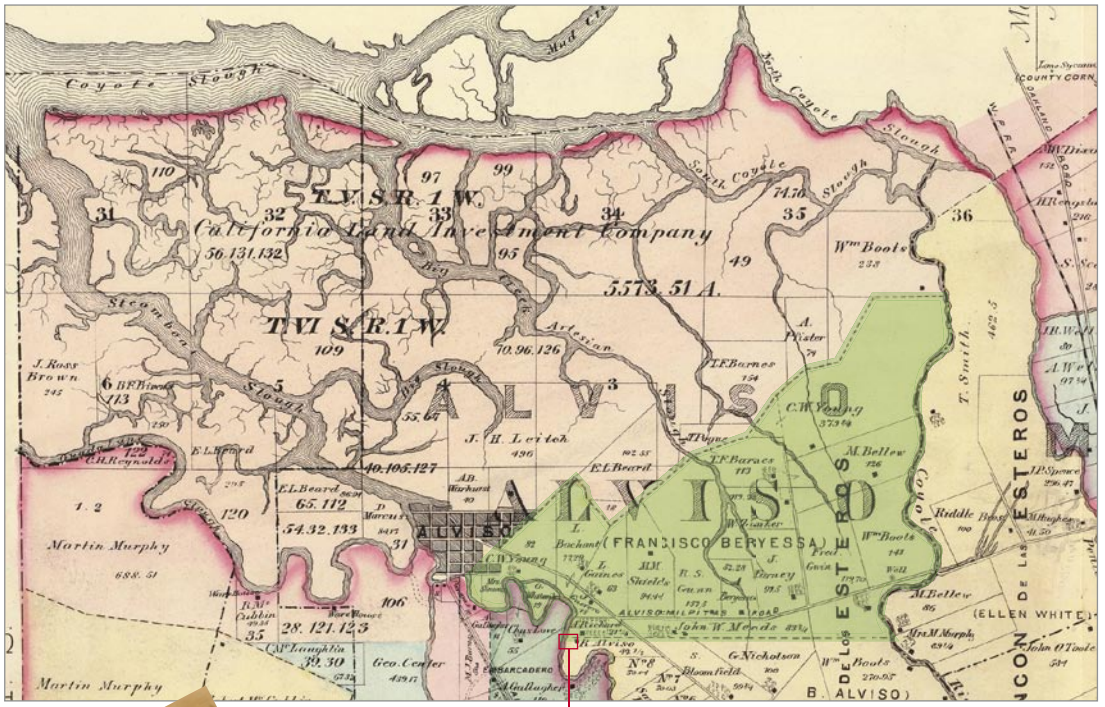
This advancement "was as profound a development at that time as the Xerox copying process of today."

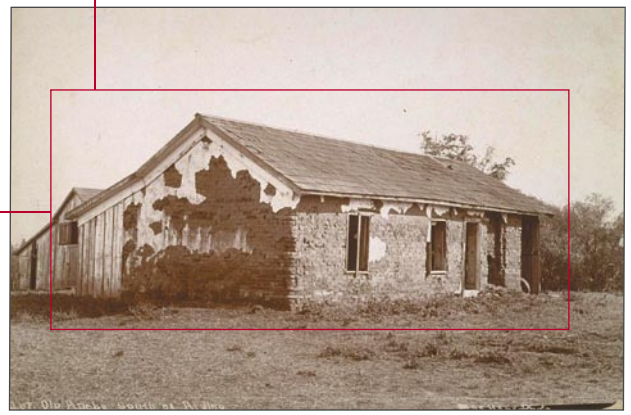
(Robinson, 1975)

comparisons: map to map

Harley suggests comparing and contrasting maps to maps from both the same and different

- *era*
- *theme*
- *space*

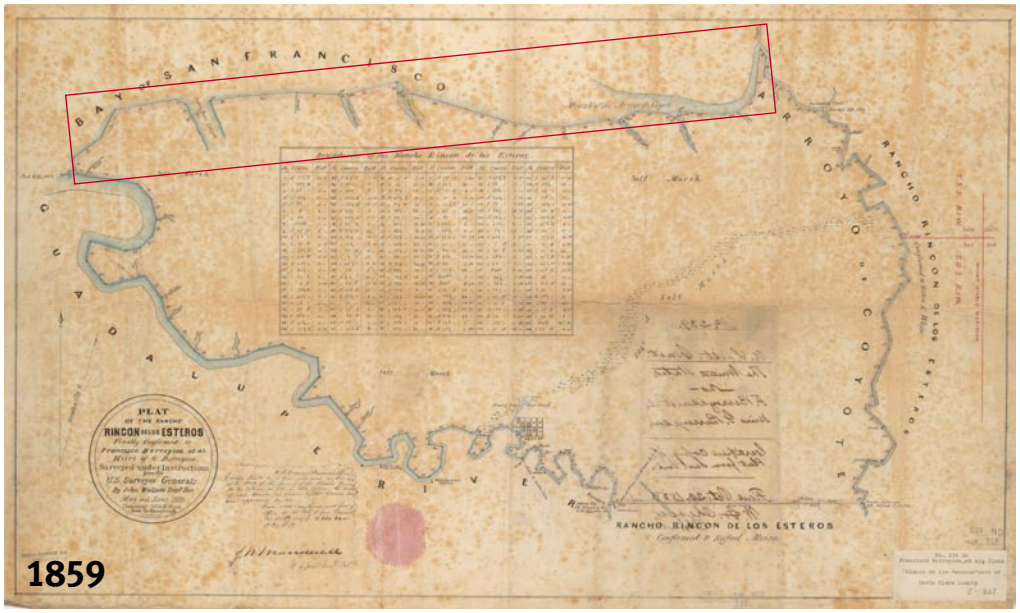




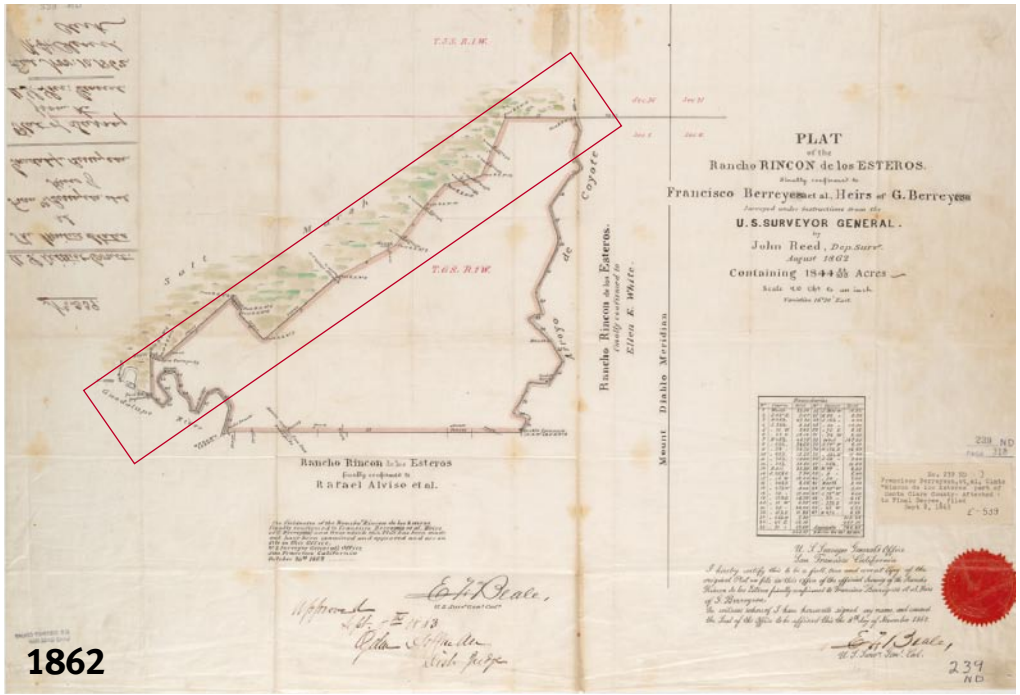
comparisons: map to map

INTERPRETING HISTORICAL MAPS

c1838



1859

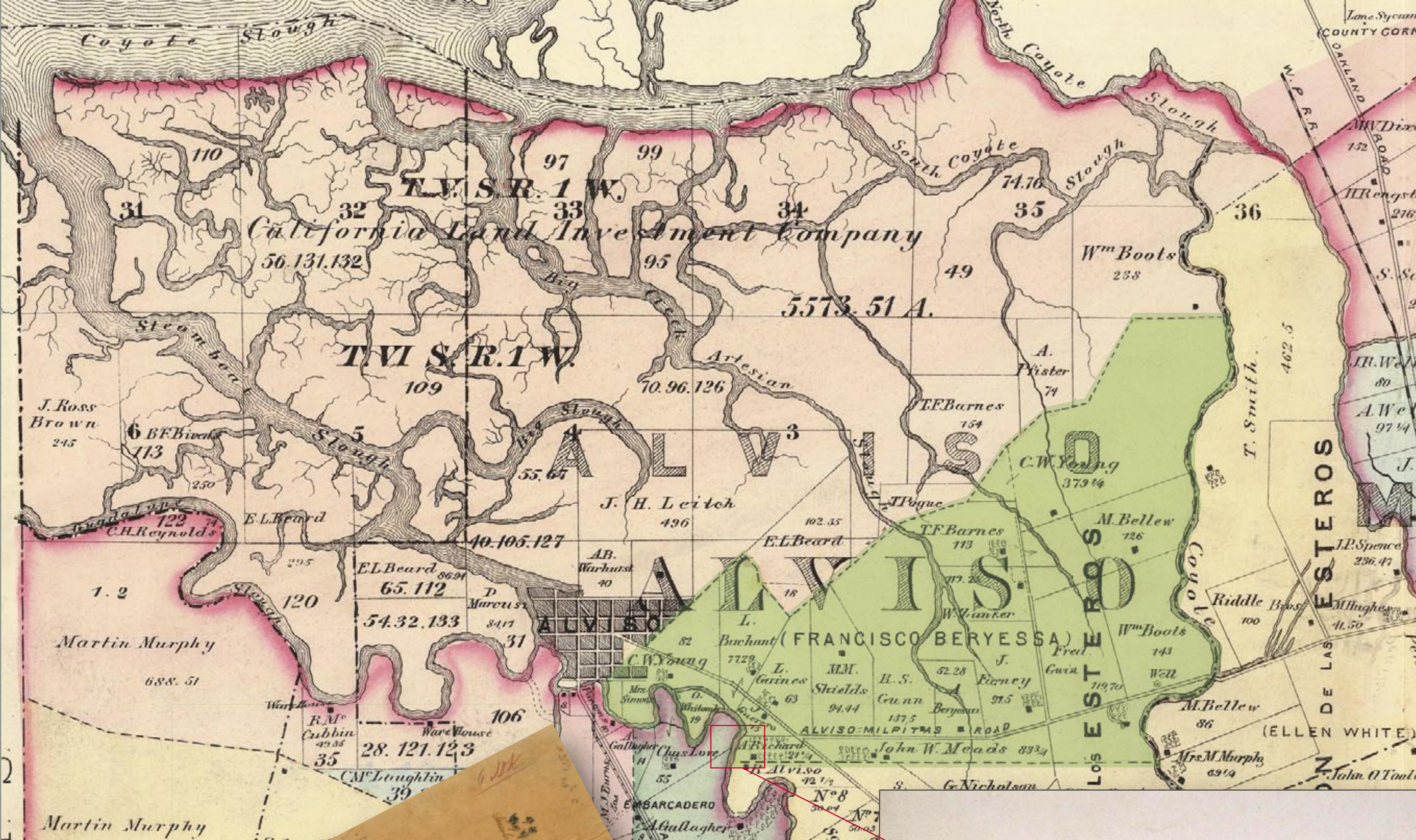


1862


Coyote Slough
North Coyote Slough
South Coyote Slough
T.V.S.R.1W.
T.VI S.R.1W.
California Land Investment Company
56.131.132
5573.51 A.
Steamboat Slough
Artesian Slough
Big Slough
J. Ross Brown
B.F. Bivens
E.L. Beard
C.H. Reynolds
Martin Murphy
J.H. Leitch
Wm Boots
A. Pfister
T.F. Barnes
C.W. Young
M. Bellew
T. Smith
Riddle Bros.
J.P. Spence
M. Hughes
A.B. Warhurst
P. Marcus
ALVISO
L. Bachant
(FRANCISCO BERYESSA)
L. Gaines
M.M. Shields
R.S. Gunn
J. Farney
Fred. Gwin
ALVISO-MILPITAS ROAD
John W. Meads
G. Nicholson
Chas Lowe
A. Richard
A. Gallagher
EMBARCADERO
Mrs M. Murphy
(ELLEN WHITE)
John O'Toole
Los Esteros
McLaughlin
Ware House
M.V. Dixon
H. Rengstorff
W.P.R.R.
Oakland Road
County Corner
Lone Sycamore

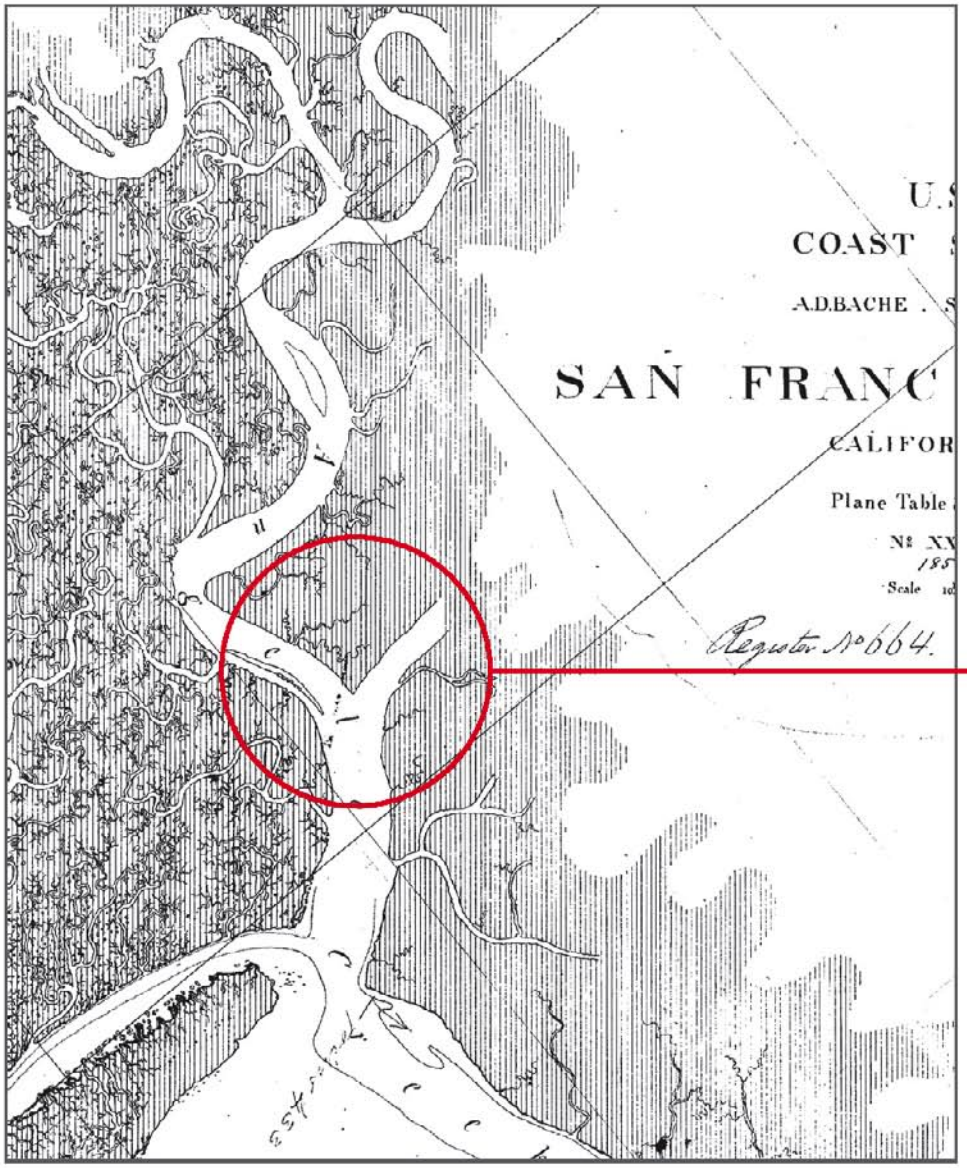

No. 239 ND
Francisco Berreyesa et al. Cl.
"Rincon de los Esteros"
Santa Clara County
B. 534

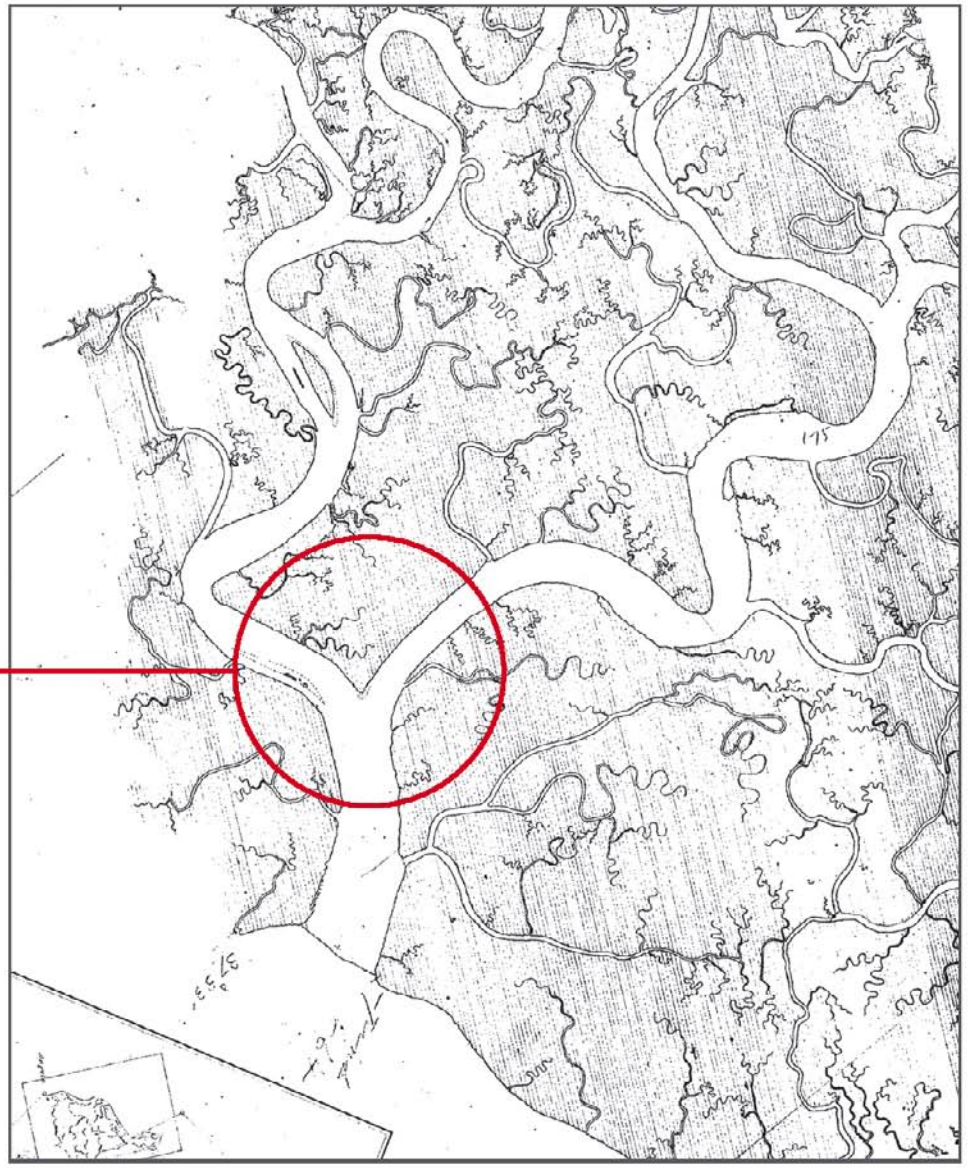

Old Adobe South of Alviso


Coyote Slough
North Coyote Slough
South Coyote Slough
T.V.S.R.1W.
TVI S.R.1W.
California Land Investment Company
5573.51 A.
Steamboat Slough
Artesian Slough
ALVISO
ALVISO
(FRANCISCO BERYESSA)
LOS ESTEROS
ALVISO-MILPITAS ROAD
ELLEN WHITE
Martin Murphy
J. H. Leitch
Wm Boots
T. Smith
E.L.Beard
C.W.Young
T.F.Barnes
M.Bellew
John W. Meads

comparisons: map to map

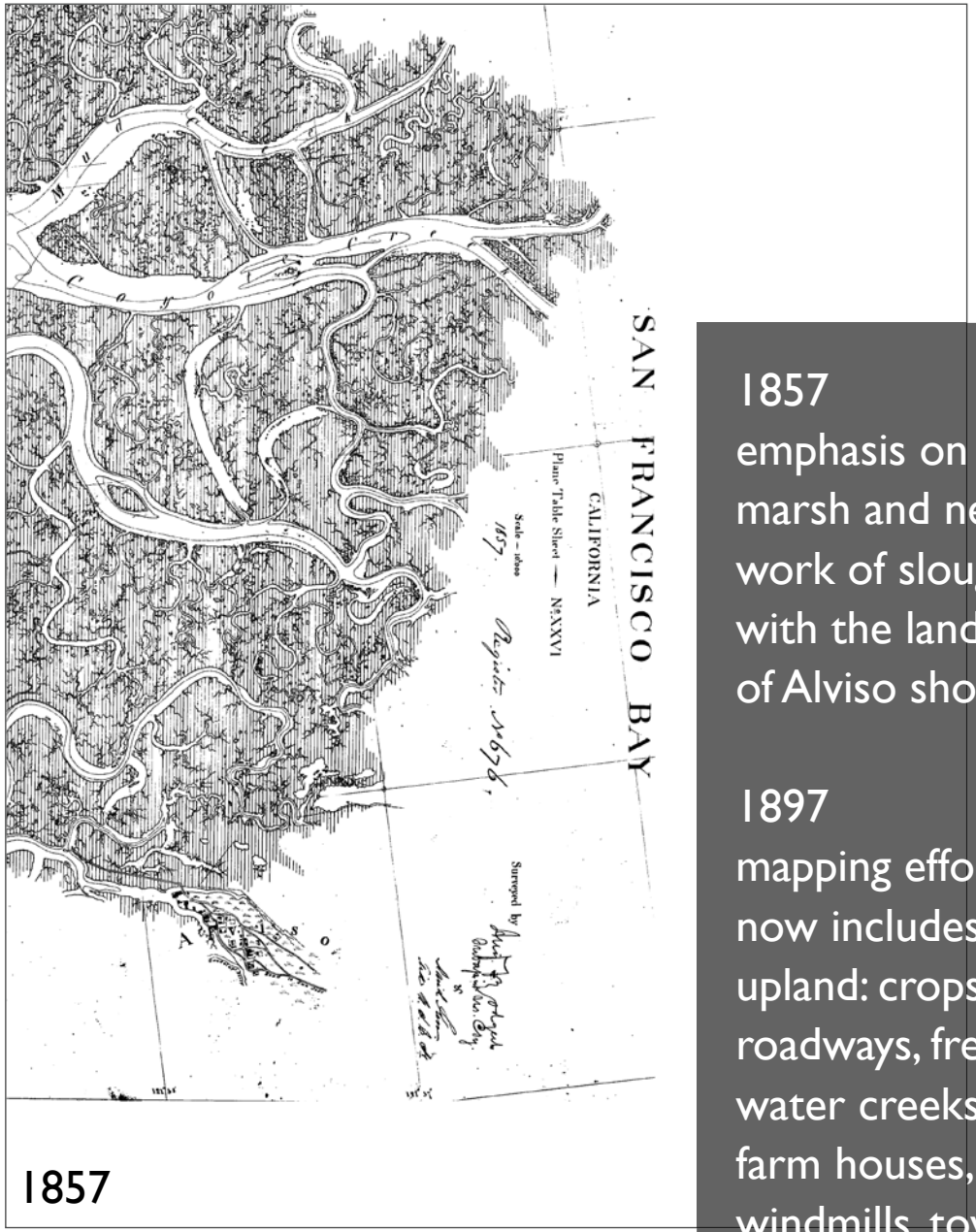
INTERPRETING HISTORICAL MAPS





comparisons: map to map

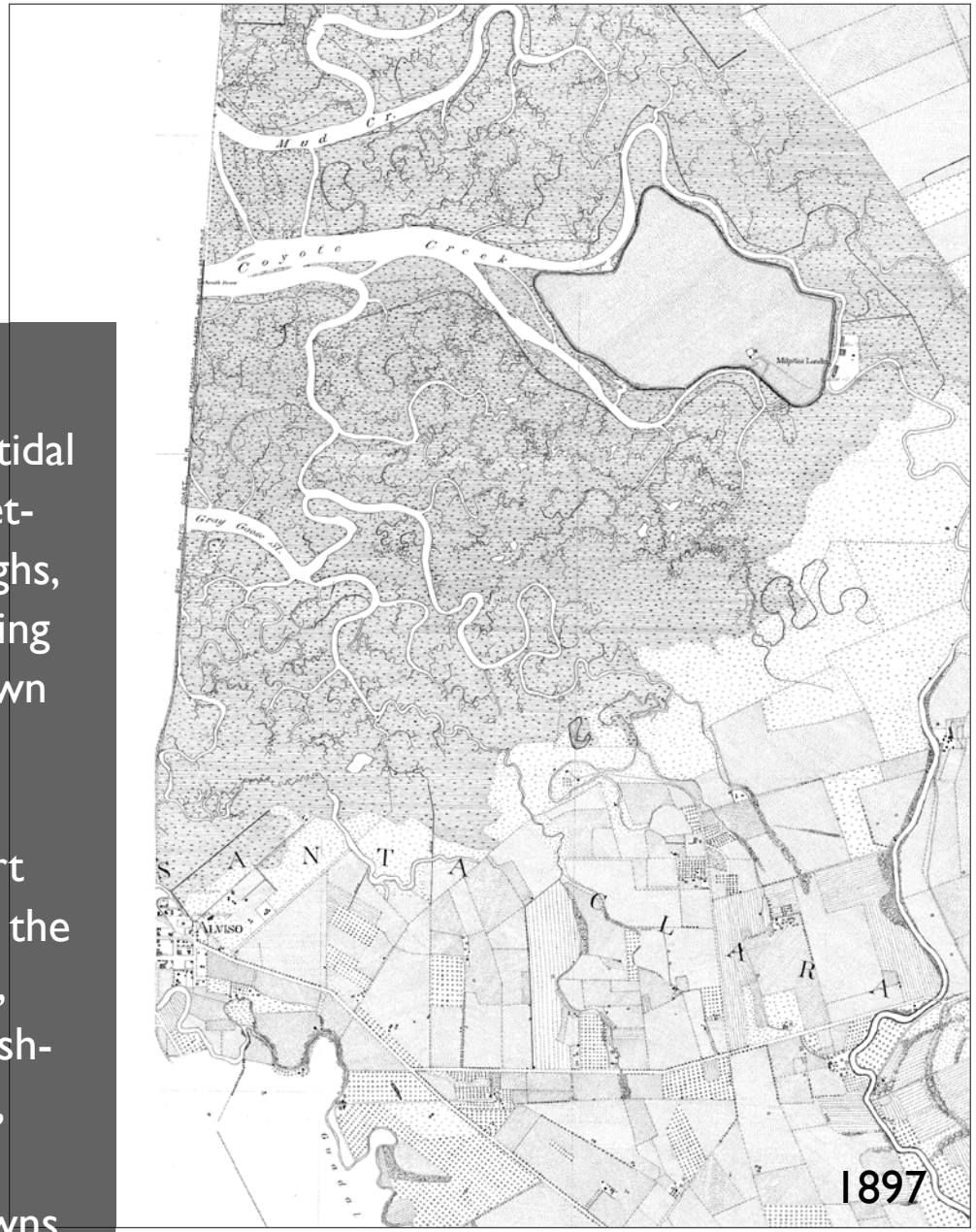
INTERPRETING HISTORICAL MAPS



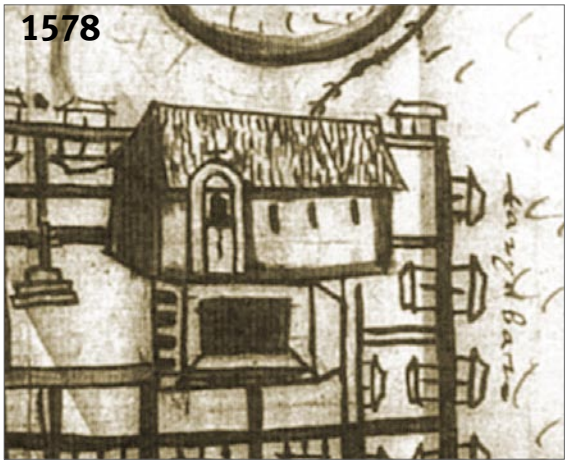
1857

1857
emphasis on tidal marsh and net-work of sloughs, with the landing of Alviso shown

1897
mapping effort now includes the upland: crops, roadways, fresh-water creeks, farm houses, windmills, towns



1897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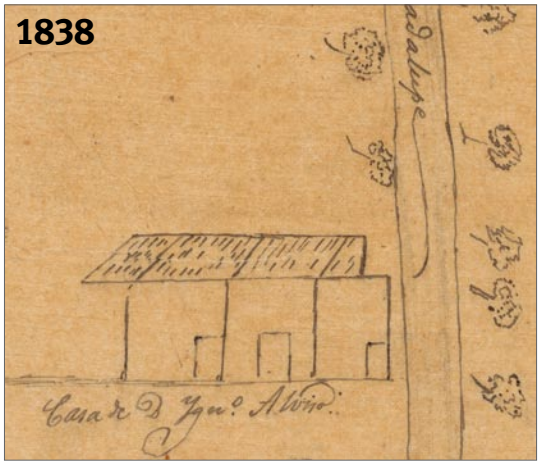
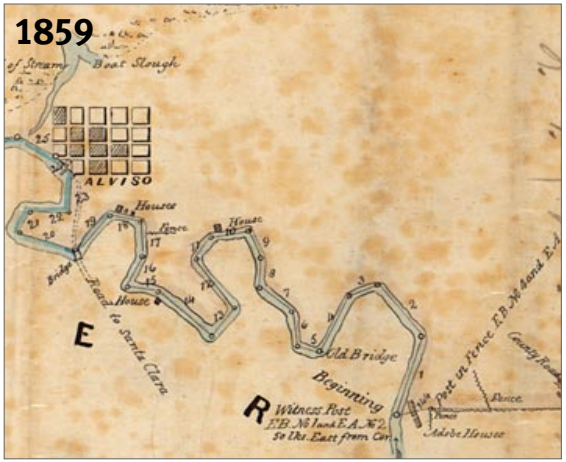
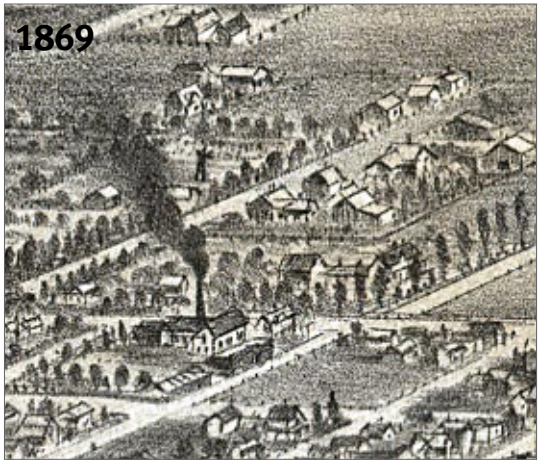
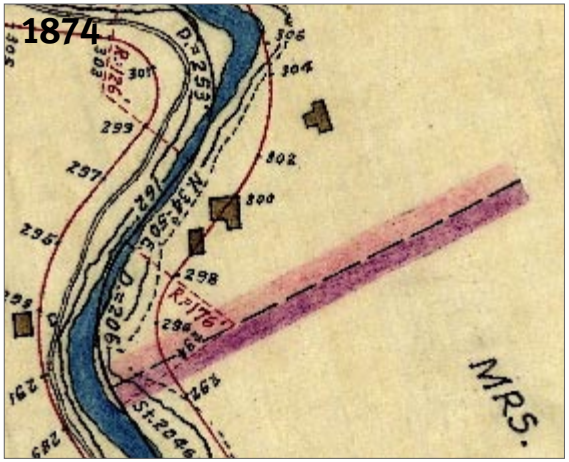
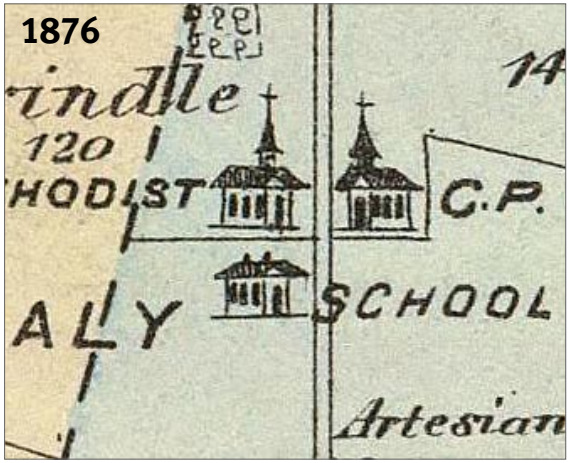

1838

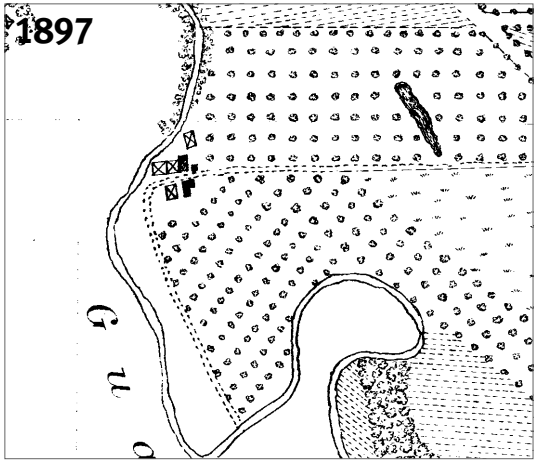

1853
Street
Street
Street


1859
ALVISO
Old Bridge
Beginning
Witness Post


1869


1874
MRS.


1876
C.P.
SCHOOL
Artesian


1897


1899

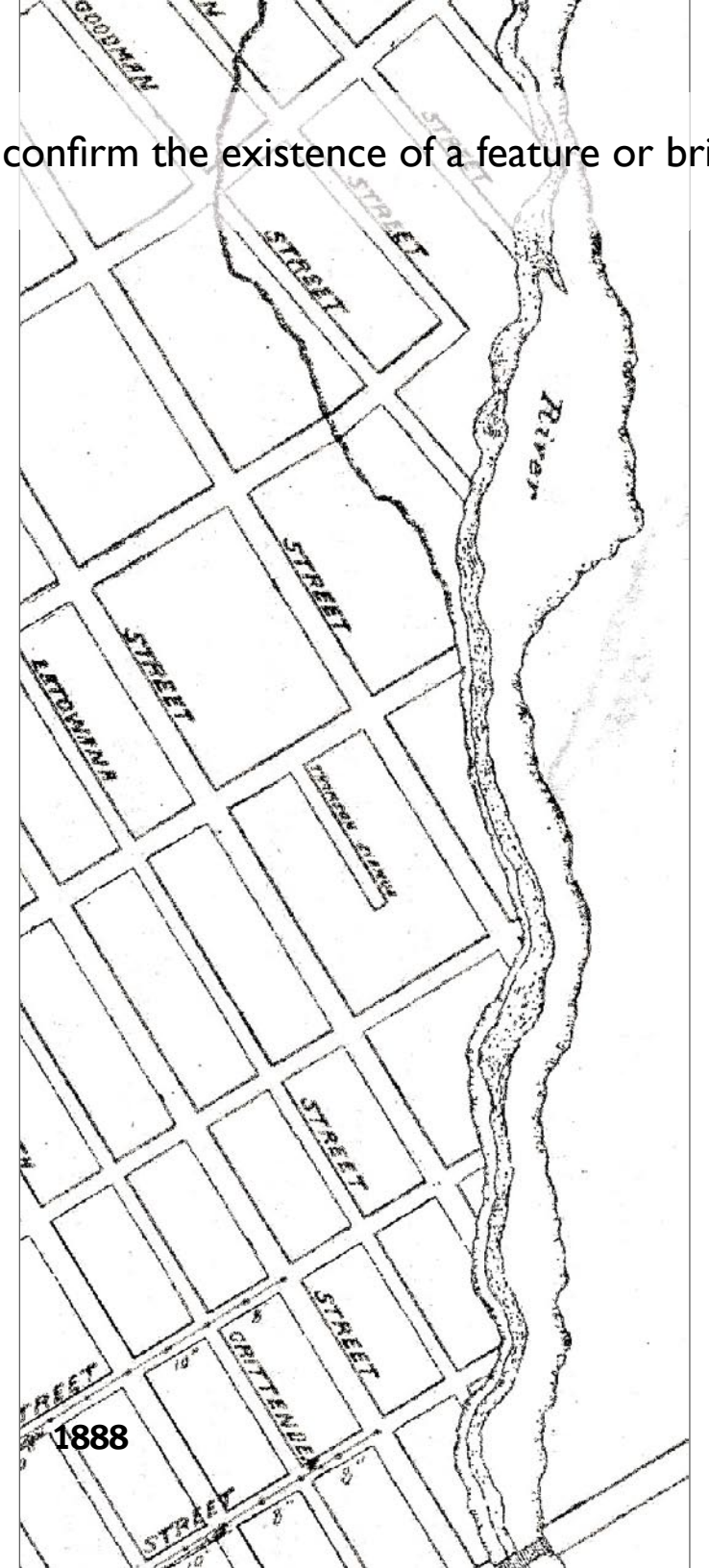

HEADQUARTERS.

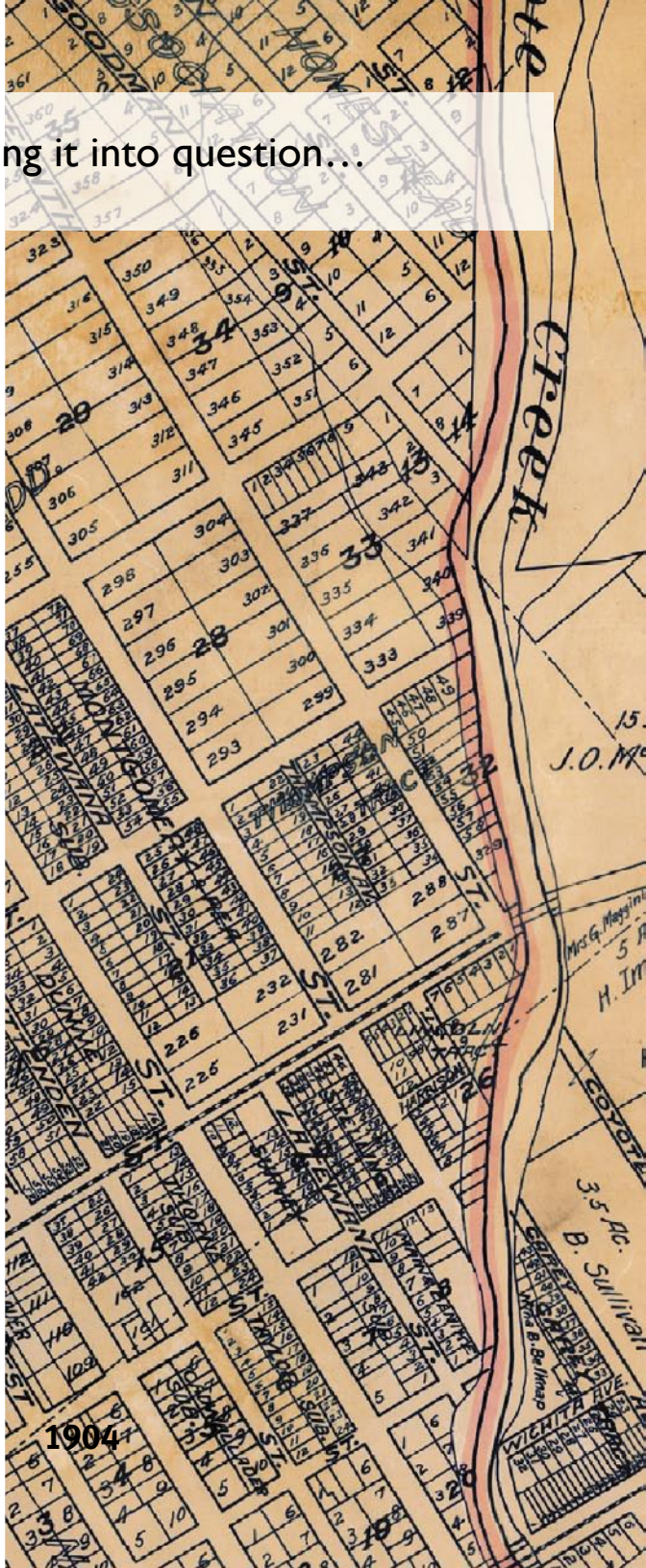

ALVISO - MILPITAS ROAD
J. DEMPSEY AND WIFE
Edge of burned portion
M. BELLEW
SLOUGH
MRS. M. MURPHY
BREAK
ALVISO-MILPITAS RD.
(From original Sheet No 3)
1874

1895


R
A
C
1897

Multiple sources can confirm the existence of a feature or bring it into question…





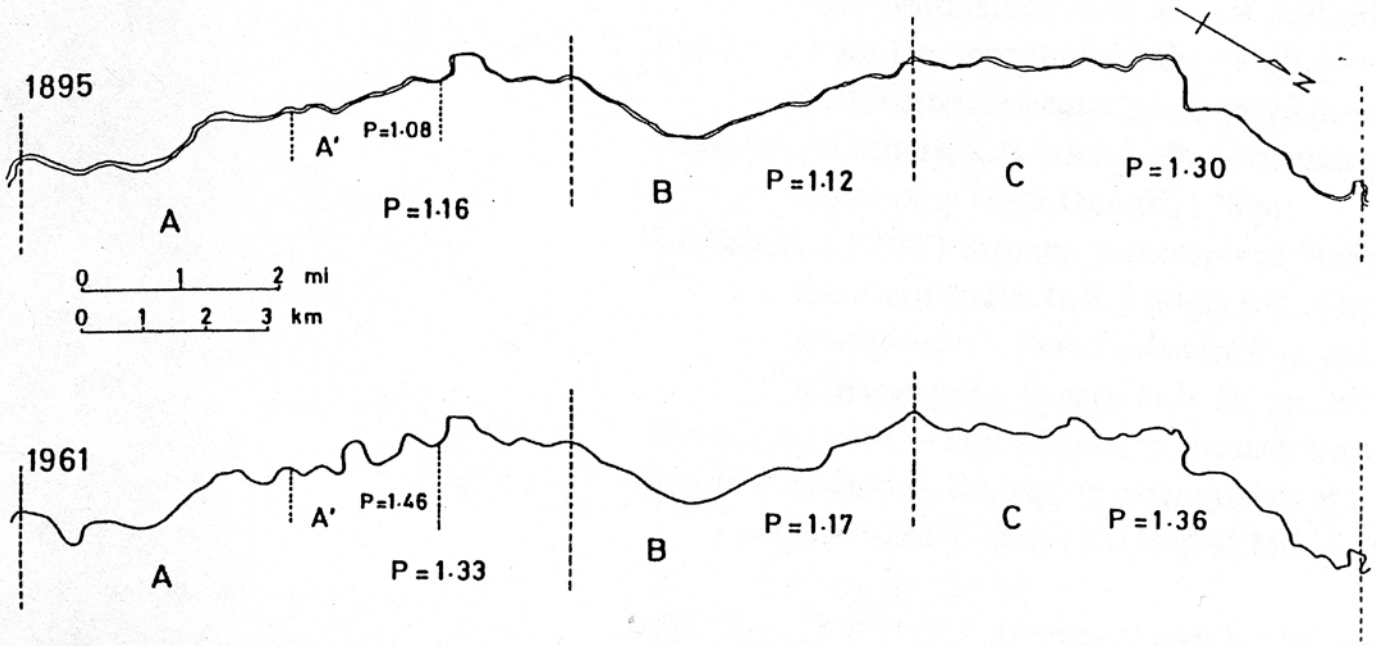
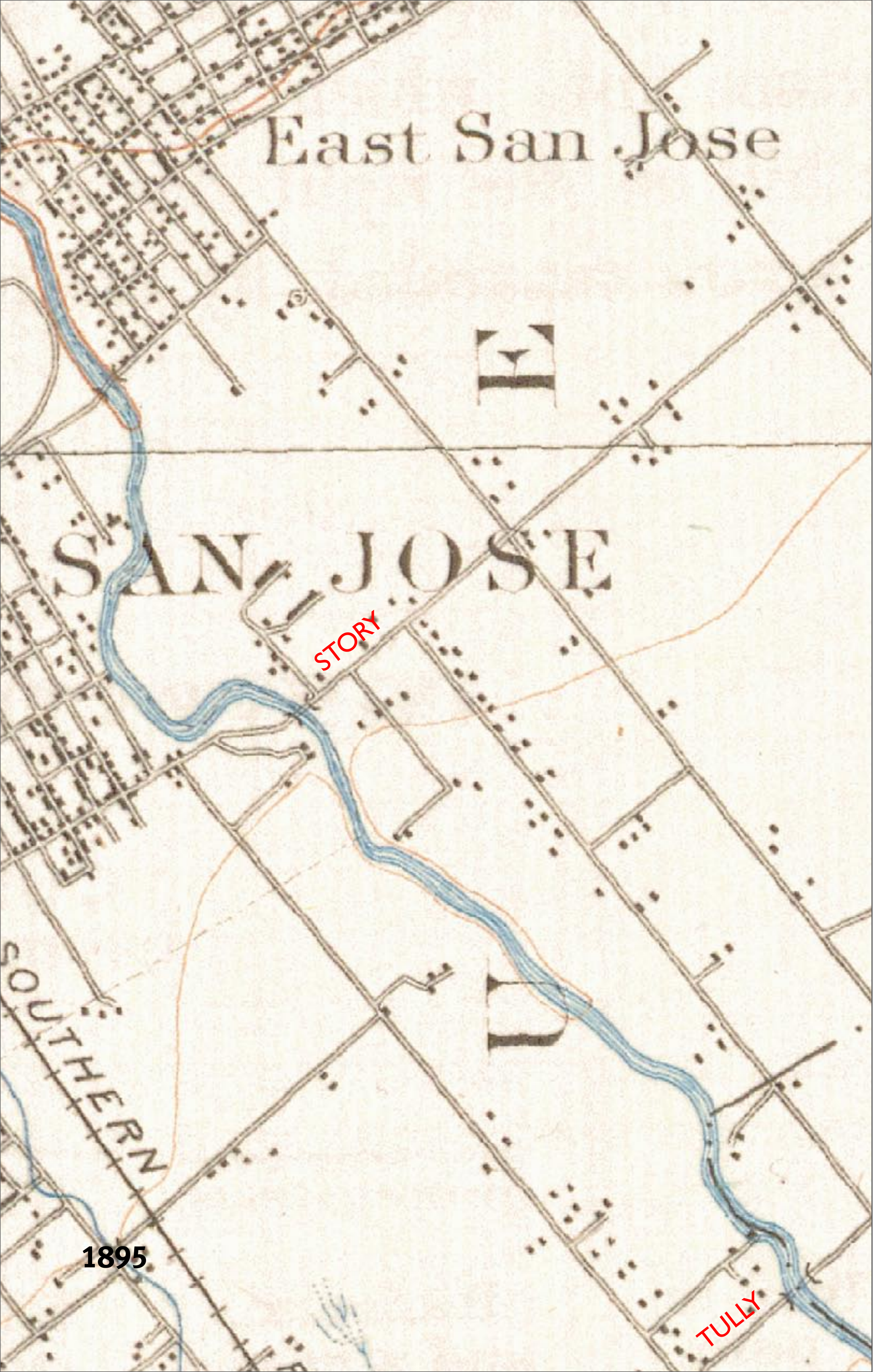
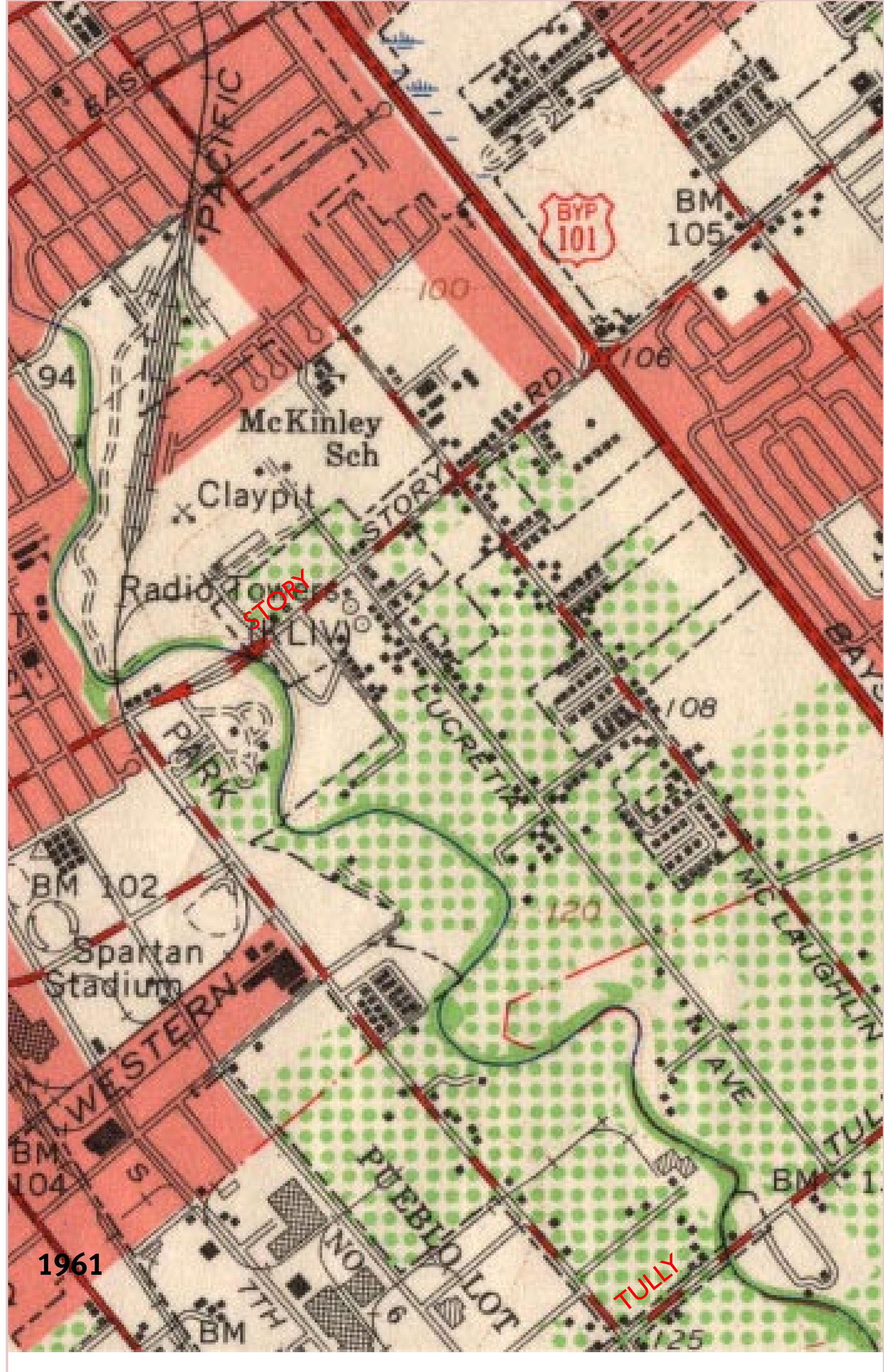


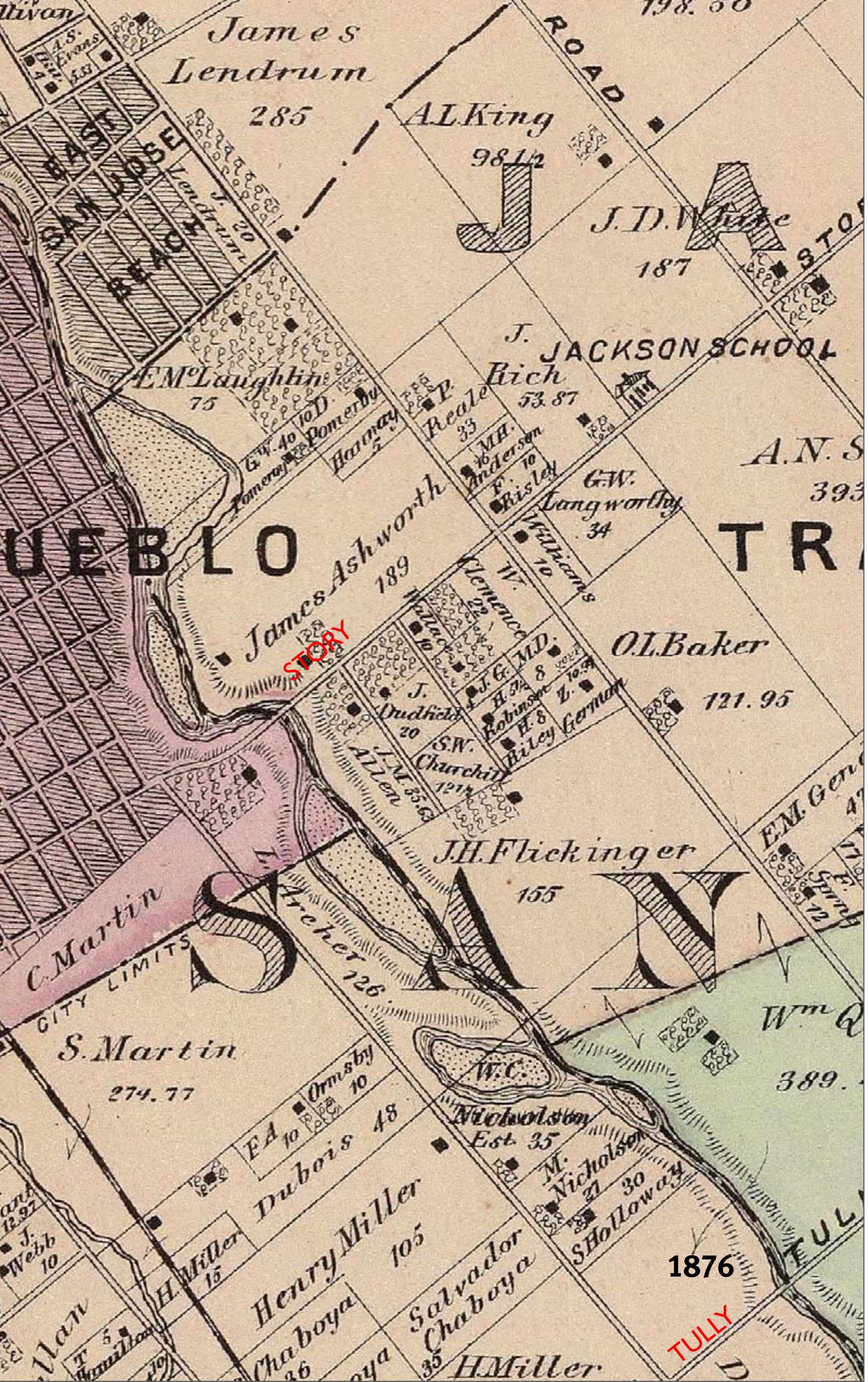
Figure 4.3 Channel patterns of Coyote Creek in 1895 and 1961. Flow is from left to right (from Ouchi, 1983). P is sinuosity.

Schumm et al. suggest

- sinuosity increased due to rapid land subsidence between Tully and Story Roads
- topographic maps from 1895 (USGS) were compared to maps from 1961 (USGS)
- found that sinuosity increased where there was a "marked steepening of gradient"


East San Jose
E
SAN JOSE
STORY
U
SOUTHERN
TULLY
1895


EAST
PACIFIC
BYP
101
BM
105
100
94
106
RD
McKinley
Sch
Claypit
STORY
Radio Towers
STORY
PARK
LUCRETIA
108
BM 102
120
Spartan
Stadium
WESTERN
MC LAUGHLIN
AVE
PUEBLO
LOT
NO
7TH
BM
104
BM
TULLY
125
1961


James Lendrum
285
A.L. King
98 1/2
ROAD
J.D. White
187
EAST SAN JOSE BEACH
Lendrum
E.M'Laughlin
75
J. JACKSON SCHOOL
Rich
53.87
P. Reale
33
M.H. Andersen
F. Risley
G.W. Langworthy
34
Williams
A.N.S
393
PUEBLO
TR
James Ashworth
189
W. Clemence
O.L. Baker
121.95
STORY
J. Dudfield
20
J.G. Robinson
M.D. Riley
E. German
S.W. Churchill
J.M. Allen
J.H. Flickinger
155
E.M. Gen
C. Martin
CITY LIMITS
Archer
126
S A N
Wm Q
389.
S. Martin
274.77
Ormsby
10
E.A. Dubois
48
W.C. Nicholson Est. 35
M. Nicholson
S. Holloway
Henry Miller
105
H. Miller
15
Salvador Chaboya
H. Miller
J. Webb
10
TUL
1876
TULLY


STORY
TULLY


STORY
TULLY
1858

Title of map as used in this chapter and responsible agency	Summary of social, political, and economic context
Diseño of Rincon de los Esteros (Mexican government)	When Mexico took control of area from Spain, Mexico allowed individuals to own land, which was a radical departure from Spain's ownership strictly by the Crown; the short-lived system of Mexican ownership was replaced by the U.S. system, which required scientific-based surveying methods (in the form of confirmation surveys) for the establishment of land ownership; the *diseños*—with their symbolic portrayal of the landscape—were in conflict with the U.S. courts and system of land ownership, but also provide a unique view of the landscape
T-sheet 676 (U.S. Coast Survey)	The Bay Area was in transition between several cultures (Native American, Spanish, Mexican, American); T-sheet 676 [illegible] porting goods; [illegible] the Gold Rush made the survey of the West Coast an immediate priority for safety and commerce
T&W Map Sheet Two (Thompson and West)	Thompson and West atlases represent a changing economic focus, with a land-based [illegible] cultural community [illegible] land grants [illegible] farming [illegible]

Title of map as used in this chapter and responsible agency	Summary of context of agency
[illegible]	Generated by individuals to satisfy requirements of state (Mexico) in [illegible] state transaction; the *diseño* was a sketch rather than a formal [illegible] one part of a number of documents required; maps [illegible] individuals not trained in scientific cartogra[illegible] [illegible] rather than carefully defined boundaries
[illegible]	Agency established because [illegible] for safe navigation and defense; commerce [illegible] but agency regarded science and scienti[illegible] primary reason for existence; individuals within [illegible] cant impact on final product, despite attempts to standa[illegible] was active in exploring and promoting highly exact mapping me[illegible] and standards
T&W M[illegible]	Atlases developed for profit through commercial sale; connected to early wall maps of individual counties and gazetteers; Thompson and West took advantage of a growing Western U.S. market; sold subscriptions to individual farmers and land owners; atlas maps were compilations of existing maps, updated to please subscribers; profit was motivating factor

Context

Title of map as used in this chapter and responsible agency	Summary of social, political, and economic context
Diseño of *Rincon de los Esteros* (Mexican government)	When Mexico took control of area from Spain, Mexico allowed individuals to own land, which was a radical departure from Spain's ownership solely by the state and church; the short-lived system of Mexican ownership was replaced by the U.S. system, which required scientific-based surveying methods (in the form of confirmation surveys) for the establishment of land ownership; the *diseños*—with their symbolic portrayal of the landscape—were in conflict with the U.S. courts and system of land ownership, but also provide a unique view of the landscape
T-sheet 676 (U.S. Coast Survey)	The Bay Area was in transition between several cultures (Native American, Spanish, Mexican, American) when T-sheet 676 was created; T-sheet 676 represents an interest in a water-based method of transporting goods; the Gold Rush made the survey of the West Coast an immediate priority for safety and commerce
T&W Map Sheet Two (Thompson and West)	Thompson and West atlases represent a changing economic focus, with a land-based transportation network and a profit-driven agricultural community; the pattern of ownership had changed radically from a few land grants supporting cattle grazing to smaller land owners and farming for profit; the water-based economy of T-sheet 676, dependent on navigable sloughs and quick bay transport, was largely replaced by railroads

Title of map as used in this chapter and responsible agency	Summary of context of agency
Diseño of *Rincon de los Esteros* (Mexican government)	Generated by individuals to satisfy requirements of state (Mexico) in a real estate transaction; the *diseño* was a sketch rather than a formal map, and was only one part of a number of documents required; maps were usually created by individuals not trained in scientific cartography, and show relationships rather than carefully defined boundaries
T-sheet 676 (U.S. Coast Survey)	Agency established because of urgent need for coastal maps for safe navigation and defense; commerce and new economy drove funding, but agency regarded science and scientific mapping methods as their primary reason for existence; individuals within agency had significant impact on final product, despite attempts to standardize; agency was active in exploring and promoting highly exact mapping methods and standards
T&W Map Sheet Two (Thompson and West)	Atlases developed for profit through commercial sale; connected to early wall maps of individual counties and gazetteers; Thompson and West took advantage of a growing Western U.S. market; sold subscriptions to individual farmers and land owners; atlas maps were compilations of existing maps, updated to please subscribers; profit was motivating factor

Title of map as used in this chapter and responsible agency	Summary of mapping and printing technology
Diseño of *Rincon de los Esteros* (Mexican government)	The *diseños* were created without specialized survey equipment; a *diseño* is a sketch rather than a formalized map and usually has no scale, legend, or title; features are often represented by pictographs rather than symbols; locations are not exact, but represent the relationship between features; sketch was created by either standing at a central point in the property and filling in features or by riding the perimeter on horseback, measuring *varas* with ropes; the measurement unit was not standardized; maps are letter-size, done in black ink, with occasional color added; the *diseños* were not printed—if additional copies were needed (such as for the U.S. court system) they were made by copying the original
T-sheet 676 (U.S. Coast Survey)	The Coast Survey utilized some of the most advanced scientific mapping methods available; T-sheet 676 used geodetic measurements to account for the shape of the earth and plane table surveying to precisely map features; T-sheets were mapped at 1:10,000 scale and match up with features that are still persistent; Coast Survey developed innovative and precise printing methods, continuing to use copperplate engraving even after the less precise lithographic technology was available but also experimented with photo-engraving techniques
T&W Map Sheet Two (Thompson and West)	The atlas maps were created by compiling existing maps, gathered by Thompson and West employees, who would create base maps from county and city maps; the base maps were updated in the field by sketching in features and correcting ownership information

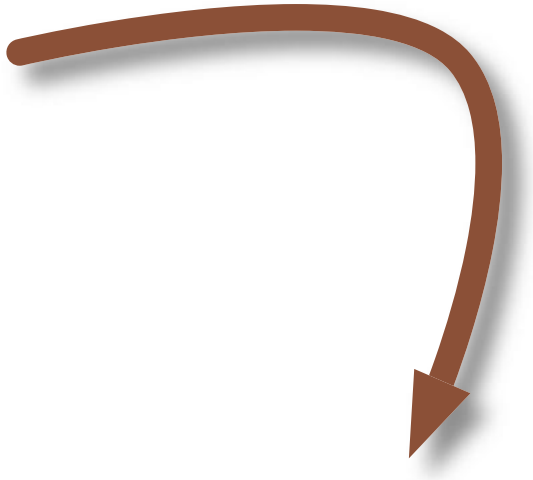
Original Purpose

Map and year	Original purpose	Possible contemporary uses in historical ecology studies
Diseño of *Rincon de los Esteros,* circa 1838	To establish ownership boundaries and to satisfy requirements of a real estate transaction between an individual and the state	Useful for symbolic and descriptive detail of natural features, especially along boundaries, including sausals, stream channels, riparian areas, pannes, sloughs, perennial wetlands; also shows relationships between features (i.e. bridge crossing is above the willow trees; house is located where road intersects creek, etc.)
Table 10.6, continued. Map and year	**Original purpose**	**Possible contemporary uses in historical ecology studies**
T-sheet 676, 1857	To survey and S.F. Bay, sloughs, and channels for safe navigation; secondary purpose to advance scientific mapping methods	Comparison with modern data sets such as aerial photography to identify remnant tidal marsh areas; use pattern of sloughs, pannes, and tidal lands in restoration efforts (for example, determine locations of levee breeches or appropriate combination of tidal channels and pannes in restoration)
T&W Map Sheet Two, 1876	To create atlases showing land ownership that would appeal to local farmers and business people	Useful for establishment of farm boundaries, land and business ownership; indicates network of early road and railroad system; relative widths of stream channels and relationships with other natural features; also provides continuous coverage of entire county and may be suitable as a base map
U.S.G.S. Palo Alto quadrangle, 1899	Objective of agency was initially to map geology; however, this was expanded to include topography, and the 1899 Palo Alto quadrangle is one of the agency's early topographic maps; maps show natural and cultural features including elevation contours, bays, sloughs, upland creeks, towns, roads, and railroads	Useful because of continuous extent across a given study area, but captures landscape after significant post-European impacts; provides a relatively small scale but consistent image of both cultural and natural features; can be used to build a segment of a time sequence in a historical ecology
Bird's Eye View, San José, 1864	Commercial print for sale to the public; for profit venture; to create a compelling and attractive image that would appeal to residents	Drawing can be used to interpret relative amount of vegetation along stream channels; relative width of stream channels; vegetation on hillsides; amount of devel-

results of research

INTERPRETING HISTORICAL MAPS

	Interpretation of feature	Size of feature	Location of feature
High (definite)	Data on map directly support strong interpretation of feature	Data on map directly support mapped size (estimated max. error +/- 10%)	Data on map directly support mapped location (estimated max. error 500 feet)
Medium (probable)	Data on map directly or indirectly support strong interpretation of feature, with some qualifications	Data on map directly or indirectly support size, but with some qualifications (+/- 50%)	Data on map directly or indirectly support location, but with some qualifications (+/- 2000 feet)
Low (possible)	Data on map are limited or contradictory, and supports interpretation of feature only with corroborative map sources	Data on map are limited or contradictory, and supports size of feature only with collaborative map sources	Data on map are limited or contradictory, and support size of feature only with collaborative map sources



Certainty / Map and year	Interpretation of feature	Size of feature	Location of feature
Diseño of *Rincon de los Esteros*, circa 1838	Low	Low	Low
T-sheet 676, 1857	High	High	High
T&W Map Sheet Two, 1876	Medium	Medium	Medium
U.S.G.S. Palo Alto quadrangle, 1899	High	Medium	Medium
Bird's Eye View, San José, 1864	Low	Low	Low
Wallace confirmation survey, 1859	Low	High	High
Reed confirmation survey, 1862	Low	High	High
Herrmann Coyote Creek survey, 1874	High	High	Medium
AAA aerial photographs, 1939	High	High	High

Summary Table

	Characteristics				Original Purpose	Certainty		
Map and year	Date of publication	Continuous spatial coverage	Scale and spatial precision	Descriptive detail	Score of how close contemporary use is to original purpose	Interpretation of feature	Size of feature	Location of feature
Diseño of *Rincon de los Esteros,* circa 1838	very early	portion only	small scale; imprecise	many	distant	Low	Low	Low
T-sheet 676, 1857	very early	portion only	large scale; very precise	some	very close	High	High	High
T&W Map Sheet Two, 1876	early	entire area	medium scale; precise	many	close	Medium	Medium	Medium
U.S.G.S. Palo Alto quadrangle, 1899	early	entire area	medium scale; precise	many	very close	High	Medium	Medium
Bird's Eye View, San José, 1864	very early	portion only	medium scale; imprecise	many	distant	Low	Low	Low
Wallace confirmation survey, 1859	very early	portion only	large scale; precise	few	close	Low	High	High
Reed confirmation survey, 1862	very early	portion only	large scale; precise	few	close	Low	High	High
Herrmann Coyote Creek survey, 1874	very early	portion only	large scale; precise	some	very close	High	High	Medium
AAA aerial photographs, 1939	recent	entire area	large scale; precise	none	close	High	High	High

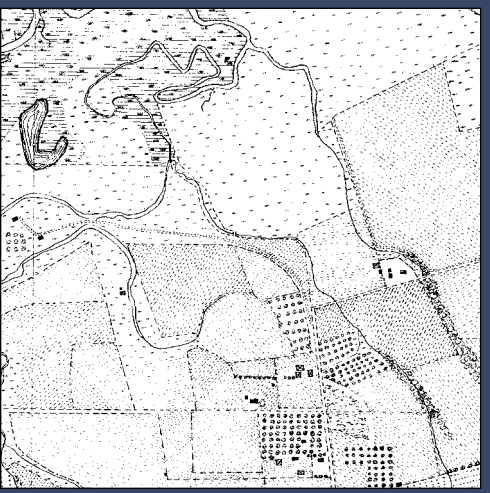
Comparing historical maps is key.

Harley: comparisons are key

multiple sources can confirm the existence of a feature or bring it into question

independent sources can calibrate the past landscape synthesis

Information collected about maps becomes synergistic

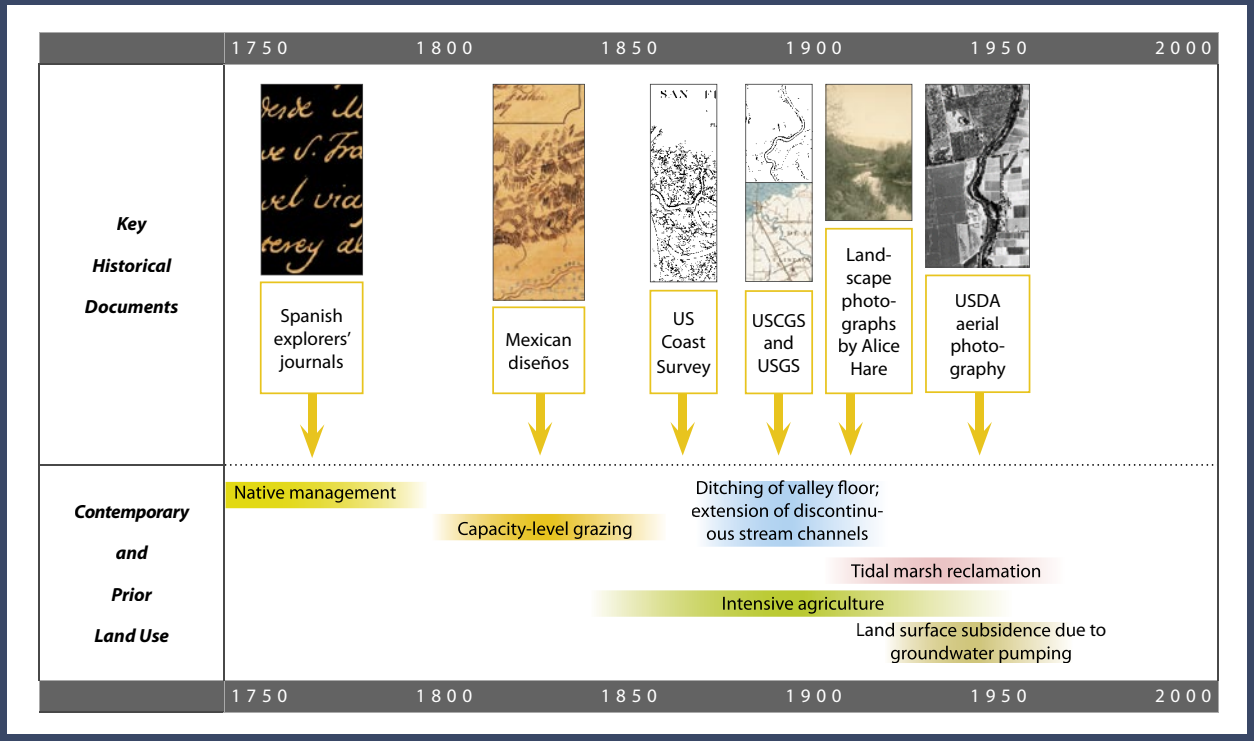


knowledge of one map informs the use of the others

one map leads to another

multi-layered effort

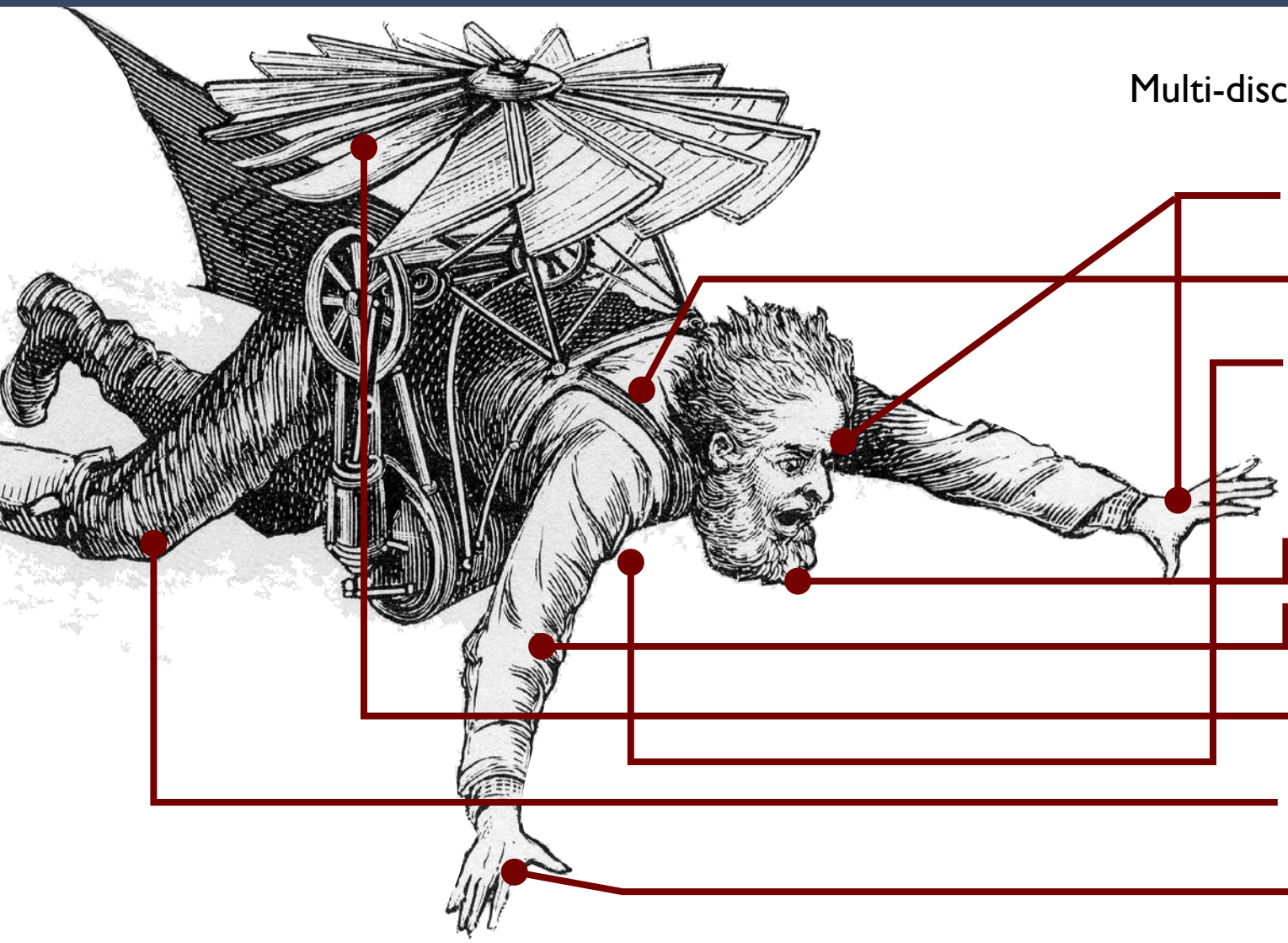
Geographic Information Systems are a logical (but not the only) tool for synthesizing historical maps



GIS used as a tool along with other sources:

explorer journals
court transcripts
newspaper accounts
pioneer diaries
landscape photographs and paintings
oral histories

Using historical maps in historical ecology requires specialization



Multi-disciplinary approach

- GIS SPECIALIST
- LIBRARIAN
- ARCHIVIST
- ECOLOGIST
- GEOGRAPHER
- HISTORIAN
- TIME TRAVELLER
- MAP HISTORIAN
- GRAPHIC DESIGNER

Further Research

- how can certainty codes in GIS be used more effectively?
- what other tools are effective? [timelines, rephotography]
- research / field methods in urban vs rural landscapes?
- how can the results be presented effectively? [web-based, multimedia)
- how do the potential sources of error [insufficient selection of maps, mis-interpretation of maps, misinterpretation of context] affect the outcome?

results of research

INTERPRETING HISTORICAL MAPS

Does understanding the context of a historical map improve its usability in reconstructing a past landscape?

Can historical maps be successfully used without placing them in context?

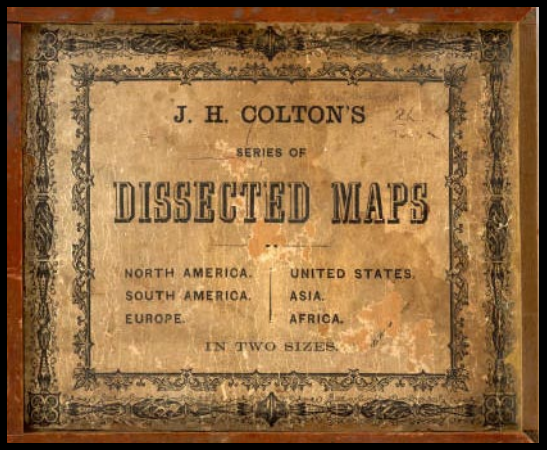
How can the use of historical maps be improved?

Increases understanding of Harley's theoretical framework through application to a new domain

Creates a "certainty level" table for integrating historical maps

Series of tables summarizing contextual events, placing maps in social, technical, and site-specific context

Development of an integrated approach for use of historical maps


J. H. COLTON'S
SERIES OF
DISSECTED MAPS
NORTH AMERICA.
SOUTH AMERICA.
EUROPE.
UNITED STATES.
ASIA.
AFRICA.
IN TWO SIZES.

TECHNICAL CONTEXT:

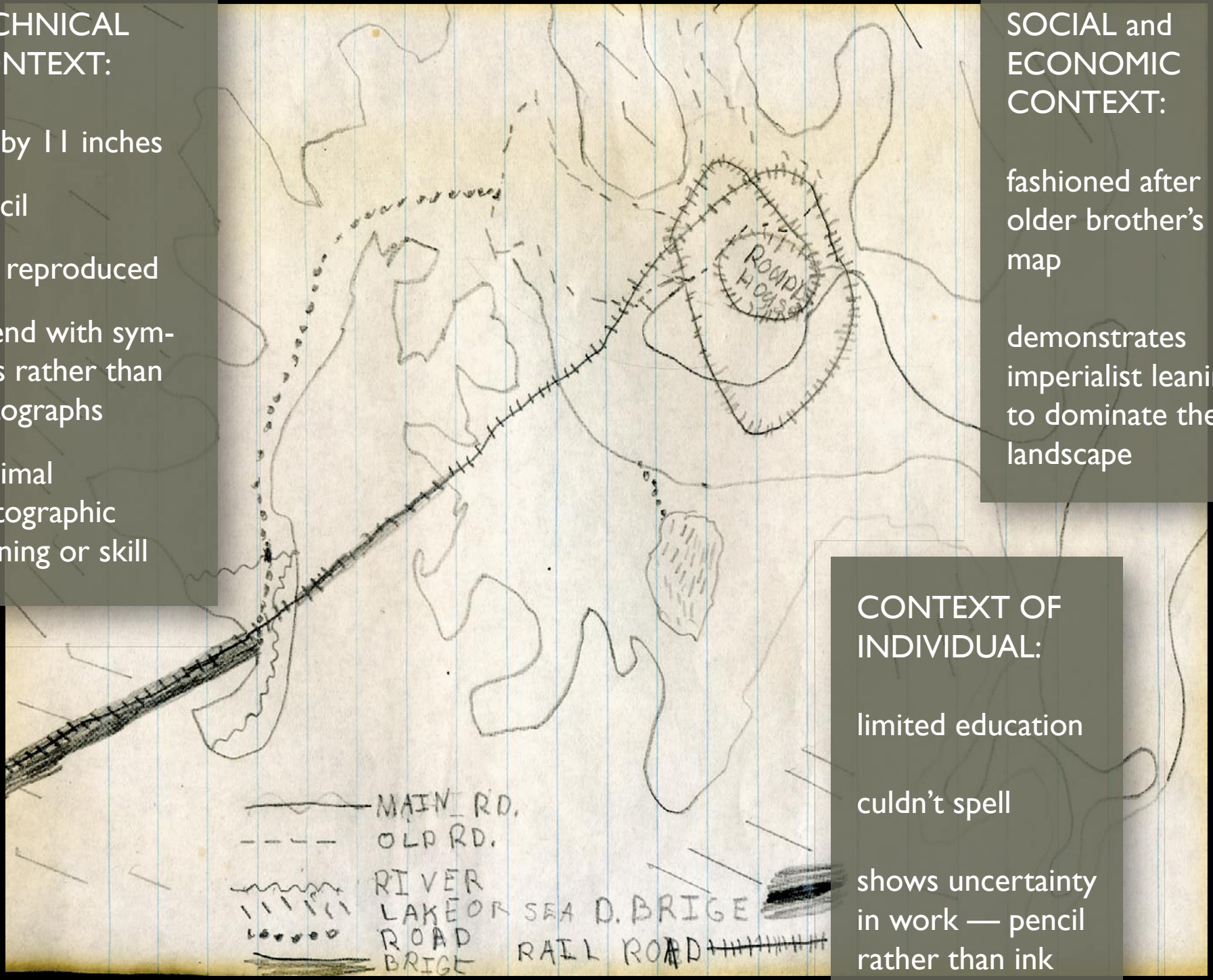
8.5 by 11 inches

pencil

not reproduced

legend with symbols rather than pictographs

minimal cartographic training or skill



SOCIAL and ECONOMIC CONTEXT:

fashioned after older brother's map

demonstrates imperialist leaning to dominate the landscape

CONTEXT OF INDIVIDUAL:

limited education

culdn't spell

shows uncertainty in work — pencil rather than ink

Ruth Askevold, age 8

thank you

everyone here, but especially

Nancy Wilkinson

Jerry Davis

Robin Grossinger

Mary Phillips