OPTIONAL FORM NO. 10
5010-103

UNITED STATES GOVERNMENT

Memorandum

TO : Carol Messick and Mike Moore
U. S. G. S. Library, Reston and Menlo Park

DATE: September 12, 1989

FROM :Joseph K. McGregor, U. S. G. S. Photo Library

SUBJECT: Open-file report 89-493 (Previously known as Catalog of Selected Photographs pertaining to Geology and Geomorphology.

As you can guess the catalog I sent you in February is now Open-file report 89-493. Central Technicial Reports states that it probably will be released in a week to ten days.

In order to put what you have on hand to some use please find enclosed the major changes. If you exchange the appropriate pages you will have a de facto second copy of said Open-file report.

Your cooperation is appreciated.

done 9/18/89 cjmm

United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 914
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY REFER TO: PHOTOGRAPHIC LIBRARY (CATALOG)

Dear Madam or Sir

The enclosed catalog of black and white photographs has been prepared in response to geology textbook author or publisher requests for photographs to illustrate introductory level geology textbooks. This catalog addresses about 150 subjects, which by no means cover all aspects of the geosciences. All photographs shown are in the public domain and do not require copyright releases or payment of special fees.

Do not assume that the Library has the exact photograph in color or that we have all subjects illustrated in the catalog in BOTH formats. If you do not find what you need in this catalog you have these options.

1. You are welcome to visit the Photographic Library in Denver, Monday through Friday (Federal Holidays excluded) between 7:30 A. M. and 4:00 P. M. USGS Library, Building 20, Room C2002 Denver Federal Center. We will gladly explain our cataloging and shelving schemes so that you may do your own research and consult in person with our staff. Several days may be needed to select photographs for an entire textbook.

2. You may search through USGS publications (Professional papers, Bulletins, Circulars etc) at your local library and submit a list showing publication name and number (Professional paper ——) and figure/plate numbers of photographs of use to you. We will verify if we have the photograph in our collection and provide ordering information, usually with 2–3 days of receipt.

3. You may submit a list of subjects of 10 or fewer subjects at a time and we will search the collection for suitable photographs. Normally this procedure takes a minimum of 2 weeks. We will assume that you want black and white photographs unless you inform us otherwise. Once we have identified suitable photographs or realize that we do not have any that would be suitable, we will then furnish photocopies and additional ordering information. Requests of more than 10 subjects will be answered in parcels of 10 subjects or suitable chapters. For color transparencies (slides) we can only furnish caption list(s) for your perusal.

Ordering forms and information are enclosed; PLEASE ask for a new price list if you have had the price list for more than 1 year.

For additional information concerning our collection see the enclosed brochure. We welcome your suggestions/comments on this catalog; please address them to Special Collections Librarian at the address shown above.

Joe McGregor
Photo Librarian

ROUTING AND TRANSMITTAL SLIP

Date 2-27-89

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. Carol Messick et al		
2.		
3.		
4.		
5.		

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
	As Requested		For Correction		Prepare Reply
	Circulate	X	For Your Information		See Me
	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

Enclosed is an interim copy of the catalog we discussed today. Please make photocopies of the cover letter and ordering forms as you need them. This may be open-filed later

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Thanks Joe MacGregor	Phone No.

5041-102

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

☆ GPO : 1981 O - 341-529 (25)

U. S. Geological Survey
Photographic Library
Instructions for Ordering Photographic Material

The Photographic Library does not have photographs in stock; photographs are reprinted as they are ordered. Please allow 2 to 3 weeks for delivery of material. Since we do not have an in-house photographic laboratory work is done by contractual agreement with local commercial photographic laboratories. Thus the Photographic Library is not responsible for payment discrepancies between you and the photographic laboratory; these matters are to be resolved directly with the laboratory.

After you have determined which photographs you want reprinted from the enclosed Catalog of Selected Photographs Pertaining to Geology and Geomorphology, please complete the order form on the reverse of these instructions. If you need additional forms either photocopy this form or make a facsimile copy on a blank sheet of paper.

1. The Photographic Library has the appropriate photographic original for all photographs included in the Catalog. Photocopies furnished from other Photographic Library sources will occasionally be marked with the notation "no negative". If that is the case you have 2 options; order a copy negative and print from a selected photo laboratory; or order just a copy negative and have a local photo shop make a print for you.

2. See the example below for additional help. Material from sources other than the Catalog... will not have the identification in parenthesis. However, the same indentification system of either a surname and number or subject name and number still applies. This indentification tag is usually at the lower left corner of the photograph.

1 ea	Malde, H. E. 455	8 x 10	Glossy	$ X.00.	$ X.00

Once you have listed the photographs you want reprinted select one of the photographic laboratories and total the charges. Please provide a Check/MoneyOrder or purchase order payable to the photographic laboratory you have selected.

FOREIGN PATRONS must provide a Cheque/Money Order payable to the photographic laboratory YOU have selected, drawn on a bank IN THE UNITED STATES OF AMERICA.

3. Forward this order form and remittance to the Photographic Library at the address shown in the upper left portion of the form. Upon receipt of your order in the Photographic Library we will forward your payment and the appropriate photographic material to the laboratory. Upon completion of the order the laboratory will return your reprints to the Photographic Library for quality control and forwarding to you at the addresss you have stated in the upper right portion of the form.

4. Unless SPECIFICALLY INSTRUCTED by you the laboratory will print all photographs "full-frame", which means a square original ordered as a 5 x 7 will be in fact about 5 x 5. THEREFORE indicate at the time you place an order any cropping that may be desired. This can be readily done by marking a photocopy.

==========

CHECK LIST

A. Is your payment made payable to one of the photographic laboratories?

B. Did you copy just the information in the parenthesis() or similar information (see instruction number 2 above) for each photograph ordered?

C. Did you assess yourself the correct charge for each copy desired, and INCLUDE the per order handling fee and sales taxes if applicable?

ORDER FORM

U. S. G. S. PL-1-3

OFFICE USE: ORDER NUMBER:
ONLY : DATE:
Check/M.O. number

MAKE REMITTANCE PAYABLE TO THE PHOTOGRAPHIC LABORATORY YOU HAVE SELECTED:

Name of Lab: _____

Mail remittance along with your order to:

U. S. GEOLOGICAL SURVEY PHOTO LIBRARY
MS 914, BOX 25046, FEDERAL CENTER
DENVER, COLORADO 80225

Please furnish your name, address and telephone number (including area code):

Name _____

Address _____

_____

Tele. number:( ) _____

Ship to (if different from above)

_____

_____

_____

ntity	IDENTIFICATION (...) Photographer name & number(s)	Size You want	Print finish you want--glossy or semi-matte	Unit Price	TOTAL
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USE BLANK SHEET FOR ADDITIONAL ITEMS.

ADDITIONAL INSTRUCTIONS: _____

_____

_____

_____

TOTAL OF ABOVE ____.

TOTAL FROM ADDITIONAL SHEETS ____.

SUBTOTAL ____.

COLORADO RESIDENTS ADD 3.0% SALES TAX ____.

COLORADO - IF YOU ARE SERVED BY RTD, ADD ADDITIONAL 0.6% SALES TAX ____.

HANDLING CHARGE ASSESSED BY LAB YOU SELECTED ____.

TOTAL COST FOR YOUR ORDER - MAKE REMITTANCE PAYABLE TO LAB ____.

[illegible] additional information.

U. S. G. S. Photographic Library

PRICE LIST FOR USE WITH SELECTED CATALOG (as of February 1989)

This price list from photographic laboratories authorized to process reprint orders from the Photographic Library has been compiled for the convenience of the typical publisher or author. ALL PRICES SHOWN ARE FOR BLACK AND WHITE RC PRINTS ONLY!! For sizes not listed please contact the Library at (303) 236-1010. Laboratories are listed in alphabetical order and do not reflect any preference on our part. All laboratories have done work for us for a minimum of 2 years. PLEASE BE CERTAIN TO MAKE YOUR PAYMENT PAYABLE TO THE NAMED LABORATORY, **DO NOT MAKE PAYMENT TO THE U. S. GEOLOGICAL SURVEY.**

==========

1. Name of photo laboratory (make payment to): CIES/SEXTON PHOTOGRAPHIC LABORATORIES.

5 x 7 or smaller	1 each $5.50	2-10 each (same photo)	$4.55
8 x 10	5.90		4.95
11 x 14	9.95		7.40

35m m Copy slide from artwork. $4.70 additional copies $1.70 each

4 x 5 copy negative $11.00 each

This firm does not charge a handling fee (pick-up and delivery from the Library).

##########

2. Name of photo laboratory (make payment to) C-L CUSTOM PHOTO INC.

5 X 7 or smaller	1 each $4.00	2-9 each (same photo)	$2.90
8 x 10	$4.50		3.25
11 x 14	$7.00		5.00

35m m copy slides from artwork $4.50 additional copies $1.00 each

4 x 5 Copy negatives $10.00 each
Handling fee per order. $8.00

****

3. Name of photo laboratory (make payment to) Pallas Photo Laboratories, Inc.

5 x 7 or smaller	1 each $5.00	2-10 each (same photo)	$4.25
8 x 10	$5.50		4.75
11 x 14	$9.00		7.00

35m m Copy slides from artwork $4.50 additional copies $1.00 each

4 x 5 Copy Negatives $10.00
Handling fee per order $5.00

))))))

(200)
R290
no. 89-493
c. 2

DEPARTMENT OF THE INTERIOR

U. S. GEOLOGICAL SURVEY



BLACK AND WHITE PHOTOGRAPHIC CATALOG OF GEOLOGIC/GEOMORPHOLOGIC PHENOMENA

by

J. K. McGregor Jr.
U.S. Geological Survey

Denver, CO

Open-File Report 89-493

This report has not been reviewed for conformity with U. S. Geological Survey editorial standards or for standards applied to stratigraphic nomenclature at the time of this publication. Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U. S. Government.

CATALOG OF SELECTED PHOTOGRAPHS PERTAINING TO GEOLOGY AND GEOMORPHOLOGY.

Part 1

Compiled by
J. K. McGregor Jr.

U. S. Geological Survey. Photographic Library. 1989.

149 su
563 pf
166 p

INTRODUCTION

This catalog of black and white photographs has been prepared to illustrate the coverage available from the U. S. Geological Survey Photographic Library on selected geologic and geomorphic features. The catalog covers only about 150 topics on aspects of the geosciences out of a possible 2,500 subjects in the Photographic Library. The 563 photographs included are representative of the 300,000 photographs in the collection, which are in the public domain and thus do not require copyright release or payment of copyright fees.

The captions for the 563 photographs in this representative sample reflect stratigraphic usage in effect at the time the photographs were made. They do not reflect modern usage.

The photographs in this catalog are available in black and white only. The Photographic Library however may have color photographs (mostly 35mm transparencies) that illustrate essentially the same geologic subjects.

For order forms and price information please write or telephone the U. S. Geological Survey Photographic Library (CAT), MS 914, Box 25046 Federal Center, Denver, CO 80225–0046. Phone (303) 236–1010.

If you do not find what you need in this catalog there are several options.

1. Visit the Photographic Library in Denver, Monday thru Friday (Federal Holidays excluded) between 7:30 A. M. and 4:00 P. M. USGS Library, Building 20, Room C2002, Denver Federal Center. The staff will gladly explain the cataloging and shelving schemes so that you may do your own research and consult in person with us. Several days may be needed to select photographs for a large number of subjects.

2. Search through USGS publications (Professional Papers, Bulletins, Circulars [number] etc) at your local library and submit a list showing publication(s) name and number (Professional paper number ____) and figure/plate numbers of photographs of use. The staff can easily verify if the photograph is in the collection and provide ordering information by return mail.

3. Submit a list of subjects for the Photographic Library to search the collection for suitable photographs. Please allow about one week for every 5 to 7 subjects. Please specify if you are seeking color photographs otherwise it will be assumed that you want black and white. After researching the list, the staff will provide photocopies of suitable photographs, ordering information, or alternative sources if any, that may provide the photographs needed. Large requests may be divided into and be answered by categories. For color transparencies (slides) only caption list(s) are furnished for your perusal.

The Library welcomes your suggestions/comments on this catalog; please address those to the attention of the Special Collections Librarian at the address shown above.

Black and White Photographic Catalog of Geologic/Geomorphic Phenomena

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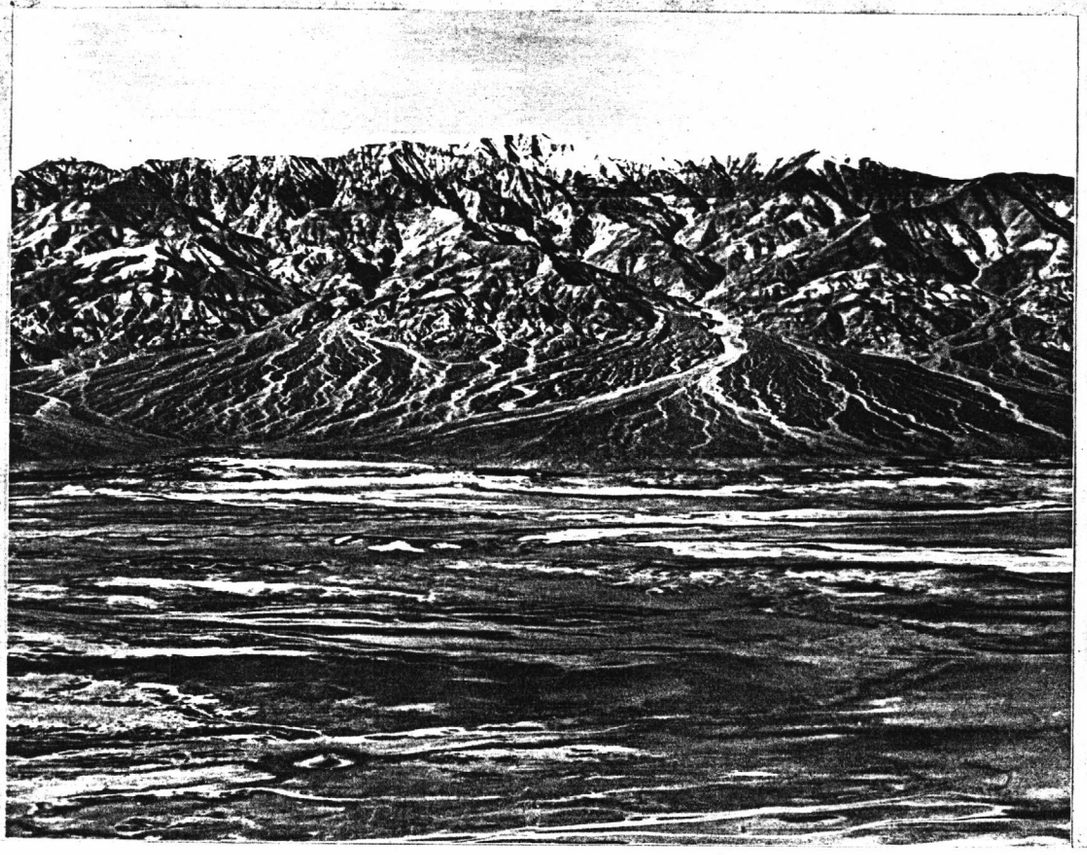
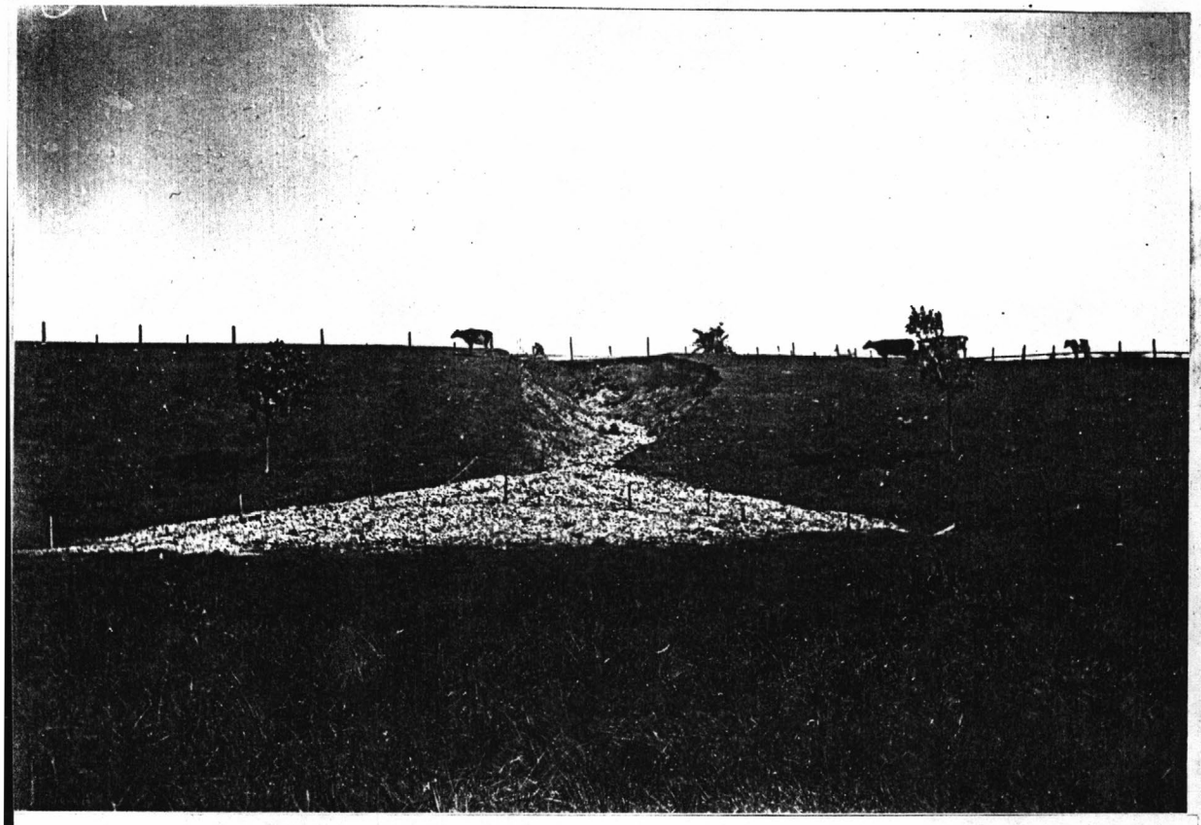
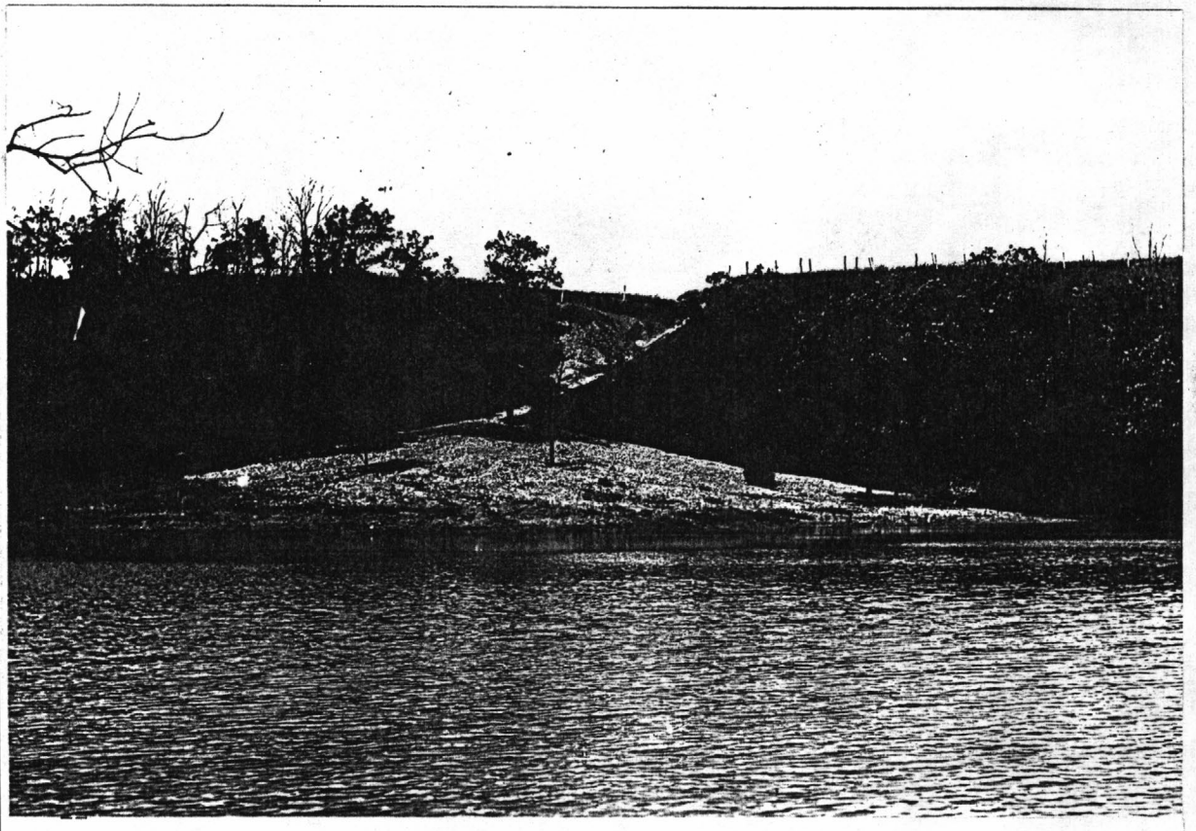


(MALDE, H. E. 455)
View of the gravel fans rising from the edge of the saltpan to the foot of the Panamint Range at the mouth of Hanaupah Canyon. The youngest gravels, light colored areas on the fans, are along the present washes. The older gravels, stained dark with desert varnish, form terraces and are capped by desert pavement. The snow-capped peak is Telescope Peak, altitude 11,049 feet Death Valley National Monument, California. ca. 1960.



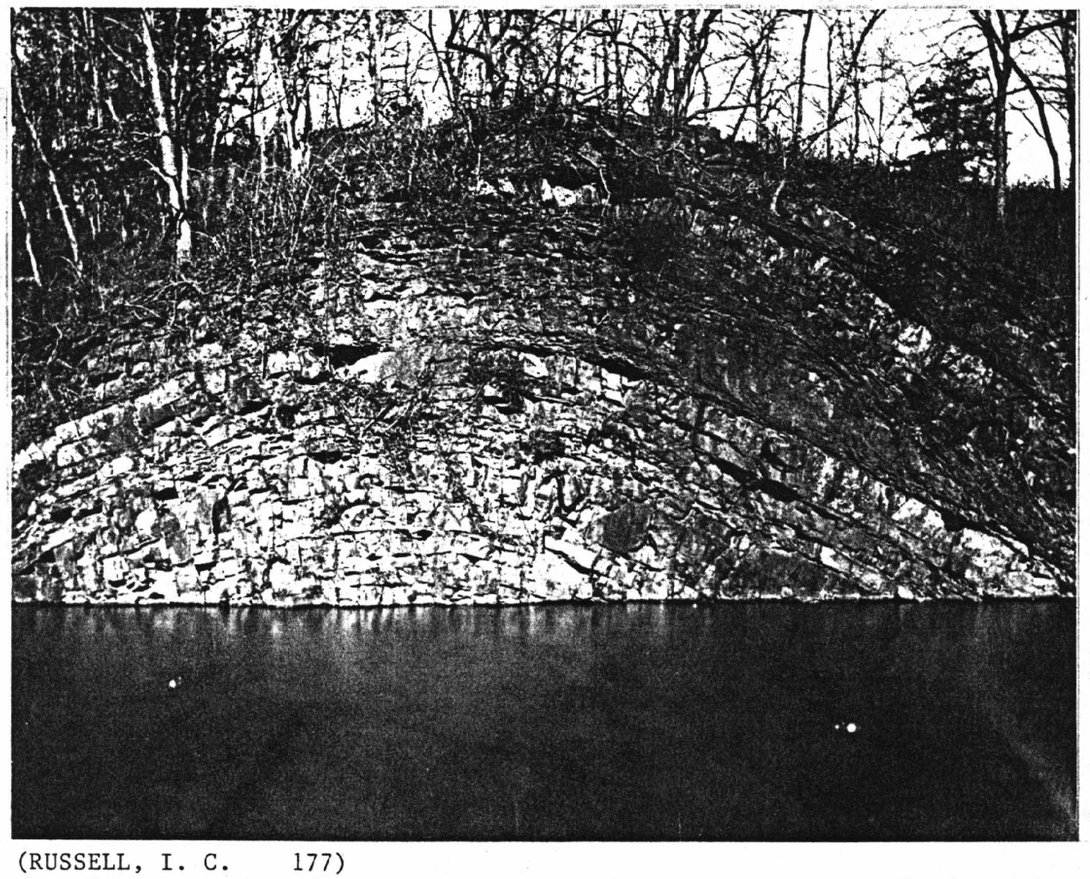
(ALDEN, W. C. 43)
Alluvial fan formed at the mouth of young valley, Sec. 25, T. 7 N., R. 17 E. Waukesha County, Wisconsin. August 23, 1904.



(ALDEN, W. C. 74)
Ravine and alluvial cone (fan) in sand and gravel in side of large kettle. NW¼ sec. 11, T. 4 N., R. 10 E. Rock County, Wisconsin. July 11, 1902.



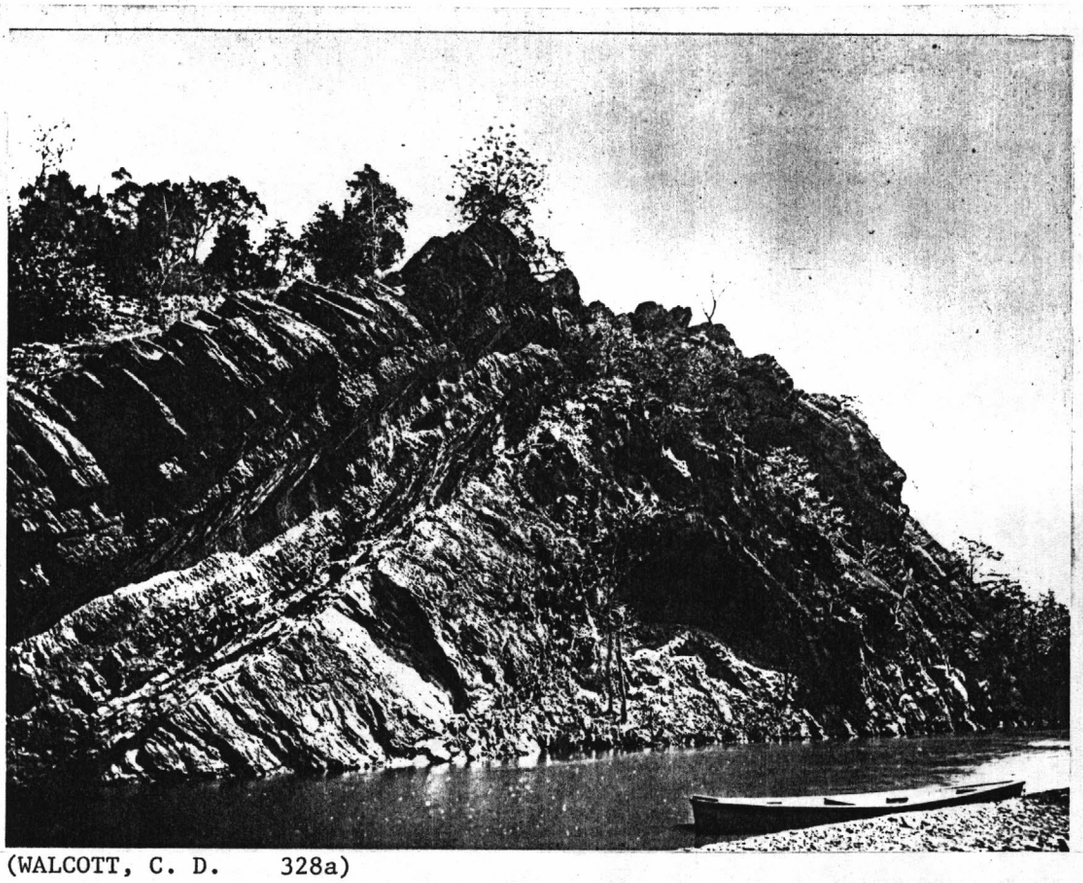
(STOSE, G. W. 70)
Alluvial cone (fan) north side of South Fork Mineral Creek. San Juan County, Colorado. n.d.



(RUSSELL, I. C. 177)
Anticline on banks of Potomac River. Washington County, Maryland. n.d.



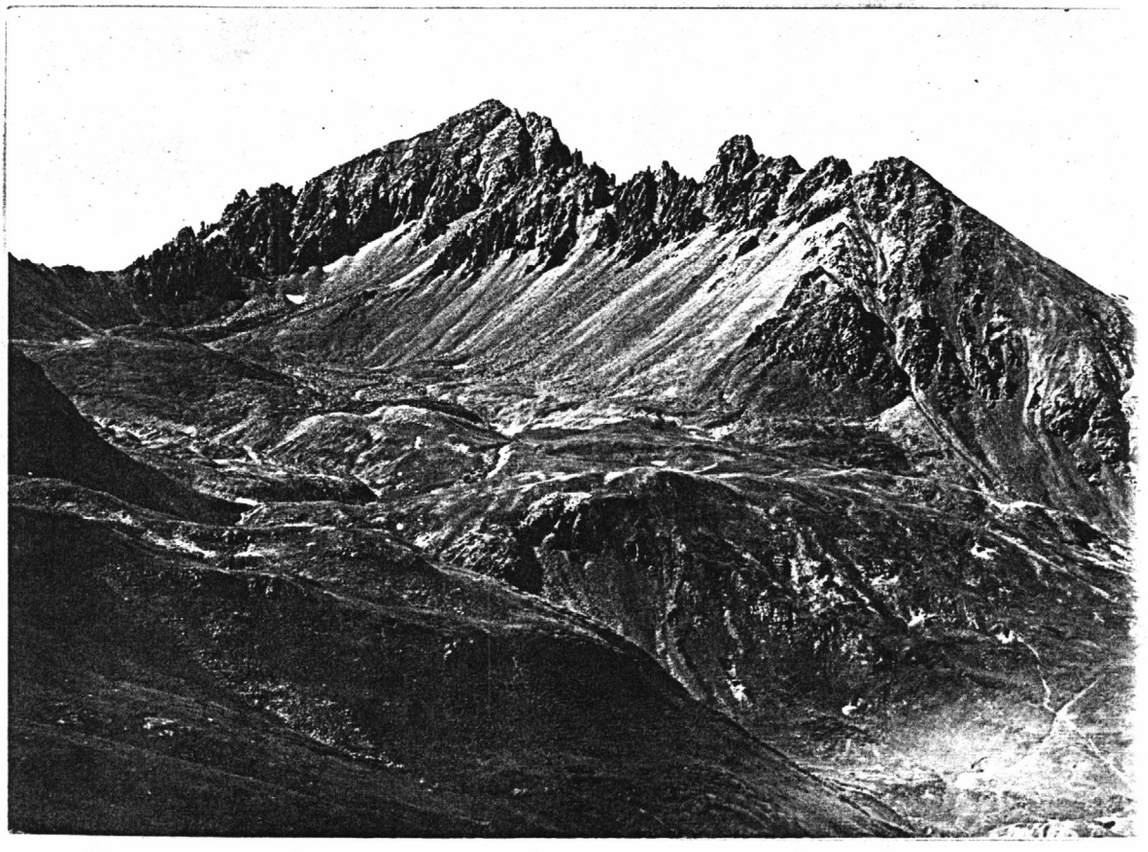
(PIERCE, W. G. 381)
Cross sectional view of the South Sunshine anticline looking south across Gooseberry Creek from cent of SE¼ Sec. 4, T. 46 N., R. 101 W. The oldest formation exposed is Morrison. The Cloverly formation forms the prominent scarps which outline the anticline. Park County, Wyoming. September 1935.



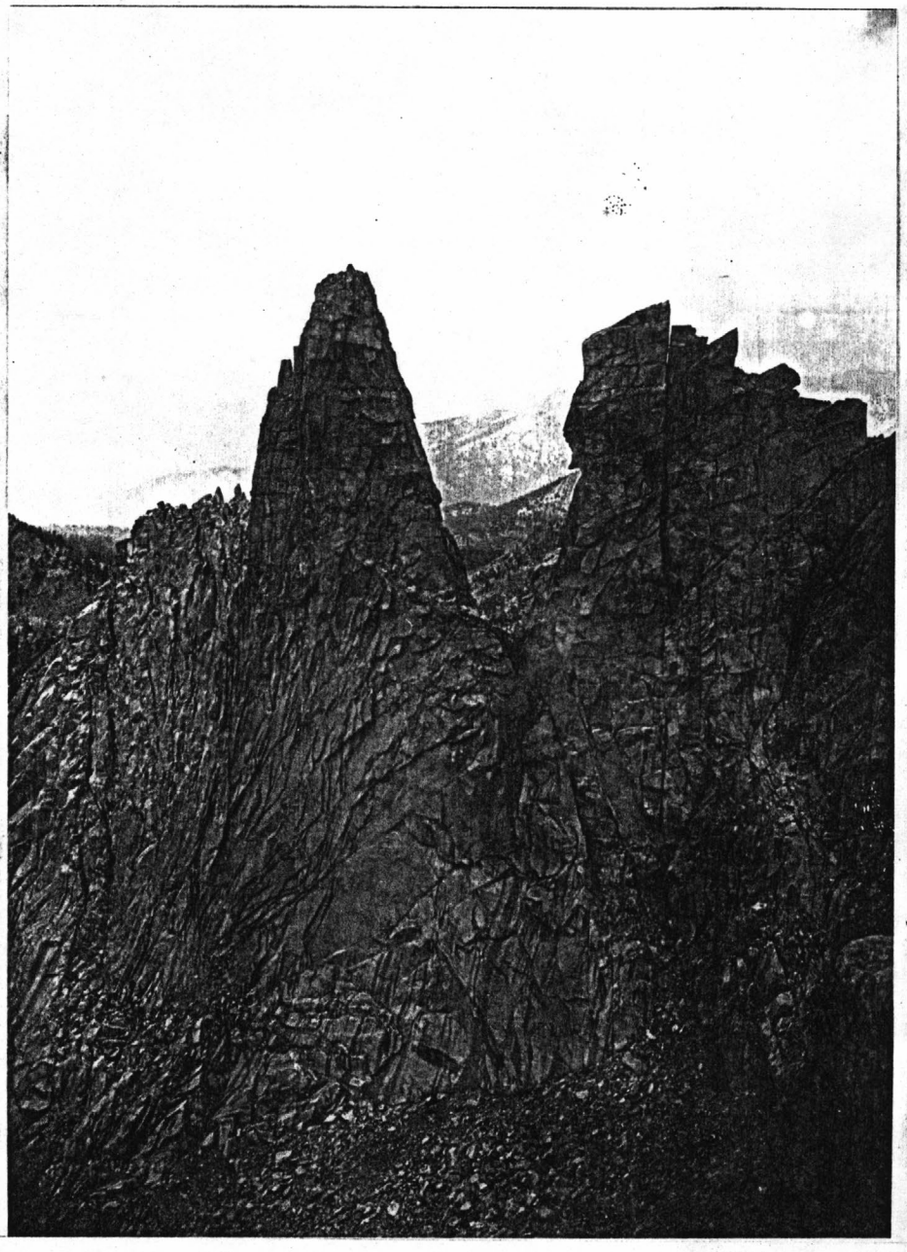
(WALCOTT, C. D. 328a)
Anticlinal fold in sandstones and shales, near base of Upper Silurian, 3 miles west of Hancock, Washington County, Maryland. 1897.



(HARDIN, E. B. 1685)
Anticlinal fold on Schuylkill River 2 miles above Port Clinton. Schuylkill County, Pennsylvania. n.d.



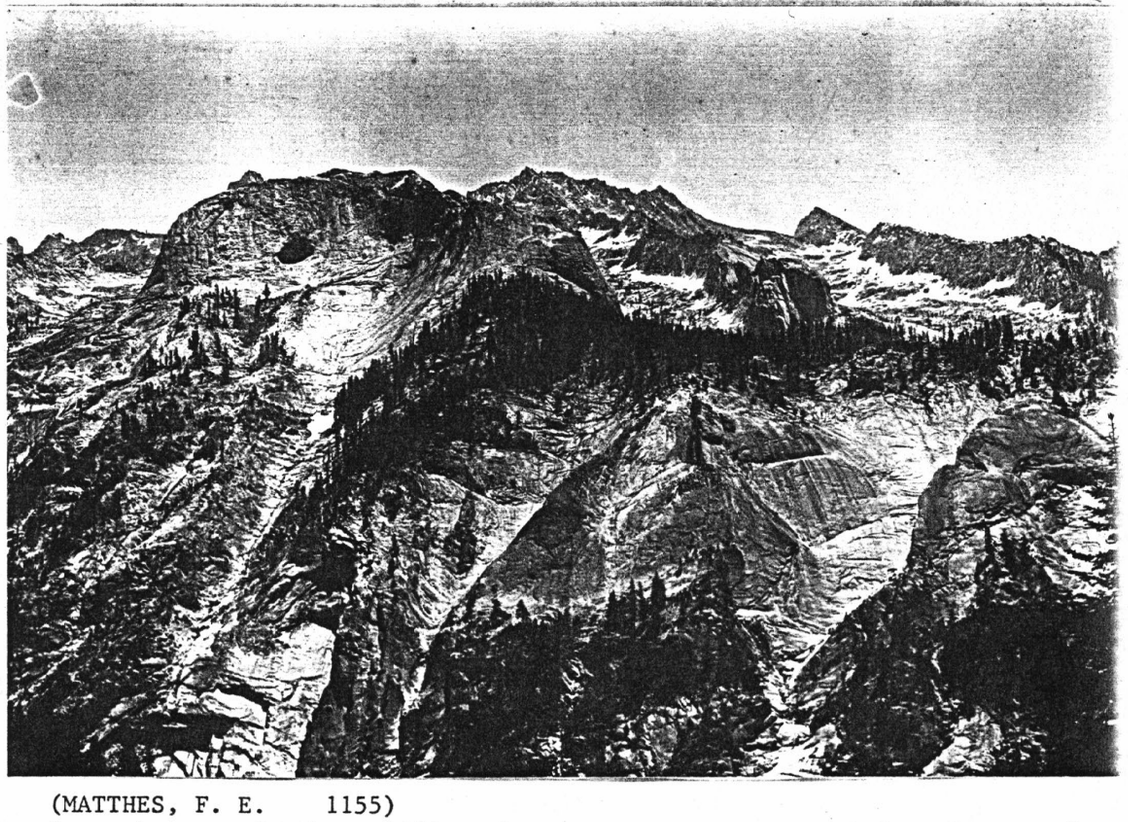
(CROSS, W. 210)
Mount Sneffels, from saddle west of Stony Mountain. A mass of diorite and gabbro cutting up through bedded volcanic series. Ouray County, Colorado. 1895.



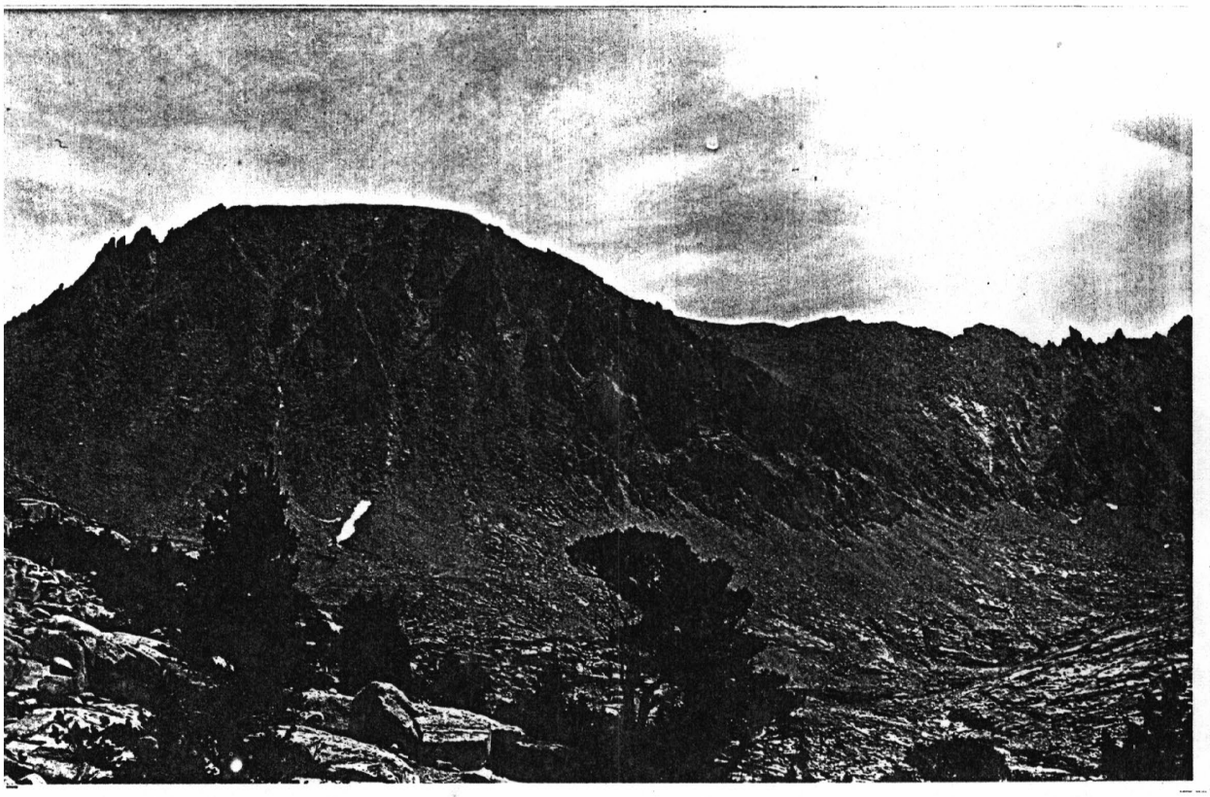
(GILBERT, G. K. 2528)
Arete between heads of Sugarloaf and Bog Creeks, Sierra Nevada. Tulare County, California. 1904.



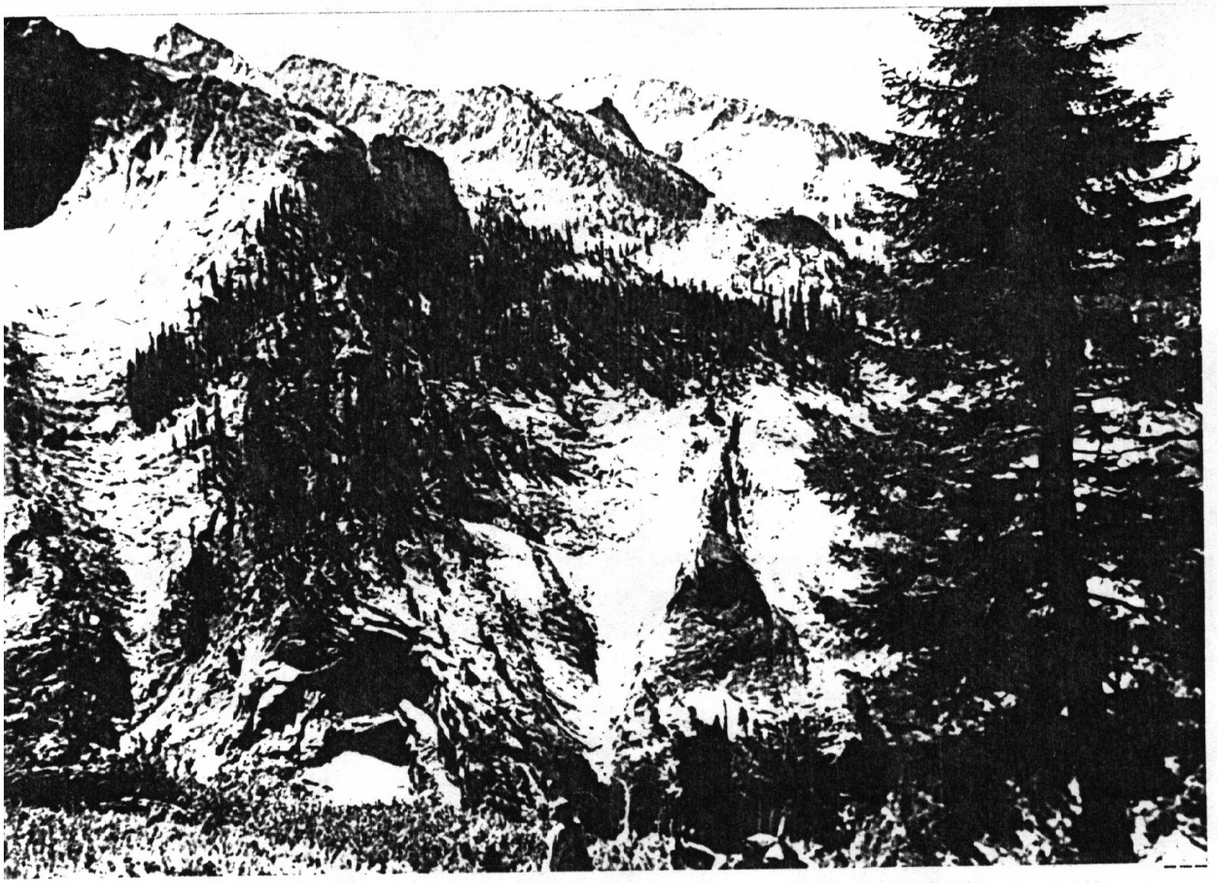
(DARTON, N. H. 863)
Granite peaks just north of Cloud Peak, looking north. Big Horn Mountains. Johnson County, Wyoming. 1901.



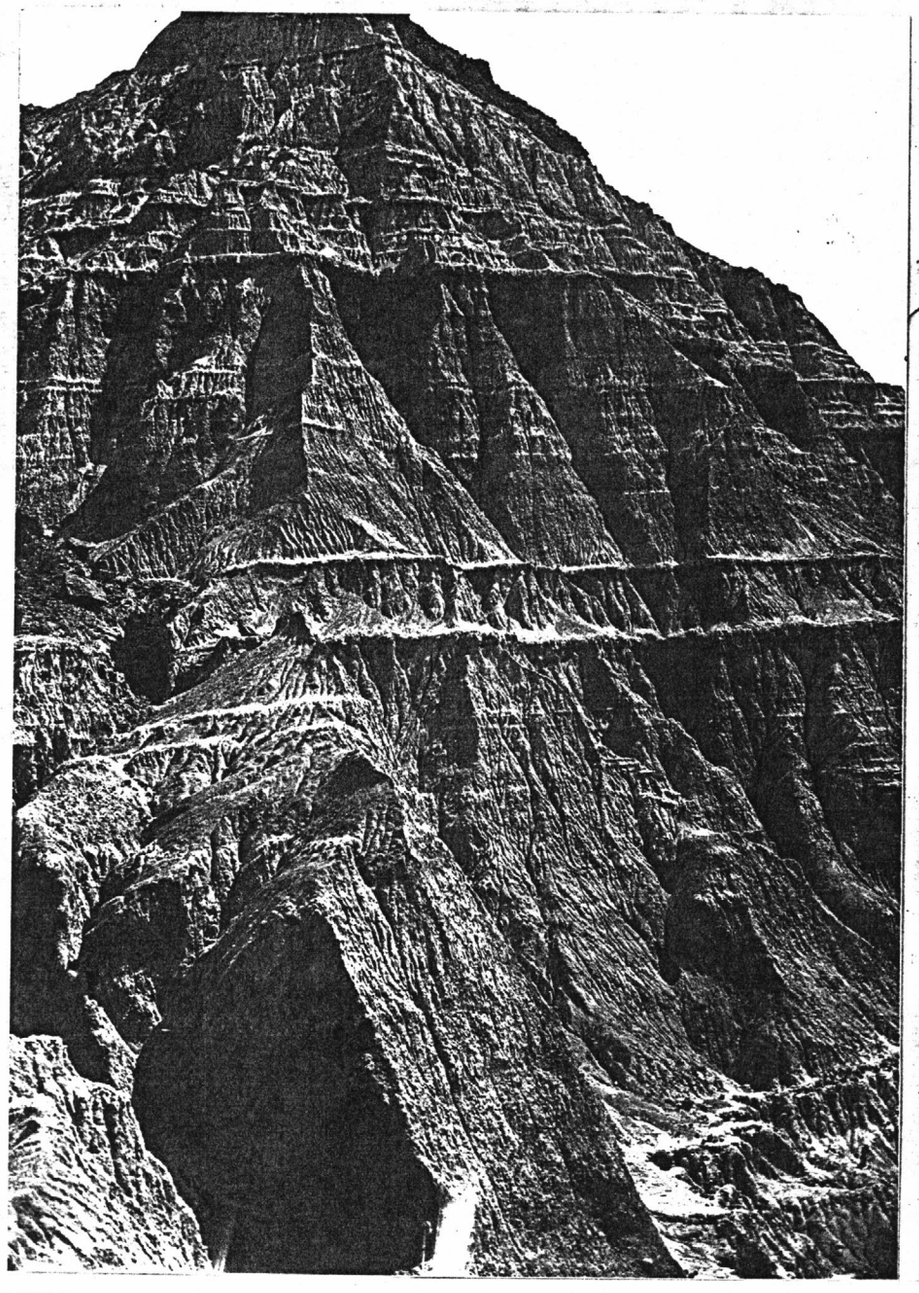
(MATTHES, F. E. 1155)
Snow chutes and other cliff sculpture in massive granite from Bearpaw Camp Sequoia National Park. California. 1936.



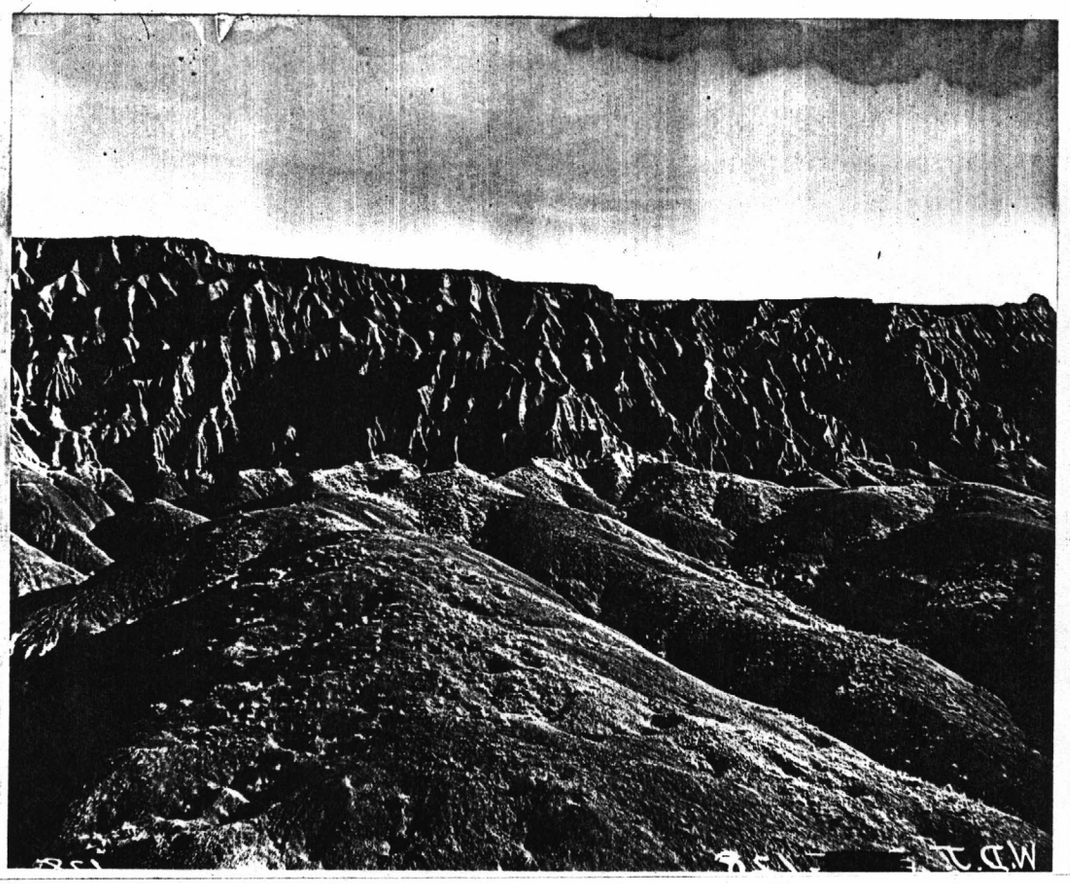
(MATTHES, F. E. 1130)
West side of Mount Whitney showing avalanche (chute) sculpture. Sequoia National Park, California. 1936.



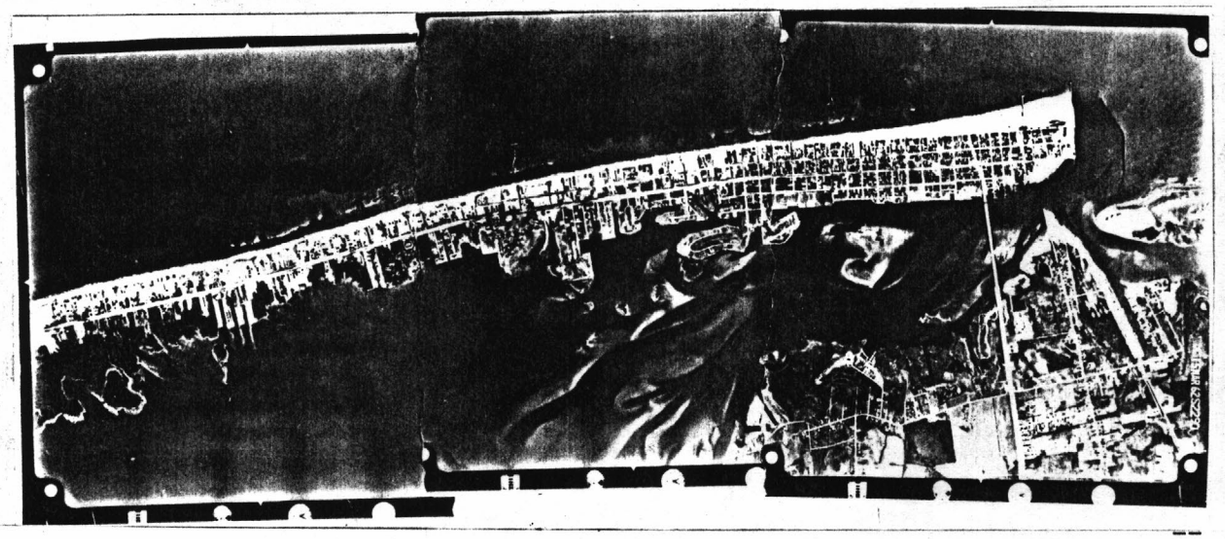
(MATTHES, F. E. 1296)
Avalanche chutes carved in massive granite opposite Bearpaw Camp. Sequoia National Park. California. ca. 1935. (photo by G. D. Delprat)



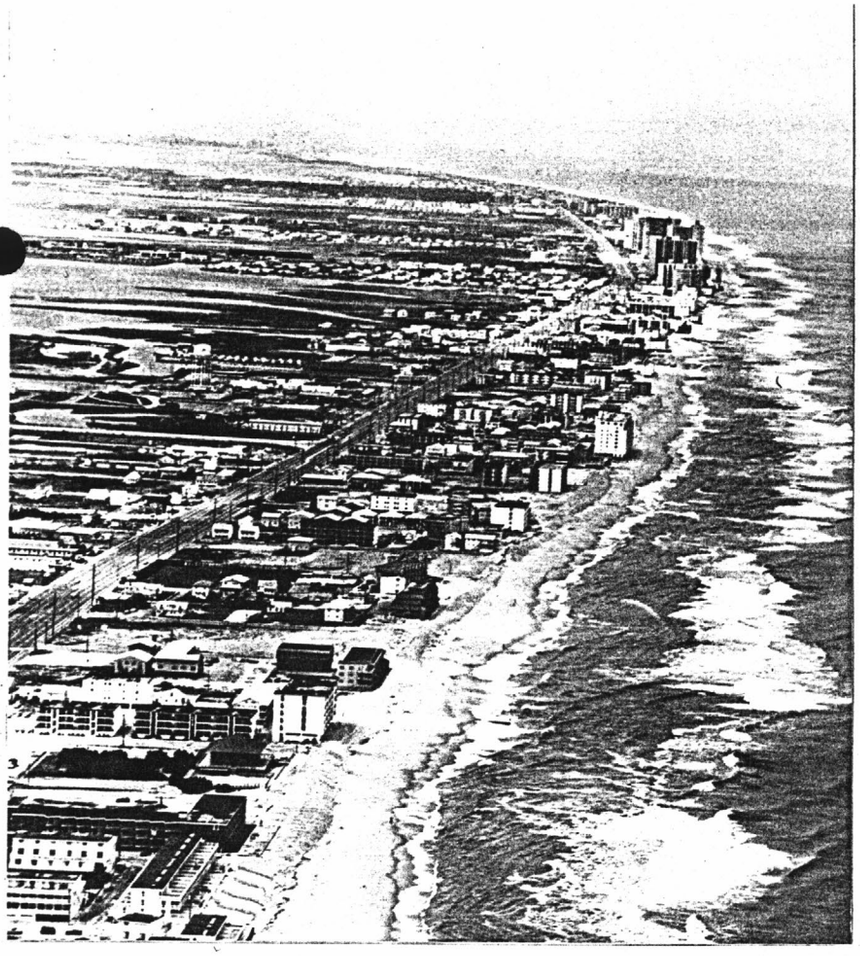
(RUSSELL, I. C. 783)
Rain erosion in Tertiary lake beds. Crook County, Oregon. 1903.



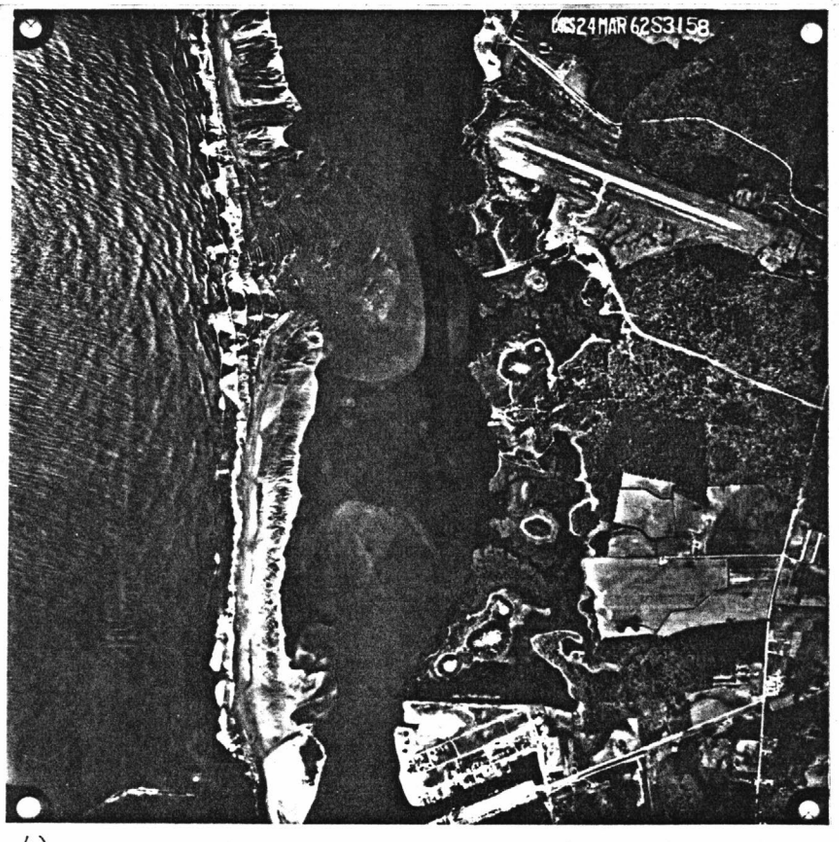
(JOHNSON. W. D. 128)
Strongly contrasted erosion types in "red beds", inner canyon of Canadian River. The difference in erosion probably has its explanation in the presence of gypsum in the foreground and not in the background. Potter County, Texas. 1897.



(DOLAN, R. 10)
Vertical aerial photo taken one week following the Great Atlantic Storm of March 7. The lightly colored areas are sand deposits that were washed over Fenwick Island during the storm surge. Worcester County, Maryland. March 15, 1972.



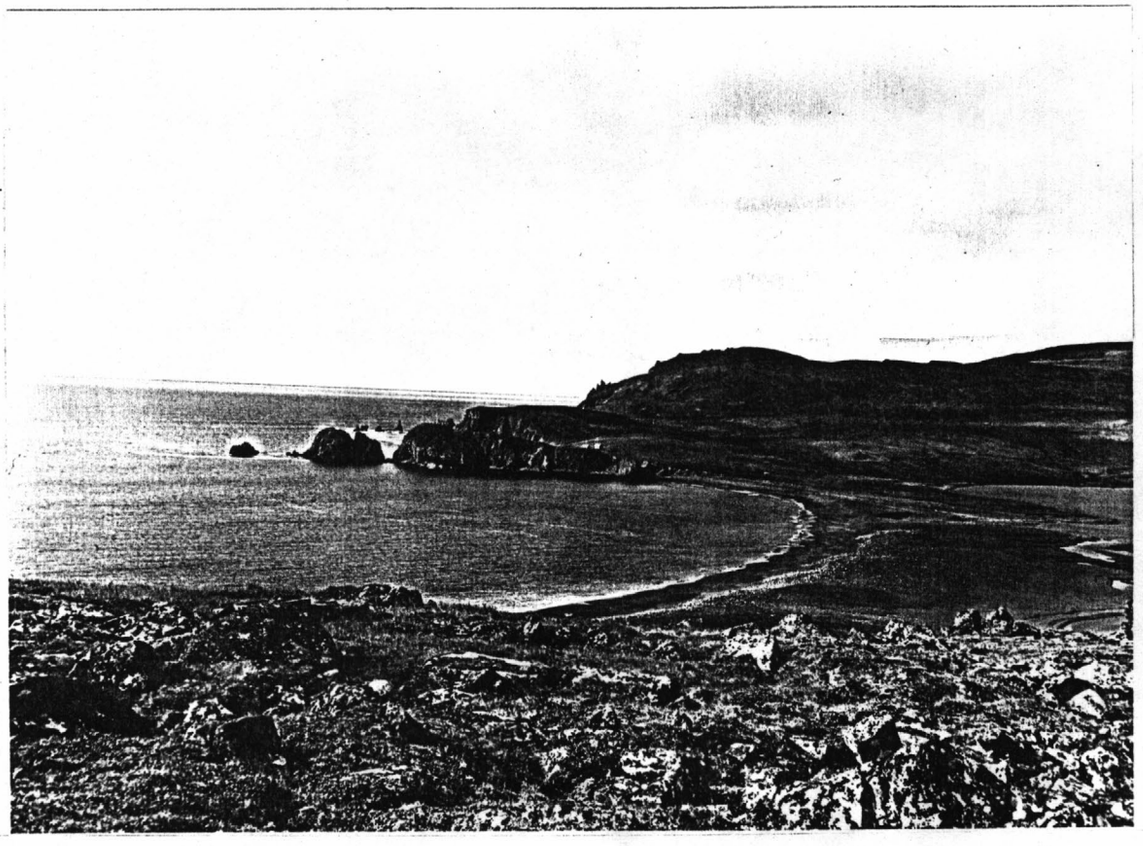
(DOLAN, R. 2)
Oblique aerial view of Ocean City. Worcester County, Maryland. 1977.



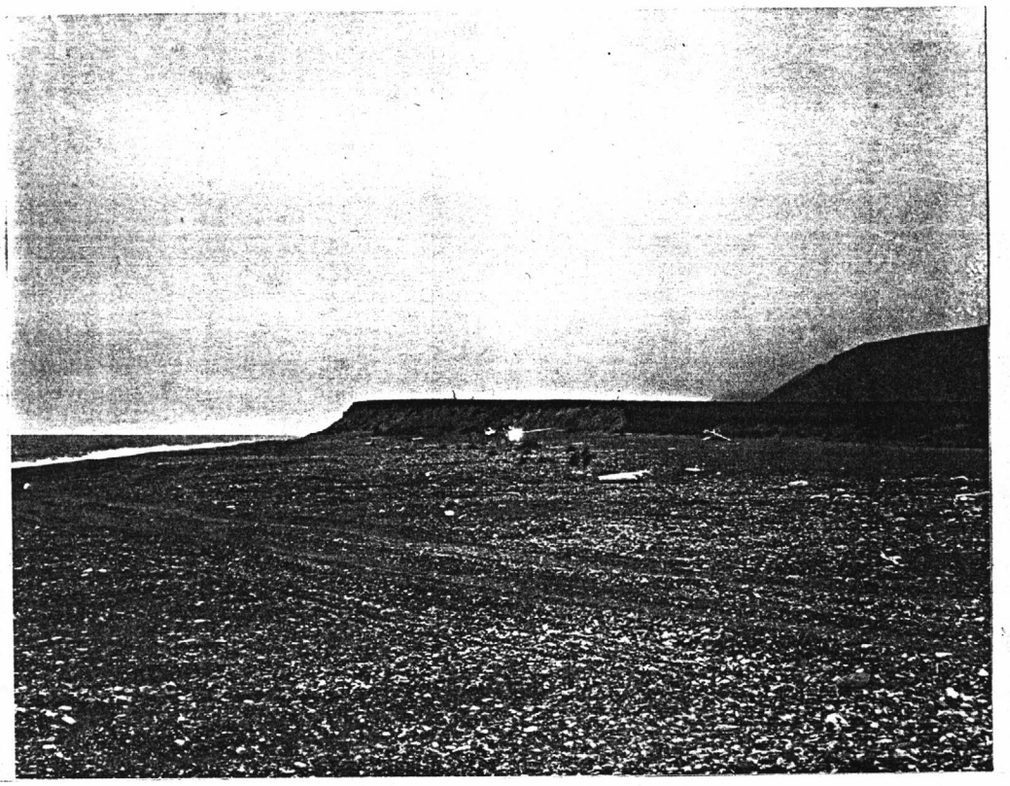
(DOLAN, R. 4)
Vertical aerial view of inlet cut through Assateague Island during the Ash Wednesday storm of March. Accomack County, Virginia. March 24, 1962.



(DOLAN, R. 13)
Oblique aerial view of hotels and development along shorefront of Ocean City. The distances between buildings and shoreline leaves little room for natural processes during storms. Worcester County, Maryland. n.d.



(ALLEN, H. B. 46)
Beach at Boxer Bay, St. Lawrence Island. Bering Sea region, Alaska. September 1948.



(MERTIE, J. B., JR. 2302)
Looking north along the ocean beach, from a point near the mouth of Salmon River. Goodnews district, Kuskokwim region, Alaska. June 29, 1937.



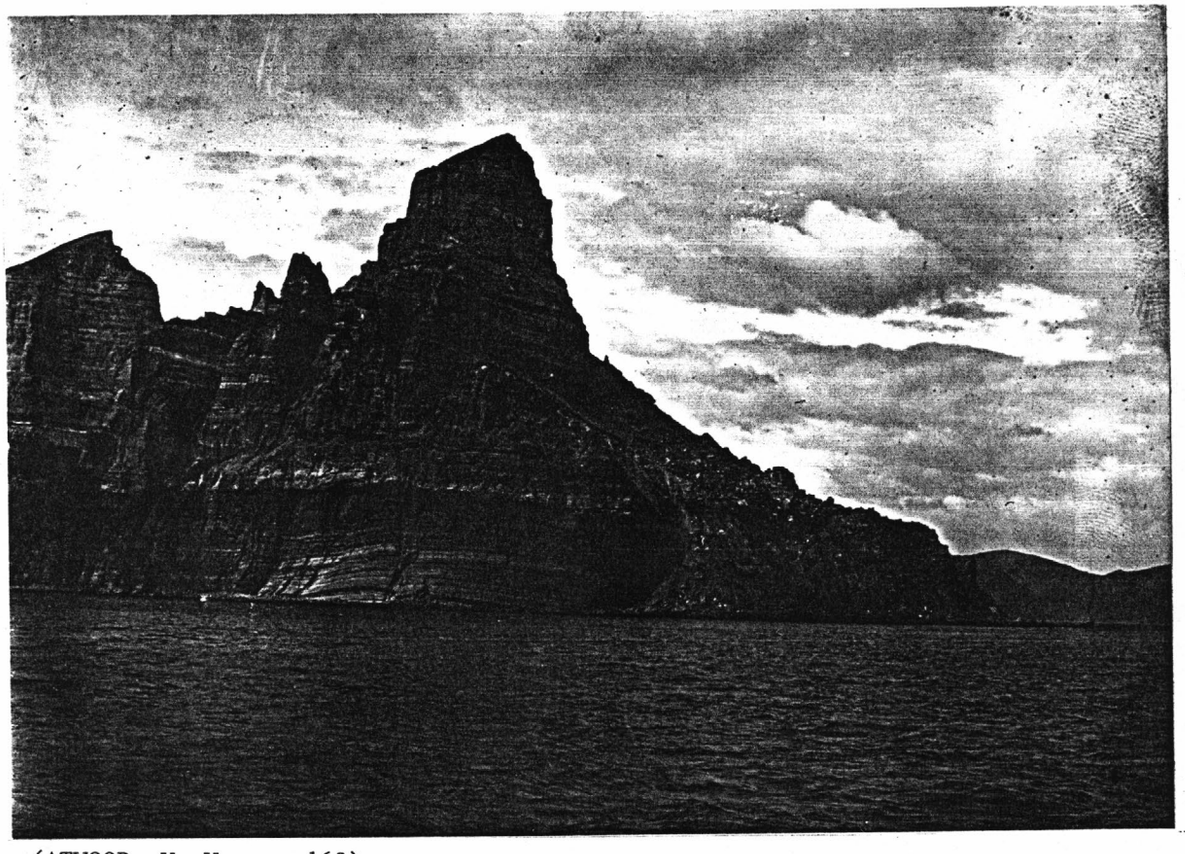
(WILLIAMS, J. R. 584)
Beach on east side of Tazlina Lake about 1 mile south of mouth of Tokaina Creek on alluvial fan of Tokaina Creek. Klutina district, Copper River region, Alaska. July 13, 1952.



(WILLIAMS, J. R. 648)
Beach typical of the driftwood-clogged beaches on north shore of Tazlina Lake between Nelchina river delta (source of logs) and lake outlet. Klutina district, Copper River region, Alaska. July 27, 1952.



(STANTON, T. W. 4)
Alternating thin-bedded sandstones and shales in lower part of Horsetown beds. Shasta County, California. July 20, 1900.



(ATWOOD, W. W. 163)
Near view of bedding at Castle Cape. Chignik district, Southwestern Alaska region, Alaska. n.d.



(RUSSELL, I. C. 840)
Cliff of Niagara limestone. Delta County, Michigan. 1904.
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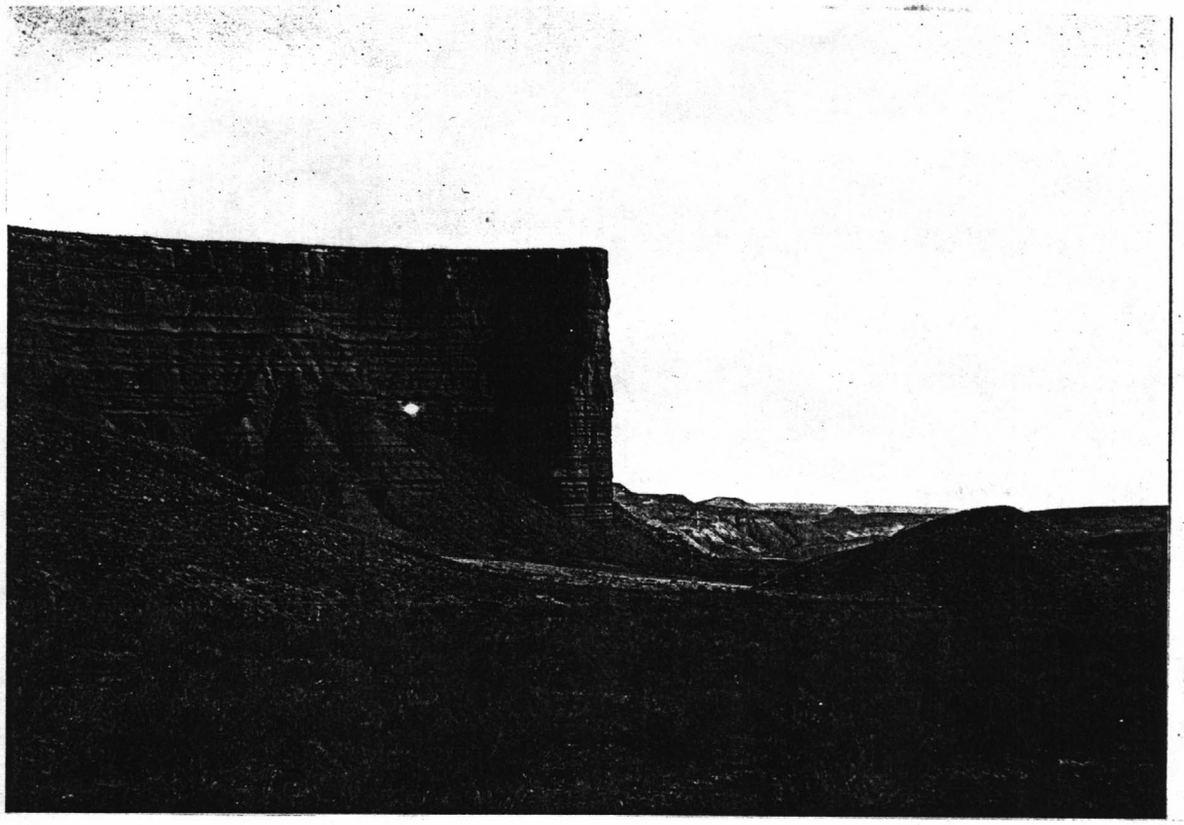
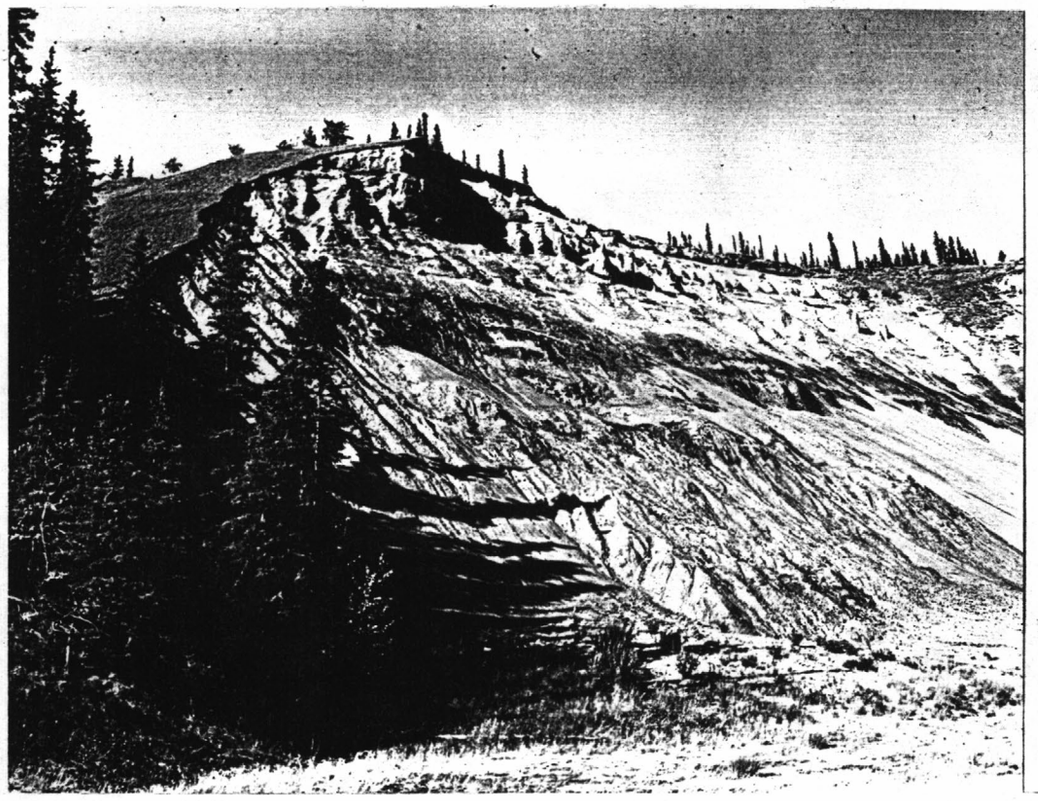
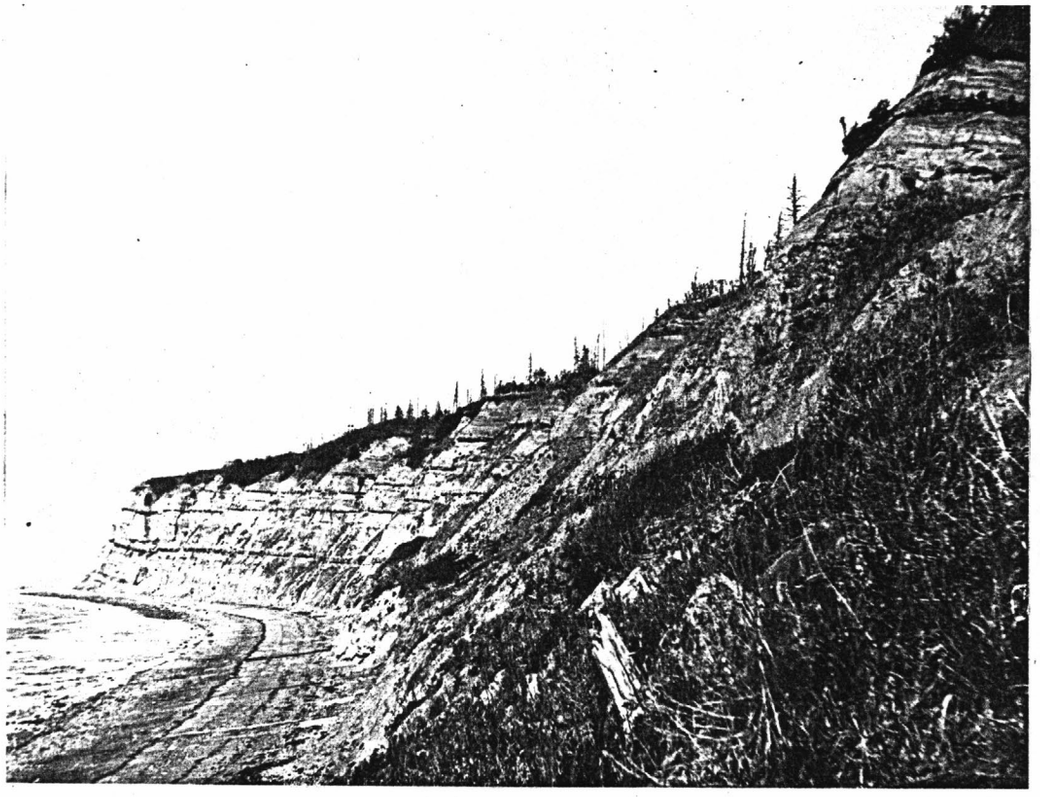


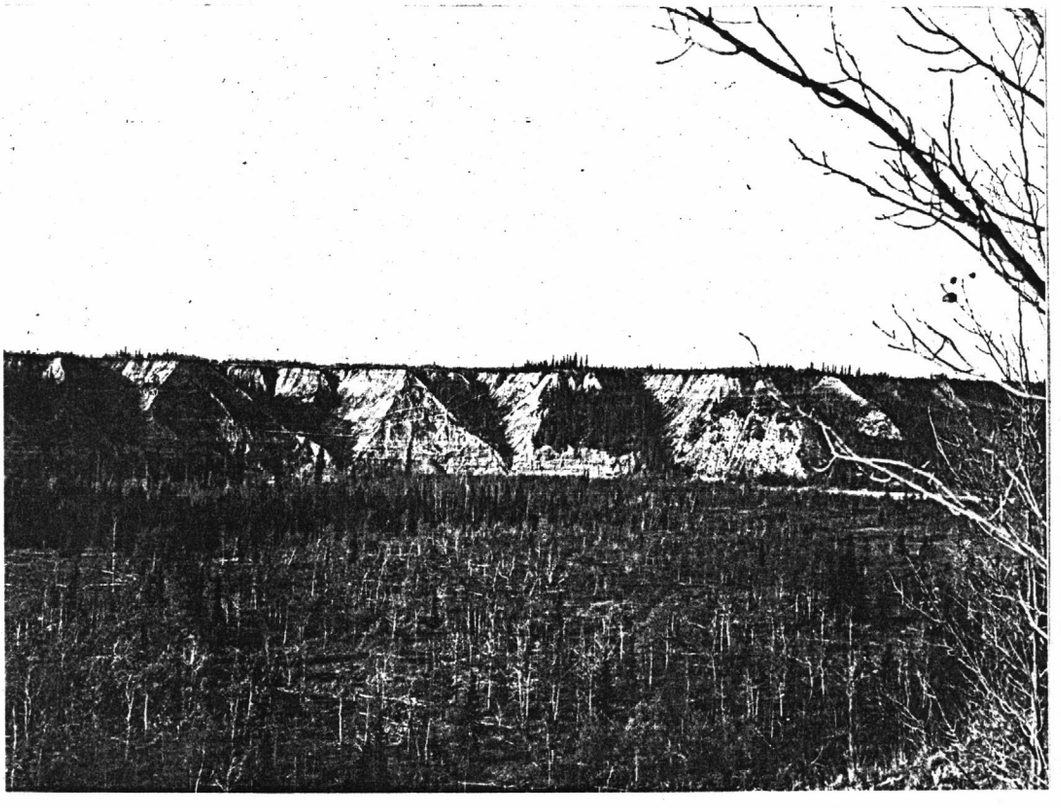
(FISHER, C. A. 3)
Chugwater Red beds weathering into a perpendicular wall, looking east near Shell. Big Horn County, Wyoming. n.d.



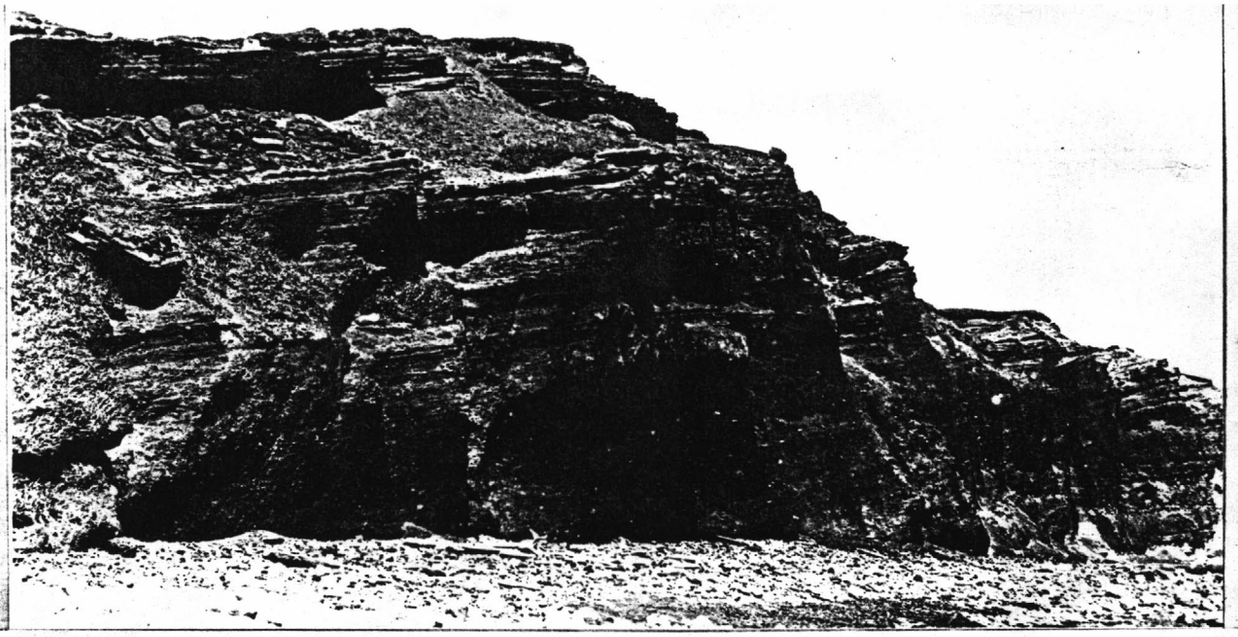
(NICHOLS, D. R. 461)
Klawasi River bluff half mile above mouth. Materials are composed of cliff head dune sand over gravel, 80 feet of till and fine outwash and till. Sanford district, Copper River region, Alaska. September 4, 1955.



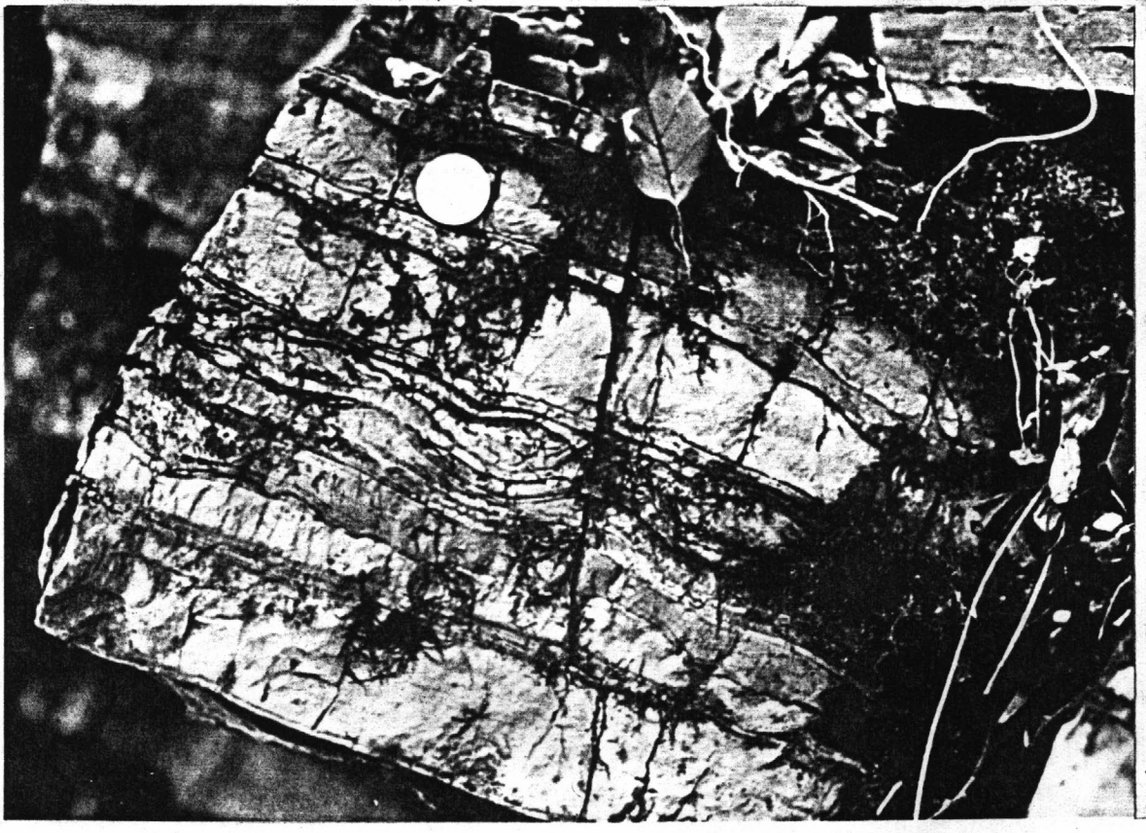
(STANTON, T. W. 162)
Coal-bearing cliffs, Bluff Point, near Homer. Seldovia district, Cook Inlet region, Alaska. n.d.



(CHAPIN, T. 230)
Tazlina River silt bluffs, near Moose Creek. Klutina district, Copper River region, Alaska. 1914.



(BARTH, T. F. W. 3)
Black bluffs, east of the village, Saint Paul Island. Pribilof district, Bering Sea region, Alaska. n.d.



(LASH, G. G. 14)
Sedimentary boudinage in ribbon limestone of the Onyx Cave Member, Virginville Formation. Exposure located approximately 3 km north of Kutztown. Berks County, Pennsylvania. ca. 1983.

BOUDINAGE - BRAIDED STREAMS

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(BERGENDAHL, M. H. 4)
Boudinage structure in banded gneiss, Tenmile Range. Felsic material between ends of boudins is very coarse grained. Summit County, Colorado. ca. 1963.
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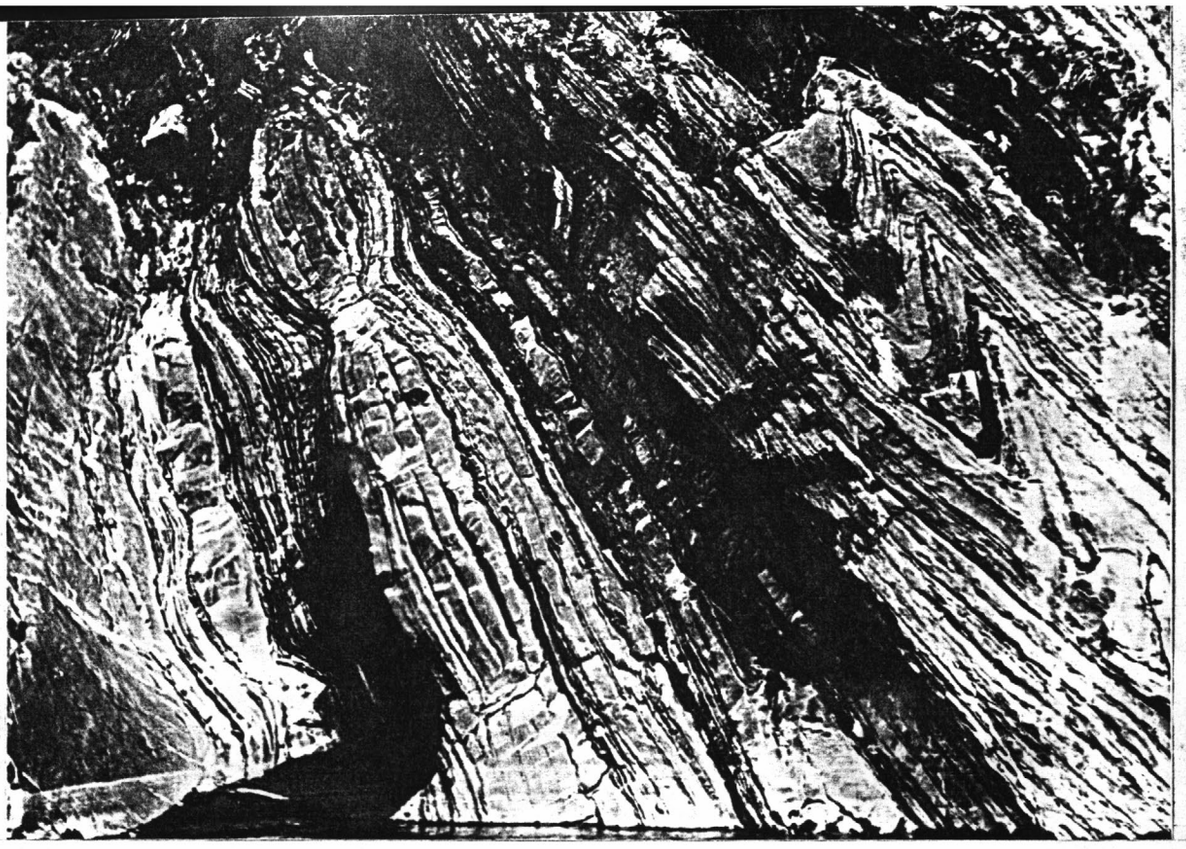
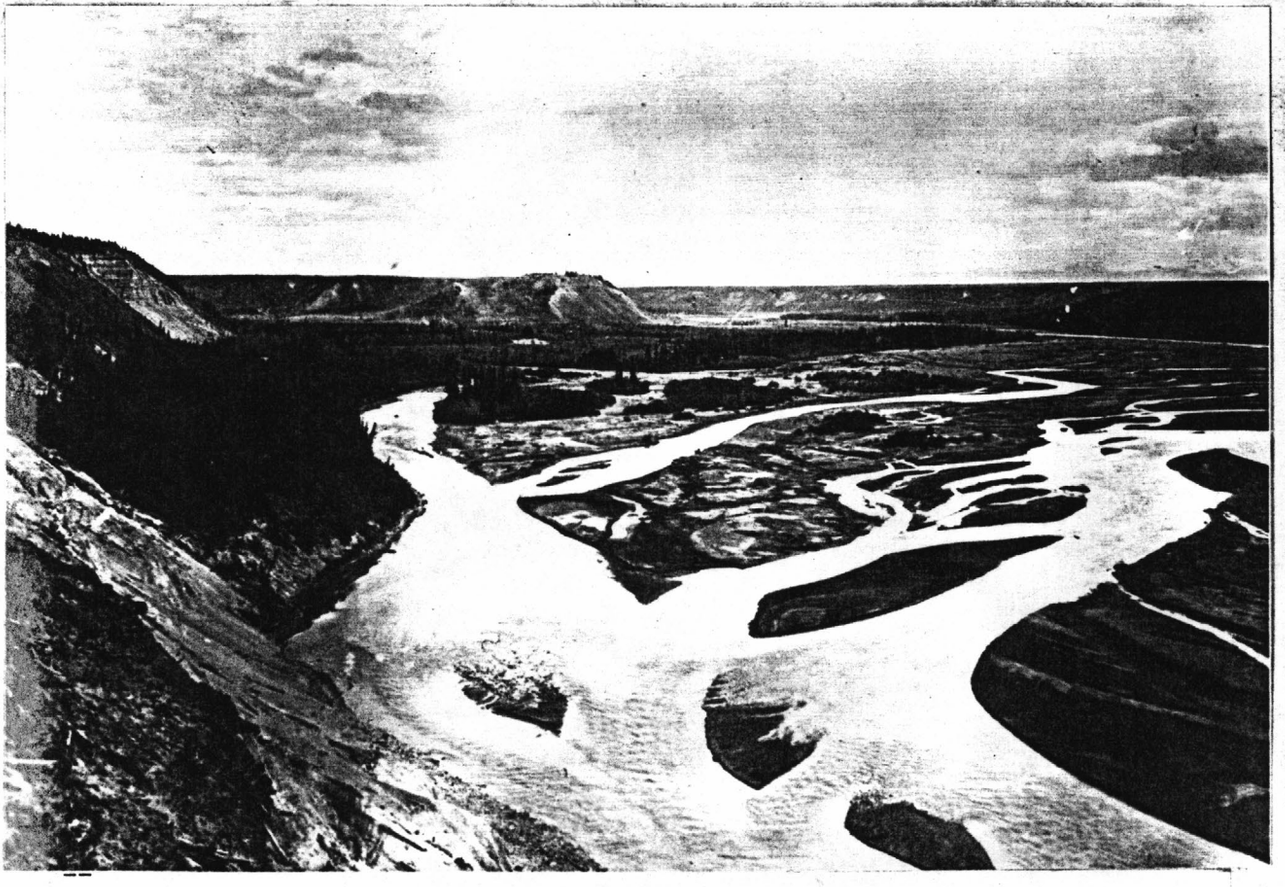
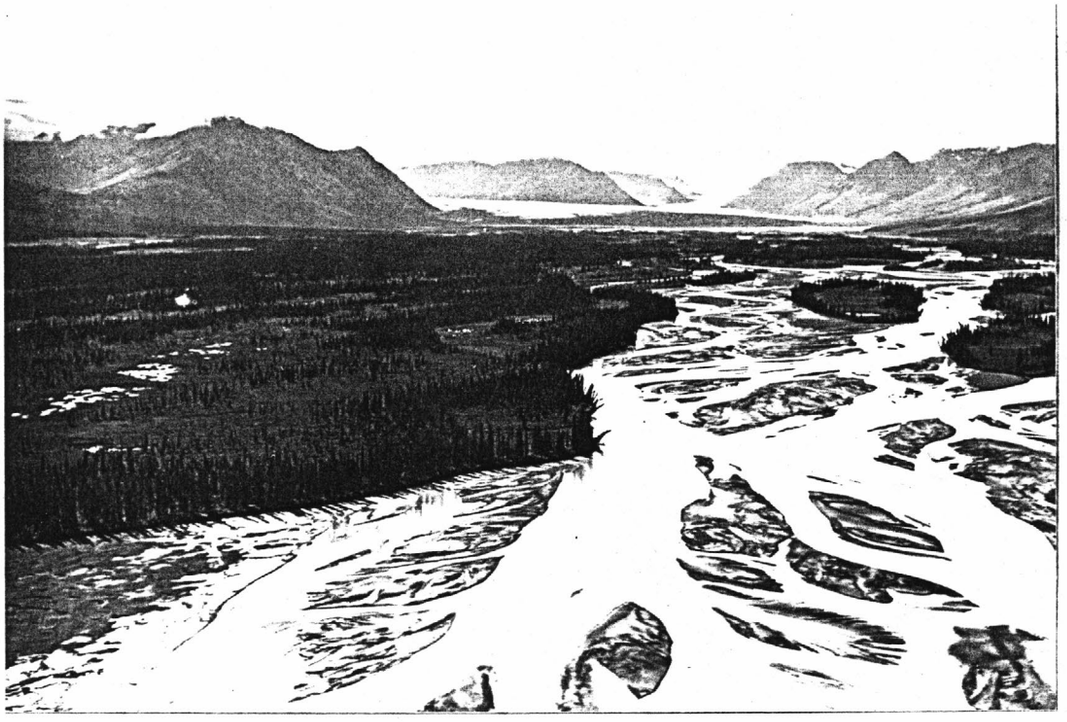


(SEGERSTROM, K. 668)
Boudinage and chevron folds in the El Doctor limestone, along the Rio Extorax between Bucareli and Las Medias. Queretaro, Mexico. ca. 1956.



(MENDENHALL, W. C. 395)
Braided streams, junction of Gakona River and Copper River, 1 mile below Gakona ford. Gulkana district, Copper River Region, Alaska. n.d.



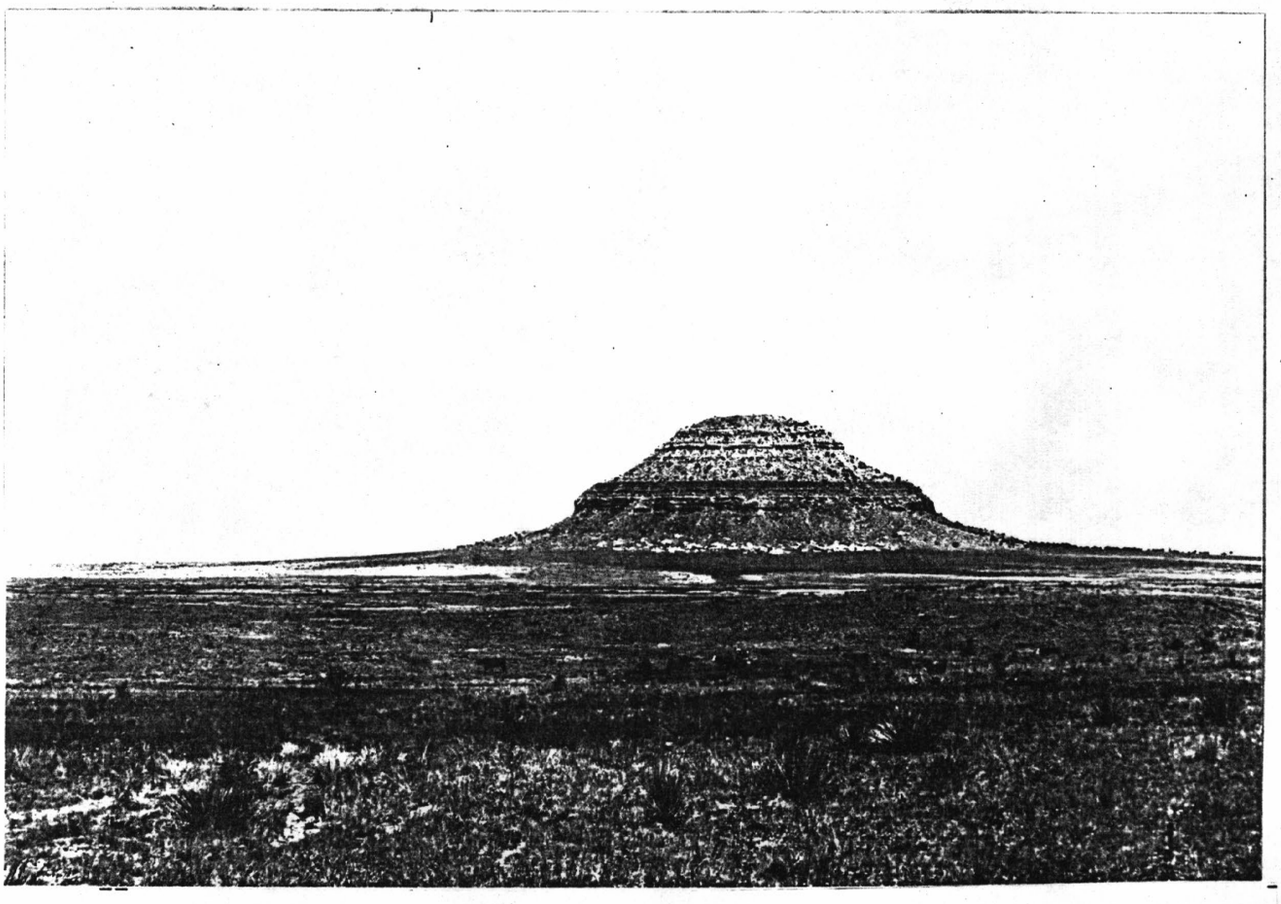
(WILLIAMS, J. R. 700)
Braided channels of Nelchina River taken at a point over mouth of Eureka Creek, looking south to Nelchina Glacier. Klutina district, Copper River region, Alaska. n.d.



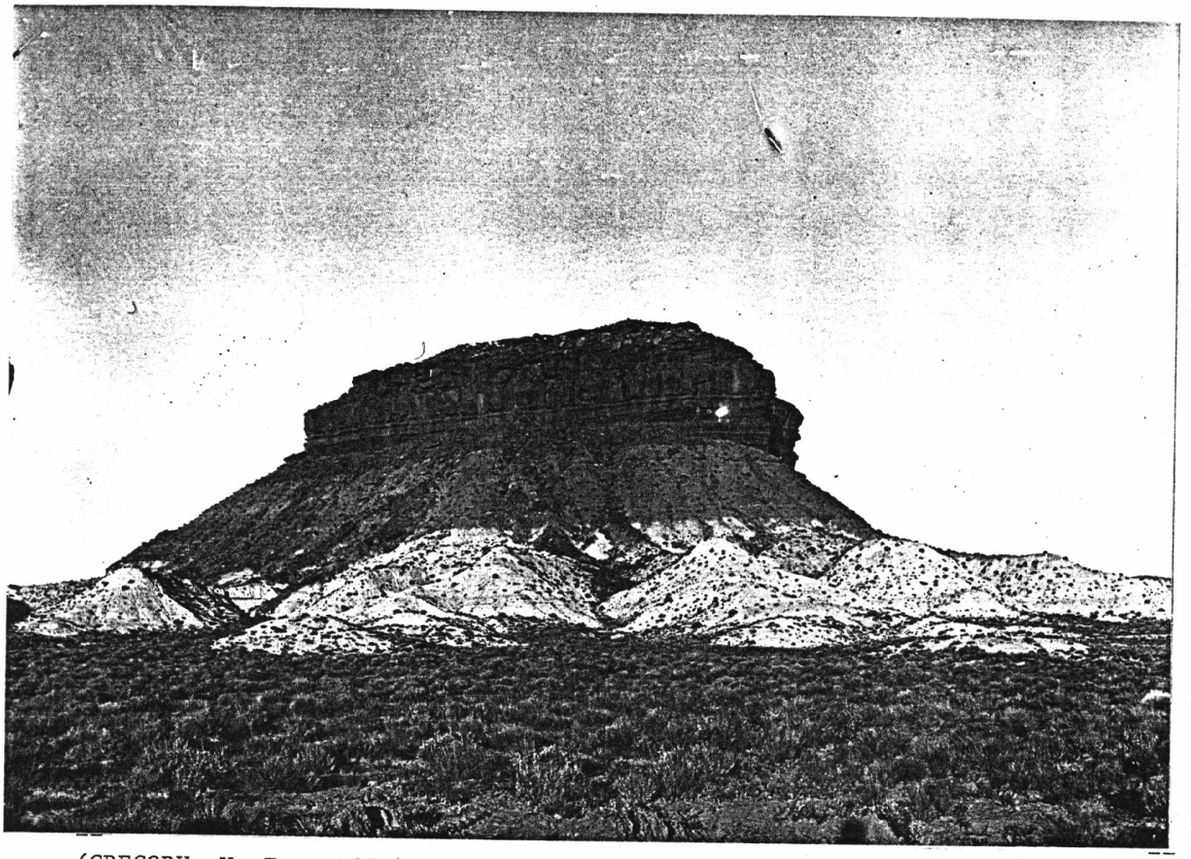
(WILLIAMS, J. R. 1056)
Aerial view south from Nelchina River up valley to glacier. Copper River region, Alaska. n.d.



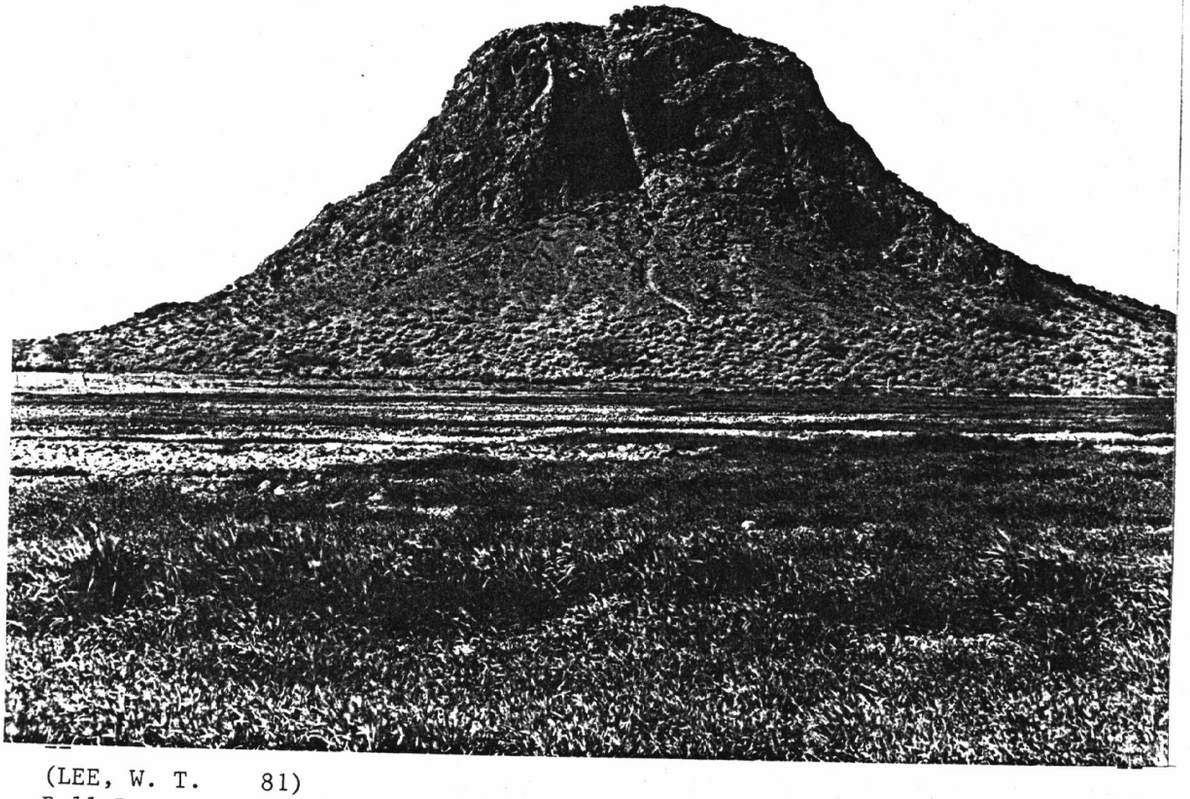
(PEWE, T. L. 849)
High altitude oblique aerial photograph of braided drainage pattern near the junction of the Yukon and Koyukuk Rivers. The Koyukuk River (dark color) joins the silt-laden Yukon River (light color) at the right. Yukon Region, Alaska. August 24, 1941.



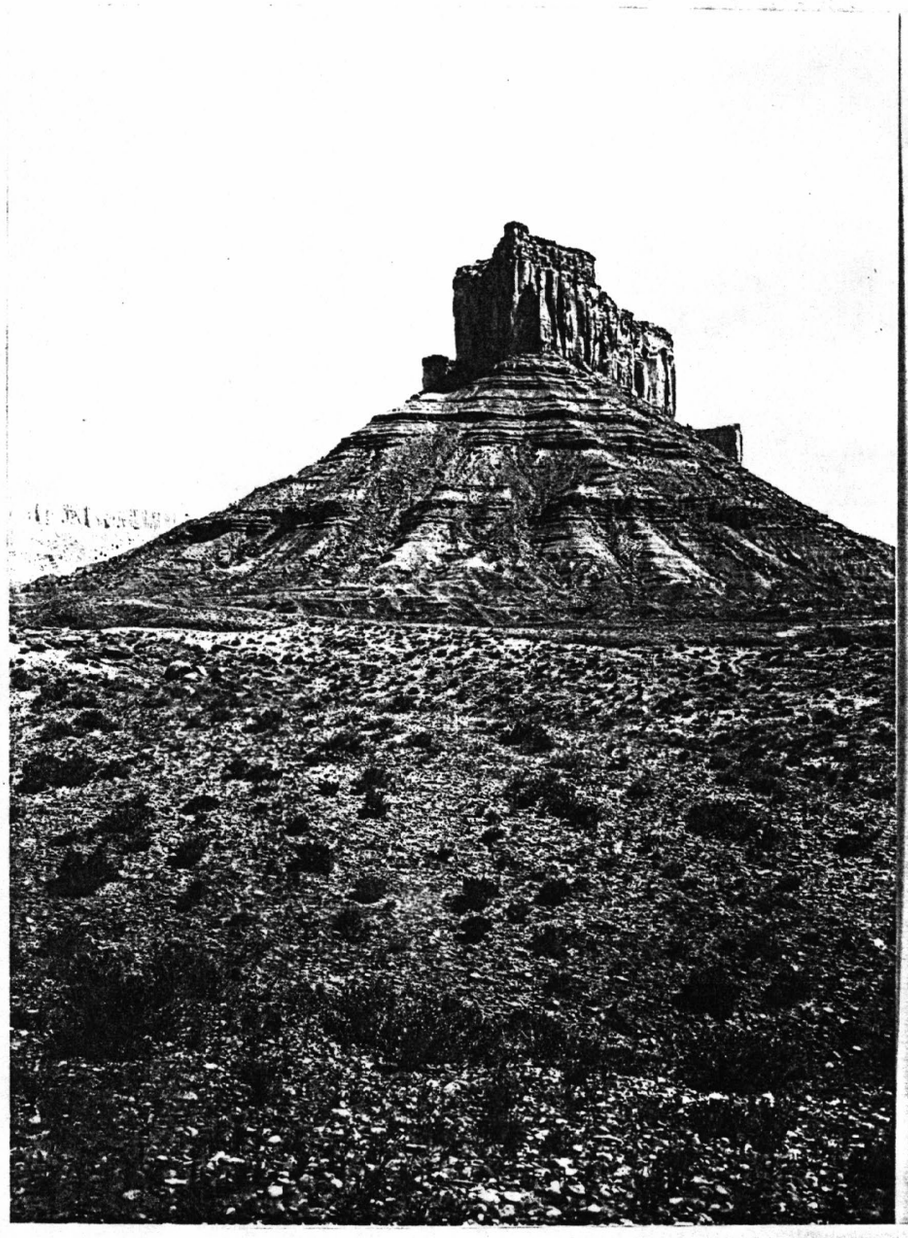
(LEE, W. T. 17)
Bell Butte, near Bell ranch. San Miguel County, New Mexico. n.d.



(GREGORY, H. E. 975)
Cowboy Butte about 2 miles north of Fredonia. Shnabkaib member of Moenkopi formation at base and Shinarump formation. Coconino County, Arizona. 1939.



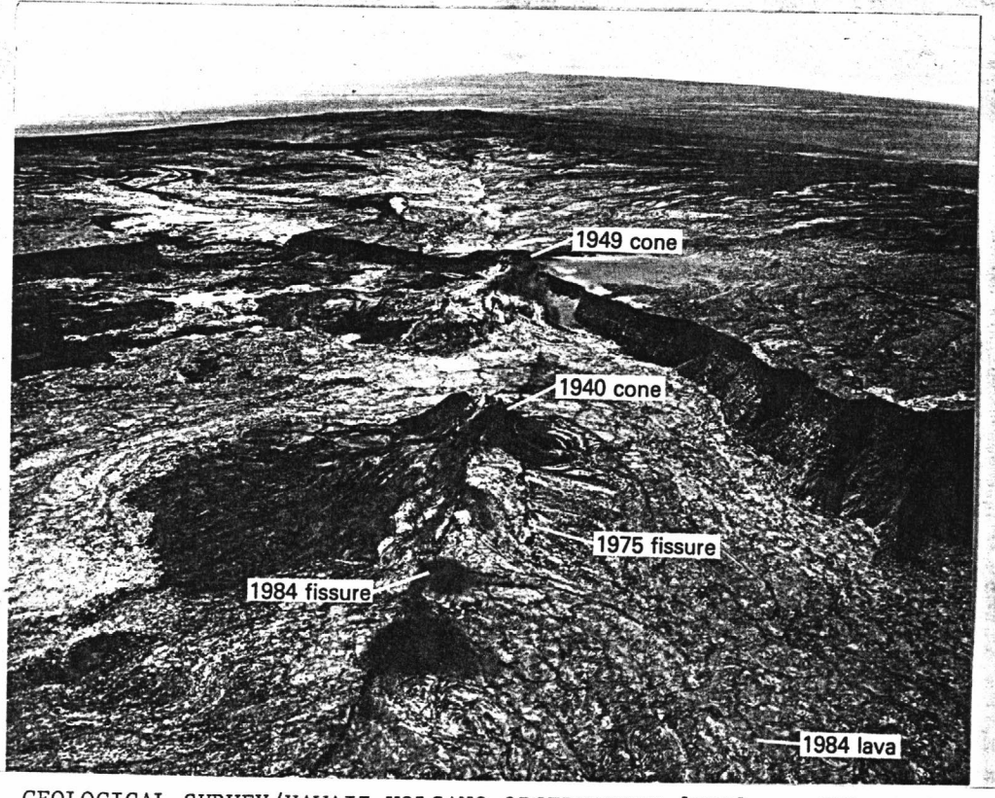
(LEE, W. T. 81)
Bell Butte southwest of Tempe. Maricopa County, Arizona. ca. 1902.



(CROSS, W. 805)
Hill capped by Vermilion Cliff sandstone between Castle and Professor valleys ...above Moab. The lower beds represent the lower portion of the Dolores formation and Permian beds, Grand County, Utah. June 24, 1905.



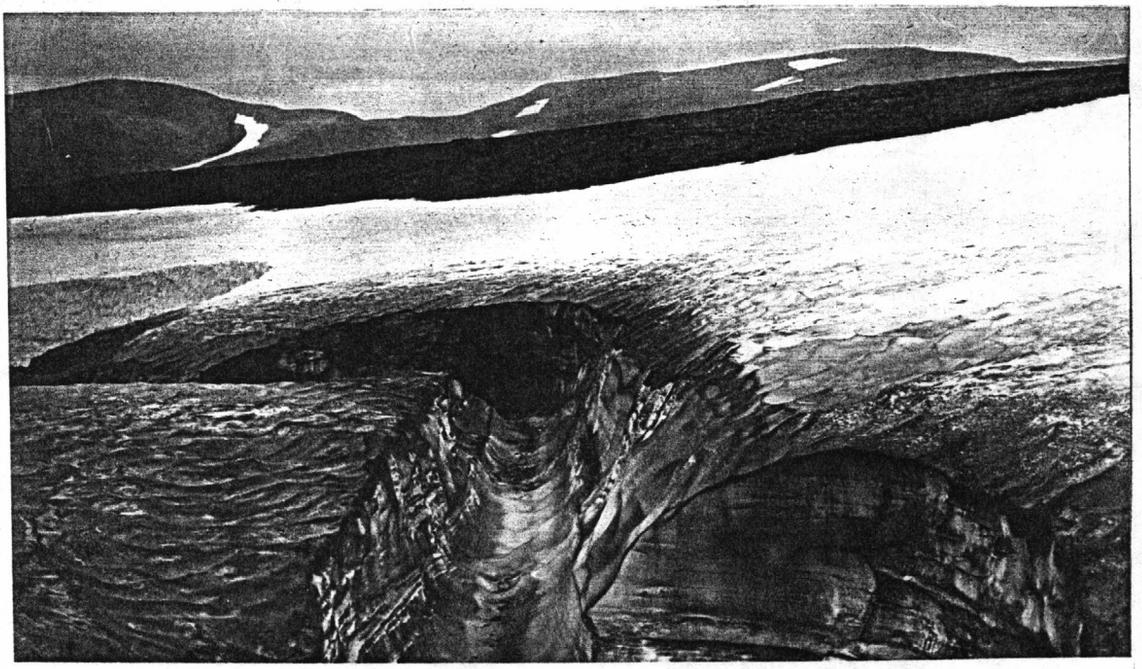
(U. S. GEOLOGICAL SURVEY 332)
Summit caldera and pit craters, Mauna Loa Volcano. Hawaii Volcanoes National Park. Hawaii County, Hawaii. n.d.



(U. S. GEOLOGICAL SURVEY/HAWAII VOLCANO OBSERVATORY [HVO] 77)
Oblique aerial view looking southwest, of 1984 eruptive fissure at southwest edge of Mokuaweoweo. Reflective pahoehoe flows on caldera floor and down upper southwest rift were all erupted on March 25. Hawaii Volcanoes National Park. Hawaii County, Hawaii. ca. 1984. (Photo by F. R. Warshauer)



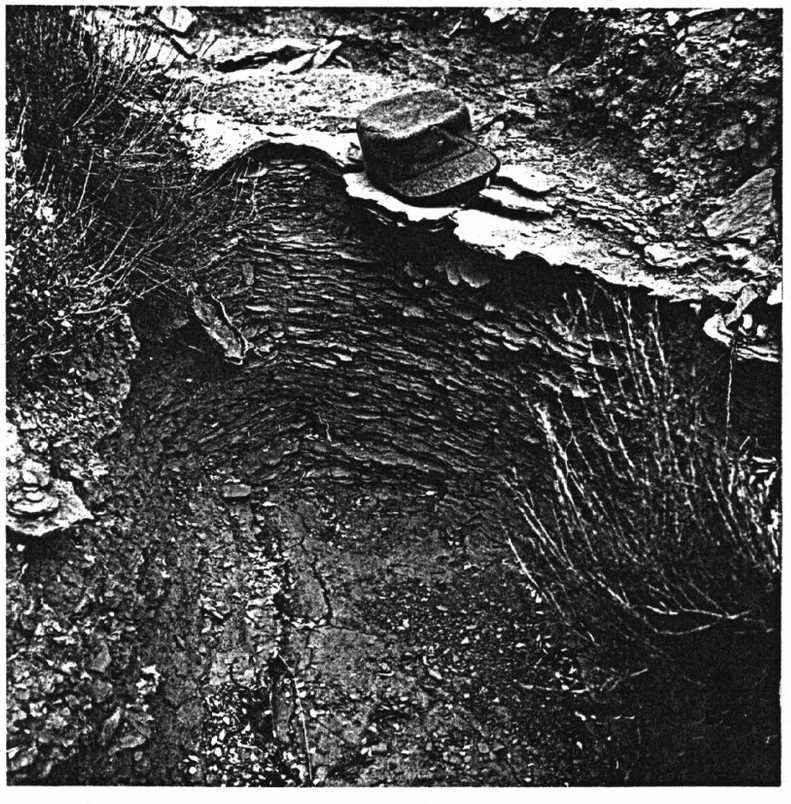
(U. S. GEOLOGICAL SURVEY/HVO 219)
Oblique aerial photograph of Kilauea caldera, looking north. Hawaii Volcanoes National Park. Hawaii County, Hawaii. November 1,1954.



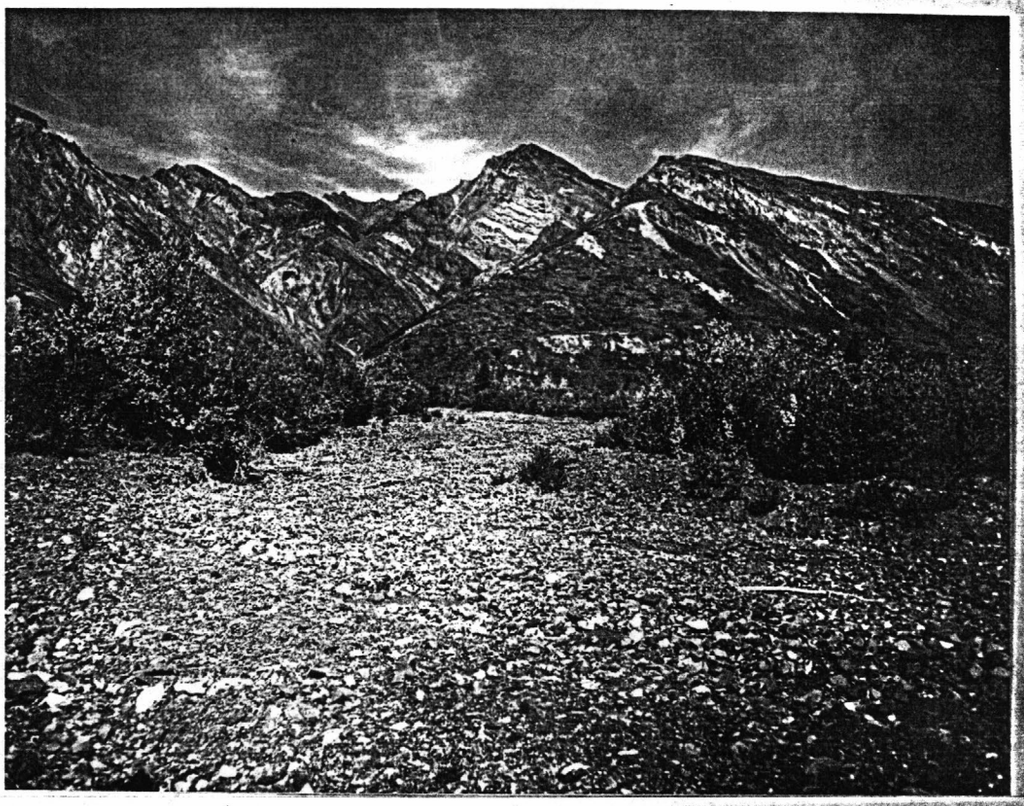
(EAKIN, H. M. 308)
Abandoned ice-marginal channel through snow bank. York district, Seward Peninsula region, Alaska. n.d.



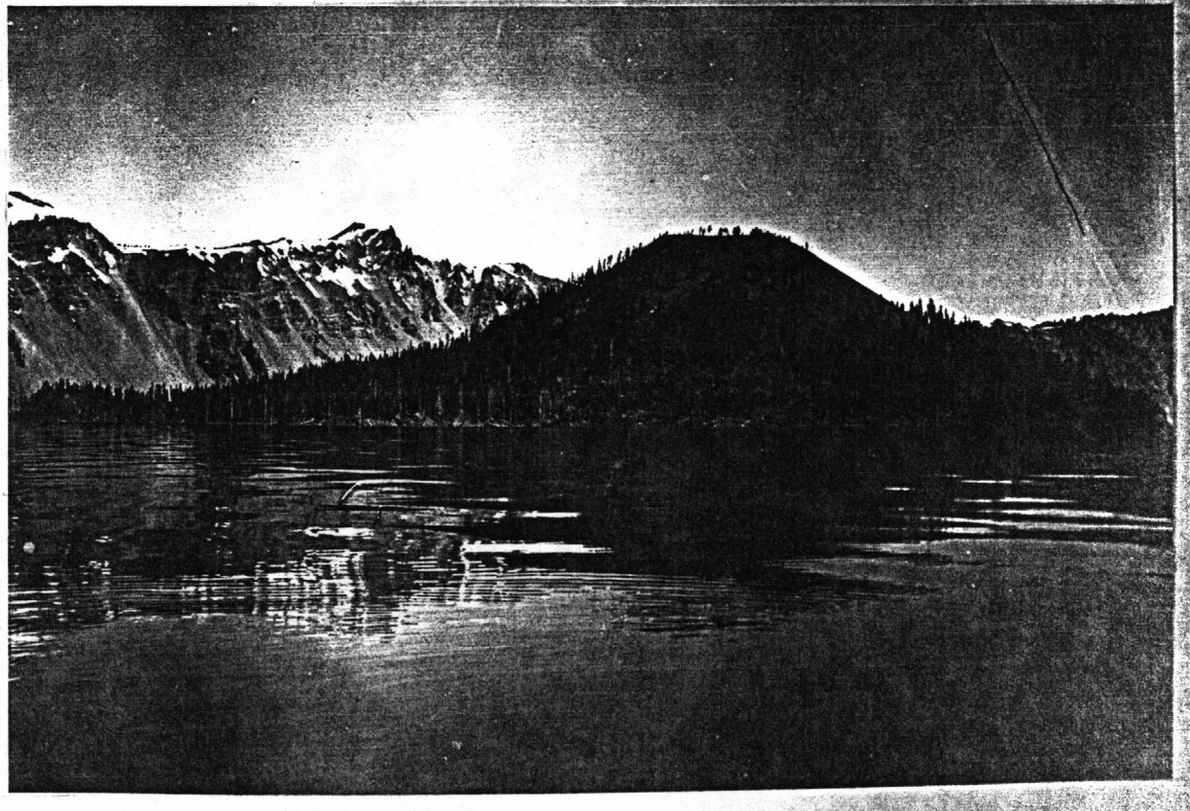
(MALDE, H. E. 692)
Earthworks along Boulder Creek, an example of channelization. Boulder County, Colorado. February 20, 1972.



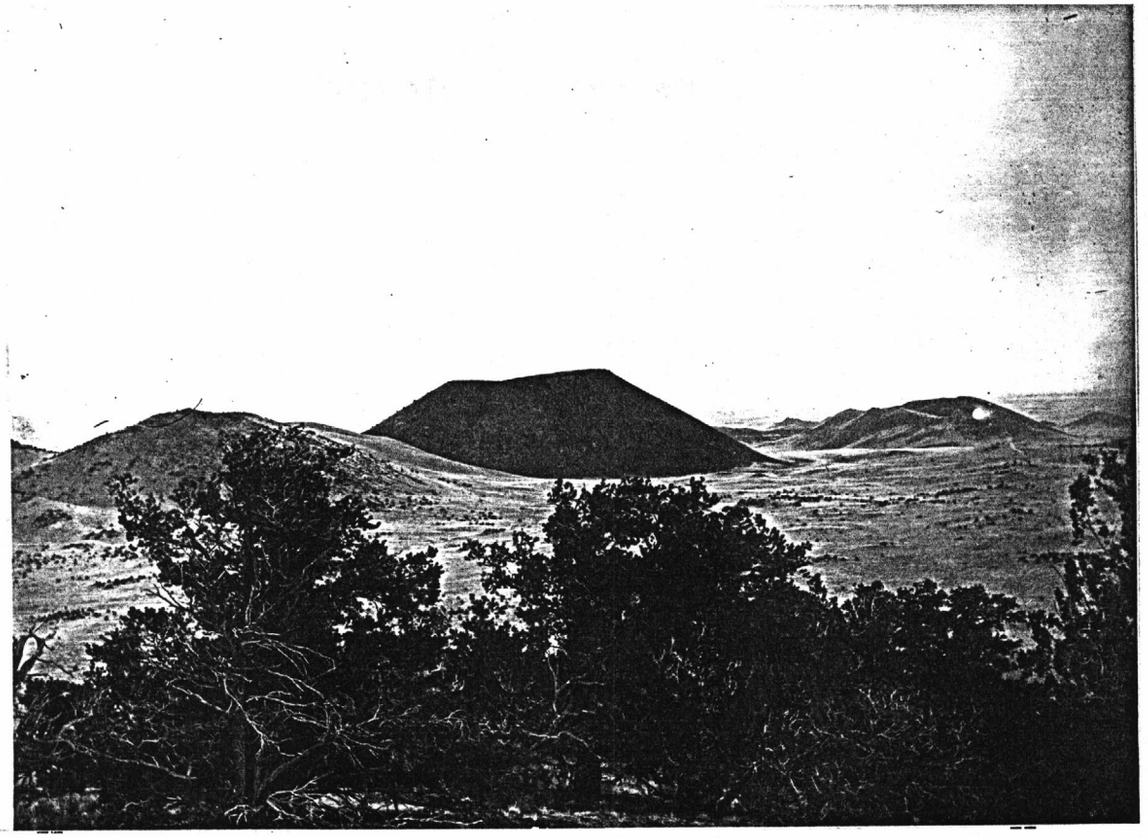
(LUSBY, G. C. 2)
Channel incised in bedrock. Hat for scale. Delta County, Colorado. ca. 1964.



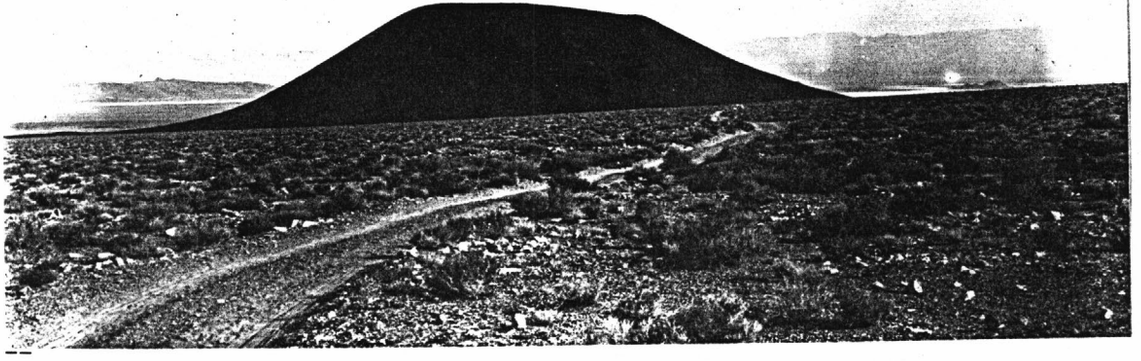
(WILLIAMS, J. H. 1287)
Dry channel of Ivy Wash, Creek flows underground on fan, emerges at break in slope where canyon is cut, leading to East Fork Matanuska River. Alaska. August 29, 1954.



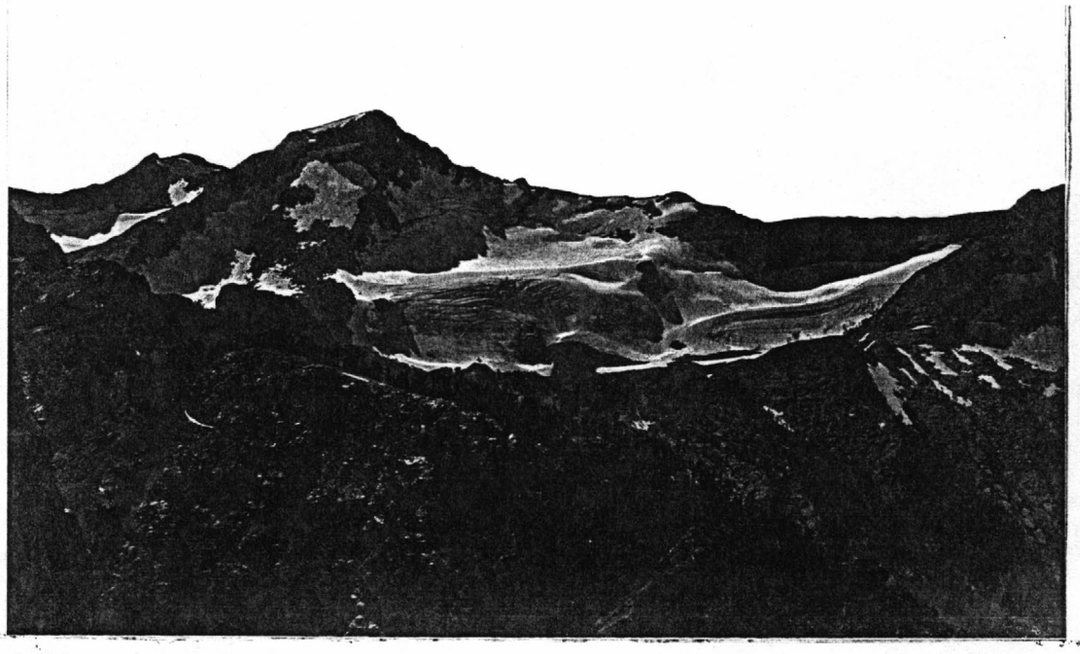
(DILLER, J. S. 473)
Cinder cone of Wizard Island from lake. Crater Lake National Park, Klamath County, Oregon. n.d.



(GILBERT, G. K. 829)
Cinder cone, San Francisco Plateau. Coconino County, Arizona. 1891.



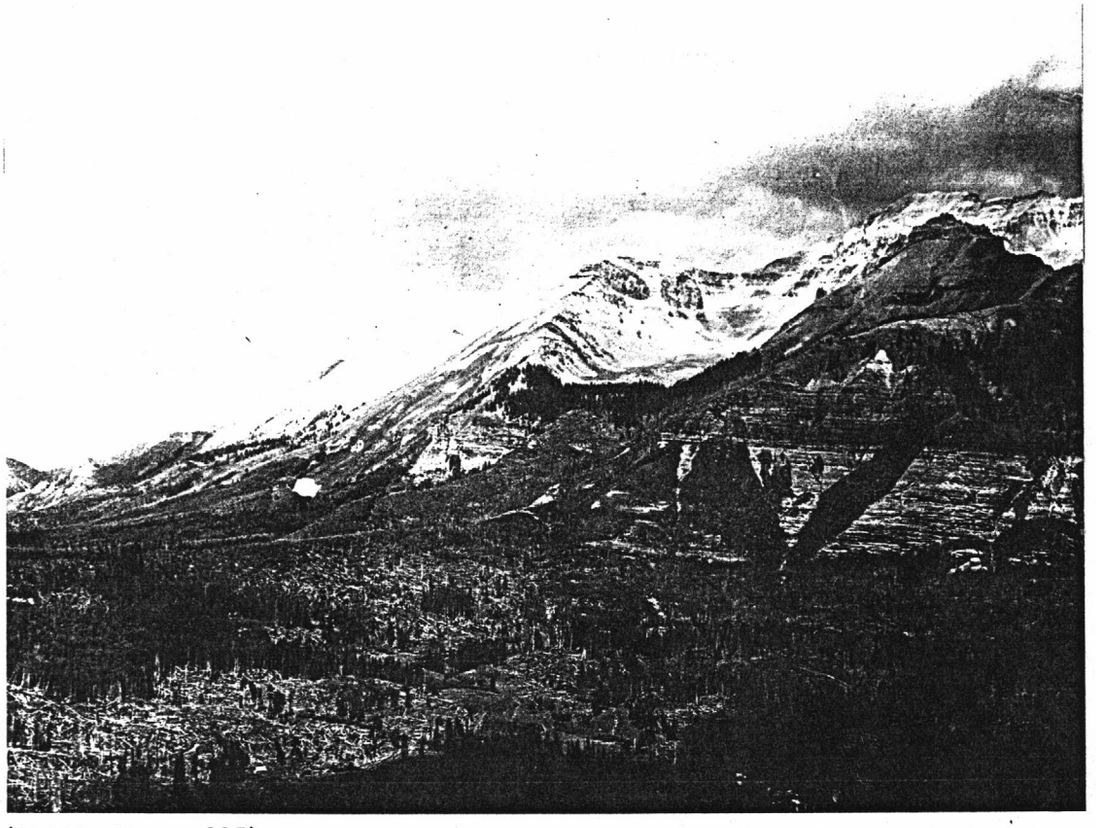
(TURNER, H. W. 67)
Cinder cone in Clayton Valley. Esmeralda County, Nevada. 1899.



(WALCOTT, C. D. 675)
Cirques in vicinity of Mount MacDonald, Mission Range, as seen from ridge on north head of Swan River. Lake County, Montana. 1900.



(DARTON, N. H. 978)
Glaciated granite cirque with glacier frozen lake in foreground, basalt dike at left. Amphitheater in summit of Bighorn Mountains, just north of Cloud Peak. Big Horn County, Wyoming. 1904.



(CROSS, W. 205)
Cirque and hanging valley near White Mountain north of the San Miguel River.
Shows the cliff formed by the Telluride conglomerate and San Juan volcanic series.
San Miguel County, Colorado. 1895.
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(LOVERING, T. S. 60a)
Oblique aerial view of cirques near Berthoud Pass, looking east toward James Peak.
Grand County, Colorado. ca. 1934.
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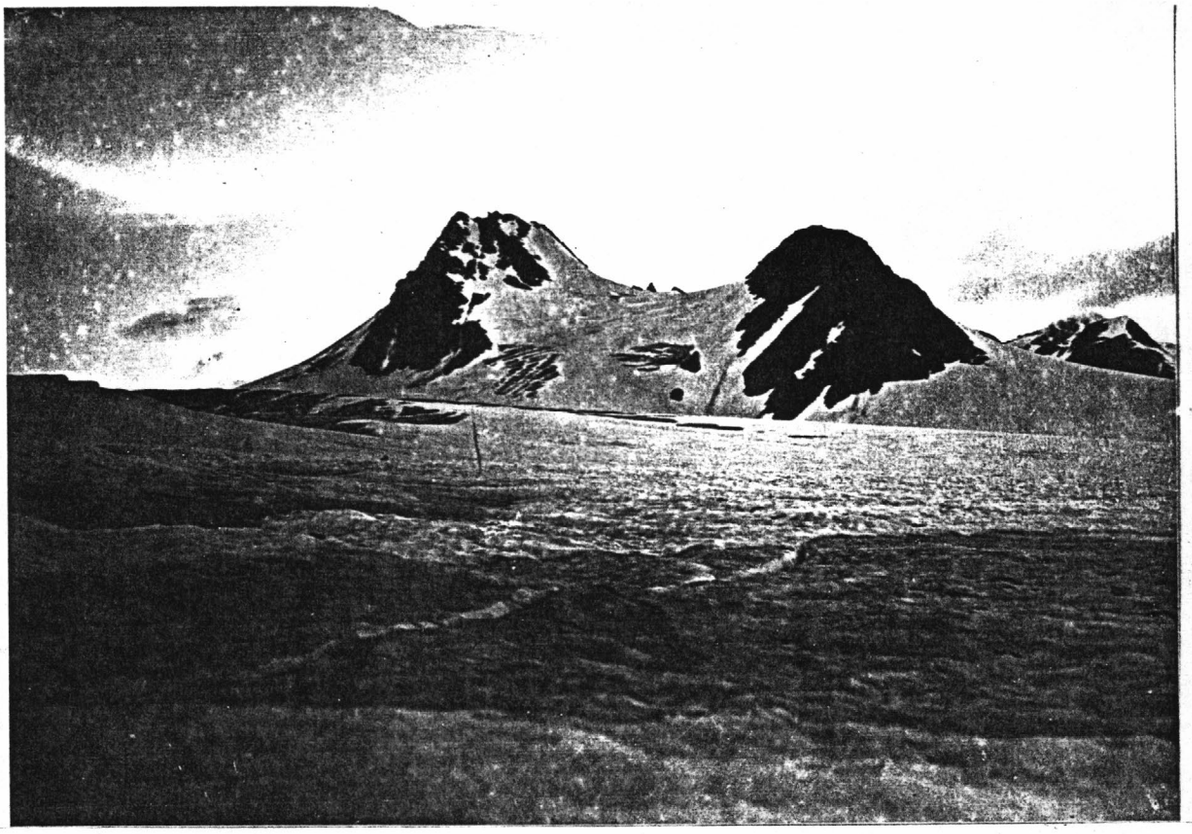
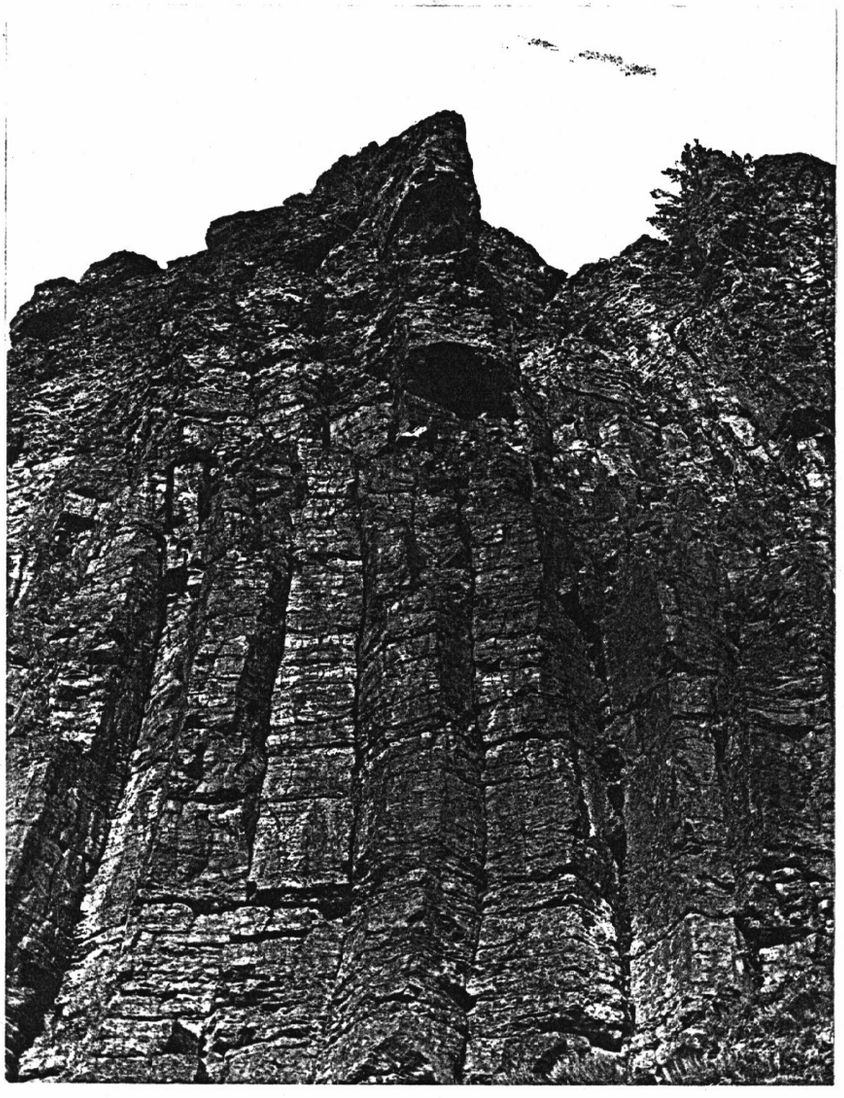


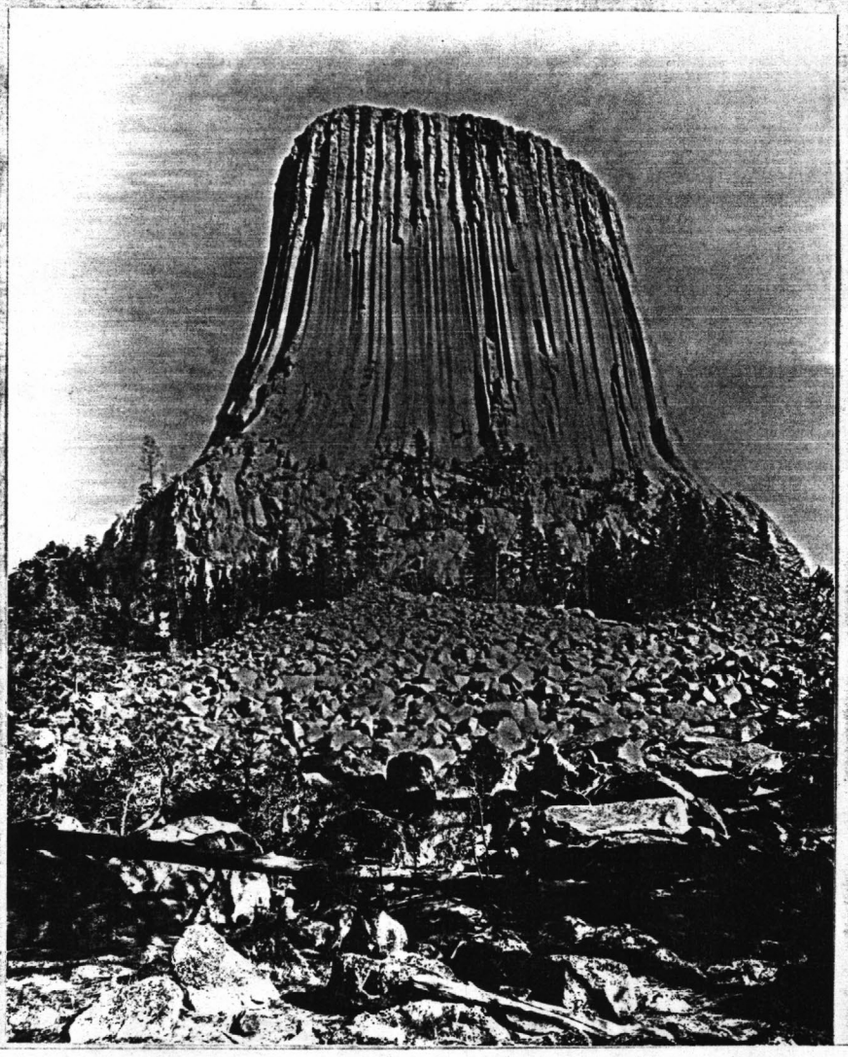
(SCHRADER, F. C. 62)
Col two miles from Valdez Summit on Klutina side of summit. Valdez Creek district, Cook Inlet region, Alaska. n.d.



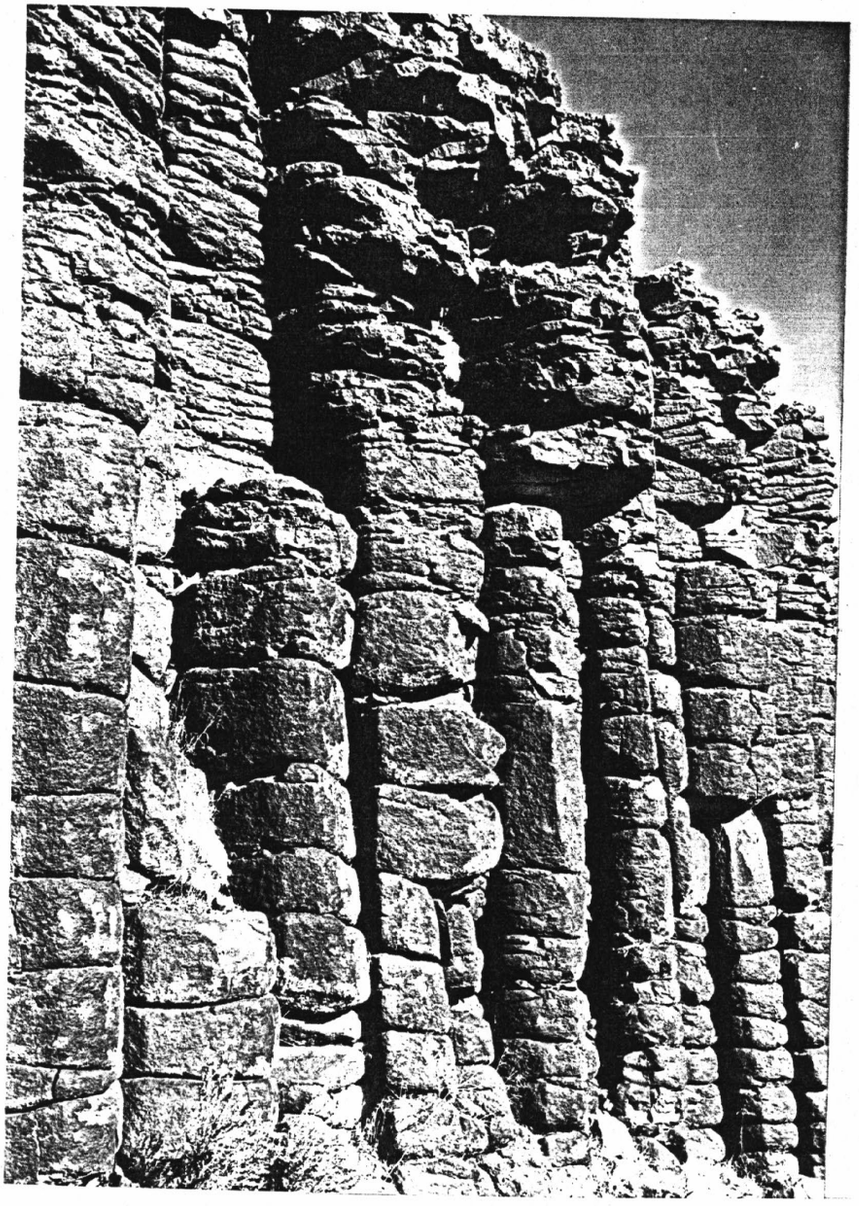
(GILBERT, G. K. 2391)
Glaciated col between Mount Huxley (right) and Mount Spencer (left). Kings Canyon National Park. Fresno County, California. 1904.



(IDDINGS, J. P. 65)
Columnar structure. Top of obsidian columns, Obsidian Cliffs. Yellowstone National Park, Wyoming. ca. 1884.



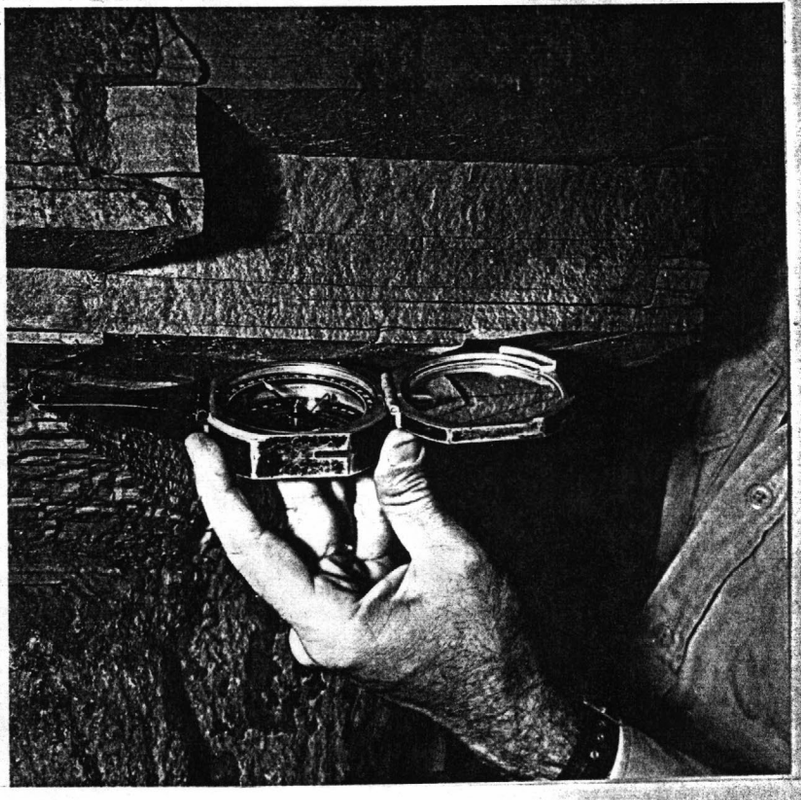
(DARTON, N. H. 739)
Devils Tower from the west, showing columns and talus. Devils Tower National Monument. Crook County, Wyoming. n.d.



(MALDE, H. E. 355)
Columnar joints in Banbury basalt (mid-Pliocene). Columns 1½ to 3 feet in diameter. NWSE sec. 14, T. 9 S., R. 14 E., 4 miles NNE of Buhl. Twin Falls County, Idaho. September 30, 1960.



(IDDINGS, J. P. 120)
Basalt columns of first Watchung flow, edge of Watchung trap sheet, O'Rourke's quarry west of Orange. Essex County, New Jersey. n.d.



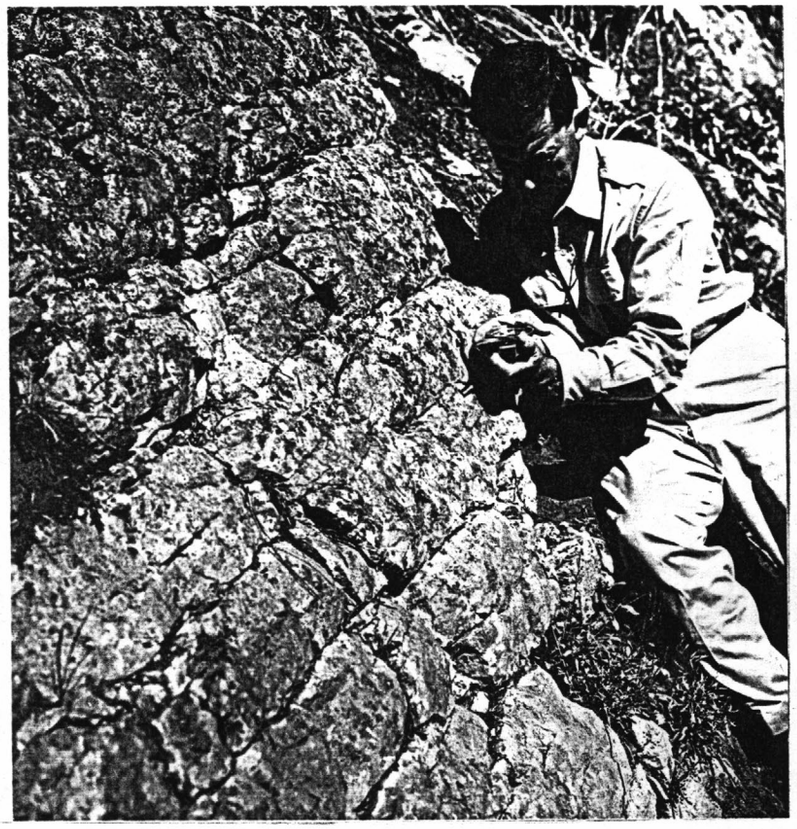
(STACY, J. R. 404)
Measuring strike at base of sandstone bed in Chinle formation. Colfax County, New Mexico. August 1958.



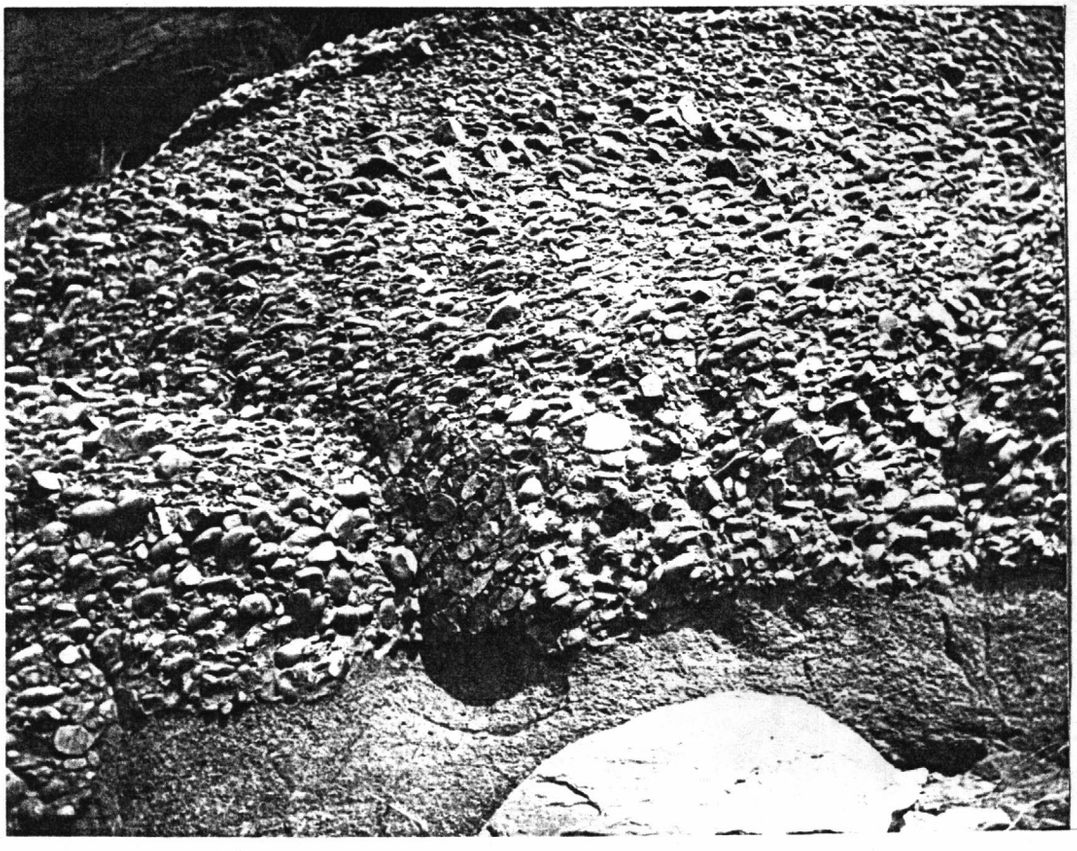
(STACY, J. R. 403)
Measuring dip at base of sandstone bed in Chinle formation. Colfax County, New Mexico. August 1958.



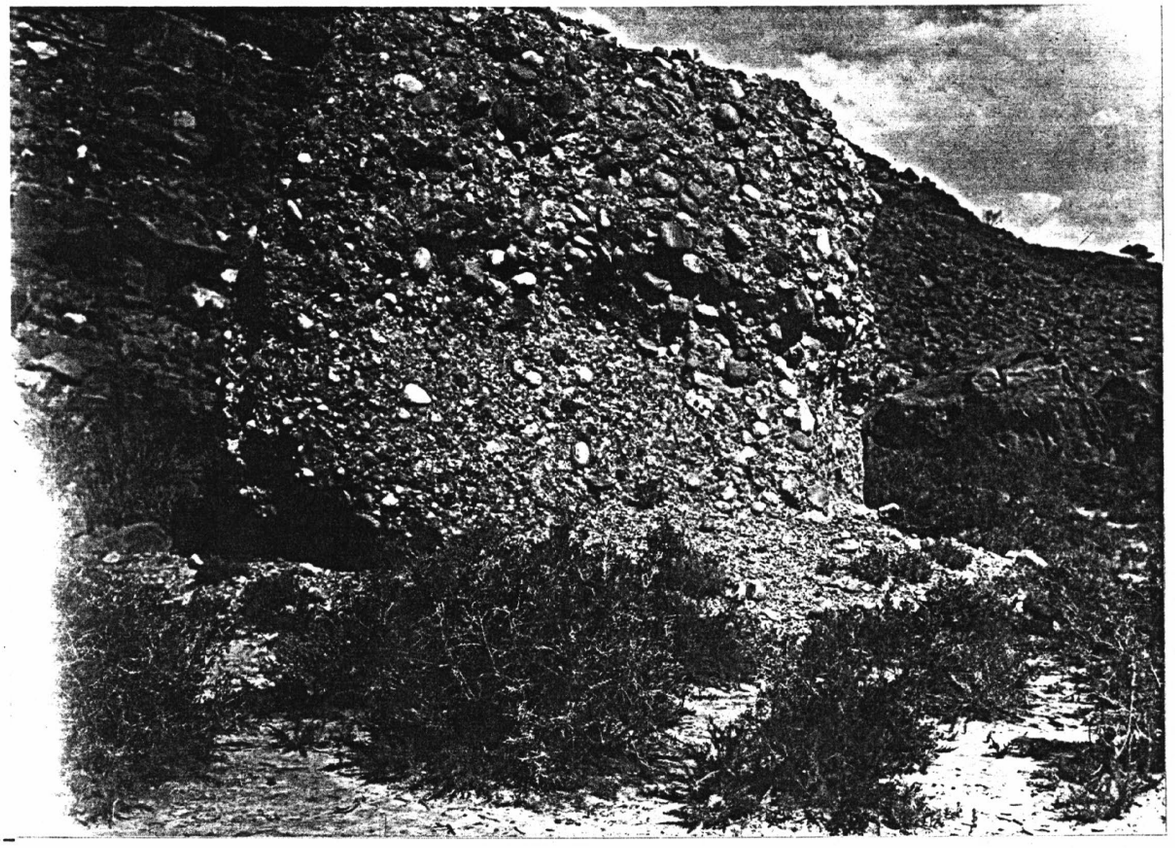
(PATTERSON, E. F. 99)
Geologist determining dip with Brunton compass. United States. 1957.



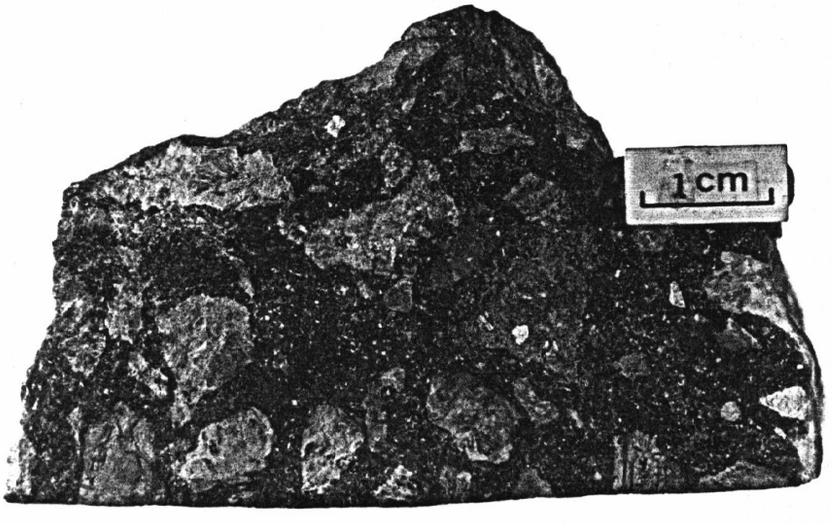
(STACY, J. R. 348)
Geologist measuring strike of Dakota sandstone with Brunton compass.
Colfax County, New Mexico. August 1958.



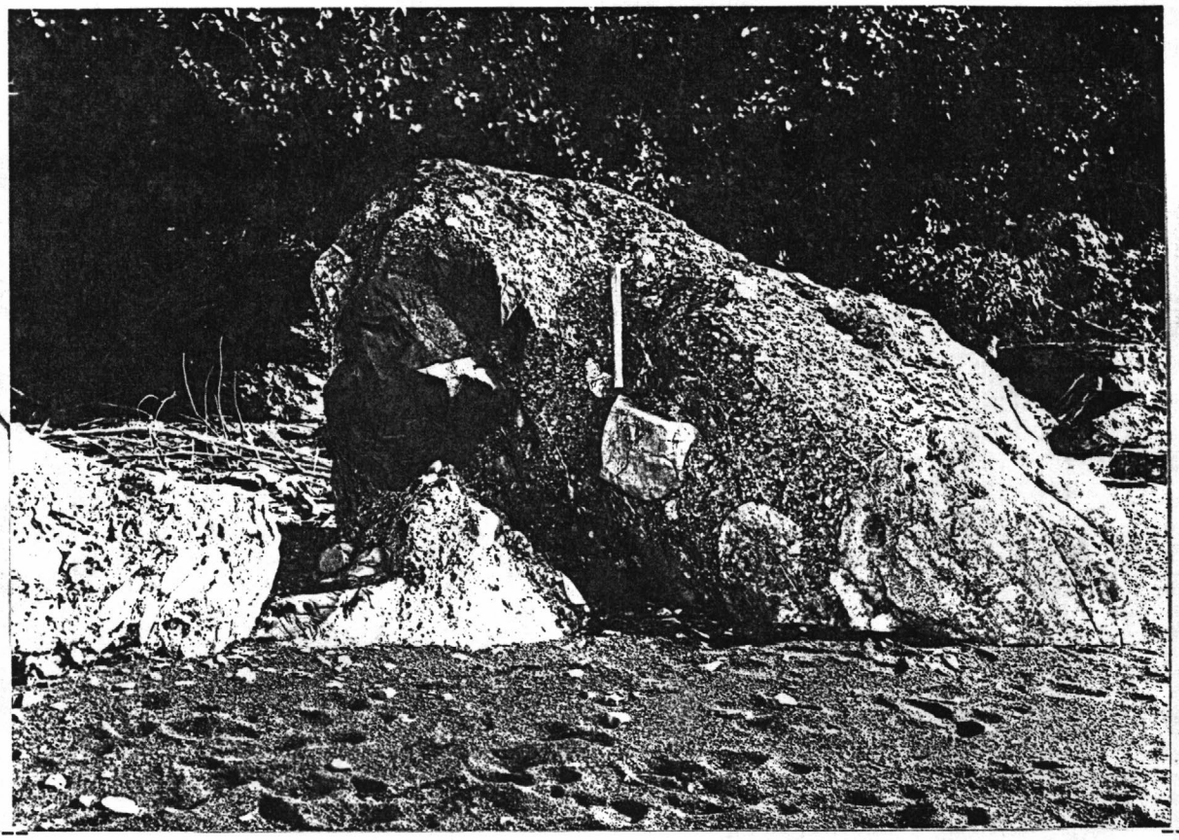
(RANSOME, F. L. 108)
Basal conglomerate on gneiss, Salt River gorge. Maricopa County, Arizona.
May 1901.



(LEE, W. T. 222)
Boulder of red conglomerate in canyon west of Parowan Lake. Iron County, Utah. 1906.



(HAYES, P. T. 50)
Specimen of conglomeratic sandstone from lower member of Canelo Hills Volcanics. The abundant angular pebbles and granules were derived from siliceous volcanic rocks. Bisbee County, Arizona. ca. 1968.



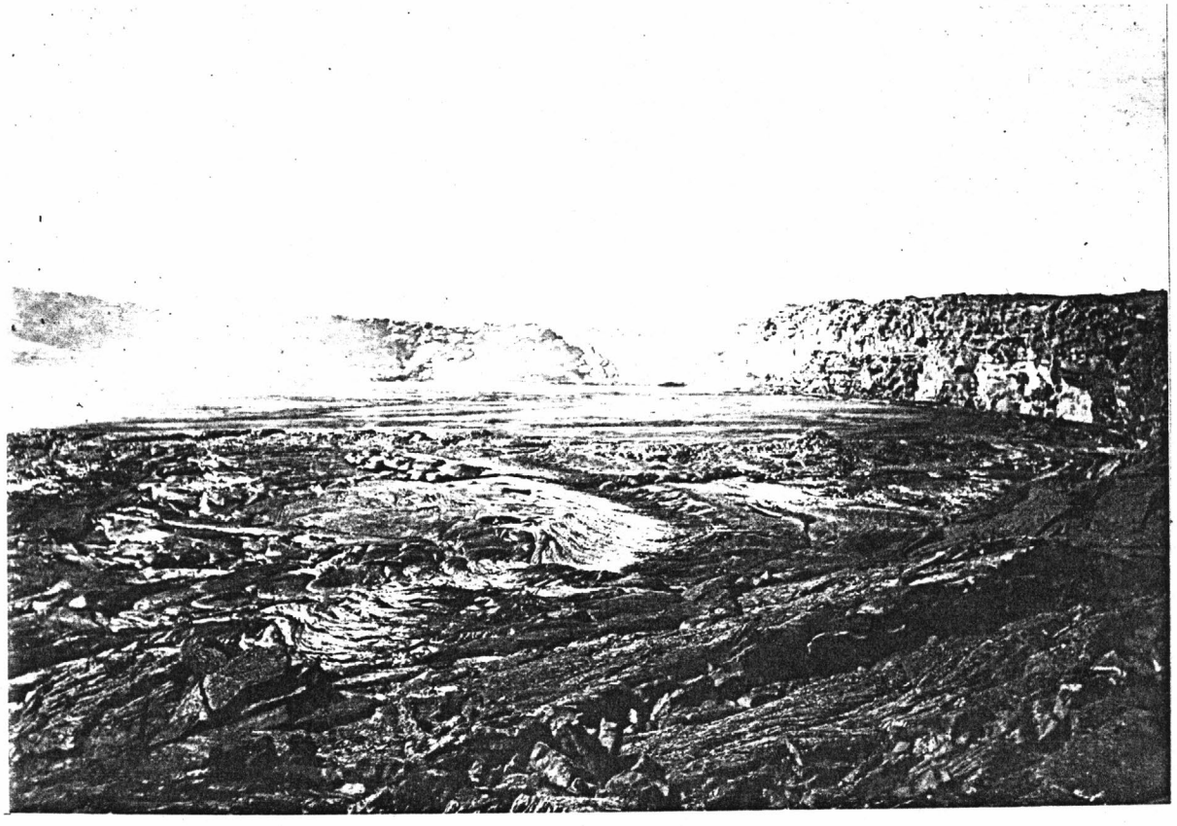
(WALCOTT, C. D. 616b)
Large boulder of Bic (lower Ordovician) conglomerate containing large boulders of limestone, on beach just below Bic Harbor Point. Province of Quebec, Canada. 1899.



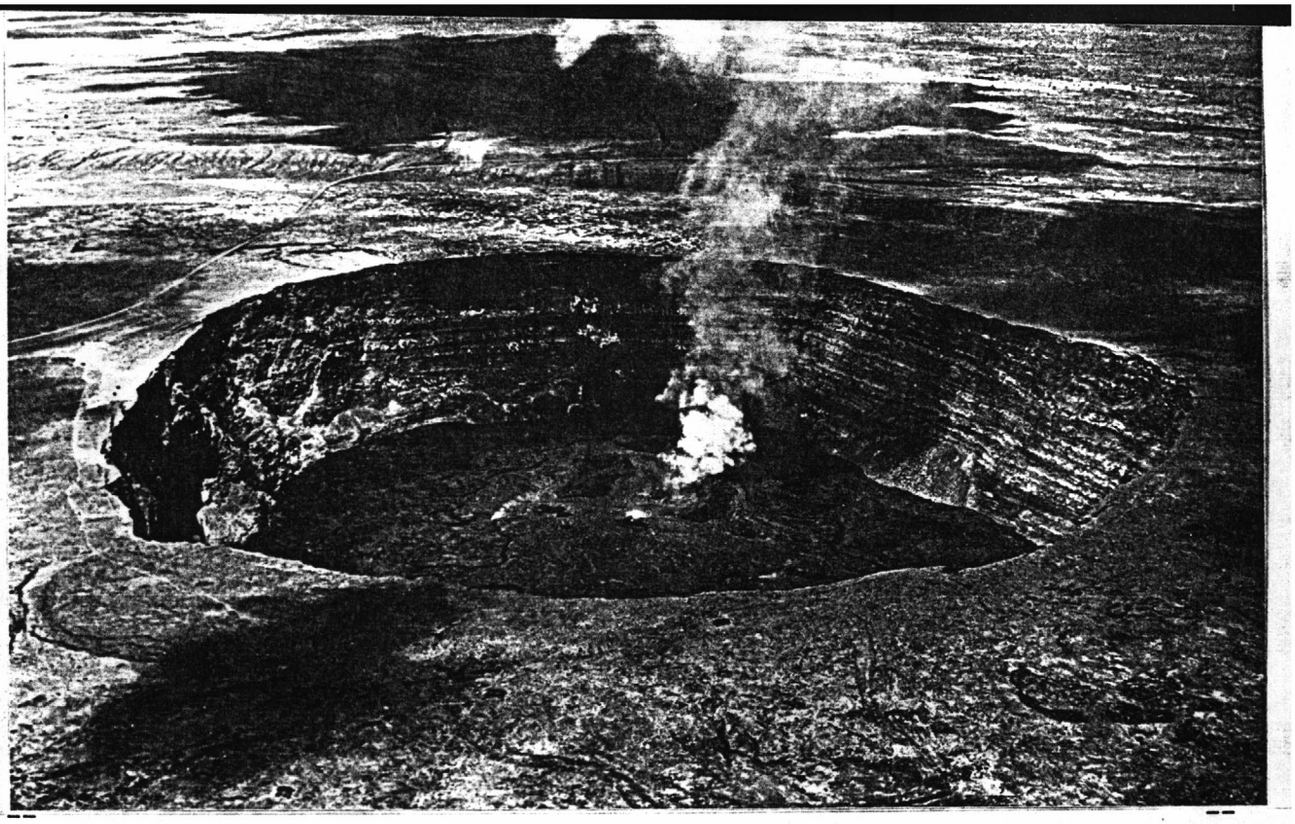
(LEE, W. T. 161)
Kilburn Crater south of Afton. Dona Ana County, New Mexico. ca. 1907.



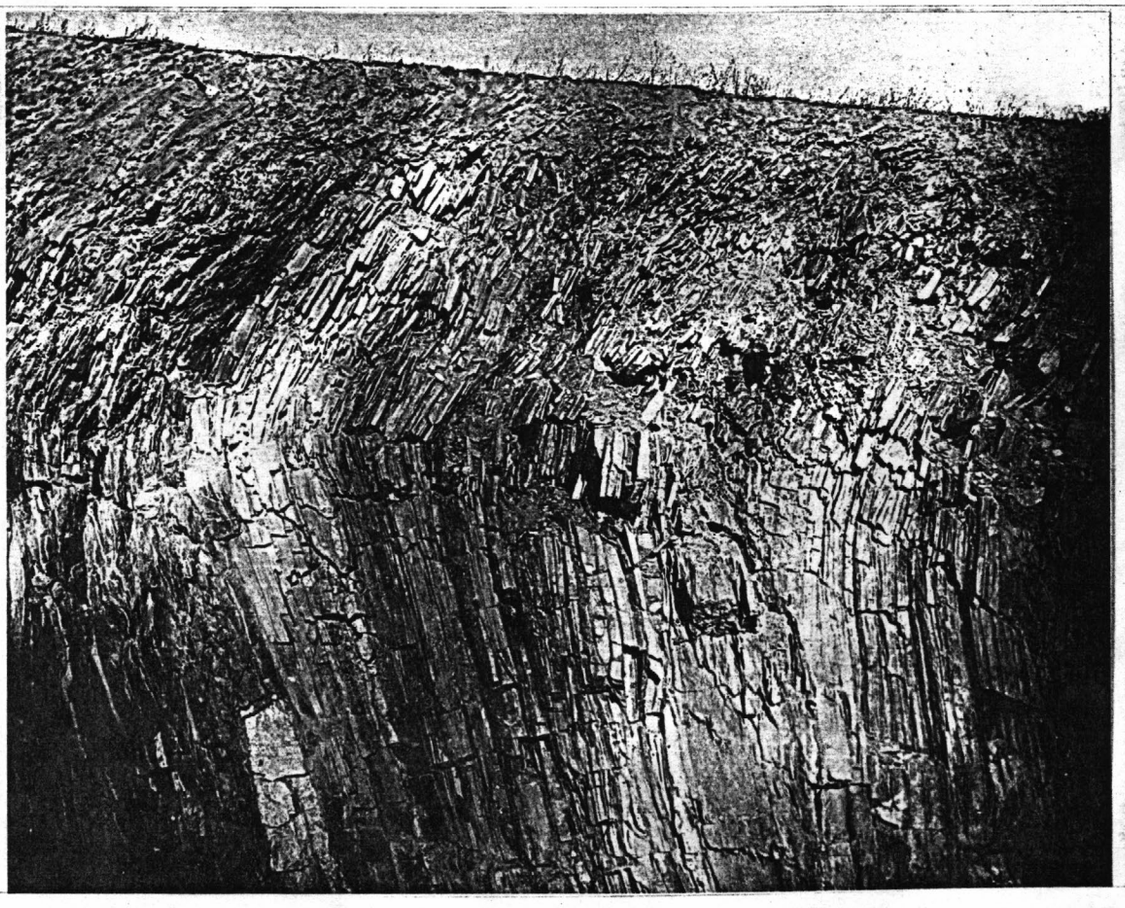
(RICHTER, D. H. 1)
Northeast collapse pin in Halemaumau crater February 24, 1961, about 1 hour after lava pond reached its maximum depth. View is toward south from northeast rim of Halemaumau, distance across pit is about 400 feet. Kilauea Volcano. Hawaii County, Hawaii.



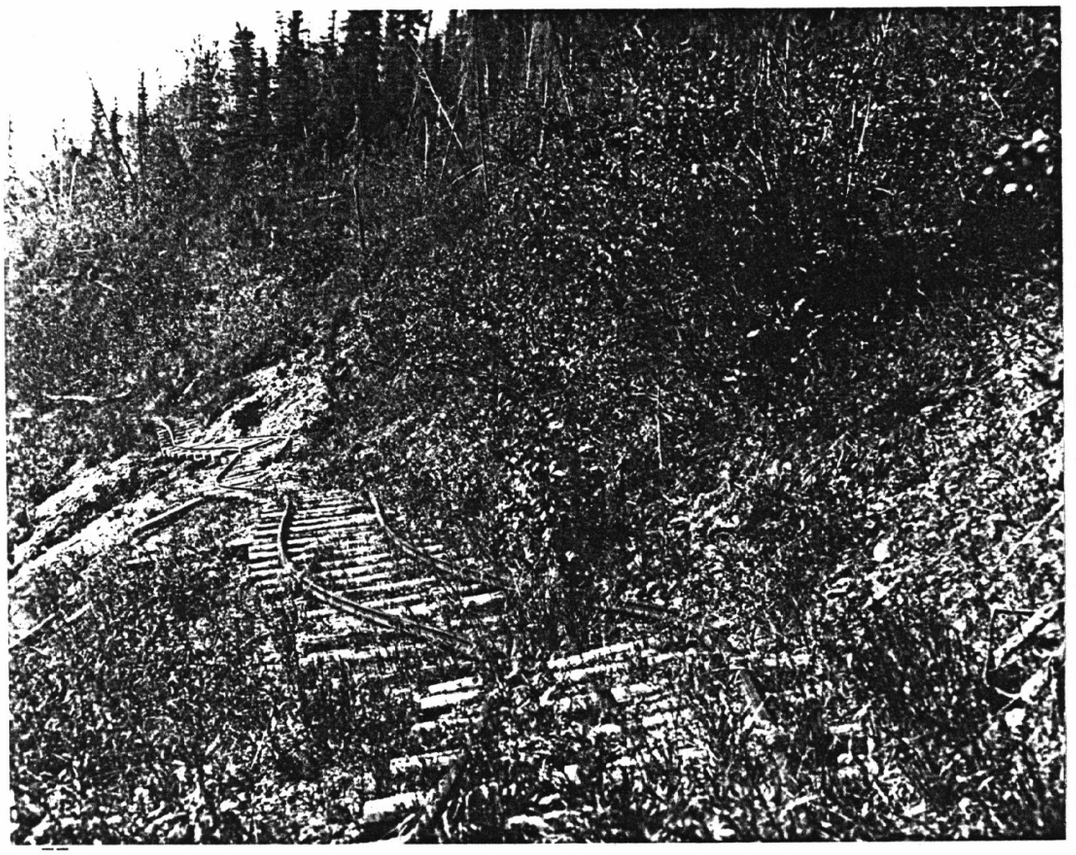
(RUSSELL, I. C. 199)
Halemaumau Crater, Kilauea Volcano. Hawaii Volcanoes National Park. Hawaii County, Hawaii. n.d.



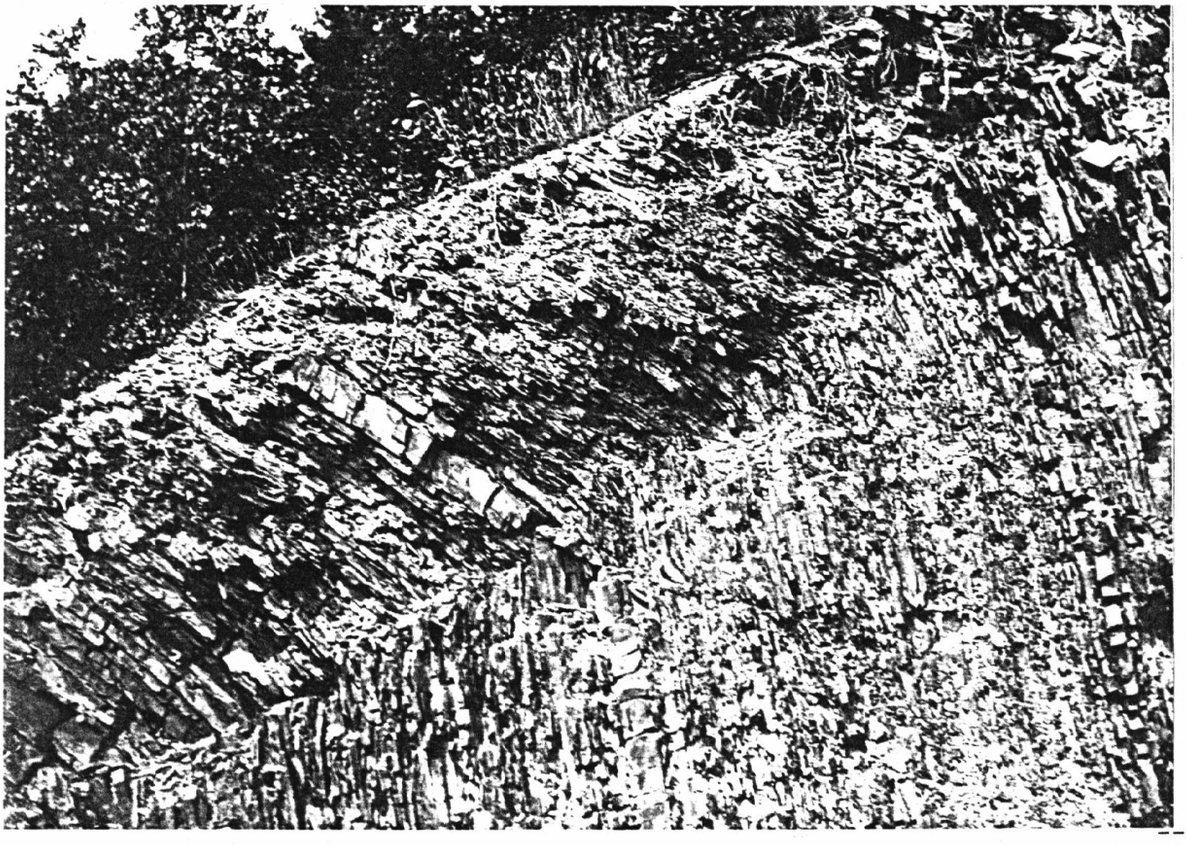
MACDONALD, G. A. 54)
Oblique aerial view of Halemaumau, looking southwestward. Note the broad fountain pin in the cinder cone and the large (lava) rivers draining from it. The crater is surrounded by the floor of Kilauea caldera. Hawaii Volcanoes National Park. Hawaii County, Hawaii. July 28, 1952.



(HARDIN, E. B. 1619)
Creep in railroad cut of Schuylkill Valley Railroad. Pennsylvania. n.d.



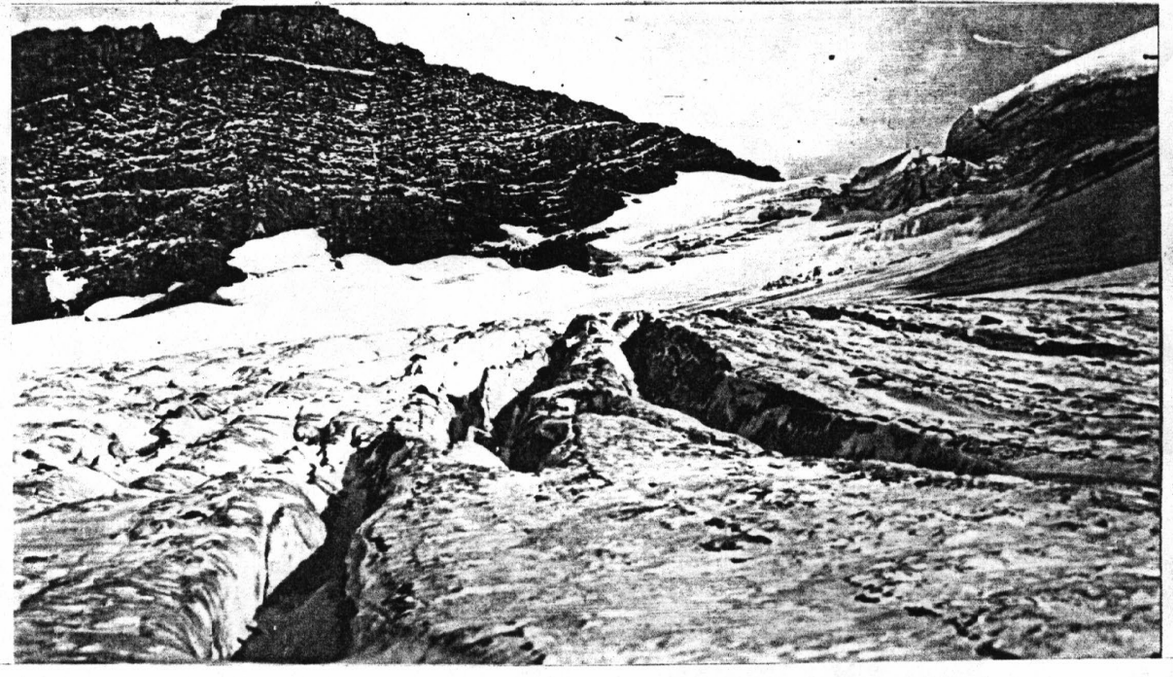
(ATWOOD, W. W. 96)
Effects of hill side creep on railroad tracks near Coal Creek. Yukon Territory, Canada. 1907.



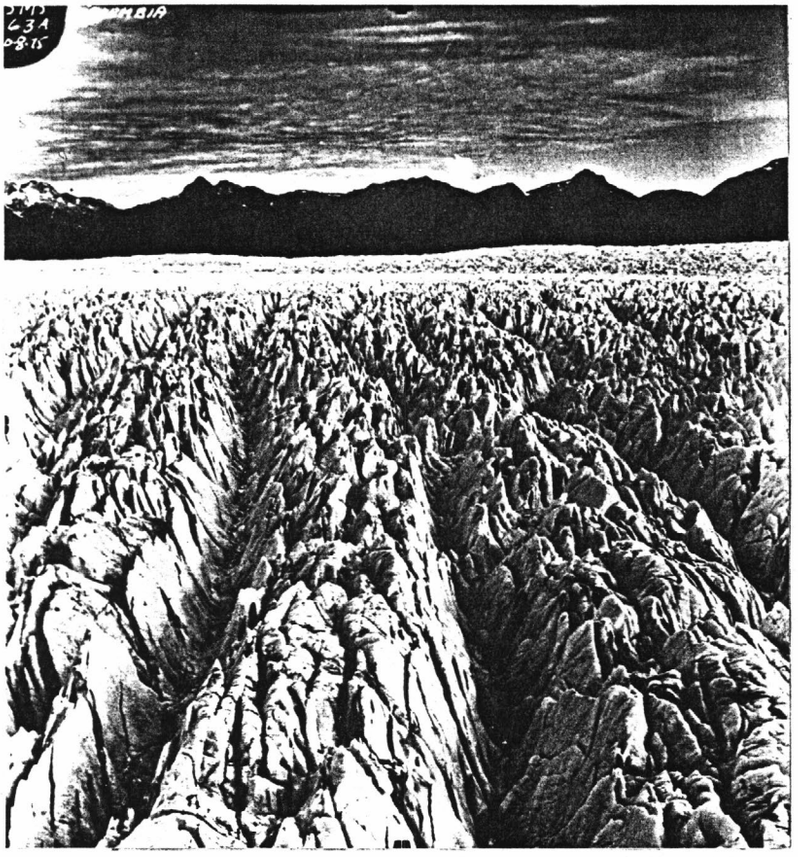
(STOSE, G. W. 329)
Creep in vertical Romney shale in Western Maryland Railroad cut 1 mile west of Great Cacapon. Washington County, Maryland. n.d.



(CRESSMAN, E. R. 80)
Retort Phosphatic Shale Member of the Phosphoria Formation exposed in bulldozer trench at Greenstone Gulch, note depth of creep zone. Beaverhead County, Montana. n.d.



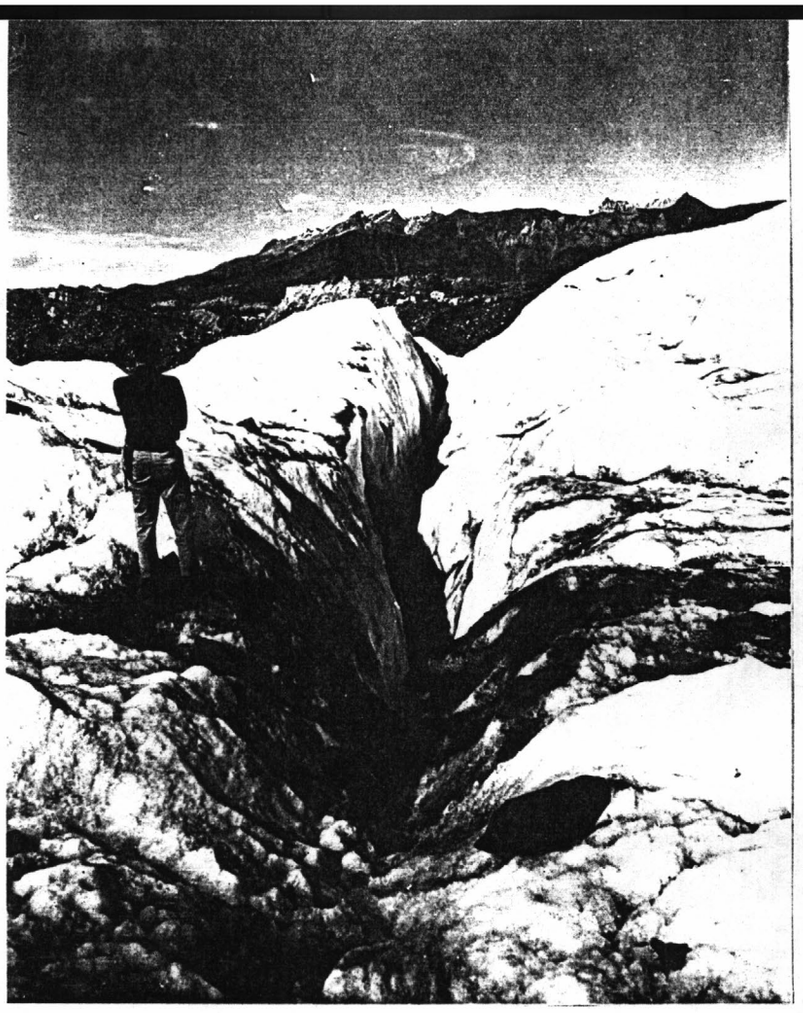
(ALDEN, W. C. 720)
Crevasses in Sperry Glacier partly filled with snow. Glacier National Park. Flathead County, Montana. August 16, 1913.



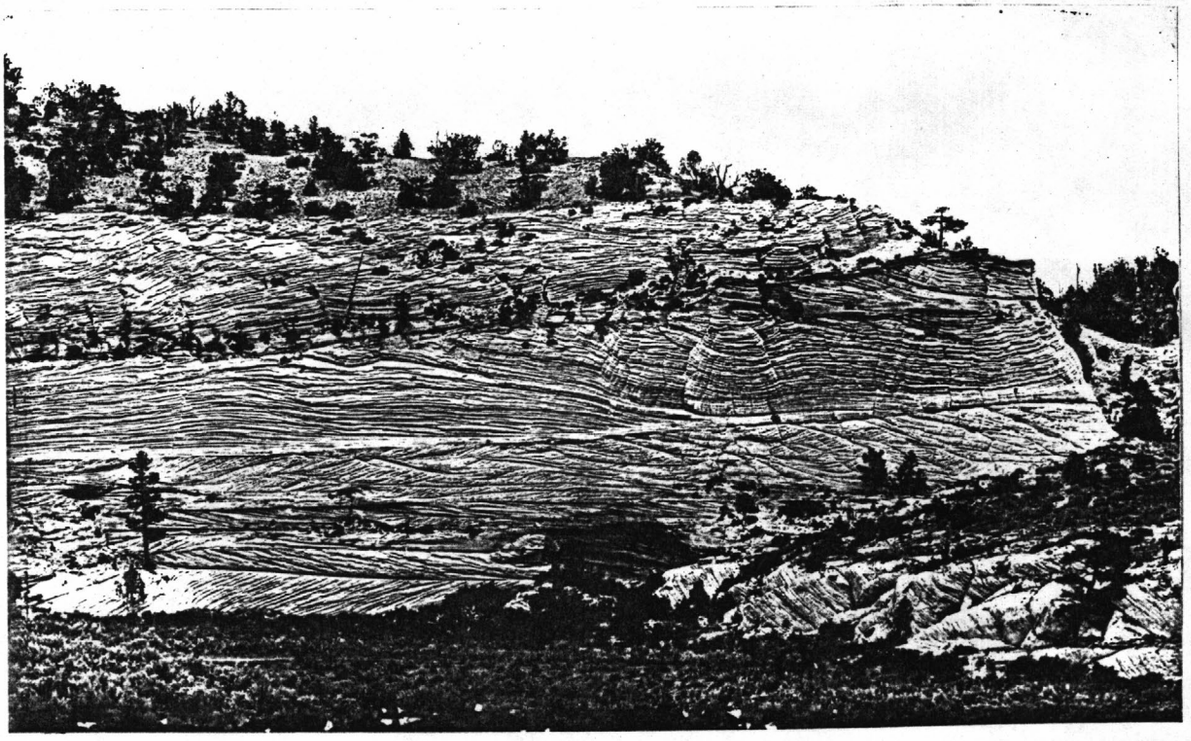
(U. S. GEOLOGICAL SURVEY 183)
The crevassed surface of Columbia Glacier is severely shattered due to its relatively high rate of flow. Geological Survey photogrammetrists were able to identify distinct crevasse patterns, even in winter photography, to measure the motion. Valdez district, Alaska Gulf region, Alaska. 1975.



(MILLER, D. J. 1340)
Low level oblique aerial view of recent crevassing near east margin of Malaspina Glacier. Yakutat district, Alaska Gulf region, Alaska. August 20, 1958.



(WILLIAMS, J. R. 1267)
Crevasse in Matanuska Glacier in white ice between terminus and main outwash channel and heavily crevassed high part of glacier. Alaska. August 22, 1954.



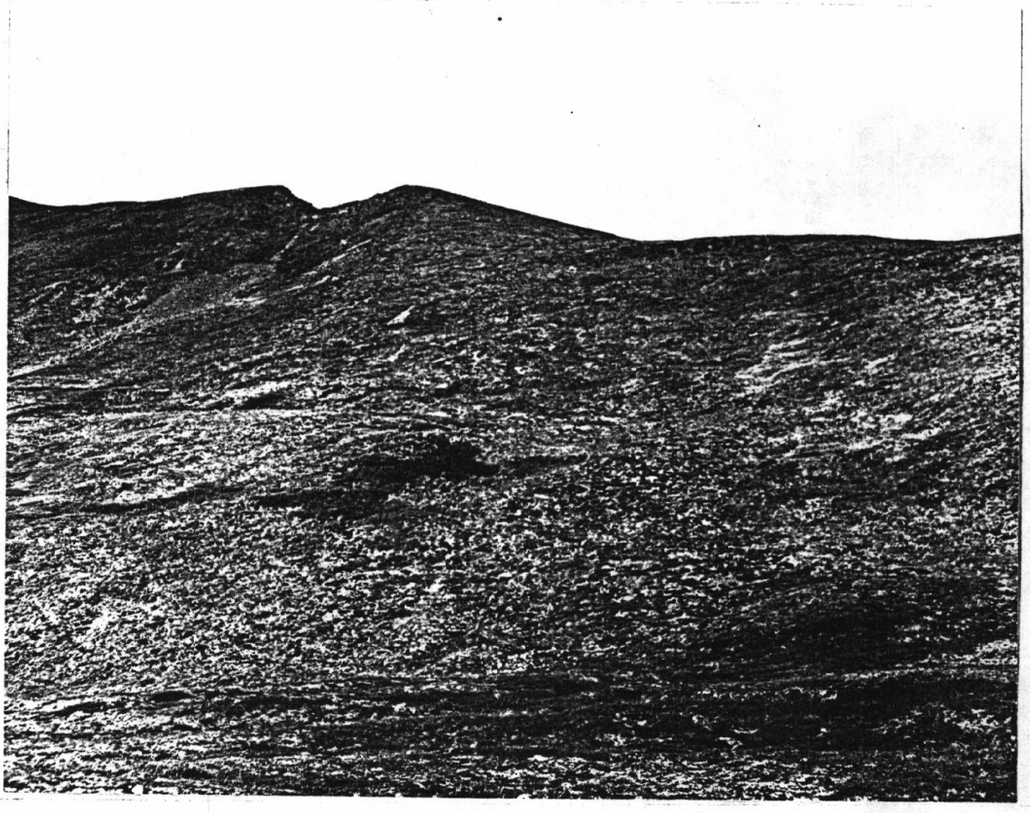
(JACKSON, W. H. 350)
Cross-bedded Navajo sandstone, Johnson Canyon. Kane County, Utah. n.d.



(BALSLEY, J. R. 2)
Oblique aerial view of dome at Sinclair. Carbon County, Wyoming. 1949.



(HILLERS, J. K. 37a)
Home of the "Storm Gods" in Yosemite Valley, with Royal Arches in the left background. Yosemite National Park, California. n.d.



(NICHOLS, D. R. 25)
Lateral drainage channel upper left. Valdez Creek district, Cook Inlet region, Alaska. July 20, 1953.
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(PETERSON, N. P. 1)
Aerial photograph illustrating typical drainage pattern developed in area underlain by Gila conglomerate. Gila County, Arizona. n.d.
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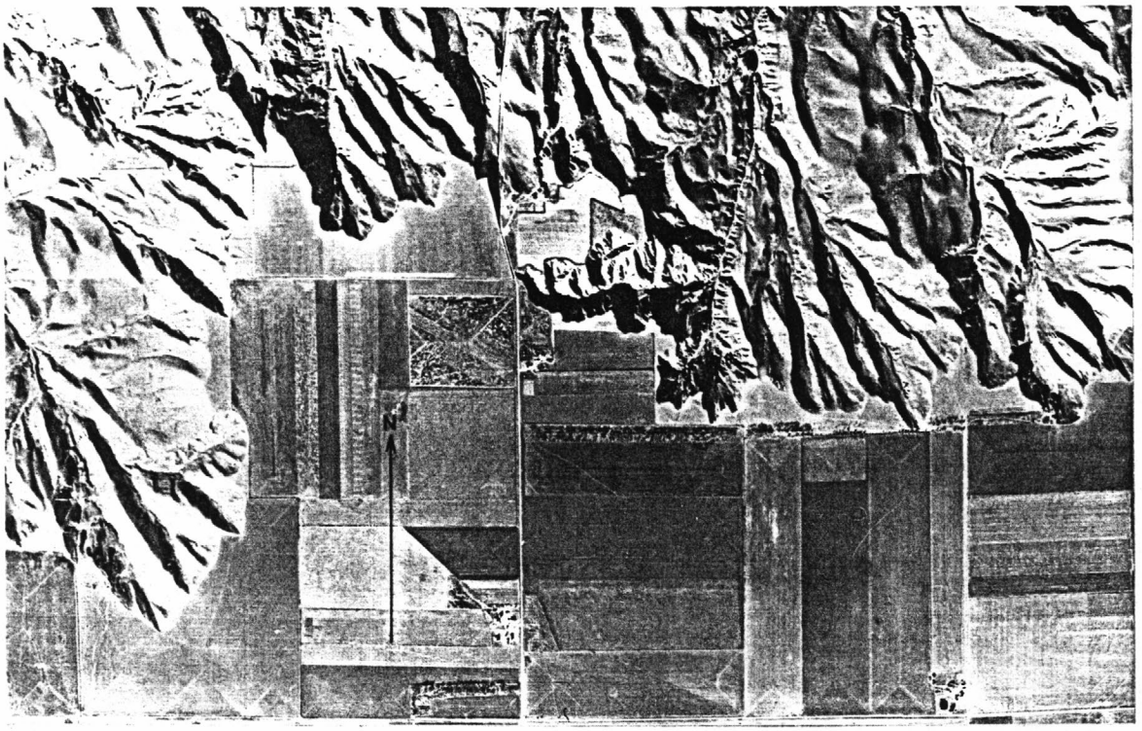
(SEGERSTROM, K. 651)
Drainage channel at Tercupicua where storm waters enter the north edge of the lava field from Paricutin. Michoacan, Mexico. 1957.



(MCLAUGHLIN, T. G. 7)
Well-developed dendritic drainage pattern on the soft rocks of the Ogallala formation near the edge of its outcrop where steam gradients are steep. Baca County, Colorado. n.d.



(BALSLEY, J. R. 54)
Dendritic pattern near Green River. Emery and Grand Counties, Utah. 1949.



(CARDWELL, W. D. E. 3)
Aerial photograph showing dendritic drainage pattern and dissection of loess uplands. Area shown is about 4.5 miles west-southwest of Wauneta. The arrow represents about 0.5 miles. Chase County, Nebraska. n.d.
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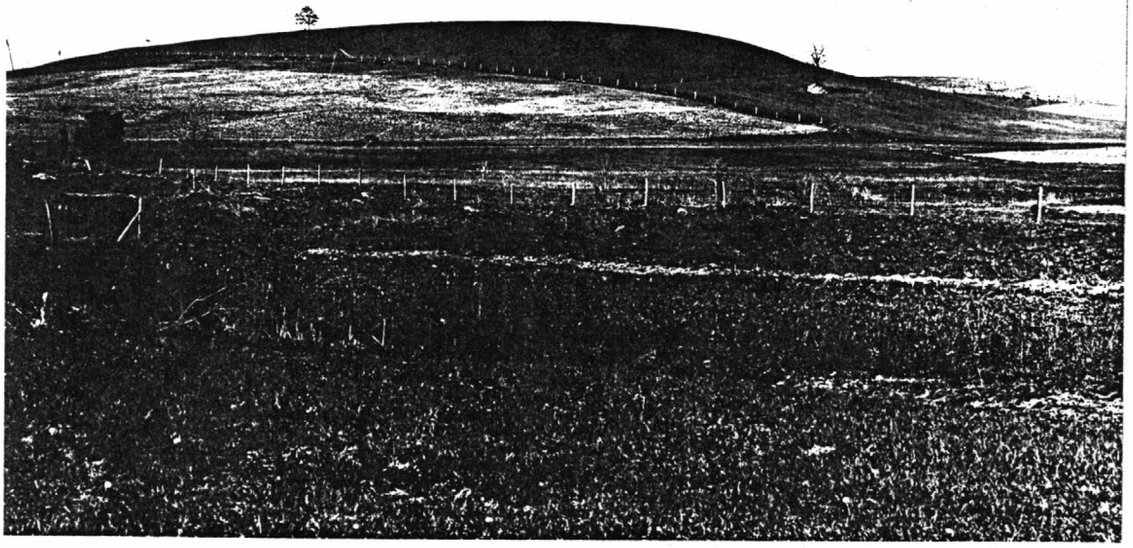

(GILBERT, G. K. 686)
Drumlin south of Newark, looking southwest. Wayne County, New York. 1902.
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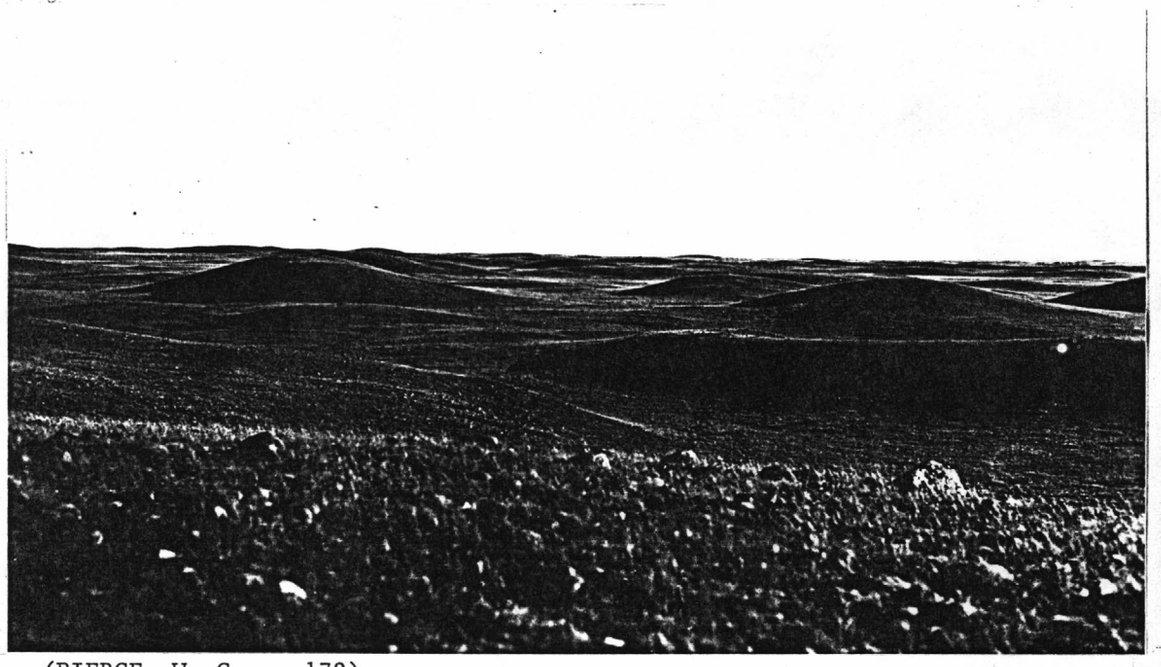

(PIERCE, W. G. 172)
Drumlins, probably in T. 5 N., R. 29 W. Province of Saskatchewan, Canada. September 21, 1932.
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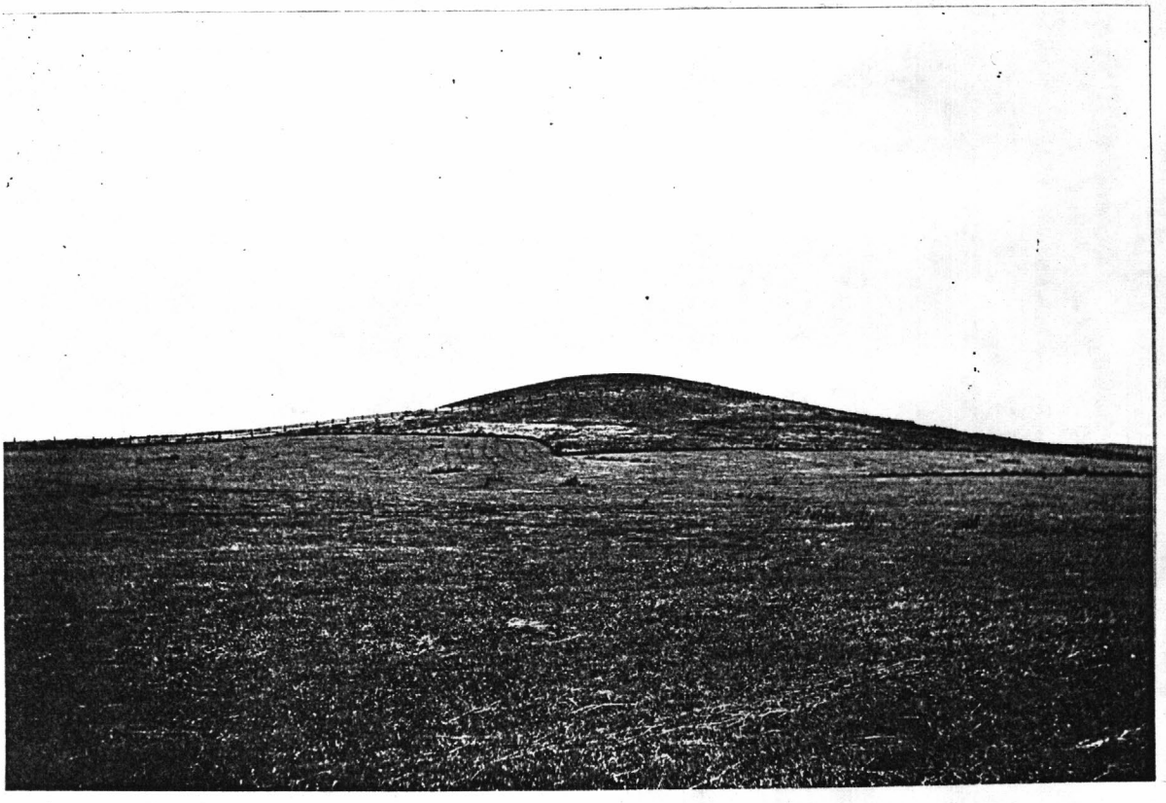

(ALDEN, W. C. 62)
End profile of the west drumlin, SE¼ sec. 2, T. 5 N., R. 11 E. Dane County, Wisconsin. July 21, 1902.
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(HANSEN, W. R. 17)
Spindle Hill, Stow, a drumlin in the Hudson quadrangle, from near Gleasondale Road. Ice moved from right to left. Massachusetts. n.d.



(MENDENHALL, W. C. 522)
Eastern edge of sand dune area near Mammoth Station. Imperial County, California. ca. 1905.



(MCKEE, E. D. 140)
Aerial photograph of simple crescentic dunes. Transverse ridges with slightly crescentic segments north of Comb Ridge, at lat. 36°51' N., long 110° W. Arizona. September 16, 1951.



(GILBERT, G. K. 505)
Transverse sand dunes near Biggs. Sherman County, Oregon. 1899.
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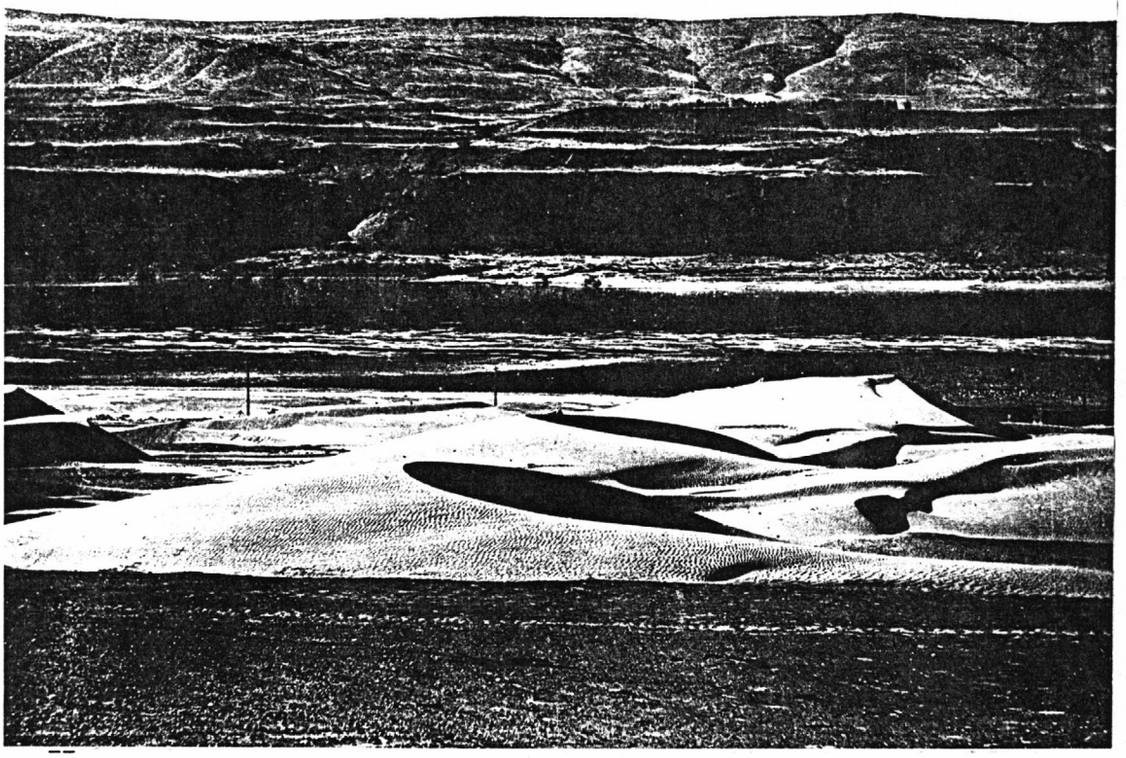

(GILBERT, G. K. 504)
Transverse sand dunes near Biggs. The strong winds in this district are controlled by the canyon walls so as to blow either upstream or downstream. The dominant winds are from the left (upstream) side. Sherman County, Oregon.
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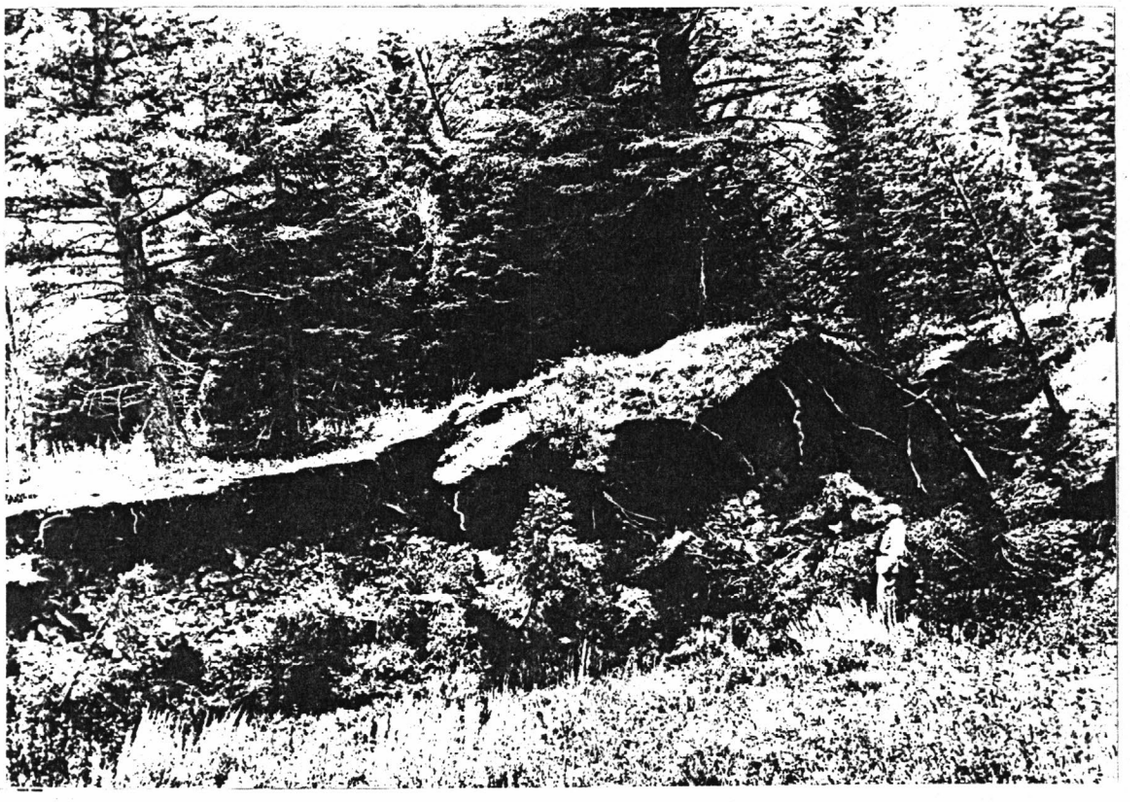
(HOLMES, G. W. 9)
Earthflow on northwest shore of Lake Schrader in Schrader till; this flow occurred within a 3-day period in August 1958. Canning district, Northern Alaska region, Alaska.



(HADLEY, J. B. 56)
Elevated margin of the Kirkwood earthflow about midway on the northeast side raised 15 feet, displaced 100 feet to the left. Man for scale at right. Hebgen Lake earthquake. Gallatin County, Montana. August 1959.



(GILBERT, G. K. 3008)
Freshly-formed earthflow on a northward slope, Berkeley Hills, 2 miles east of Berkeley. Alameda County, California. February 27, 1907.
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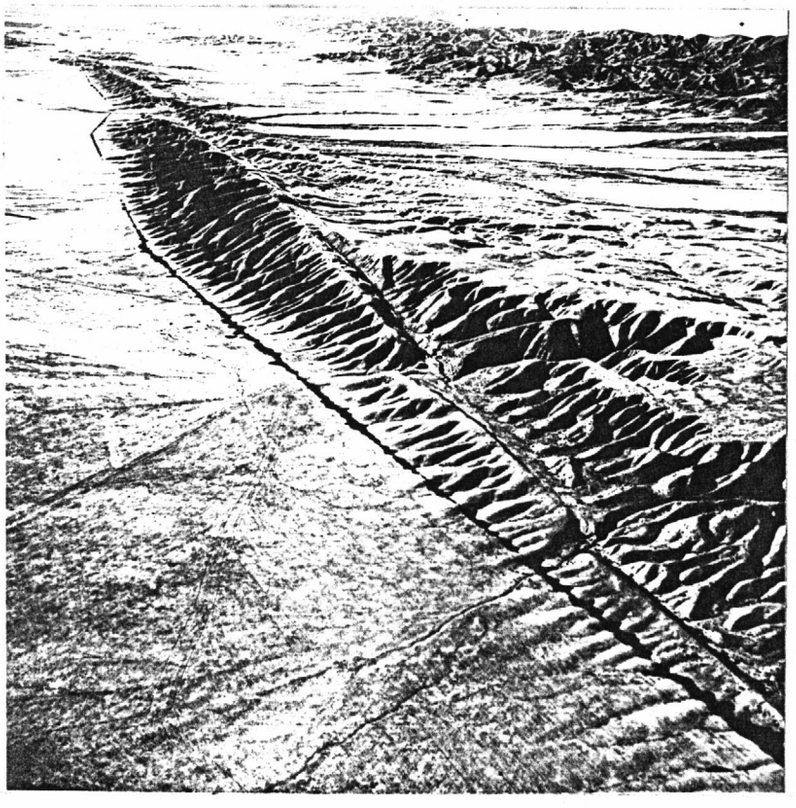
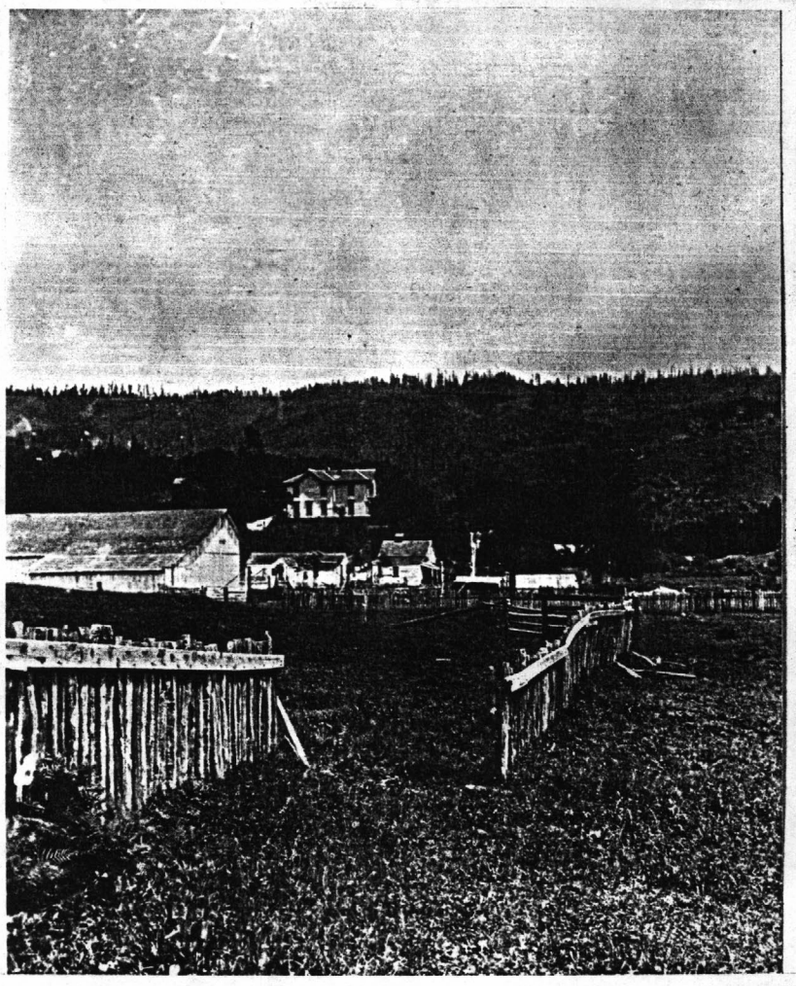
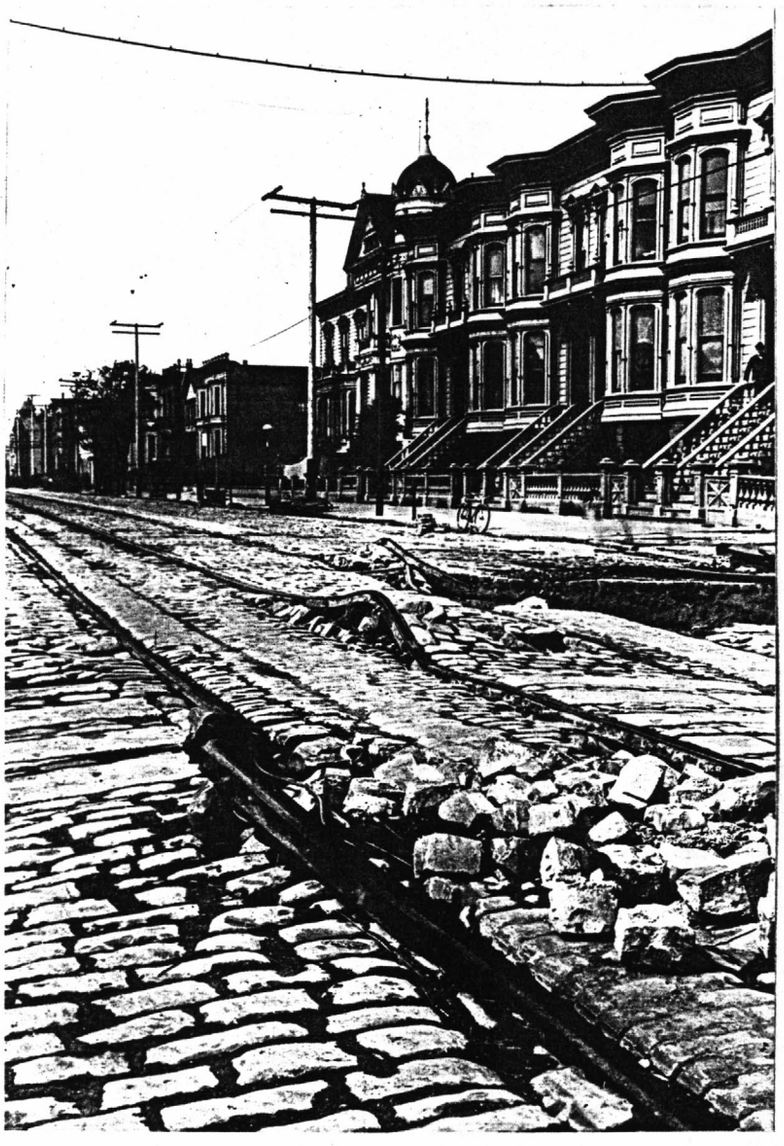
(STACY, J. R. 227)
Earthflow area east of Hebgen Lake. Fault scarp (top left) and pressure ridge at east side of flow (bottom center). Note variably tilted trees. Hebgen Lake earthquake. Gallatin County, Montana. August 1959.



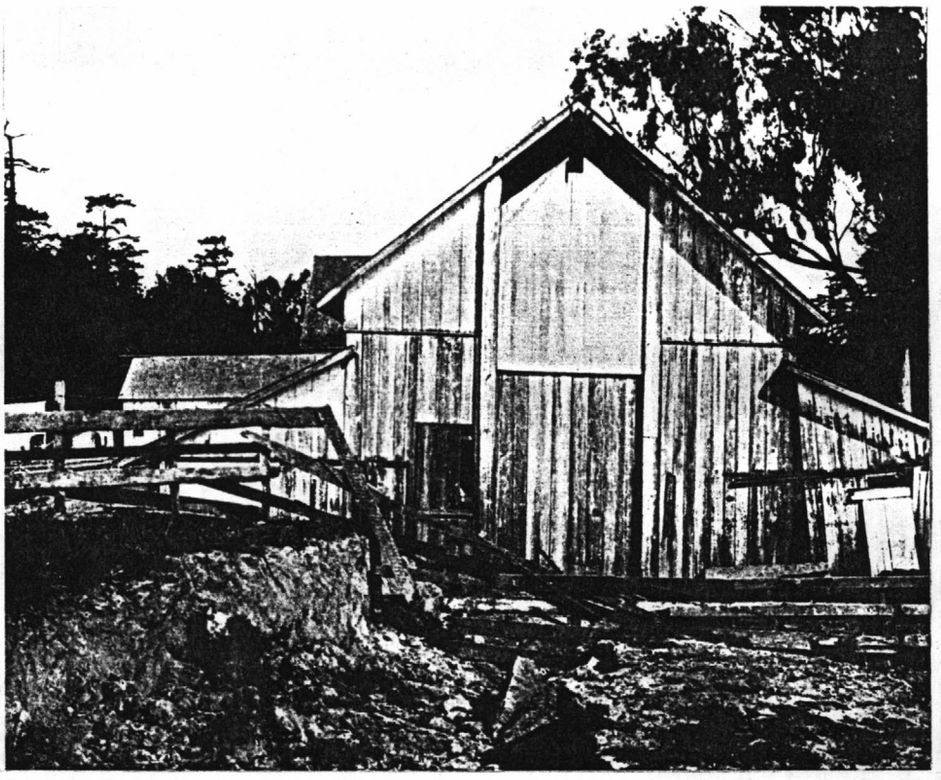
(WALLACE, R. E. 194)
Oblique aerial view looking northerly, along Elkhorn scarp. The Carrizo Plains on the left; Elkhorn Plains on the right. San Andreas fault, San Luis Obispo County, California. 1965.



(GILBERT, G. K. 2845)
Fence offset 8½ feet by main fault one-half mile northwest of Woodville, looking northeast. Marin County, California. 1906.



(GILBERT, G. K. 2879)
Northward on Howard Street at Seventeenth Street. The soil at right foreground settled and moved forward. The buckle of railway tracks resulted from this movement. San Francisco. San Francisco County, California. 1906.



(GILBERT, G. K. 2849)
The main fault at he Skinner place, 1 mile west of Olema looking northwest. The fault passes under the barn to right of center. The main part of the barn remained on its foundation; the shed (right) was dragged 15 feet. Marin County, California. May 1906.



(HILLERS, J. K. 16)
The worst earthquake wreck in Charleston. Charleston County, South Carolina. August 31, 1886.
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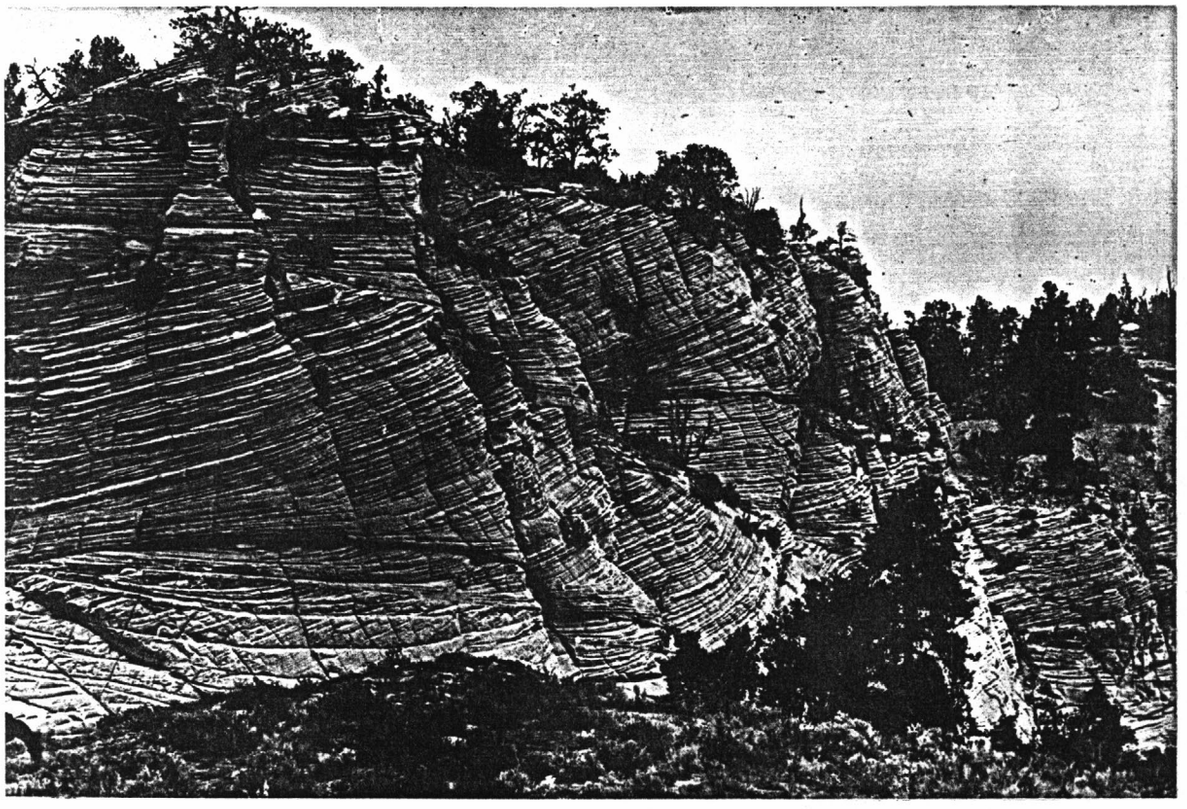
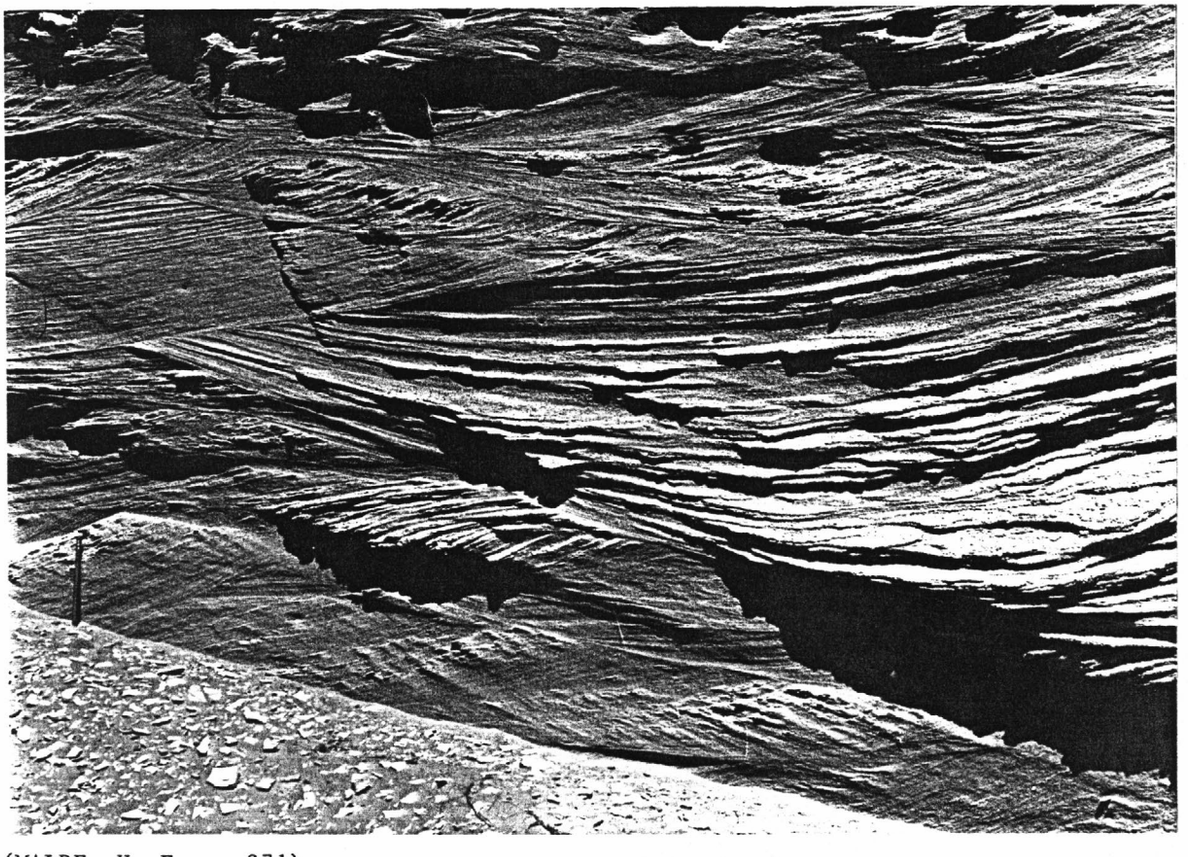
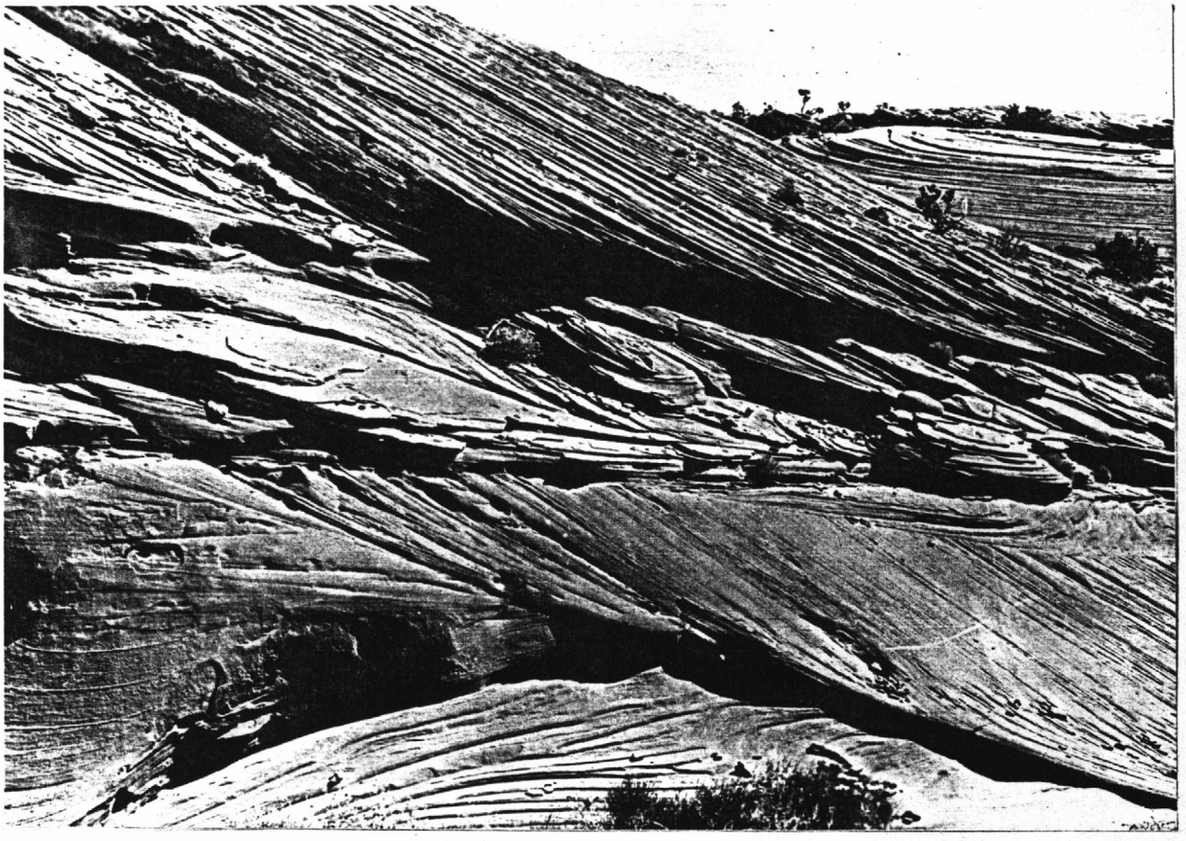


(HILLERS, J. K. 456)
Cross-bedding in Navajo sandstone, near Kanab. Kane County, Utah. n.d.



(MALDE, H. E. 271)
Close view of cross-beds in coarse sand of fluviatile facies of Glenns Ferry formation. Larger grains consist of pea-sized pumice. Pencil for scale at left. NESW sec. 31, T. 5 S., R. 9 E. Elmore County, Idaho. September 11, 1960.



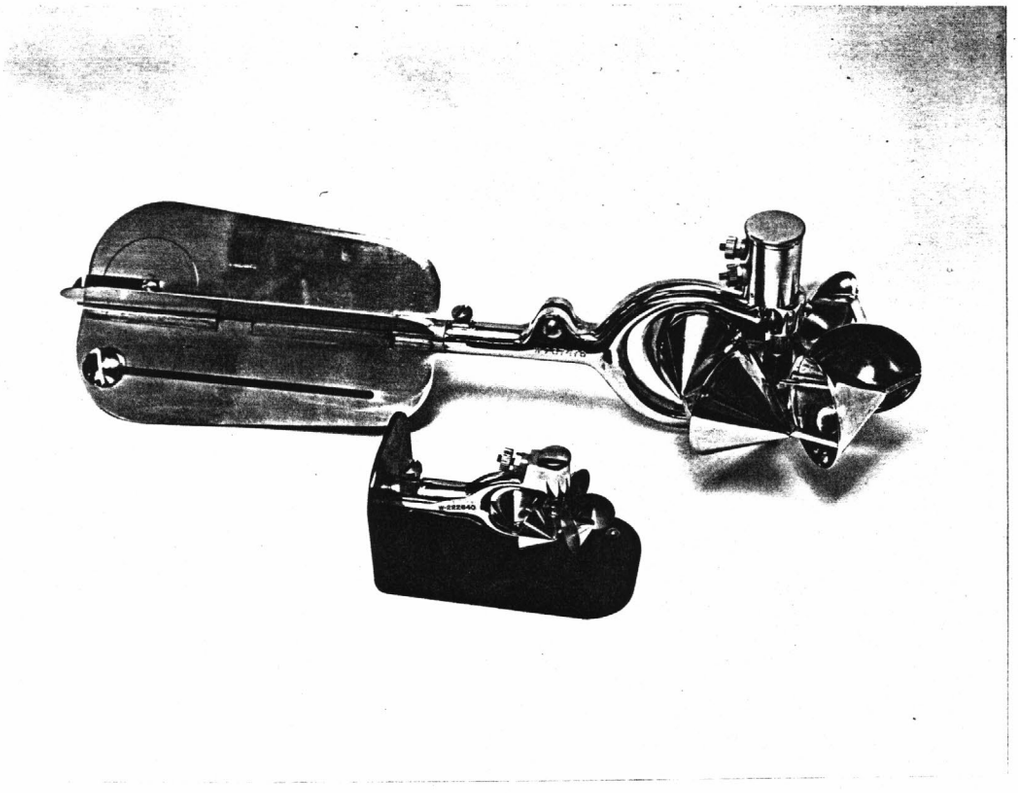
(GREGORY, H. E. 246)
Cross-bedded DeChelly sandstone, head of Gypsum Creek. Navajo County, Arizona. August 1914.



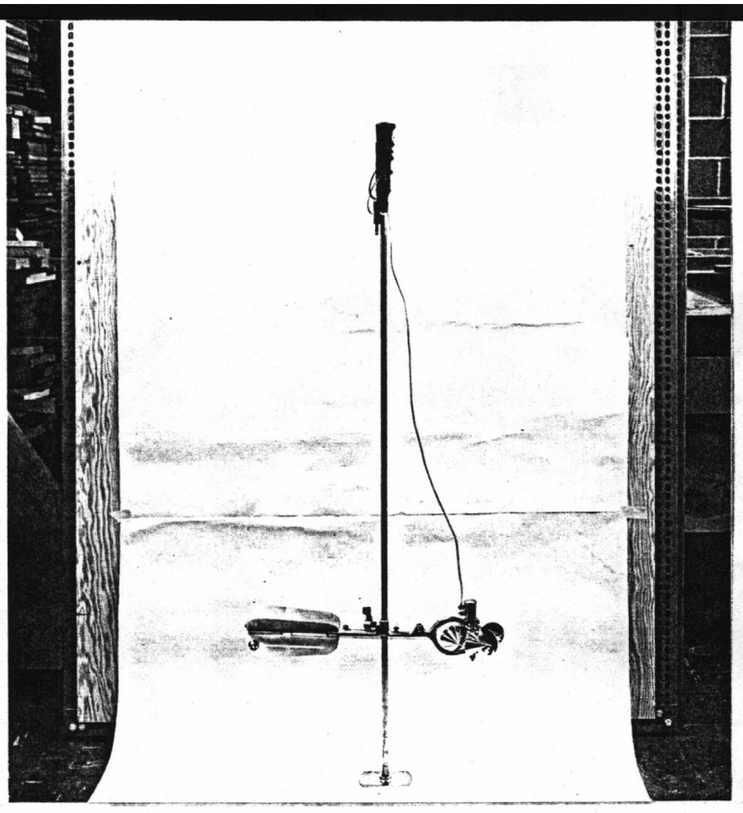
(STACY, J. R. 500)
Making a discharge measurement by wading on Clear Creek near Lawson, Colorado. Type AA small Price current meter suspended on a wading rod is used to determine velocity of water.



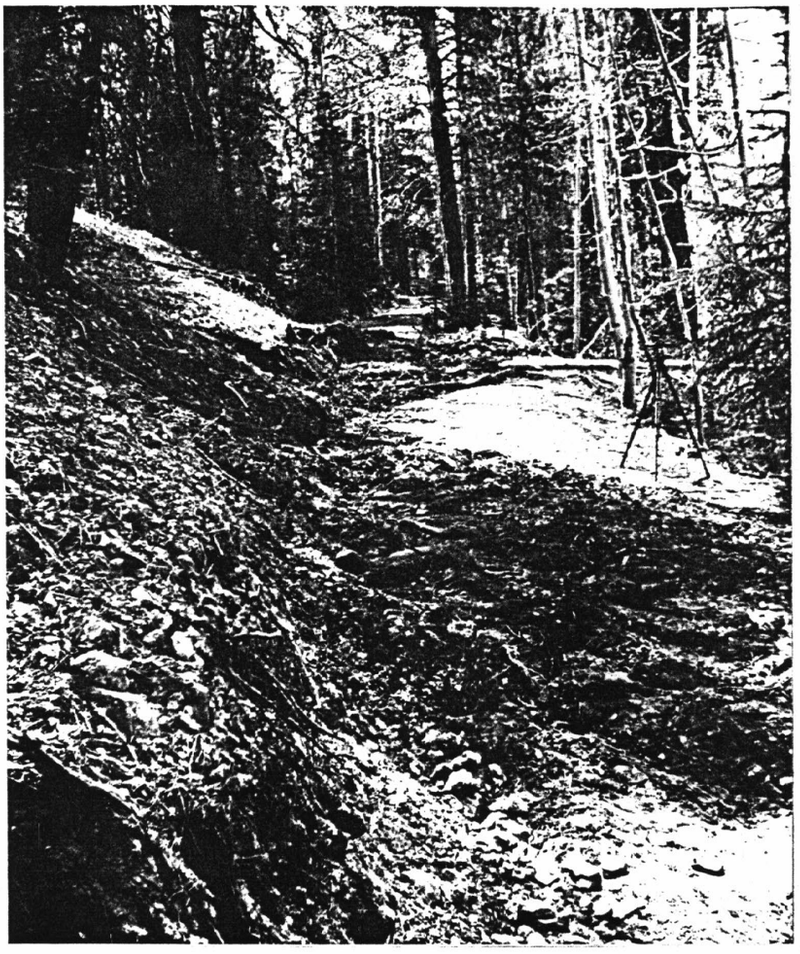
(STACY, J. R. 499)
Equipment used for making a discharge measurement of a stream by wading. A type AA small Price current meter suspended on a wading rod that is graduated in tenths of feet. Colorado. November 27, 1962.



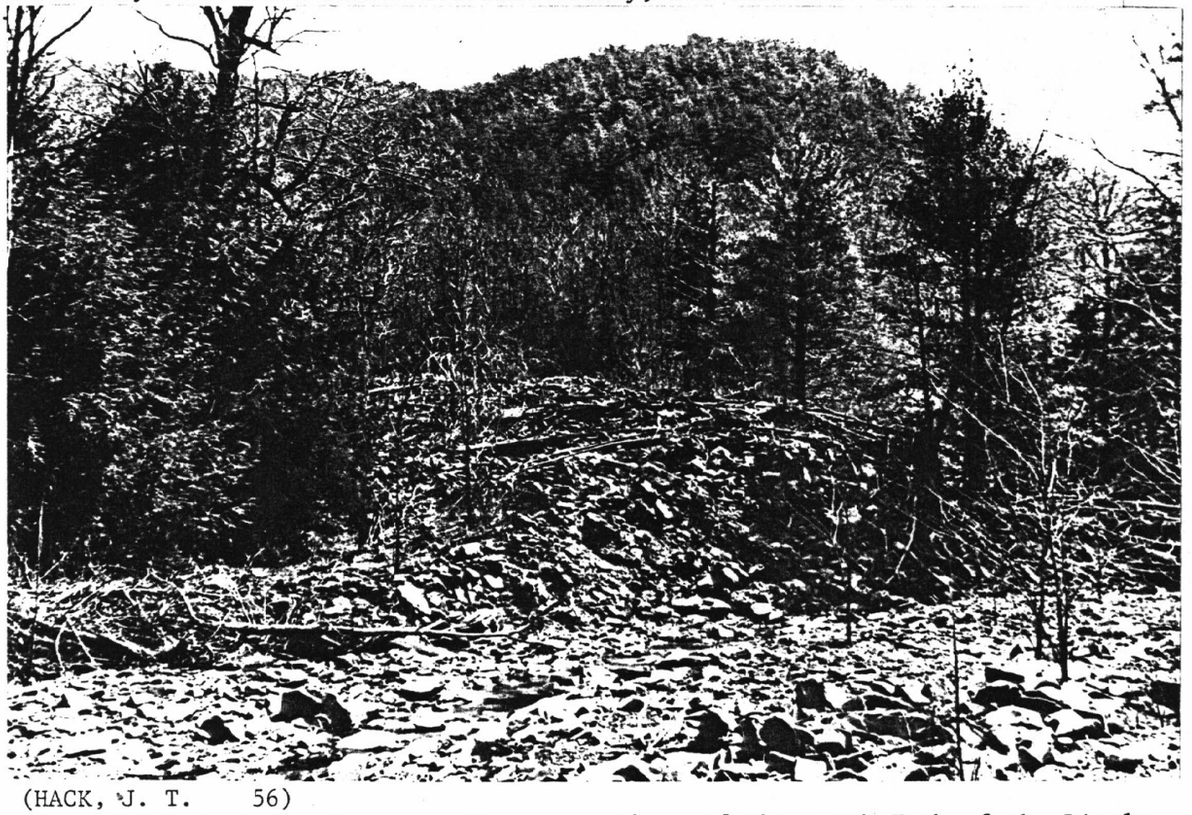
(BUCHANAN, T. J. 25)
Price type AA meter, top; Price pygmy meter bottom. United States. n.d.



(BUCHANAN, T. J. 34)
Round wading rod with Price current meter attached. United States. n.d.



(COOLEY, M. E. 8)
Debris slide along the Point Sublime Trail 0.25 mile east of Outlet Canyon. Grand Canyon National Park. Coconino County, Arizona. ca. 1966.



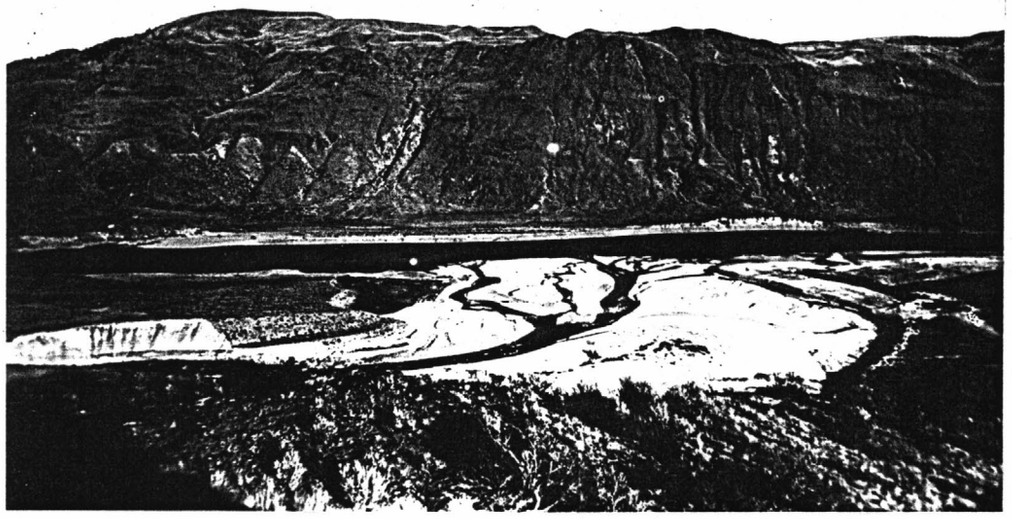
(HACK, J. T. 56)
View of debris fan. Fan is on the flood plain of the North Fork of the Little River. Augusta County, Virginia. n.d.



(U. S. GEOLOGICAL SURVEY 177)
Low level aerial view of debris flow deformation of a house in the Repetto Hills of southern California. n. d.



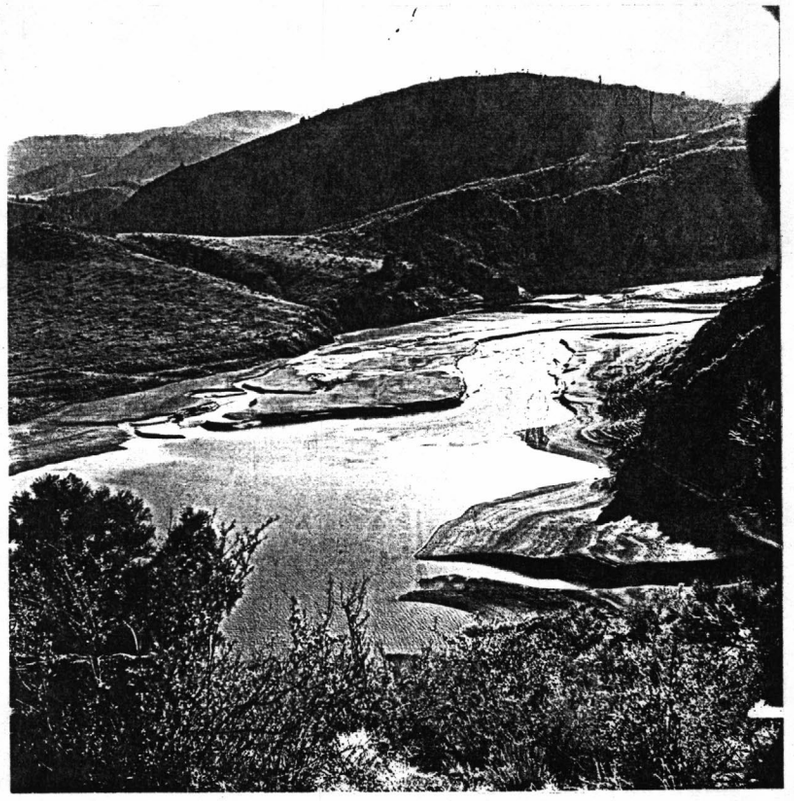
(RADBURCH-HALL, D. H. 18)
Recent debris flow on one edge of a fan constructed by many such flows in the past. Cunningham Gulch, San Juan Mountains. San Juan County, Colorado. n.d.



(WILLIS, B. 233)
Delta of Chelan River entering the Columbia River, Chelan Ferry. Chelan County, Washington. n.d.



(MARTIN, G. C. 494)
Delta and flats west of Chinaput Bay. Seldovia district, Cook Inlet region, Alaska. July 12, 1911.



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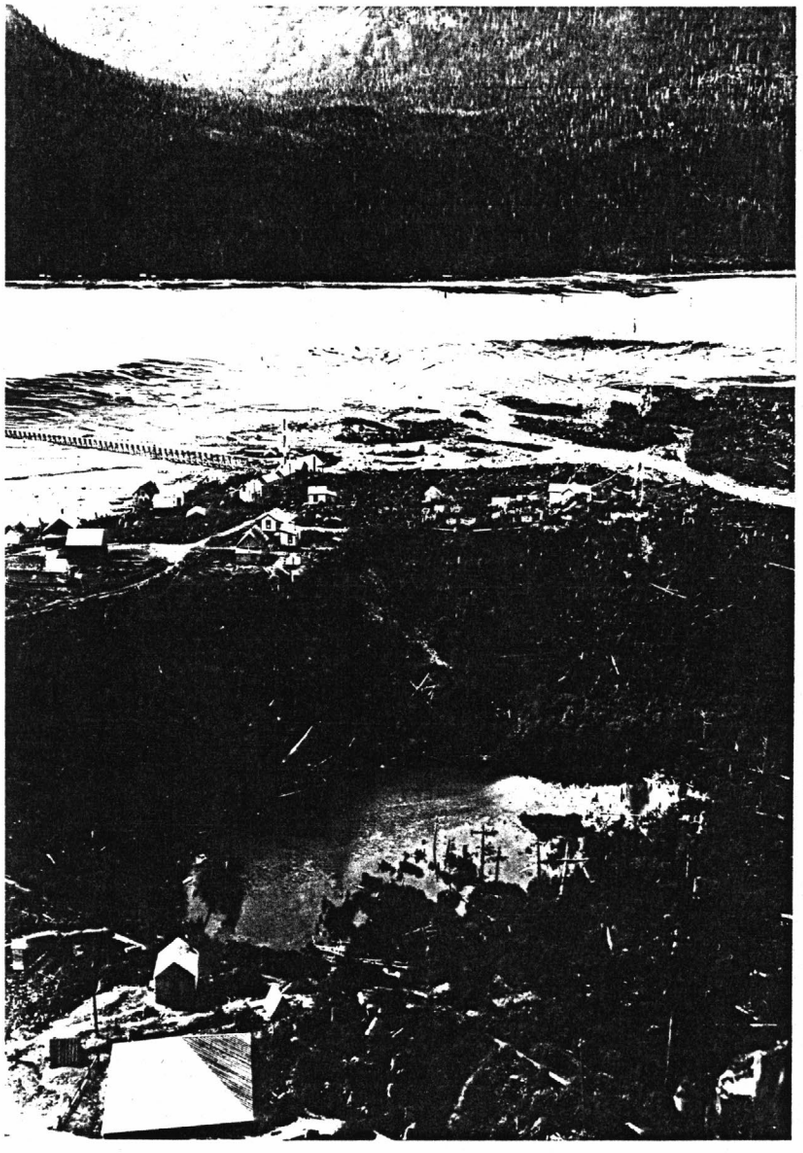
(GUY, H. P. 143)
Sediment deposition in a delta. Seaman Reservoir on North Fork Poudre River. Larimer County, Colorado. n.d.



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(GILBERT, G. K. 472)
Delta of Gold Creek. In the foreground an oxbow lake. Juneau district, Southeastern Alaska region, Alaska. 1899.

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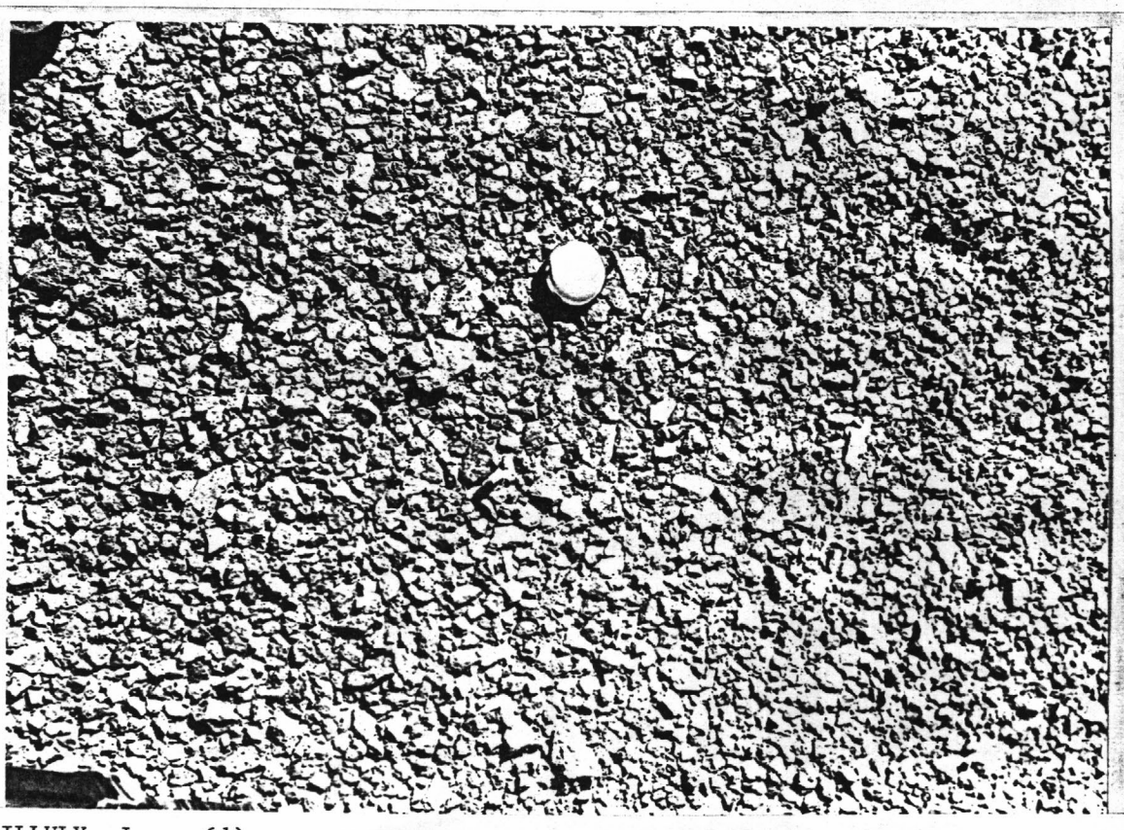
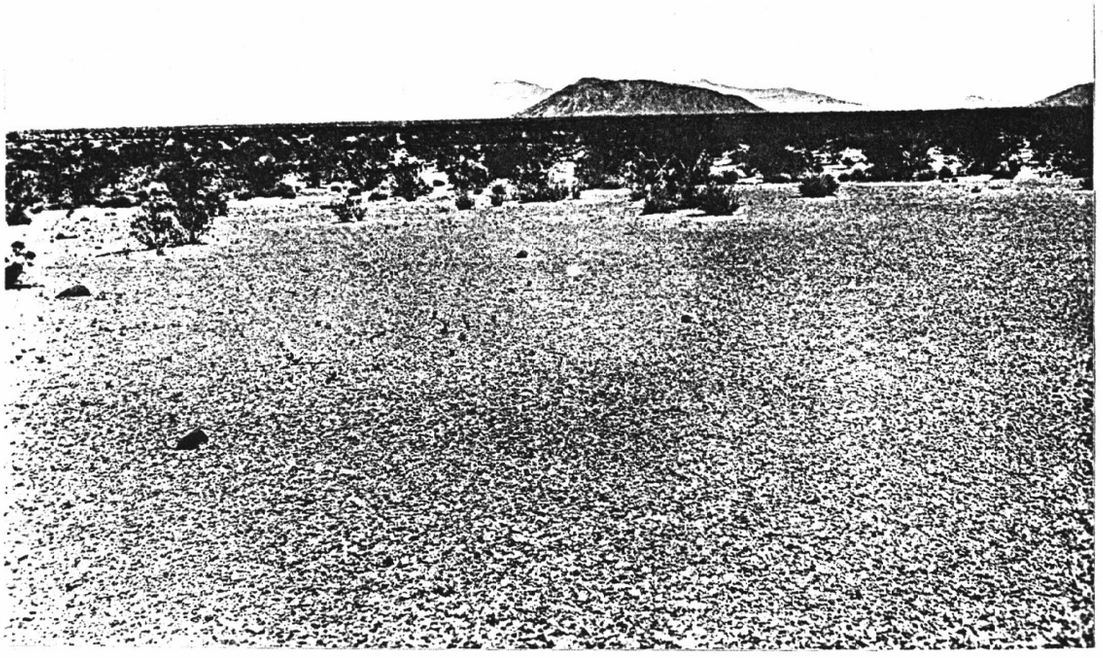
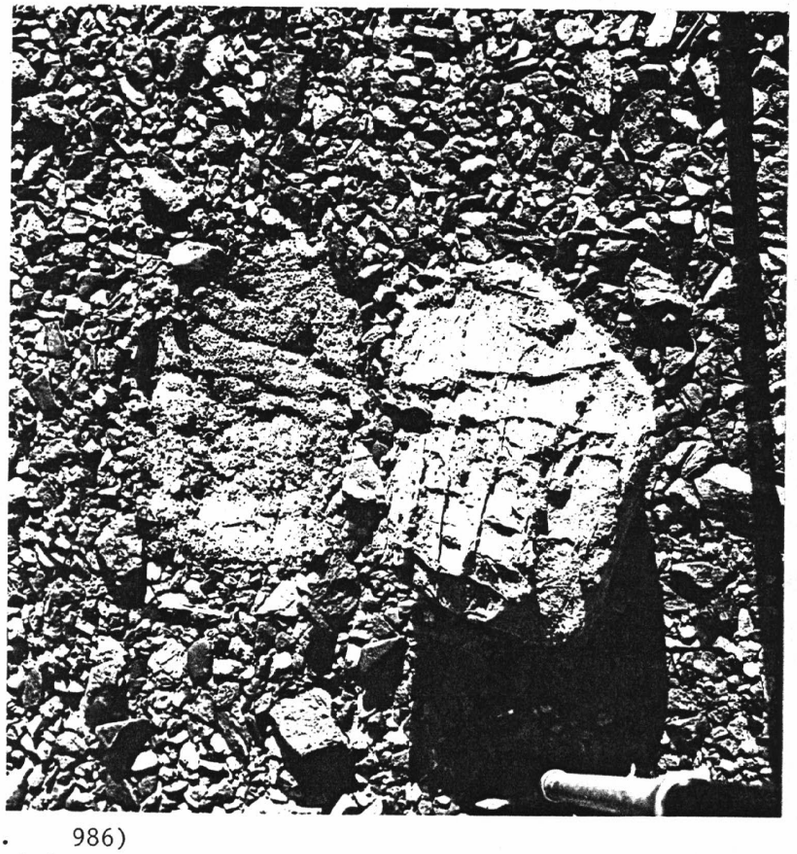
(HUNT, C. B. 984)
Detail of desert pavement on surface of old gravel. The pavement is composed of closely spaced angular stones that are fragments of the large rounded ones that originally comprised the gravel deposit. Death Valley National Monument. Inyo County, California. ca. 1960.



(GILLULY, J. 61)
Close-up view of desert pavement on alluvium. All finer silt is carried off by rain wash and wind, leaving a pebble pavement. Pima County, Arizona. 1933.



(GILLULY, J. 85)
Desert pavement in foreground, Black Mountain in extreme distant left. Pima County, Arizona. 1933.



(HUNT, C. B. 986)
Weathering of desert pavement progresses from below as well as from above. The bottom of this pebble of limestone has been etched evidently by an acid solution. Death Valley National Monument. Inyo County, California. ca. 1960.
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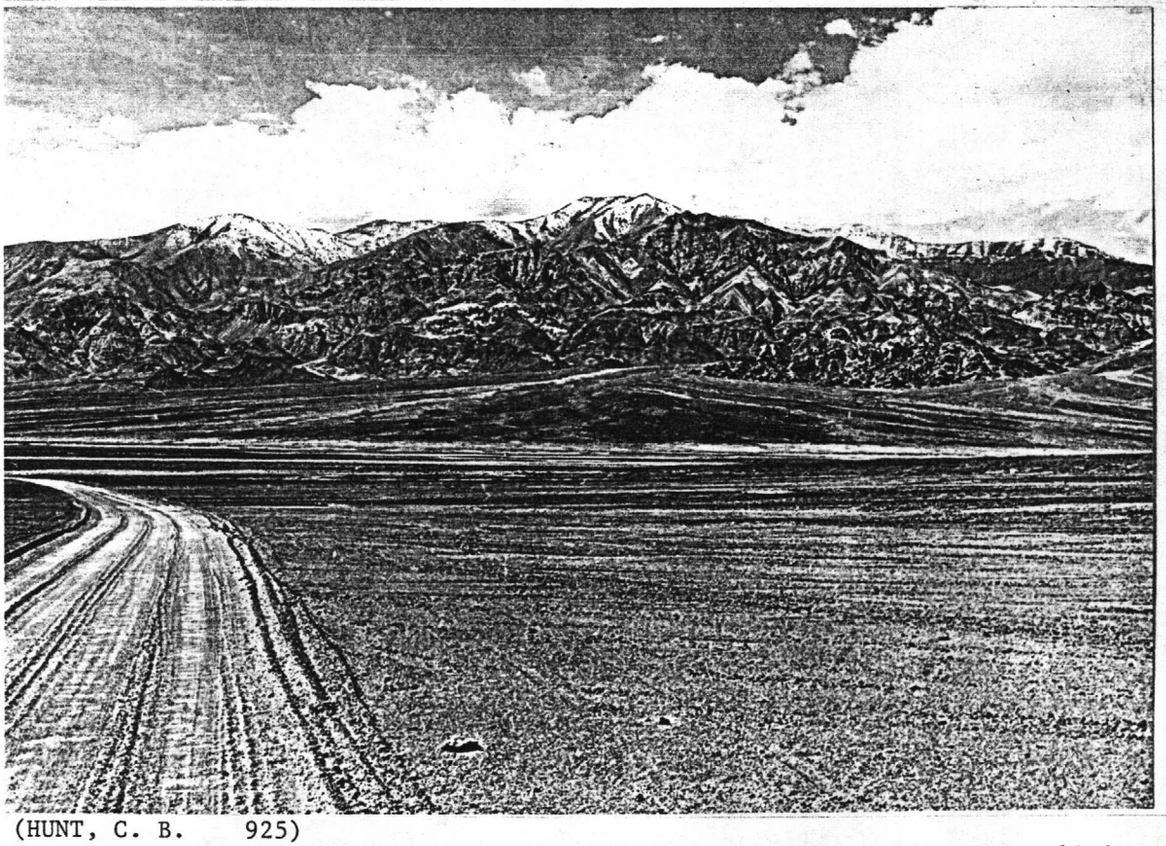
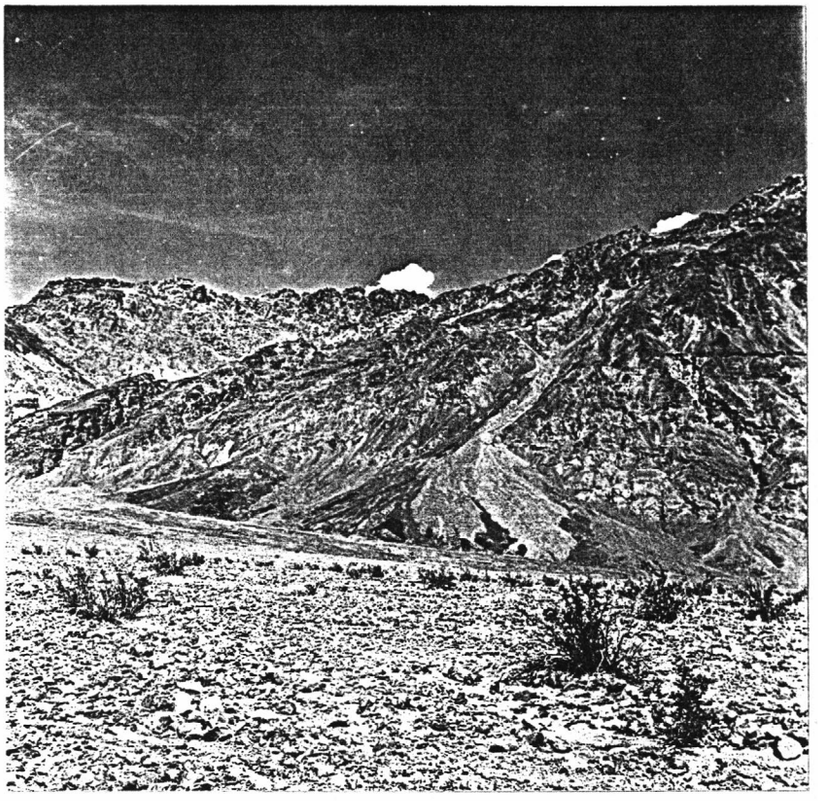
(HUNT, C. B. 981)
Contrast between the No. 3 (right) and No. 4 (left) gravels. No. 3 gravels are stained with desert varnish, No. 4 being subject to washing at the present time are not. Death Valley National Monument, California. ca. 1960.



(HUNT, C. B. 925)
View west across Death Valley to Trail Canyon fan showing how the lower limit of the desert varnish flows the contour. The light ground not only is without varnish it is highly saliferous. Death Valley National Monument. Inyo County, California. ca. 1960.



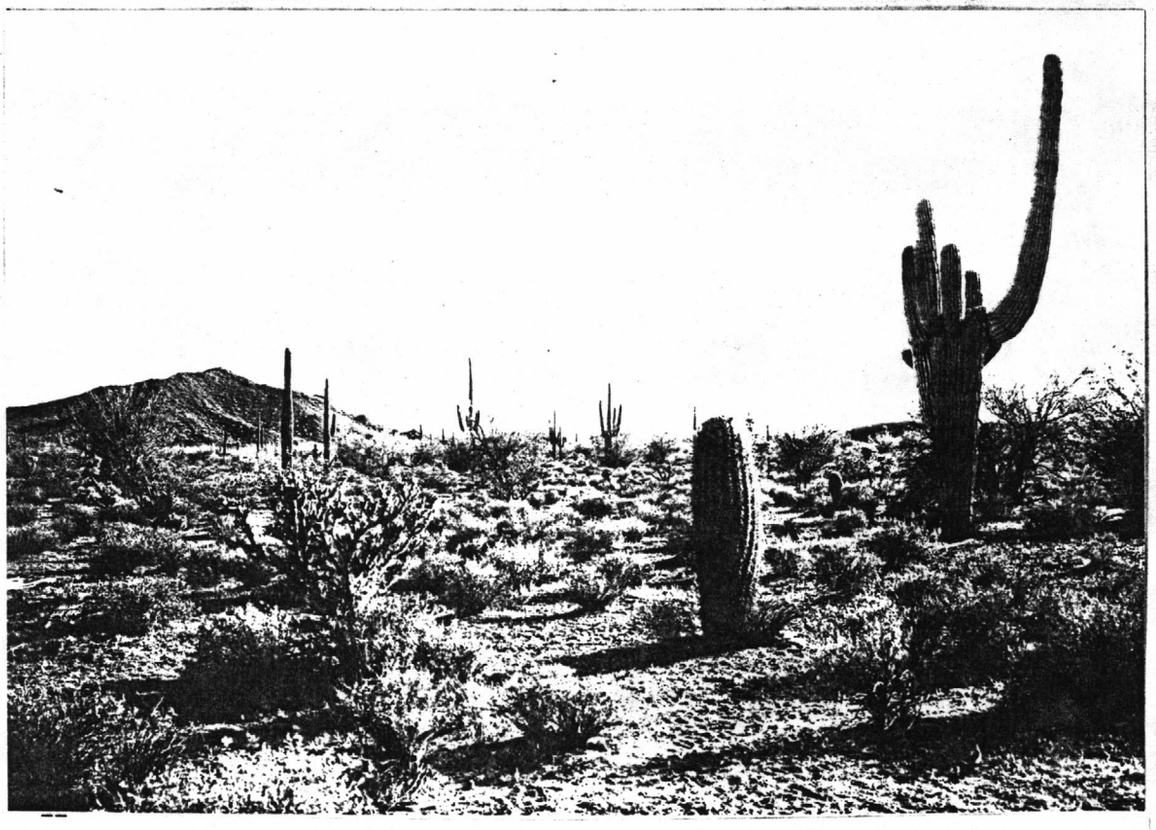
(HUNT, C. B. 979)
Most fans show several shades of staining by iron and manganese oxides (desert varnish). The most stable and oldest surfaces are stained darkly, the least stable and youngest surfaces are without staining. Death Valley National Monument. Inyo County, California. ca. 1960.



(WEEKS, F. B. 61)
Ten miles south of Furnace Creek, West slope of Funeral Range in background. Death Valley National Monument. Inyo County, California. October 11, 1900.



(WALLACE, R. E. 198)
Oblique aerial of eastern Mojave Desert. San Bernardino County, California. 1965.



(LEE, W. T. 74a)
Desert vegetation, Maricopa County, Arizona. ca. 1902.



(WALCOTT, C. D. 694)
South end of Great Salt Lake desert from southwest of Simpson Range. Tooele County, Utah. 1903.



(STACY, J. R. 579)
Pegmatite dike in Precambrian gneiss in Bear Creek Canyon. Jefferson County, Colorado. October 16, 1966.
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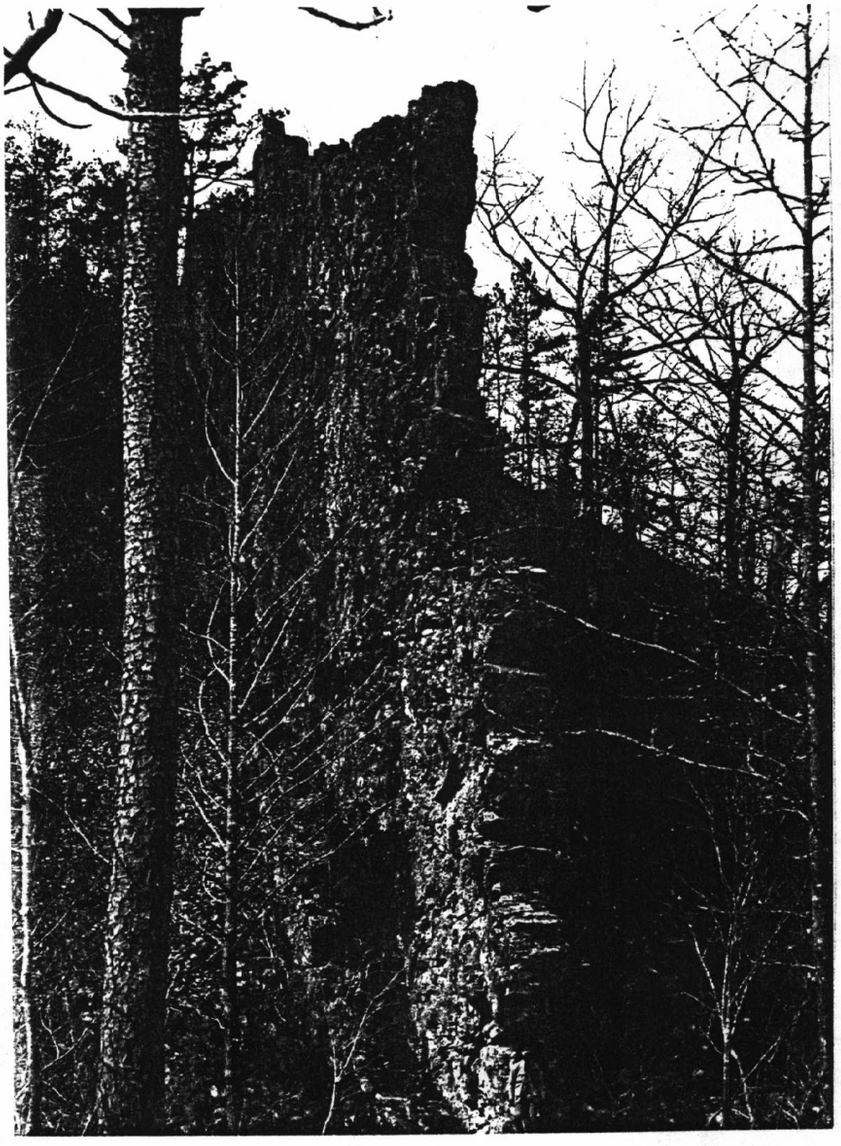
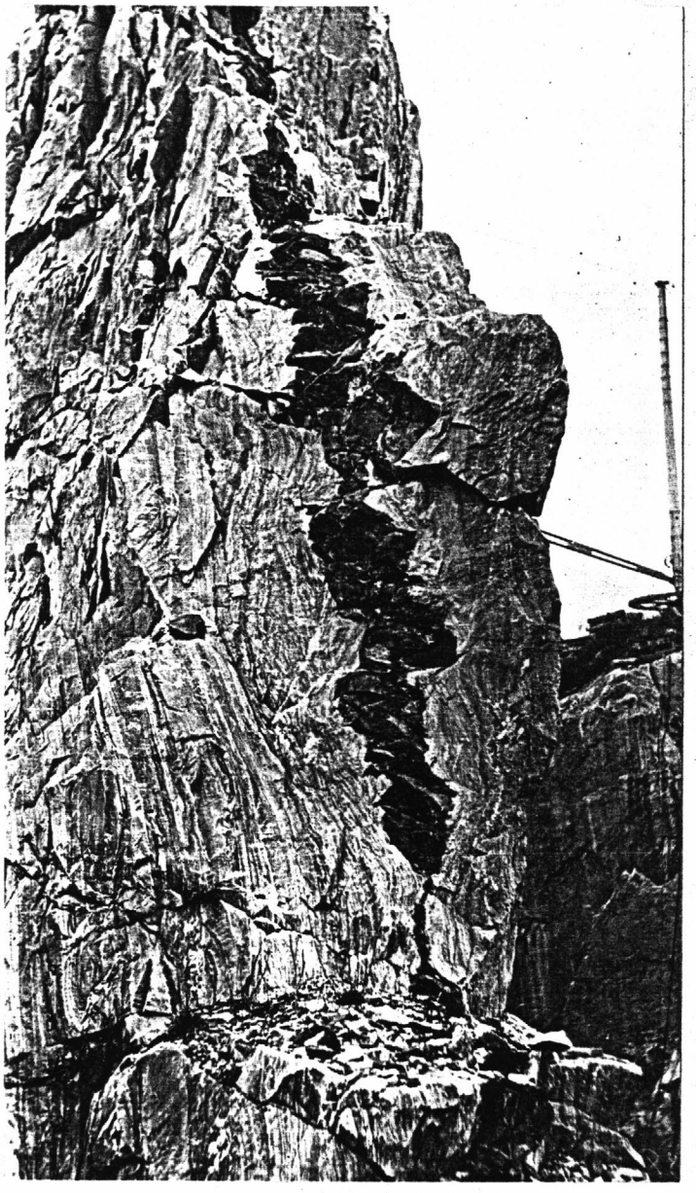
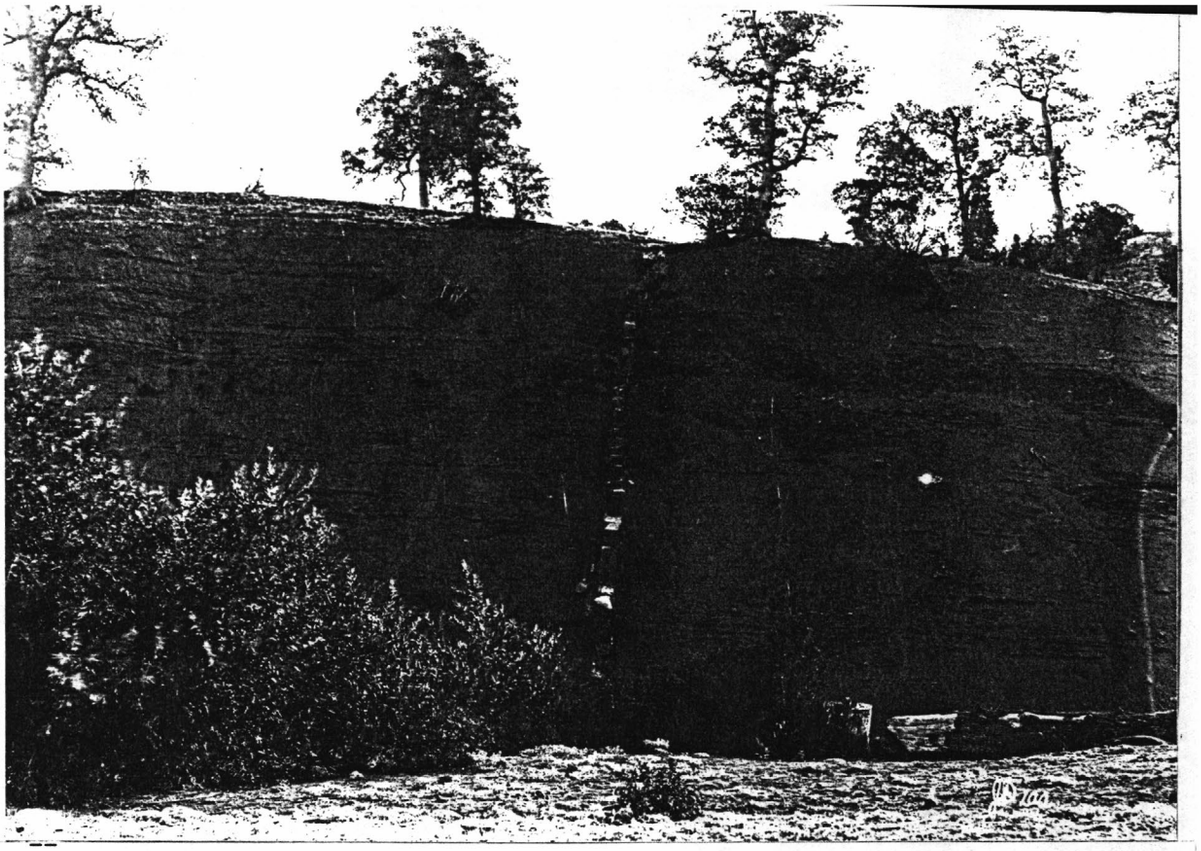


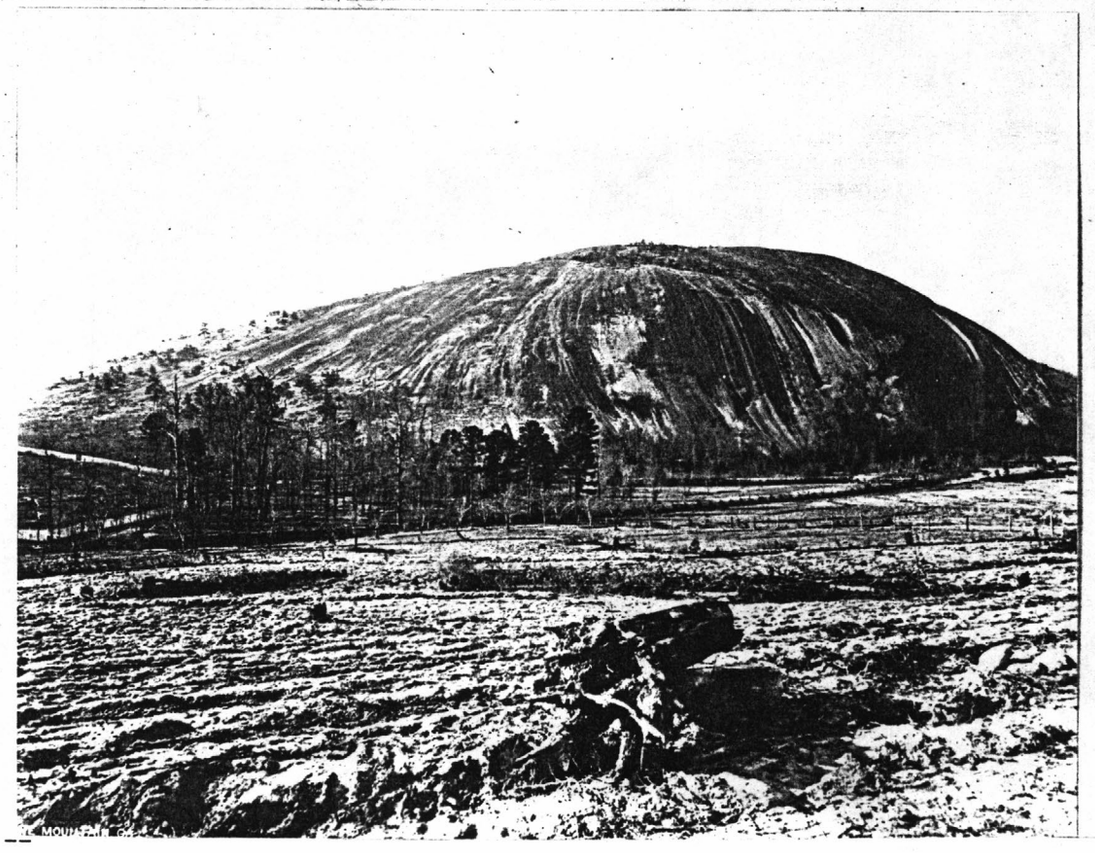
(JENNY, W. P. 40)
View of Standing Rock on Board Camp Creek. The cliff is quartzite interbedded in soft shales. The erosion of the shales has left the quartzite in relief. Northwestern Arkansas. 1890.



(BASTIN, E. S. 38)
Fractured basic dike in crystalline limestone. Maximum width of dike 15 inches. The limestone has "flowed" while the dike has "fractured" in the general regional folding. One mile west of Rockland. Knox County, Maine. 1905.



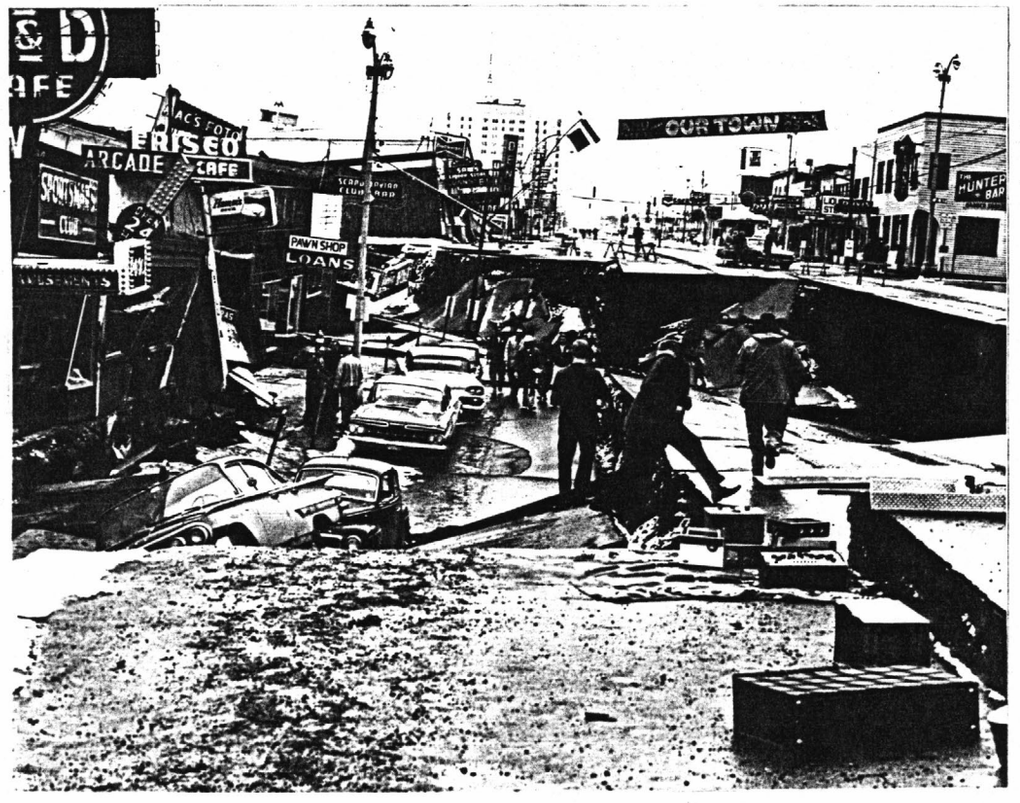
(DILLER, J. S. 100)
Sand dike cutting Cretaceous shale, west side of Sacramento Valley, Tehama County, California. n.d.



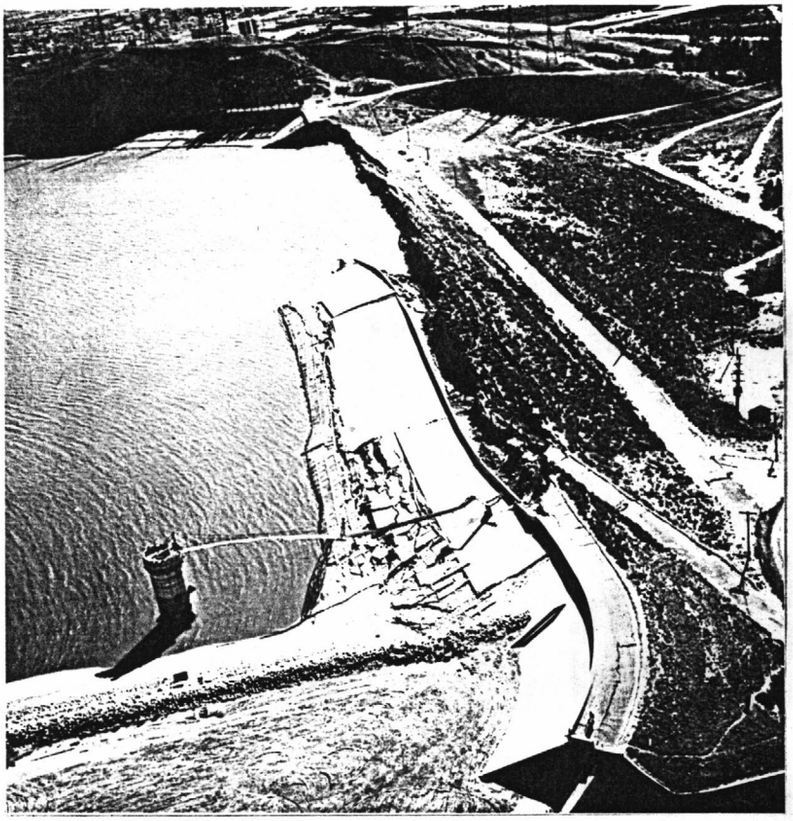
(HILLERS, J. K. 166)
Stone Mountain a monadnock. De Kalb County, Georgia. n.d.



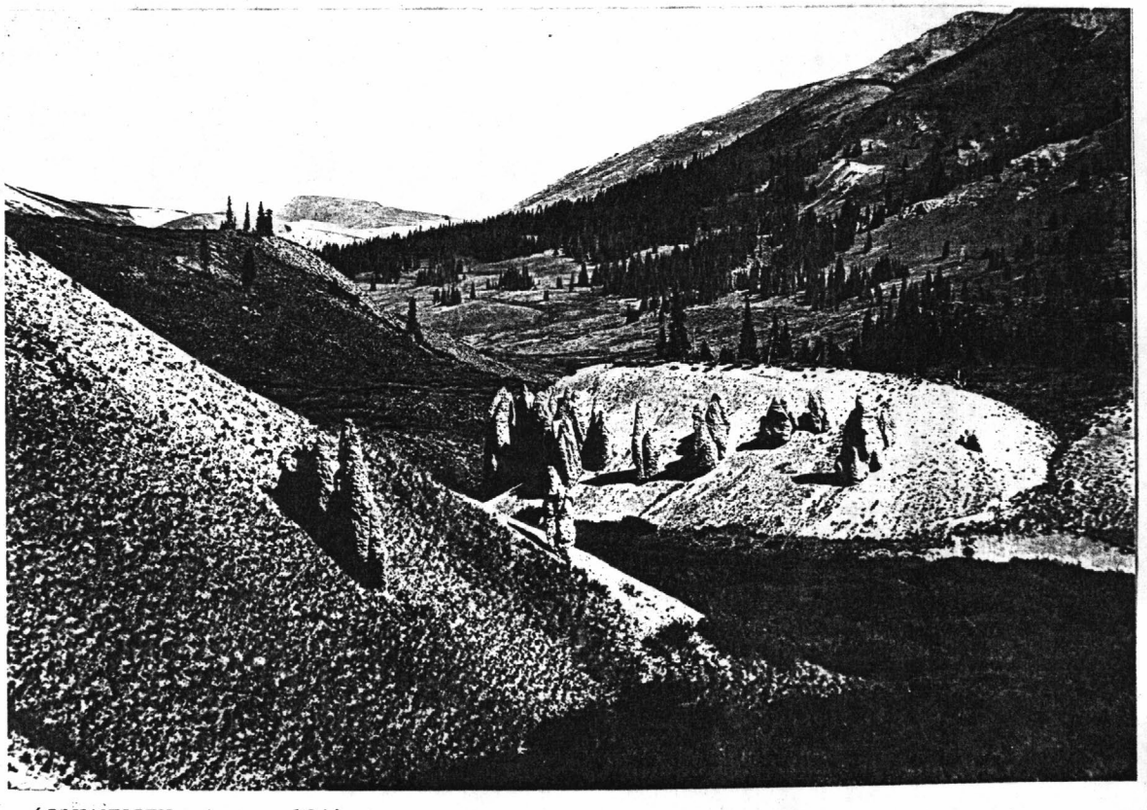
(STACY, J. R. 77)
Compressed fence caused by Hebgen Lake earthquake. Underthrust fault marked by shovel handle at right. Gallatin County, Montana. August 1959.



(ALASKA EARTHQUAKE 144)
Collapsed Fourth Avenue near C Street, due to landslide caused by March 27, 1964 earthquake, Anchorage. Anchorage district, Cook Inlet Region, Alaska.



(CALIFORNIA EARTHQUAKE 14)
Lower Van Norman Dam near San Fernando, showing slumping on north side and concrete dropping into lake in the wake of the February 9, 1971 earthquake. A considerable amount of water had been emptied from the lake at the time. Los Angeles County, California.



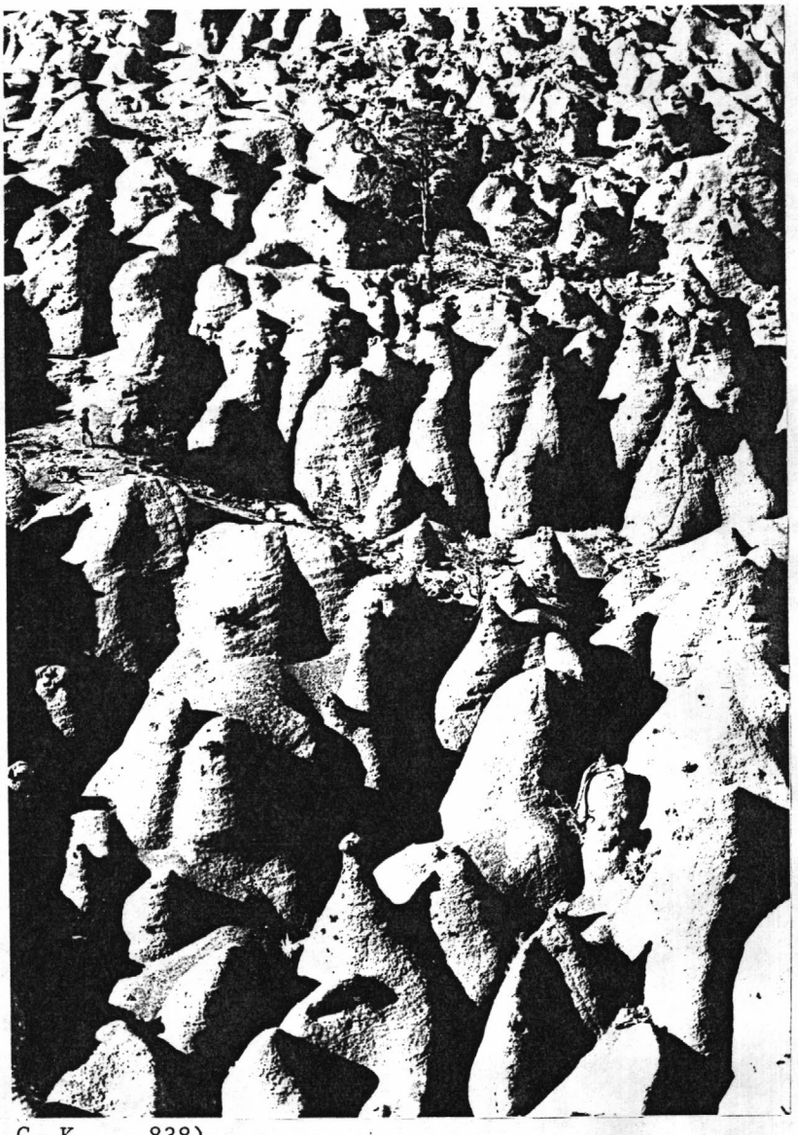
(JOHANNSEN, A. 124)
Hoodoos up Pole Creek. Hinsdale County, Colorado. August 16, 1906.



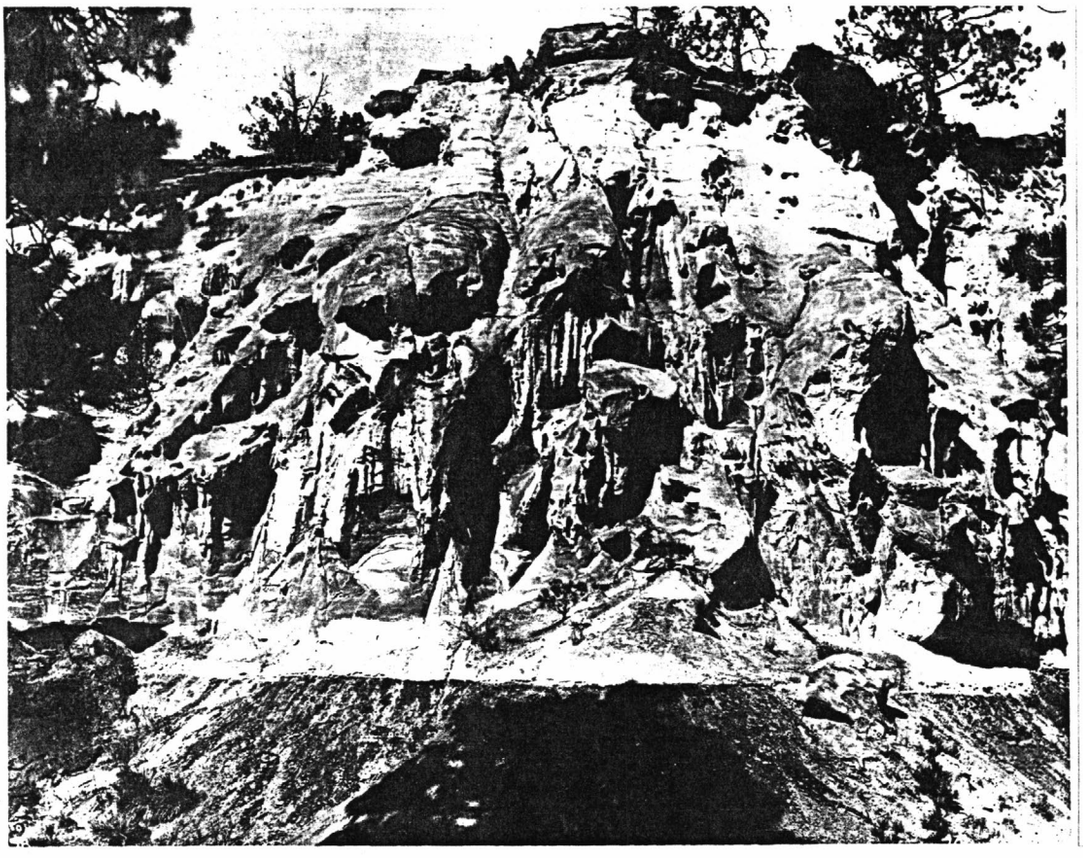
(DARTON, N. H. 1054)
Effects of differential weathering in Garden of the Gods Park, northwest of Colorado Springs. El Paso County, Colorado. n.d.



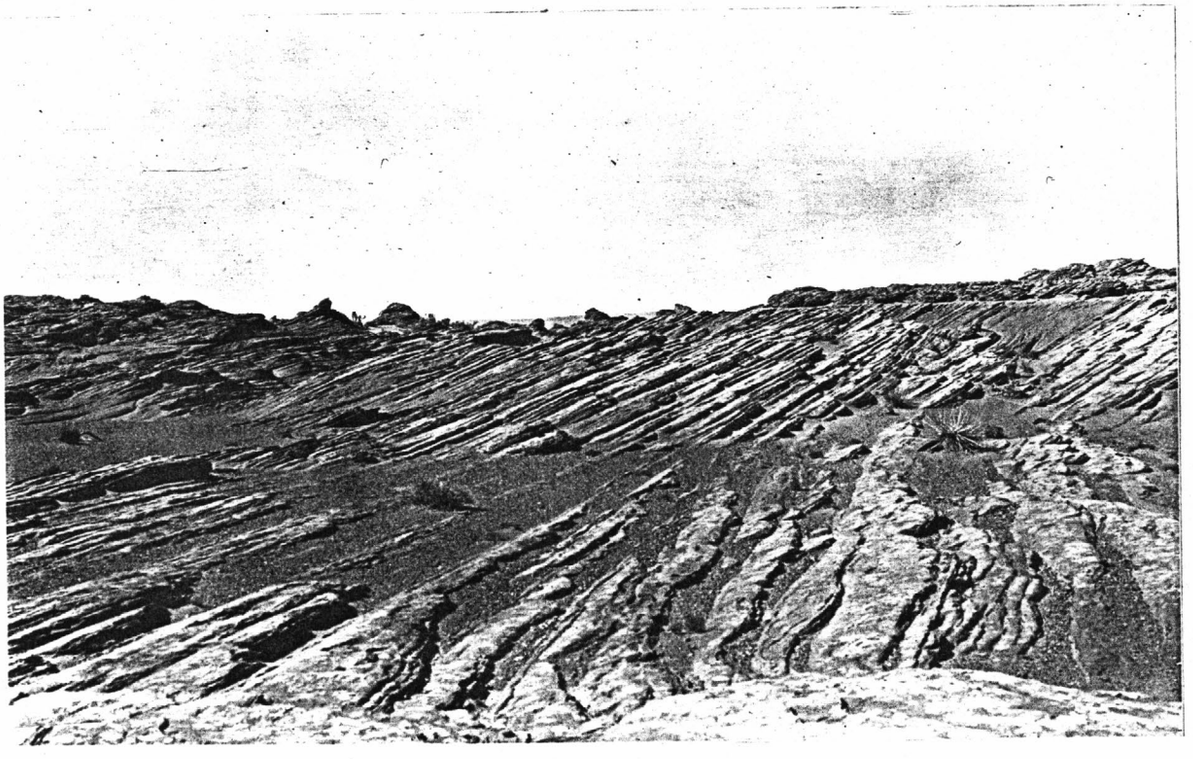
(DILLER, J. S. 787)
Pinnacles of Anna Creek Canyon. Crater Lake National Park. Klamath County, Oregon. ca. 1901.



(GILBERT, G. K. 838)
Sculptured face of Red Mountain a cinder cone of the San Francisco Plateau. Man for scale upper left side. Coconino County, Arizona. 1891.



(DARTON, N. H. 473)
Wind sculptured Jurassic sandstone on red beds, 7 miles south of Hot Springs, Black Hills. Fall River County, South Dakota. n.d.



(GREGORY, H. E. 201)
Wind erosion, Kaibito plateau near Tuba. Coconino County, Arizona. July 1913.
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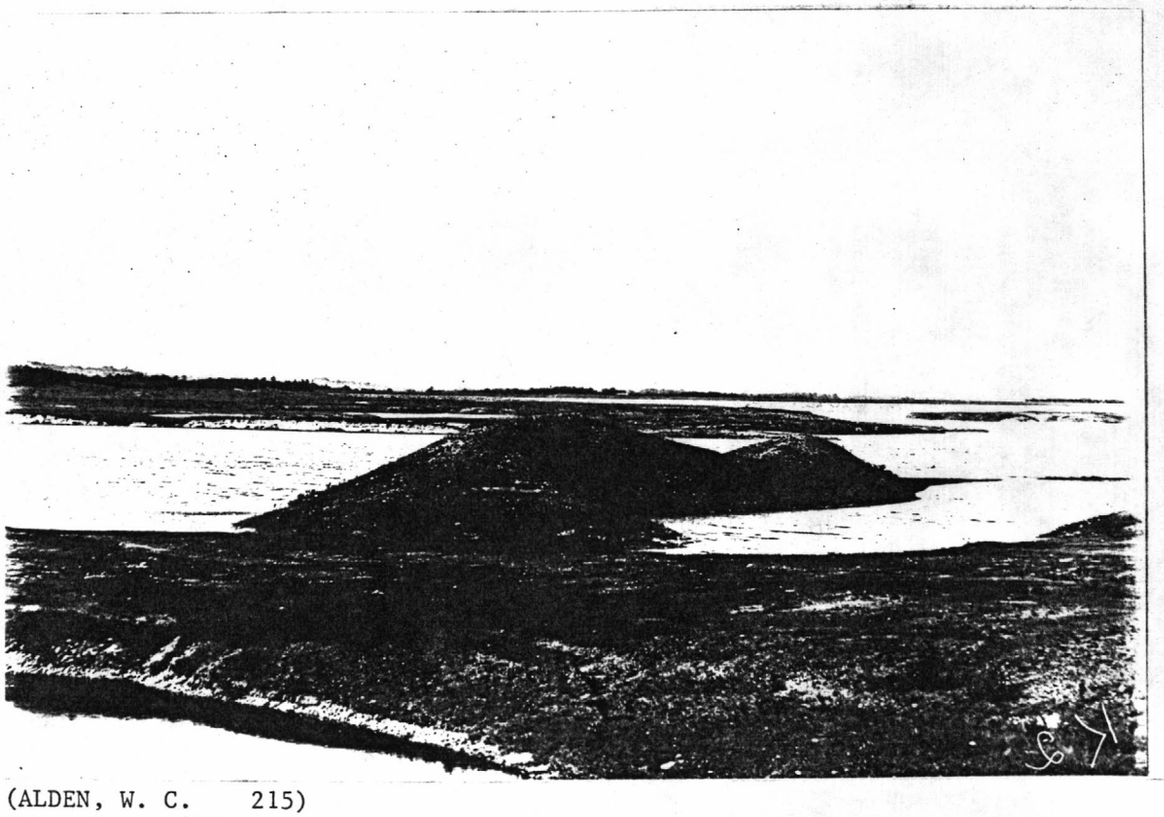
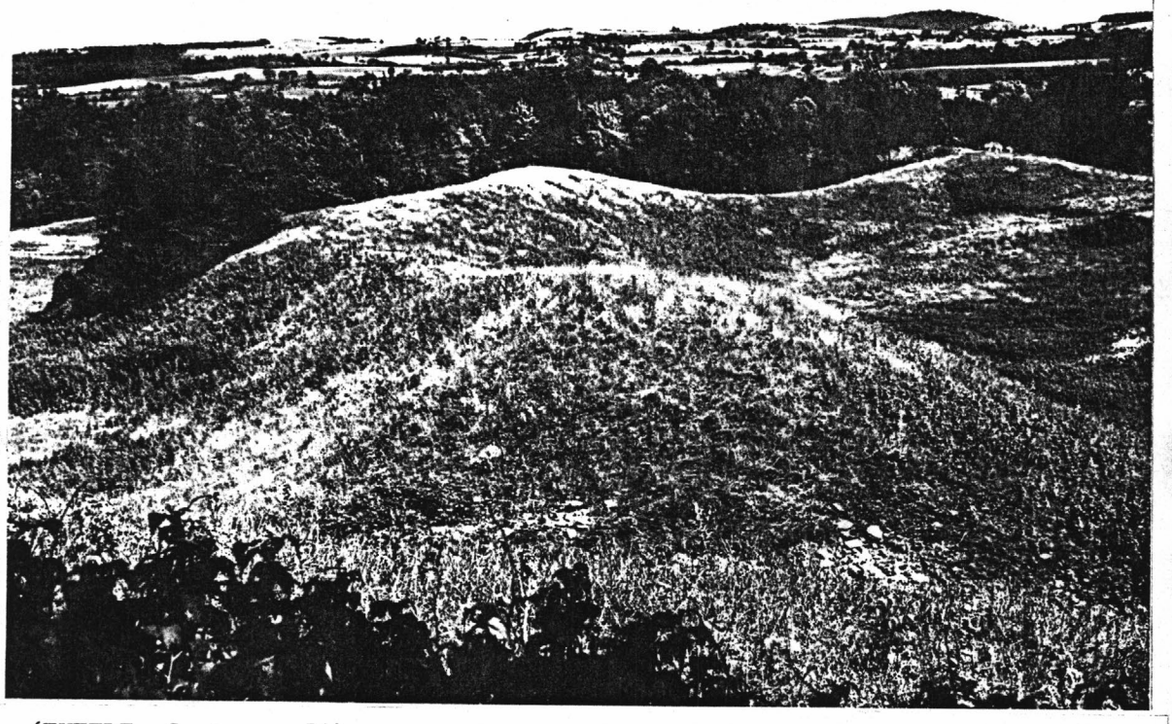
(MENDENHALL, W. C. 648)
Sand blast erosion of schist boulder near Palm Springs station. Colorado desert. Riverside County, California. n.d.



(ALDEN, W. C. 215)
Esker (partially submerged) formed at the Boylston stage tributary to the delta-sand plain terrace, 3 miles south of Clinton. In the background delta sand plains of the Clinton stage. Worcester County, Massachusetts. August 1906.



(TUTTLE, C. R. 54)
Esker near Mallory. Oswego County, New York. 1942.
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(ALDEN, W. C. 431)
Esker in SW¼ sec. 18, T. 12 N., R. 13 E. Dodge County, Wisconsin. September 1909.
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(ALDEN, W. C. 455)
Francis Creek esker. Manitowoc County, Wisconsin. September 22, 1910.



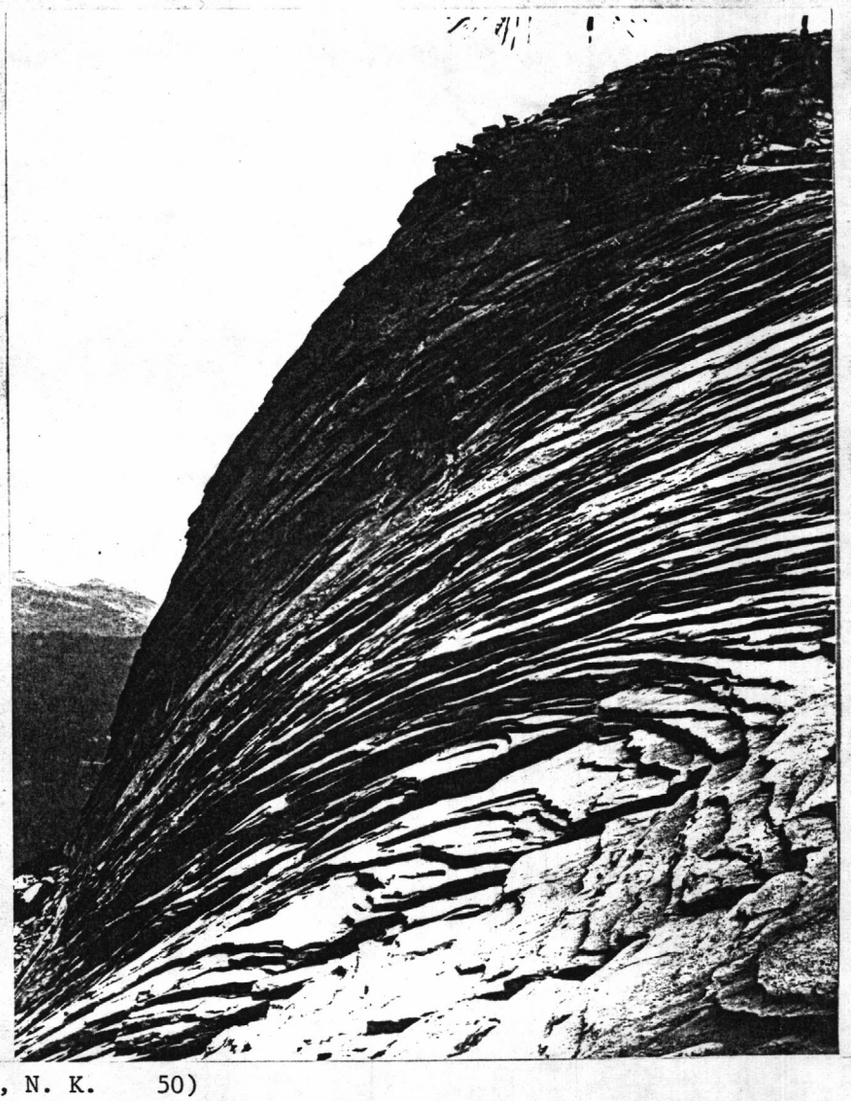
(HUNT, C. B. 980)
Quartz monzonite boulder breaking up by exfoliation. The exfoliation is probably due to hydration that causes the minerals to swell. The exfoliated shells are breaking down into the coarse grit. Death Valley National Monument, California.



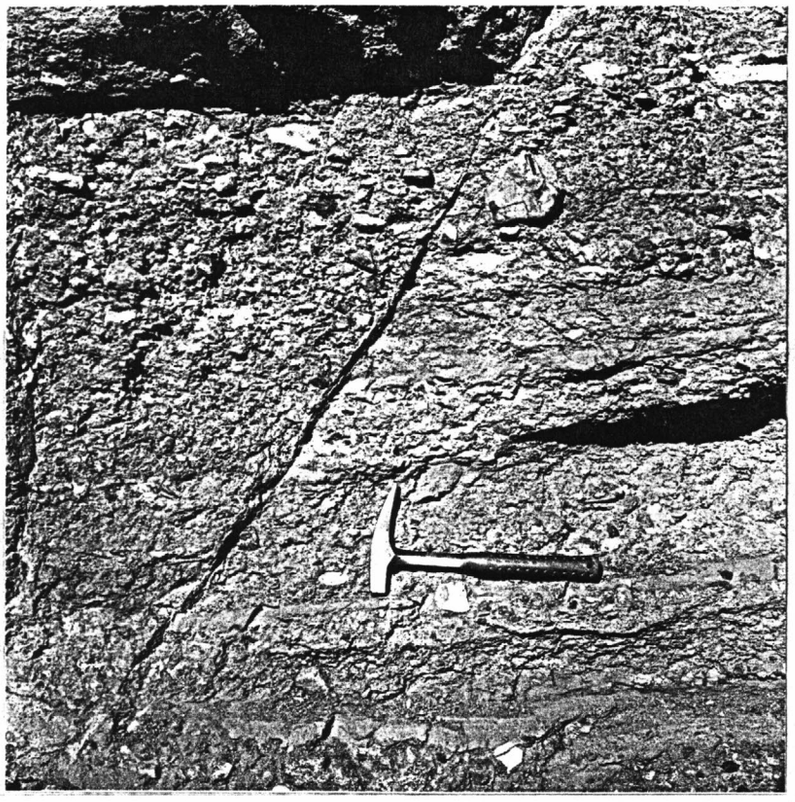
(TURNER, H. W. 111)
Blocks of exfoliating granite on slope northwest of Grouse Lake. The blocks have been fractured and displaced by frost action. Madera County, California. n.d.



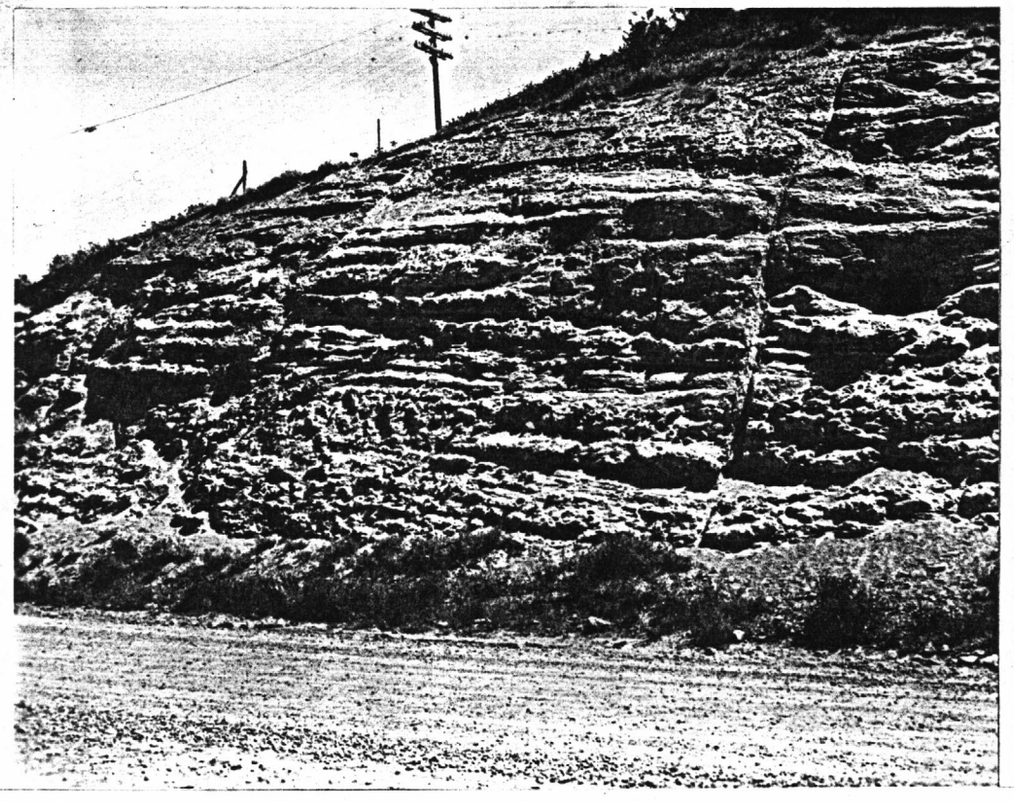
(GILBERT, G. K. 2032)
Granite boulder shaped by exfoliation, the boulder is about 40 feet in diameter, the separated fragment resting on it about 10 feet thick. Giant Forest, Kaweah Basin, Sequoia National Park, California. 1903.



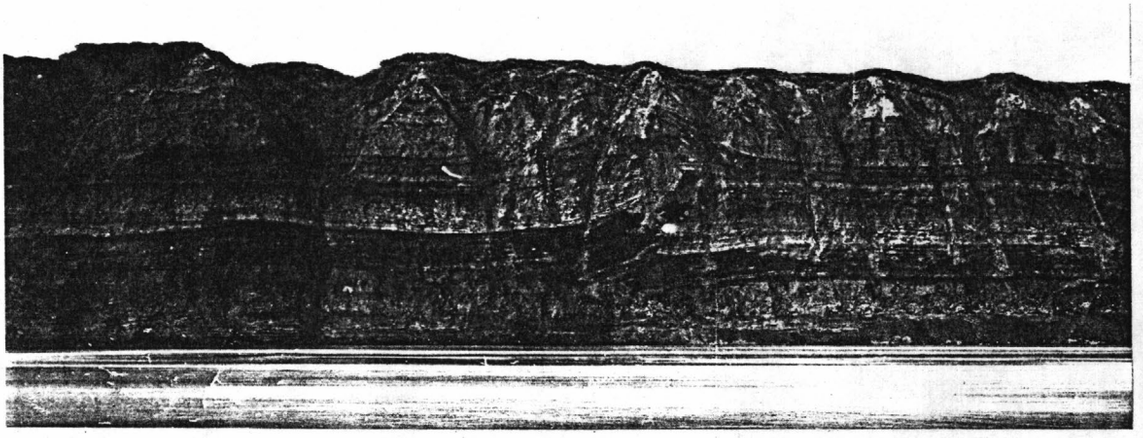
(HUBER, N. K. 50)
Exfoliation in granite near Shuteye Peak in the Sierra Nevada Mountains. Madera County, California. n.d.



(BULL, W. B. 6)
Normal fault in alluvial-fan deposits adjacent to the south side of the Catalina Mountains. Arizona. 1966.



(HACKETT, O. M. 6)
Small normal faults in the Tertiary strata in the SW¼SE¼ sec. 7. T. 2 S., R. 6 E. Gallatin Valley. Gallatin County, Montana. ca. 1953.



(SCHRADER, F. C. 1000)
Faulted strata on Goobic River. Alaska. n.d.
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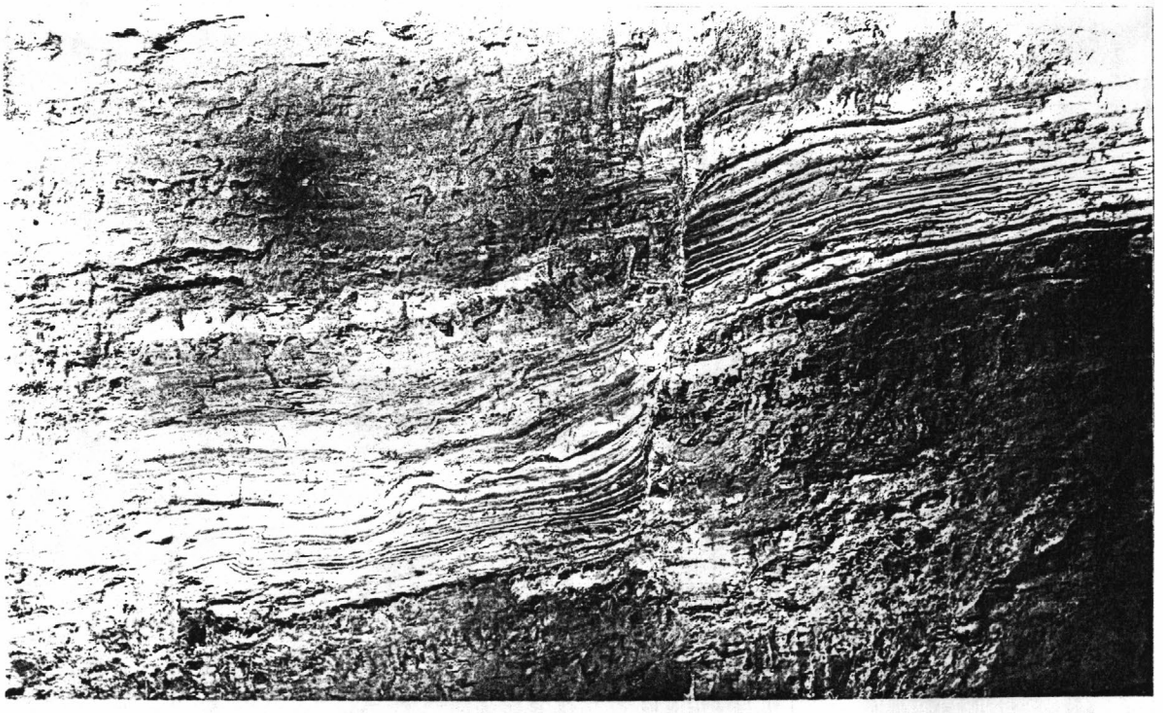
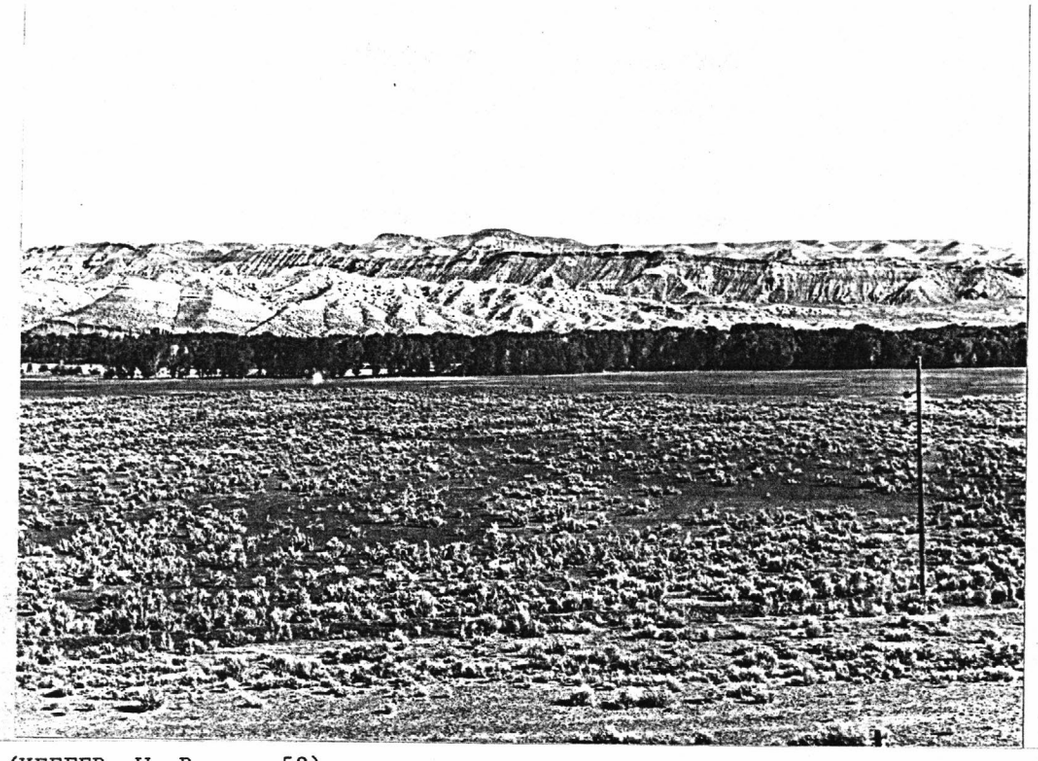
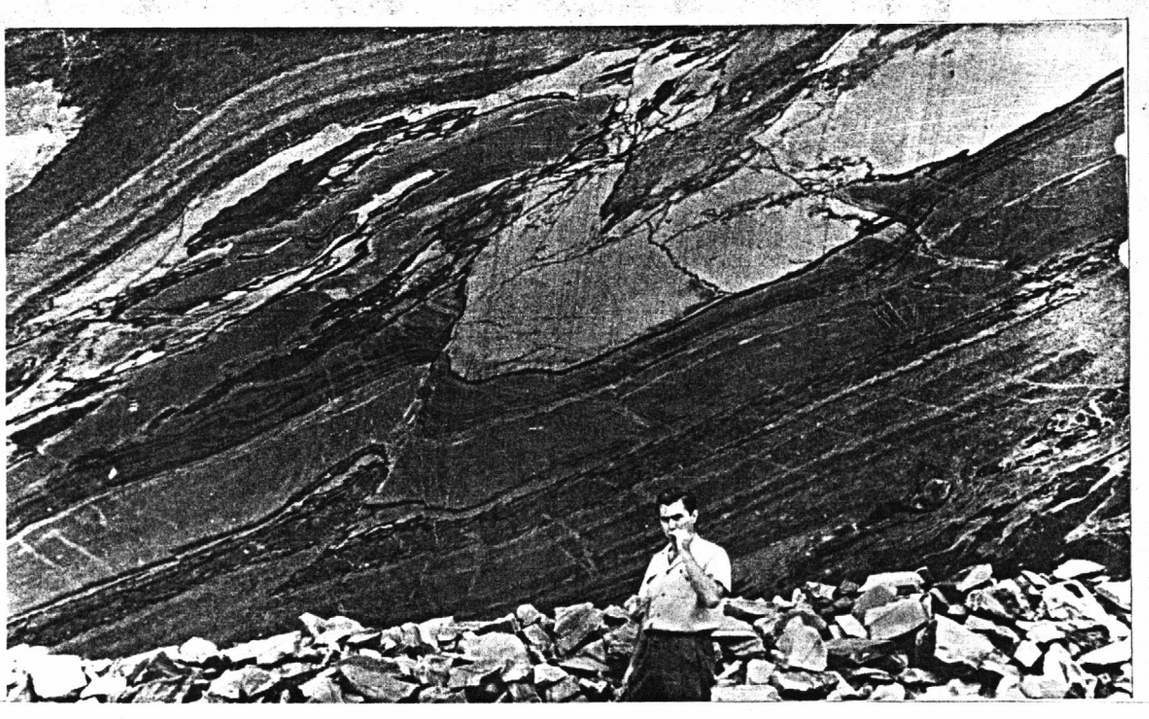


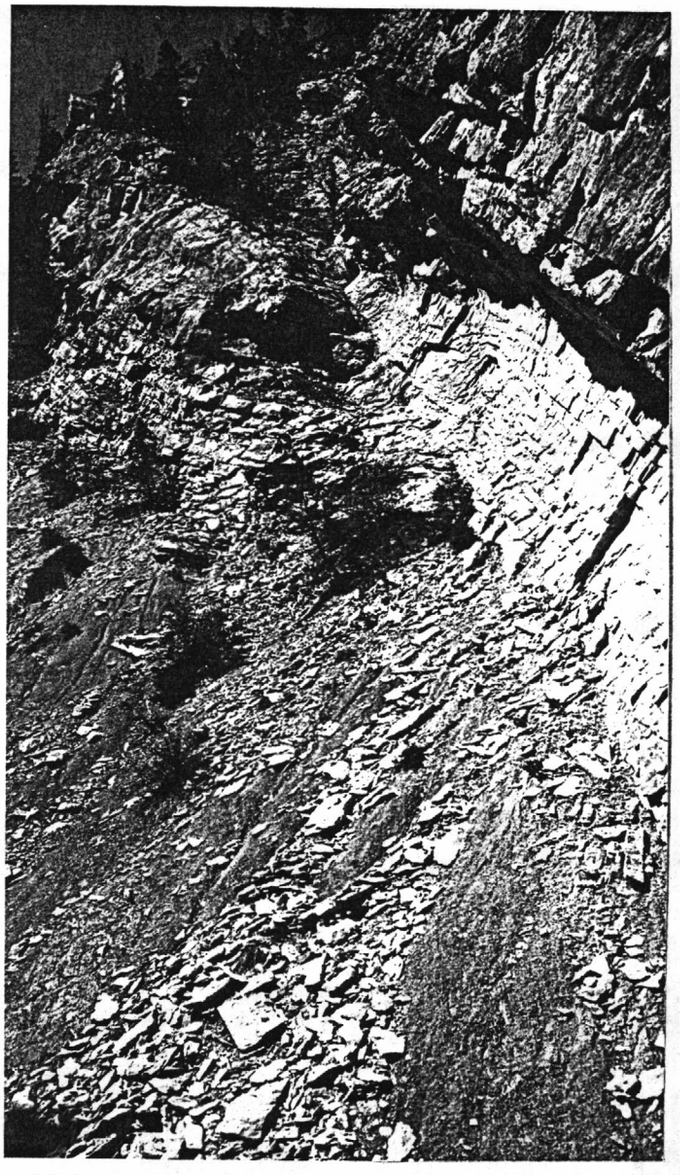
(KEITH, A. 13)
Normal fault in sandy shale 1 mile southwest of Little River gap in Chilhowee Mountains. Blount County, Tennessee. 1889.



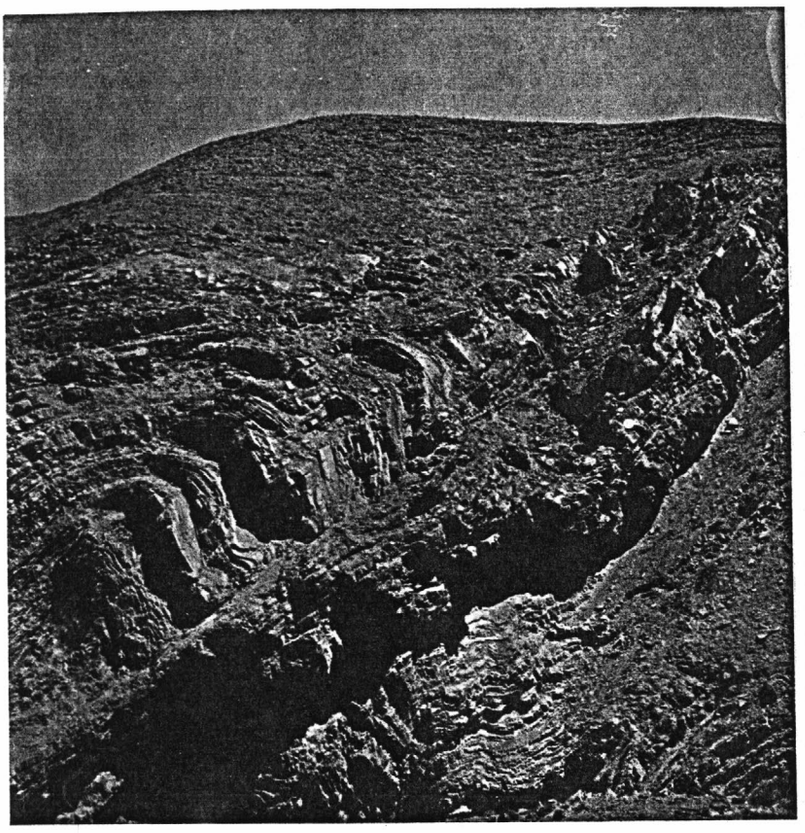
(KEEFER, W. R. 52)
Cretaceous rocks faulted against lower Eocene rocks along north side of Wind River. Wind Ridge reverse fault. NW cor. T. 5 N., R. 5 W., Wind River meridan. Fremont County, Wyoming. ca. 1968.



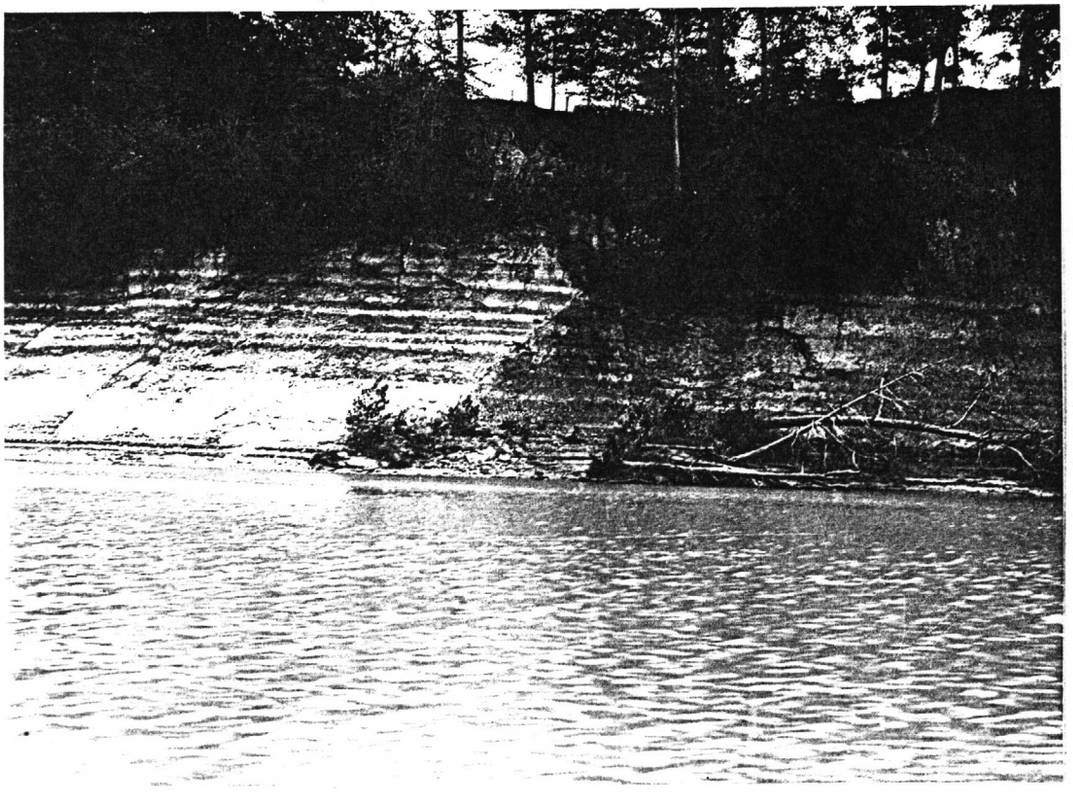
(WALLACE, R. M. 20)
Steep reverse fault in dolomitic marble at the Jazida do Urubu. Drag folds near the foot of the face are well defined along the fault plane but less distinct above. Minas Gerais, Brazil. 1957.



(PIERCE, W. G. 447)
Small reverse fault in sec. 12, T. 54 N., R. 104 W. Madison limestone on right with Gallatin shale below. Fault occurs along bedding at base of Madison. Park County, Wyoming. August 1937.



(SEGERSTROM, K. 552)
Thrust fault and drag fold of thin-bedded limestone of the Nantoco formation about 50 m below the Gamma Member, Quebrada de Las Penas. Height of the cliff immediately below the fault plane is 3 to 8 m. Atacama Province, Chile. n.d.



(MONROE, W. H. 197)
Thrust fault in Coastal Plain. Selma chalk faulted up into Ripley formation. Tombigbee River below Paces Landing. Marengo County, Alabama. October 14, 1937.



(COLLIER, A. J. 471)
Thrust fault 2 miles east of Wevok. Northern Alaska region, Alaska. n.d.
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(DURHAM, D. L. 68)
Small thrust fault in Monterey Shale, exposed in the bank of the San Antonio River. Monterey County, California. ca. 1961.
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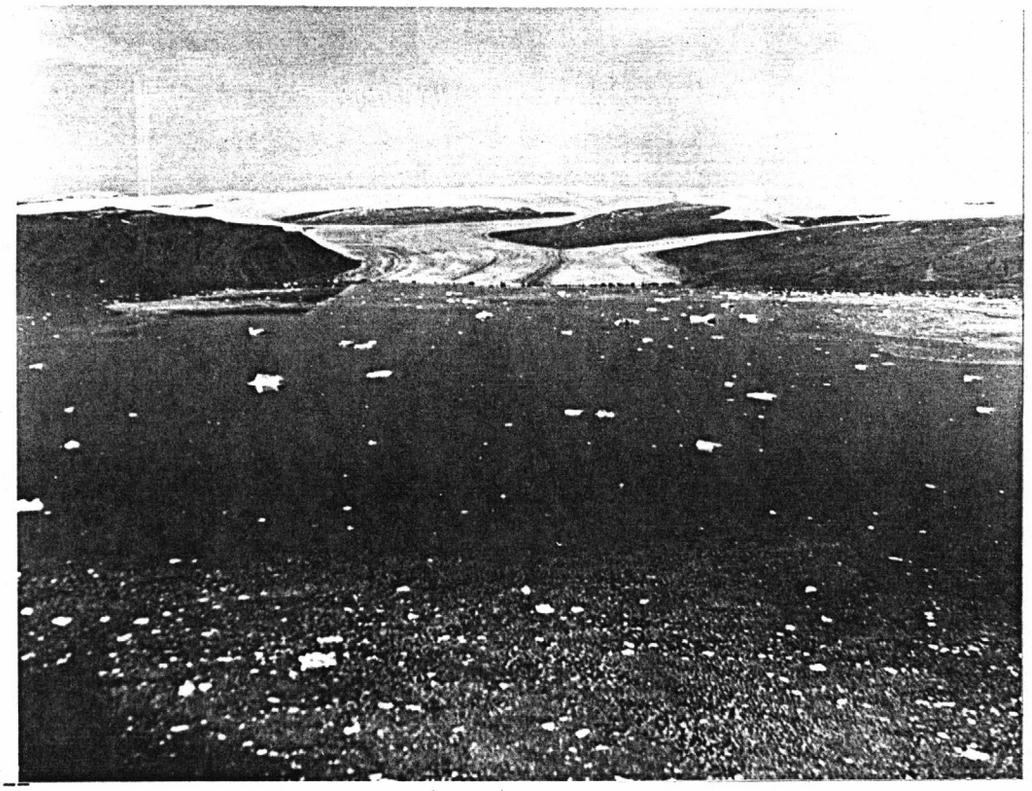
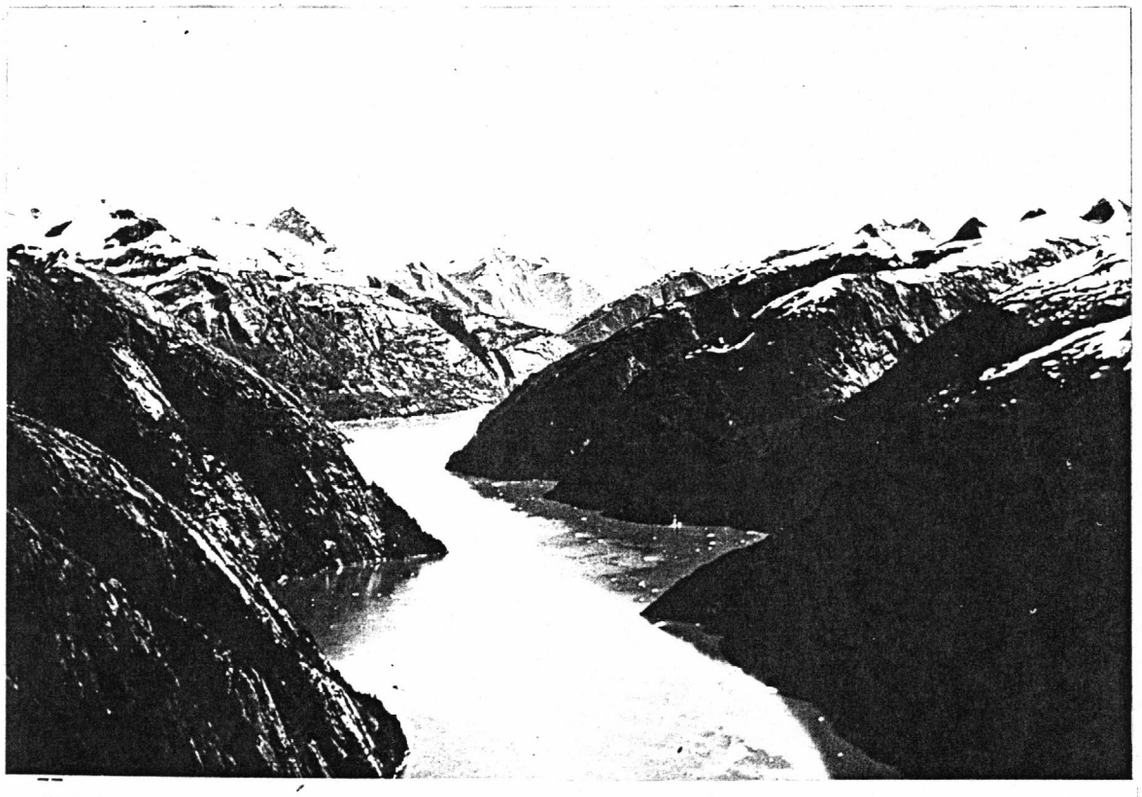
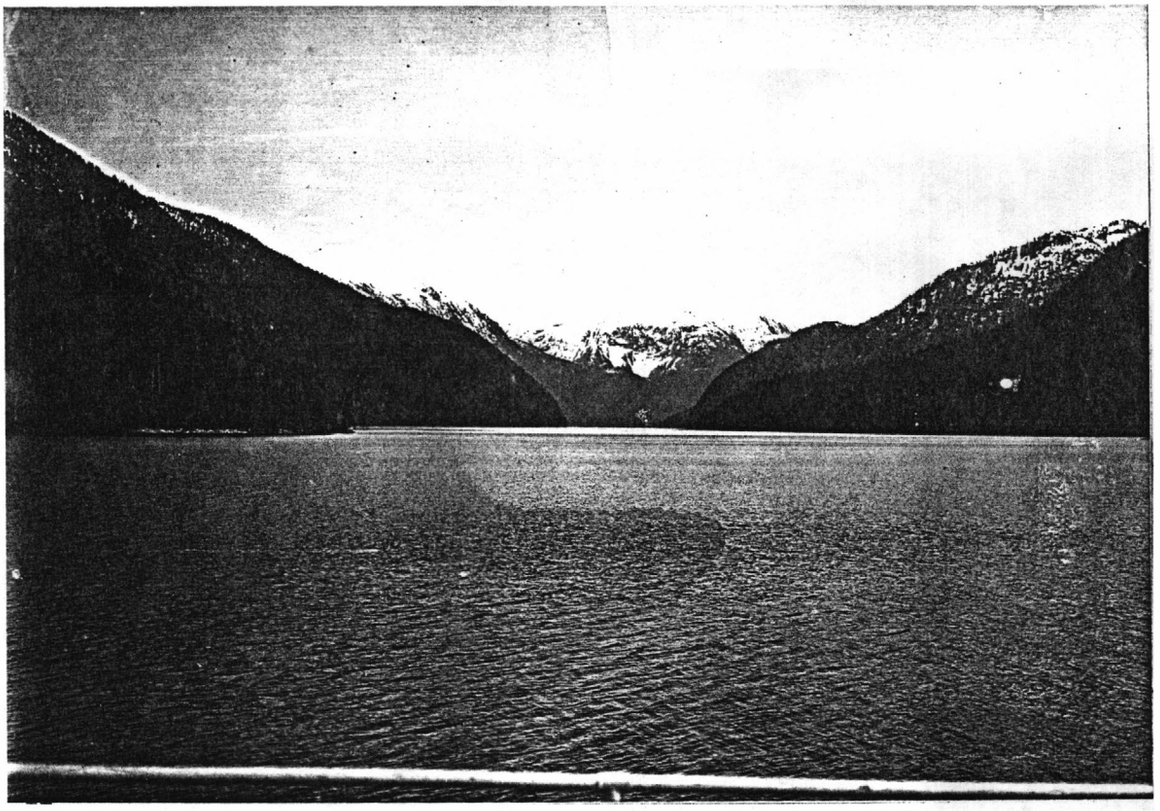


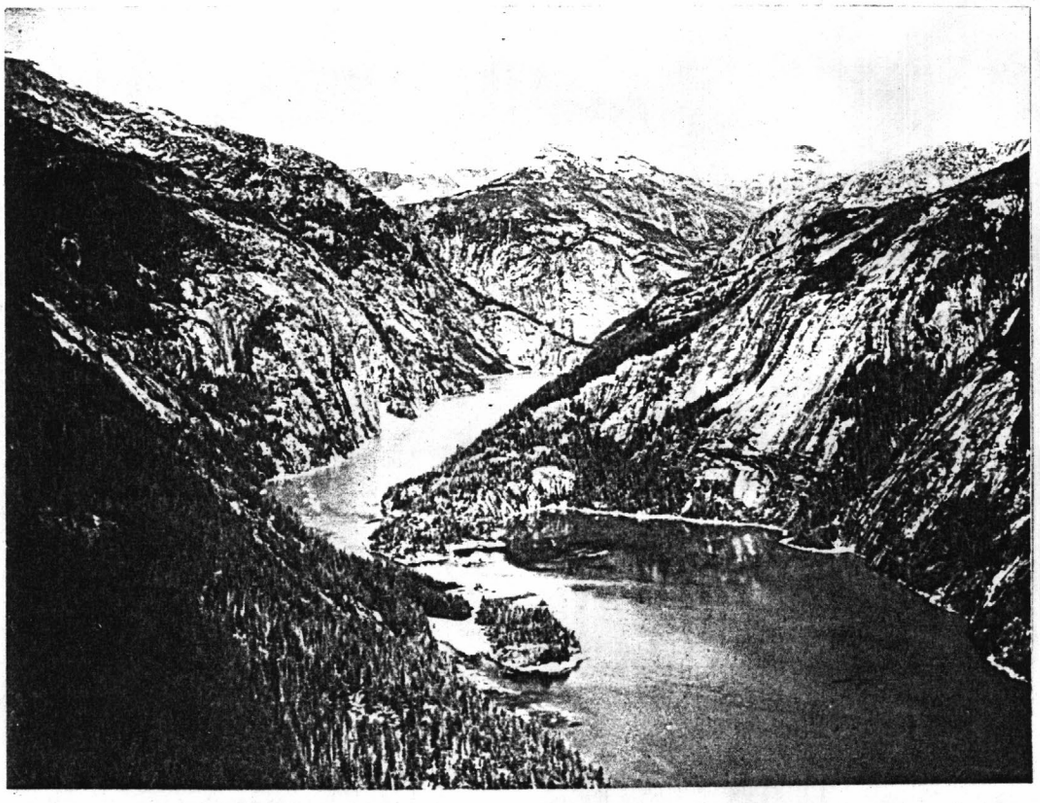
(COLTON, R. B. 131)
Wolstenholme Fjord looking toward Dike Mountain. Nunatarssuaq region, Greenland. August 22, 1953.



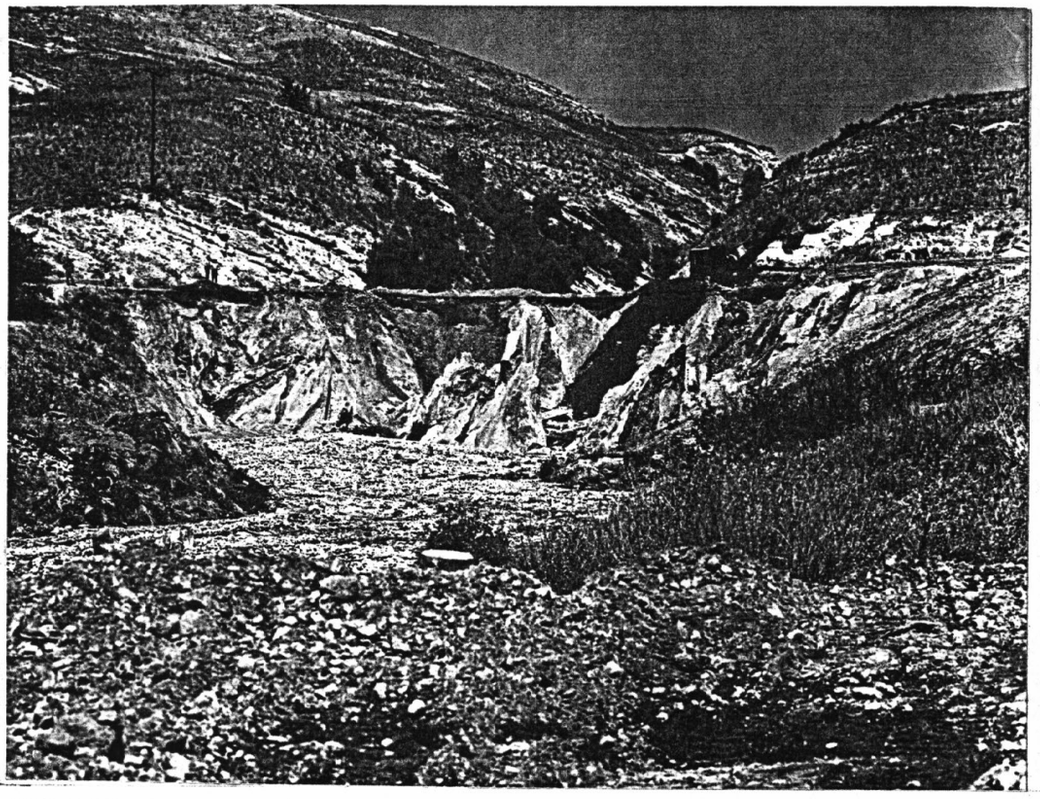
(BREW, D. A. 7)
Oblique aerial view looking east toward the head of Tracy Arm. Juneau and Petersburg districts, Southeastern Alaska region, Alaska. ca. 1974.



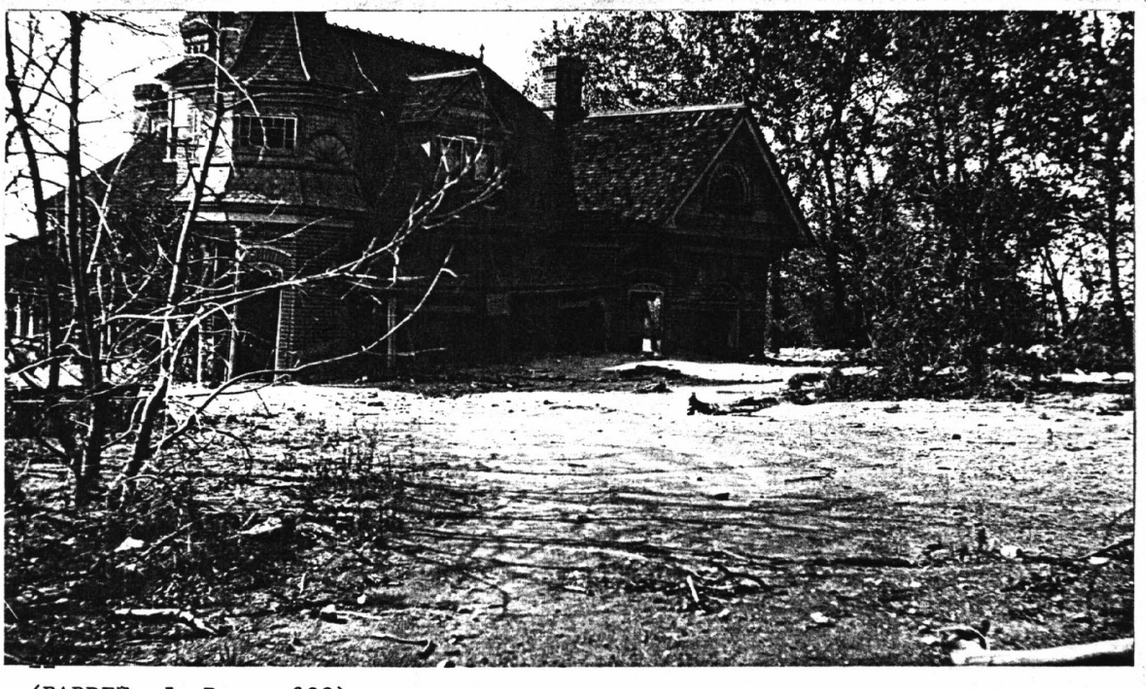
(ATWOOD, W. W. 118)
Grenville Channel, British Columbia, Canada. 1908.



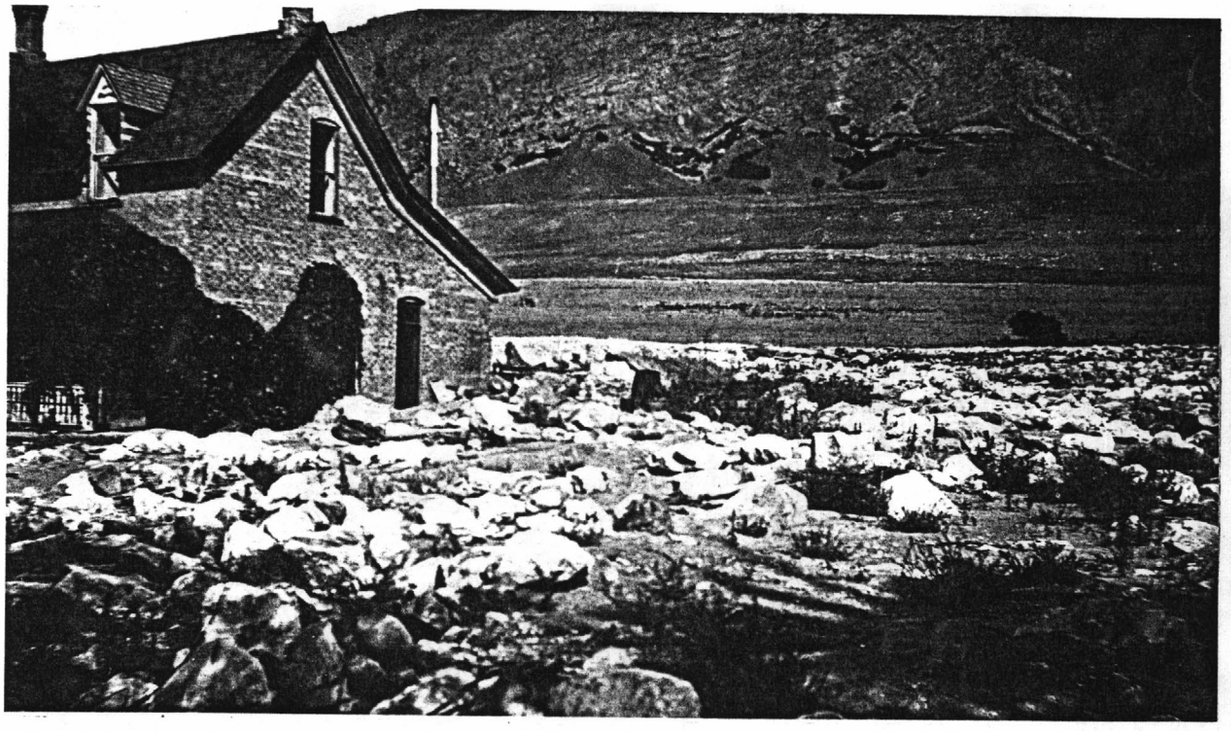
(BREW, D. A. 9)
Oblique aerial view looking north at the Narrows in Fords Terror. Petersburg district, Southeastern Alaska region, Alaska. ca. 1974.



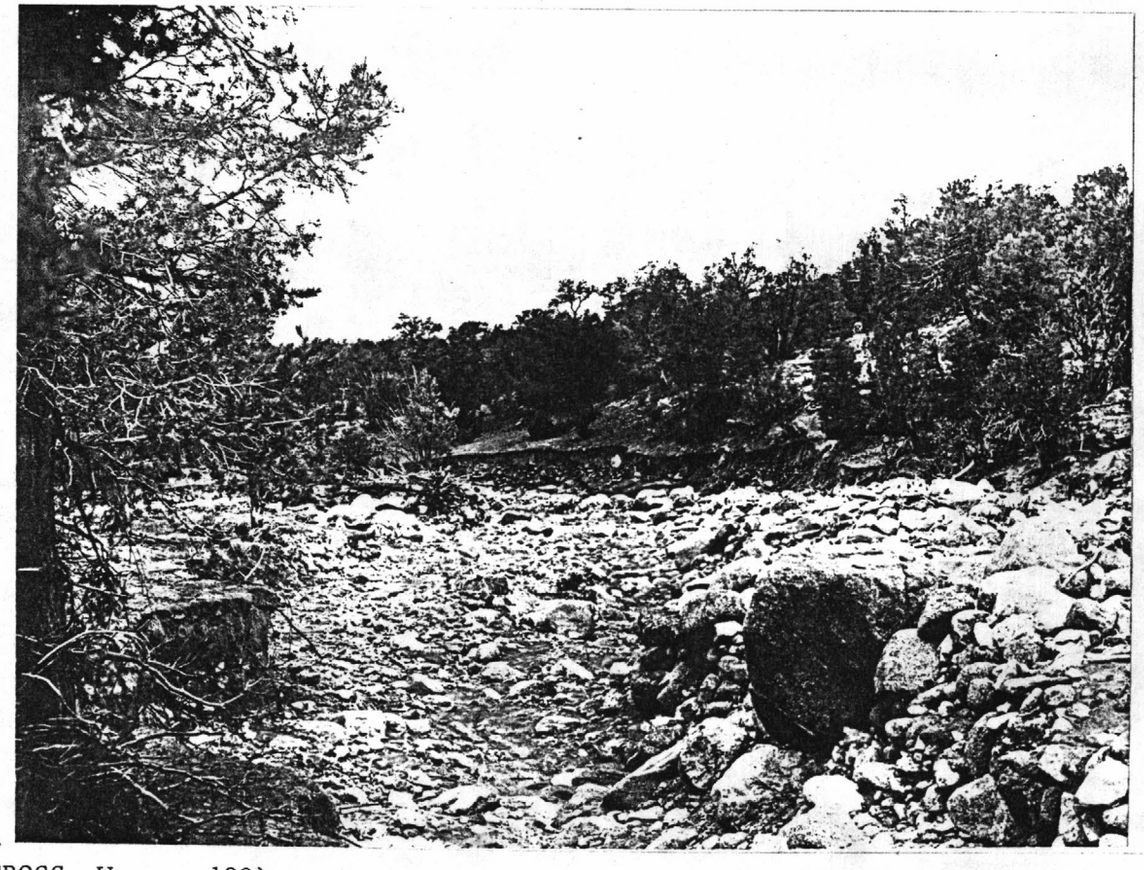
(WOOLLEY, R. R. 429)
Looking into Perrys Hollow at city cemetery after flood of August 19, 1945. Utah.



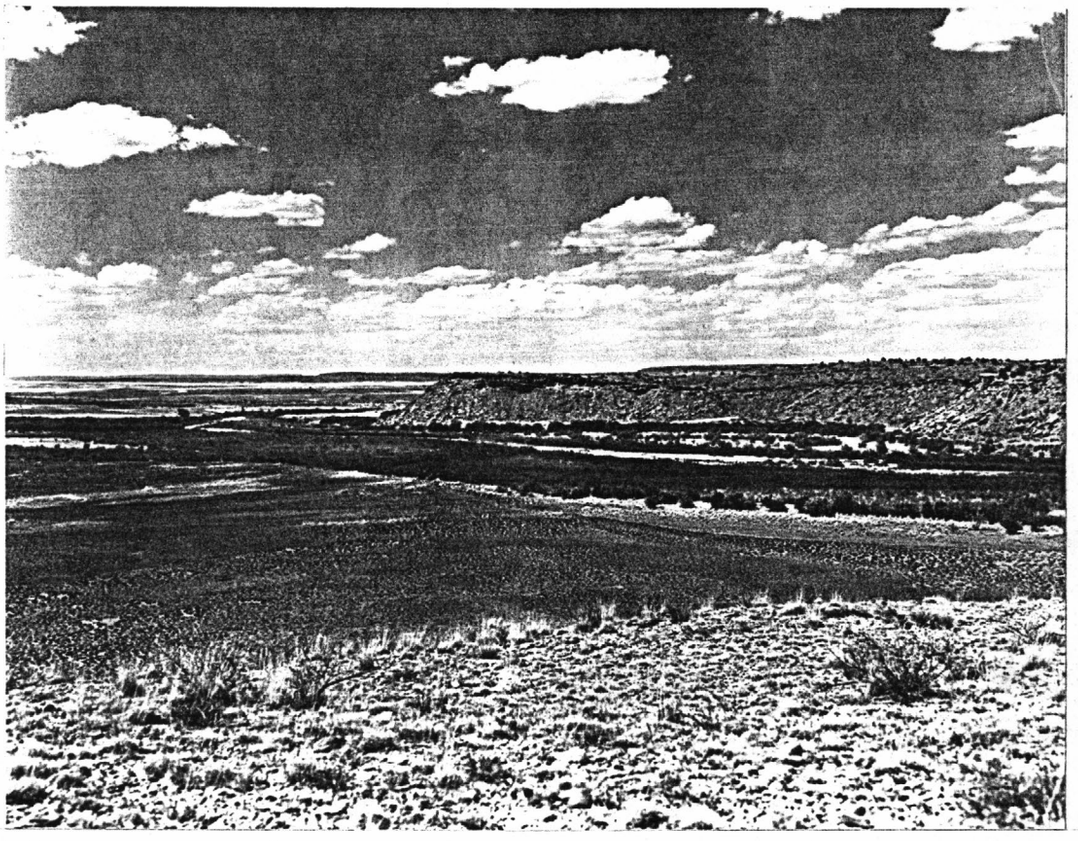
(PARDEE, J. D. 939)
Cloud burst flood destroyed house at Farmington. Davis County, Utah. September 16, 1924.



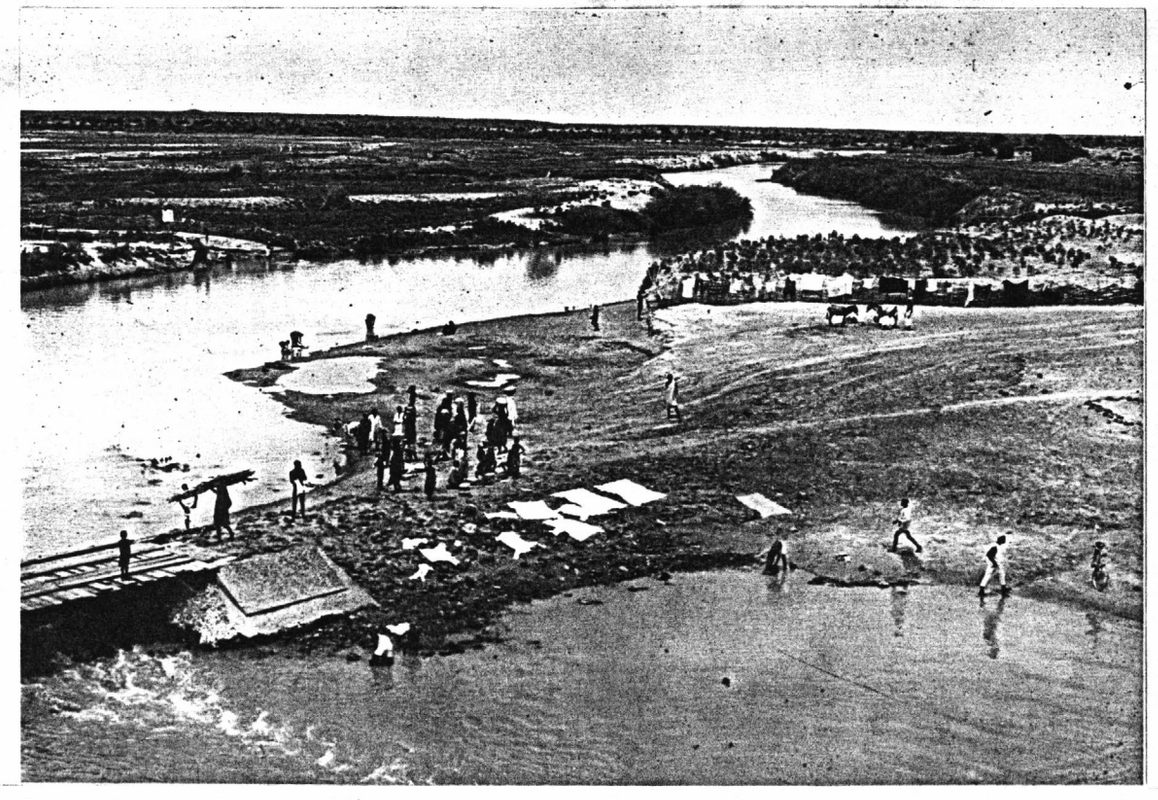
(PARDEE, J. D. 937)
Debris carried out by cloud burst flood of August 13, about 3/4 mile from the mountain. Box Elder County, Utah. September 14, 1924.



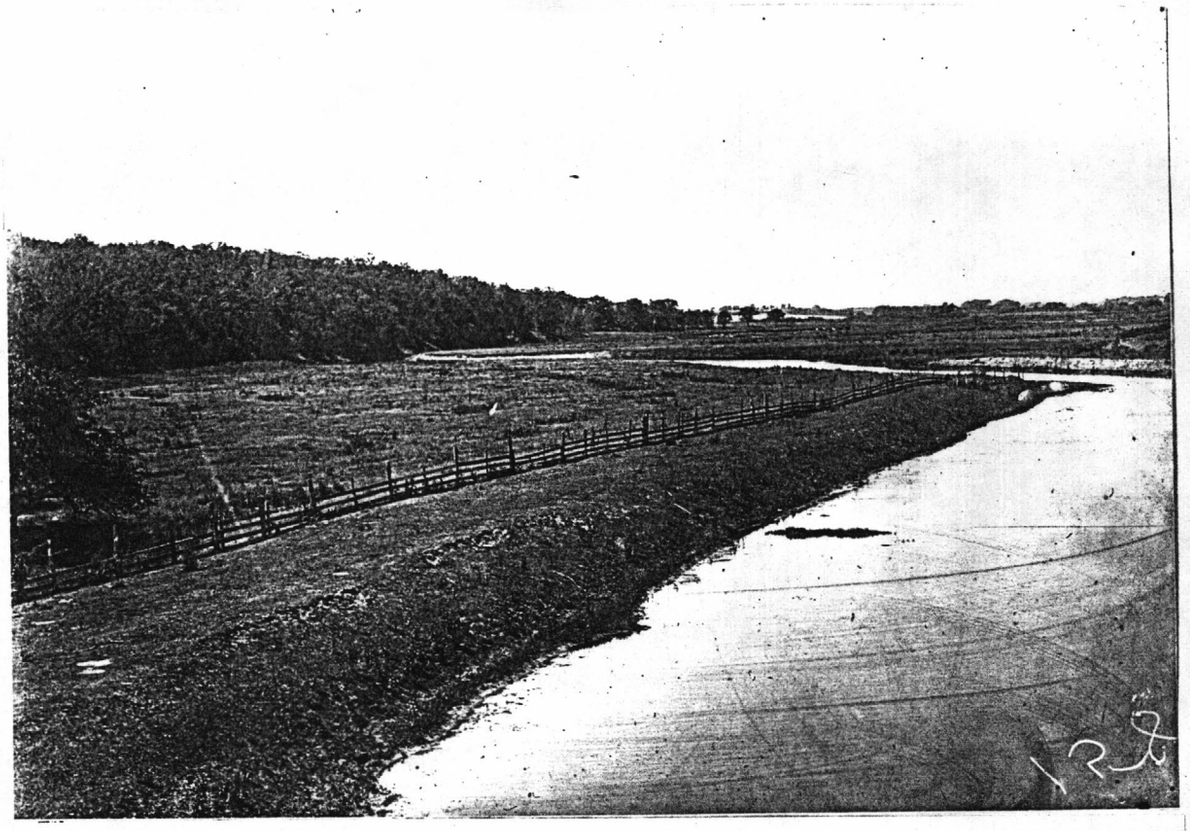
(CROSS, W. 190)
Bed of Felch gulch, showing boulders washed down by cloud-burst flood. Garden Park Bay. Fremont County, Colorado. 1894.



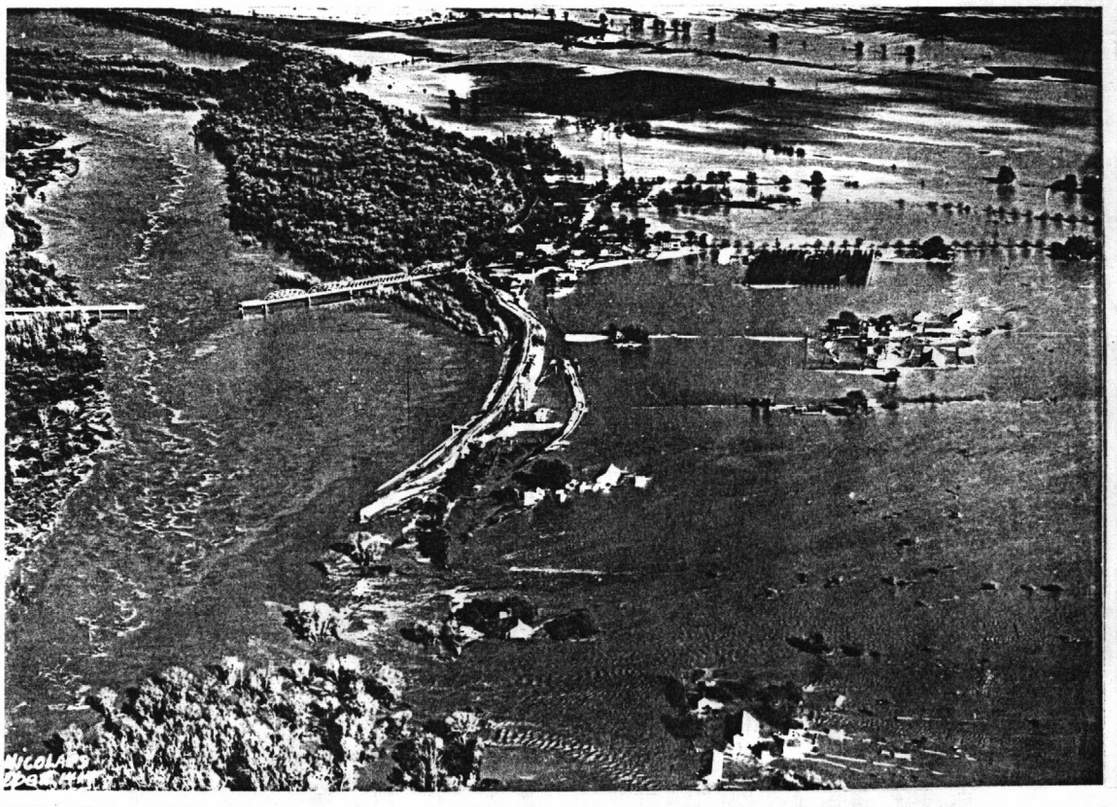
(GRIGGS, R. L. 18)
Flood plain of Canadian River with mesa capped by middle member Chinle formation. New Mexico. ca. 1957.



(TAYLOR, G. C., JR. 26)
Sokoto River near Birnin Kebbi. View upstream along the flood plain. Terrain is underlain by Upper Cretaceous and lower Tertiary sedimentary rocks. Nigeria. n.d.



(ALDEN, W. C. 158)
Flood plain of Turtle Creek from the top of bridge. Eroded in Darien outwash gravels and Galena limestone. Sec. 32, T. 2 N., R. 14 E. Rock County, Wisconsin. July 13, 1901.



(HOFMANN, W. 2)
Floodwaters of the Feather River at Nicolaus on December 24, 1955. The break in the east levee is in the foreground. Sutter County, California.
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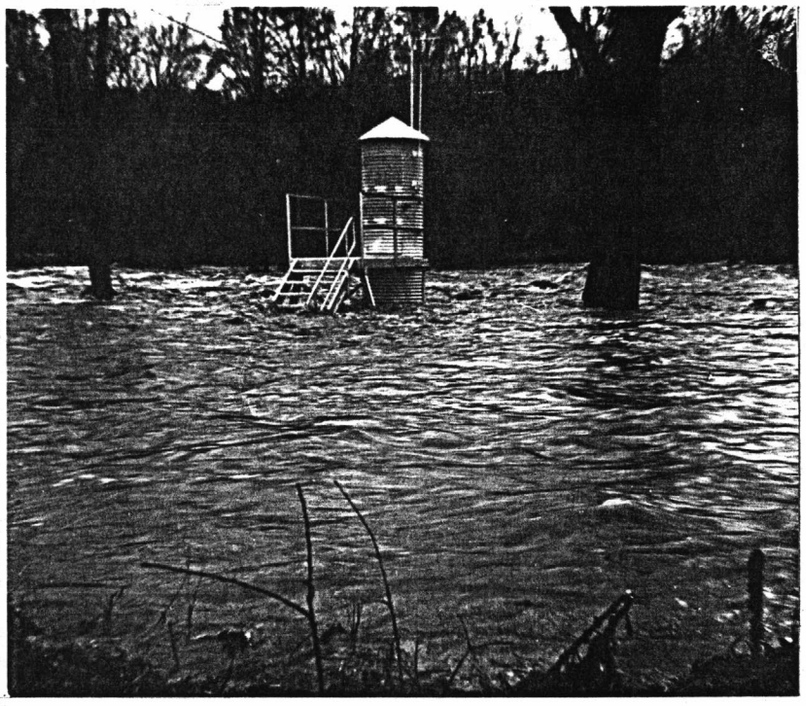
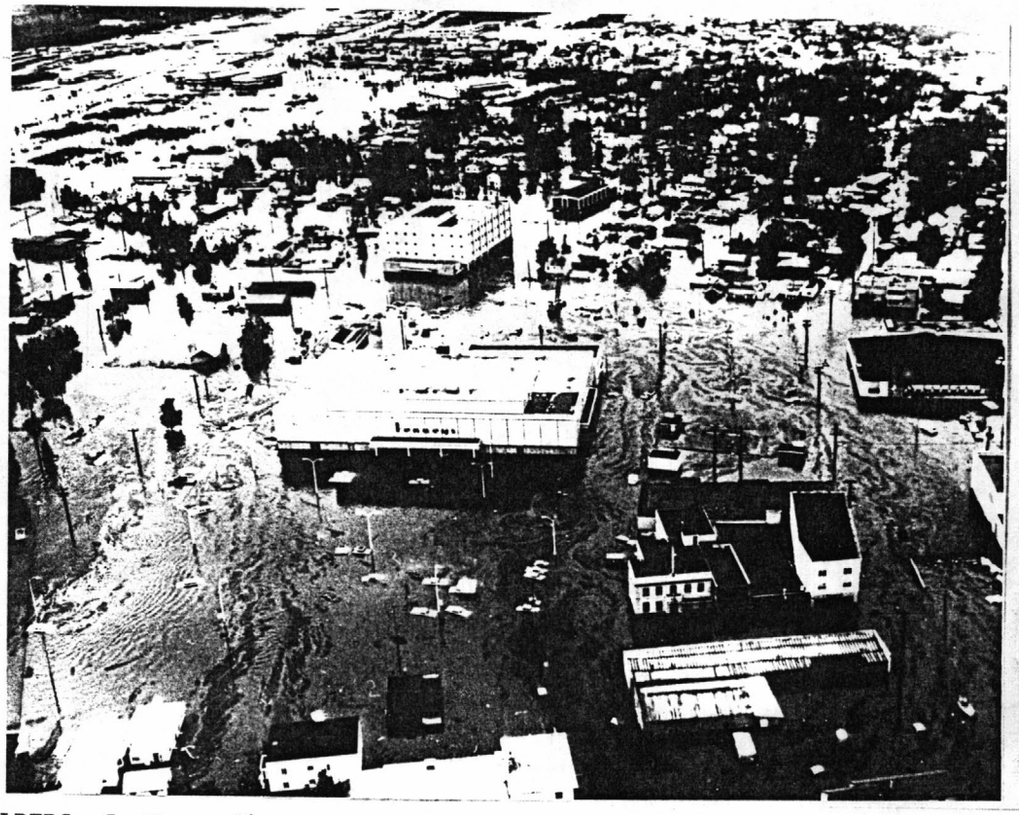


(WAANANEN, A. O. 1)
Flood isolated gaging station on Battle Creek downstream from Coleman Fish Hatchery near Cottonwood. Shasta and Tehama Counties, California. December 22, 1964.



(GUY, H. P. 164)
Three feet of deposition in the lower part of this boulevard channel in Boulder, caused flooding by a flow of less than one-fifth the design capacity of the channel. Shows effect of coarse-sediment deposition. Boulder County, Colorado. n.d.



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(CHILDERS, J. M. 9)
Chena River flood in downtown Fairbanks August 15, 1967. Fairbanks district, Yukon region, Alaska.

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(STACY, J. R. 501)
Stream flow measurement station on Clear Creek. A discharge measurement is being made by wading. The structure at right houses a float operated water-stage recorder which produces a graphic record with respect to time. Colorado. November 27, 1962.



(STACY, J. R. 500)
Making a discharge measurement by wading on Clear Creek near Lawson. Type-AA small Price current meter suspended on a wading rod is used to determine velocity of water. Colorado. November 27, 1962.



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(PATTERSON, E. F. 260)
Gage house and recorder for measuring water stage at Blue Lake Springs near Twin Falls, Idaho. 1957.
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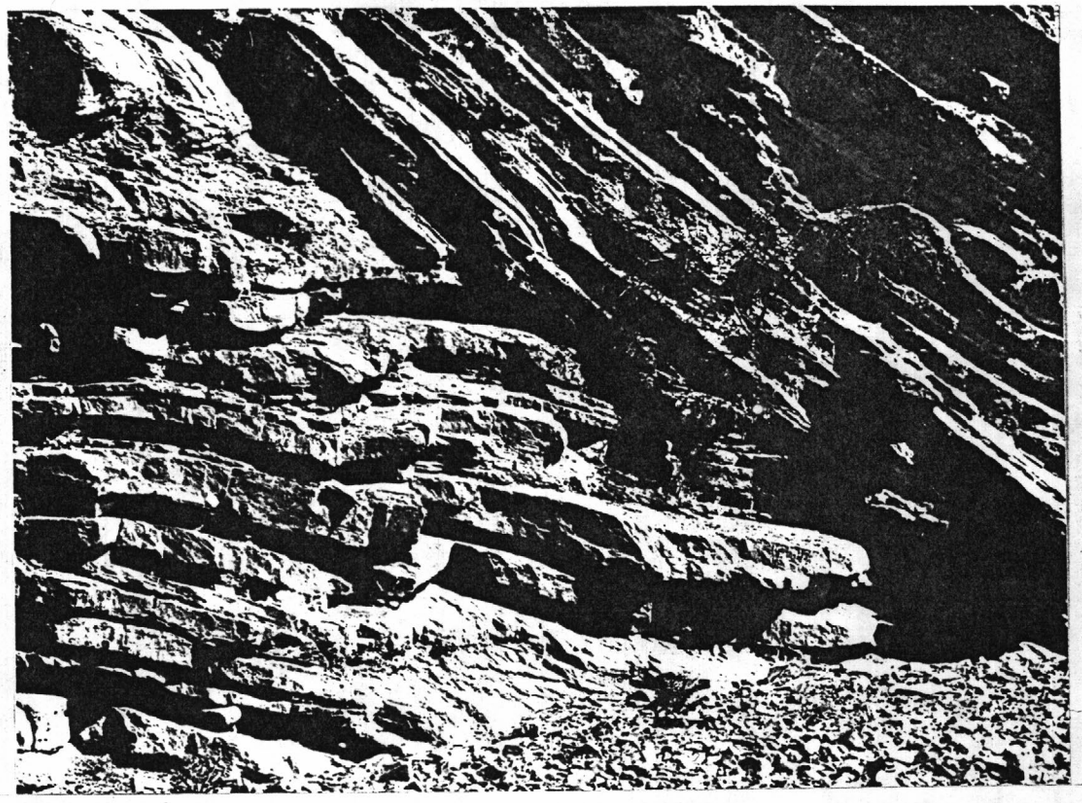
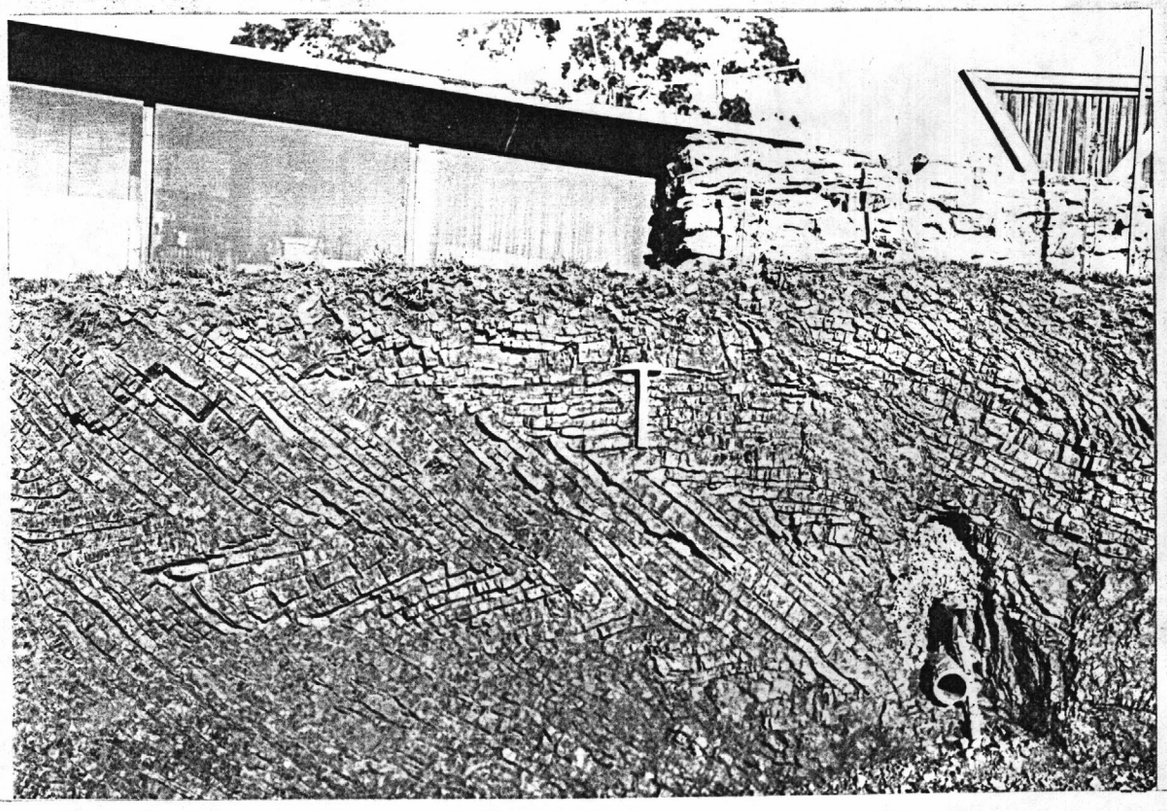
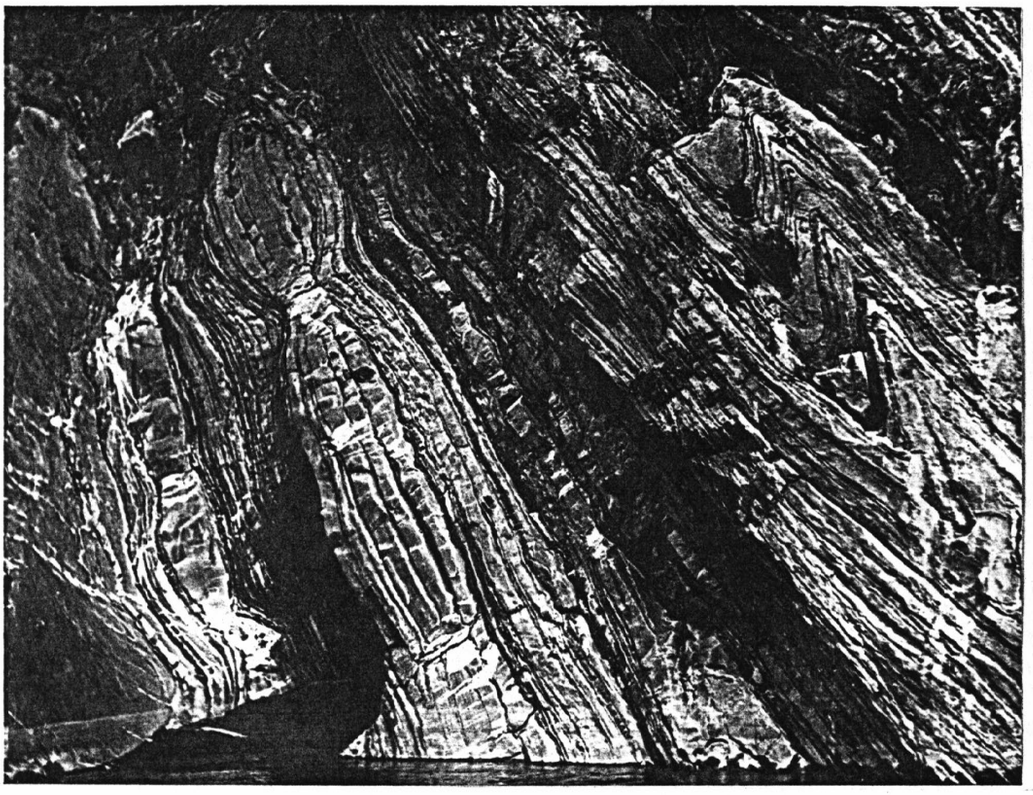


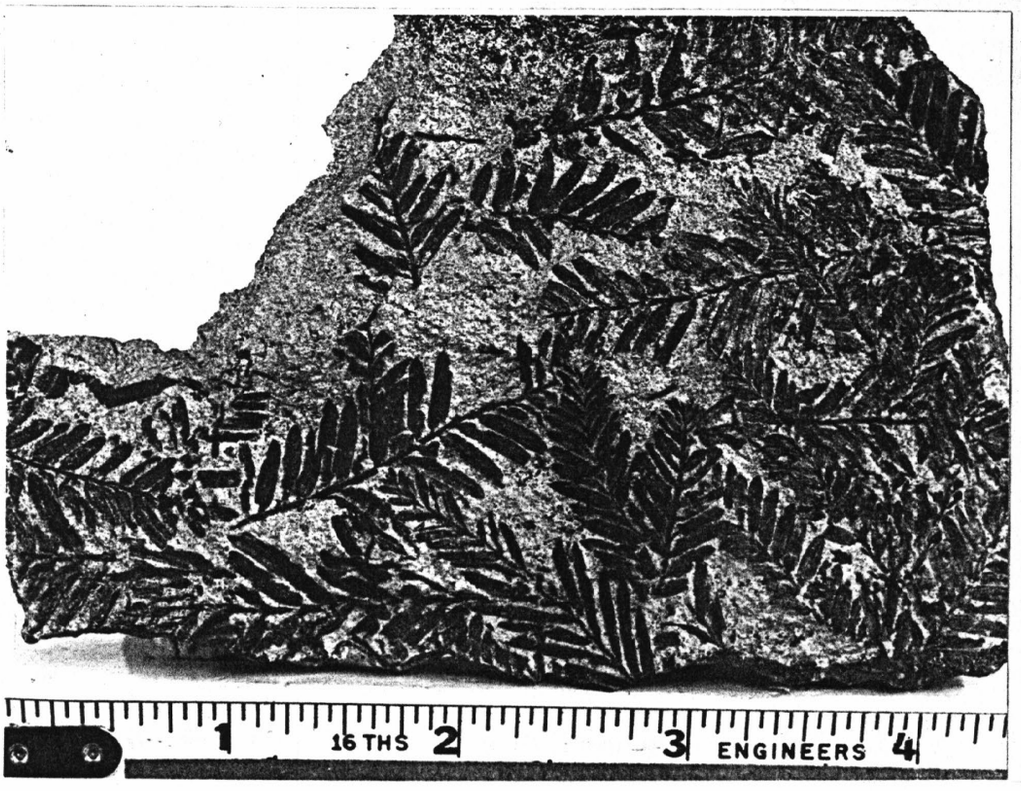
(SEGERSTROM, K. 665)
Tight chevron fold in the Las Trancas formation 6 km south of Higuerillas. Queretaro, Mexico. ca. 1956.



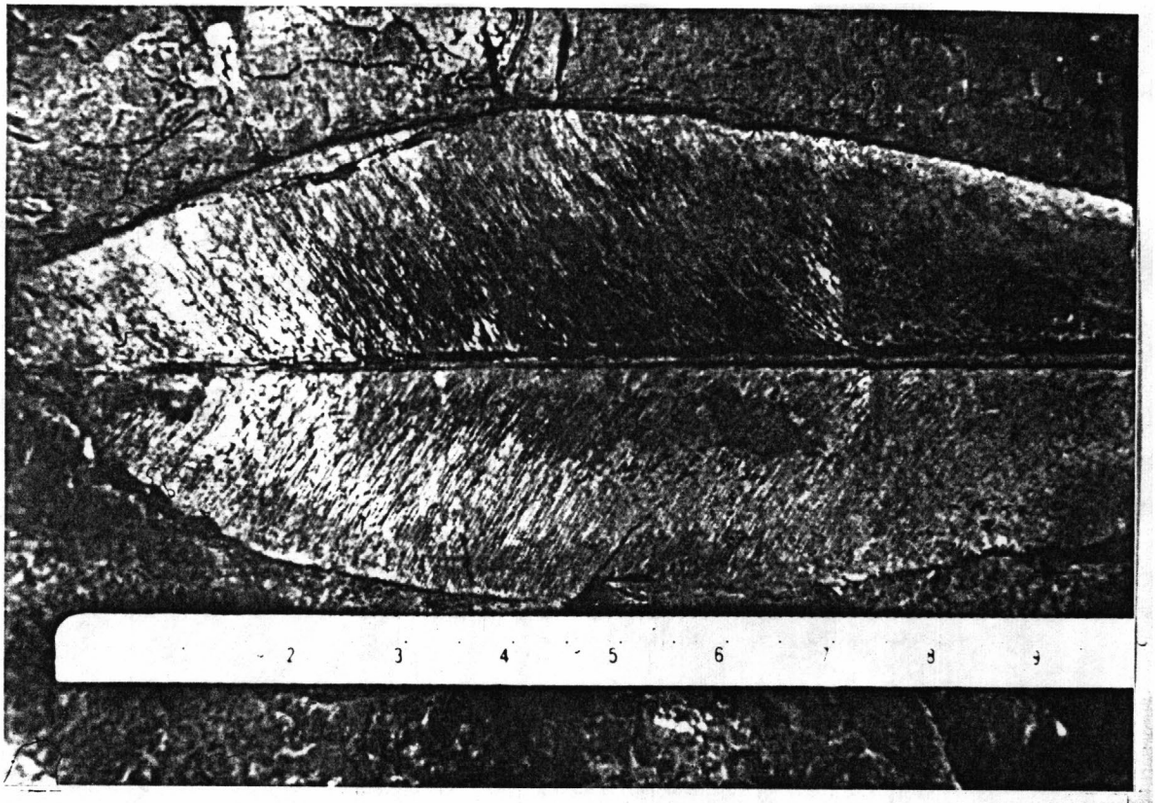
(SCHLOCKER, J. 25)
Chevron folds in radiolarian chert of the Franciscan Formation 2 miles northwest of Golden Gate Bridge, Marin Peninsula. Marin County, California. n.d.



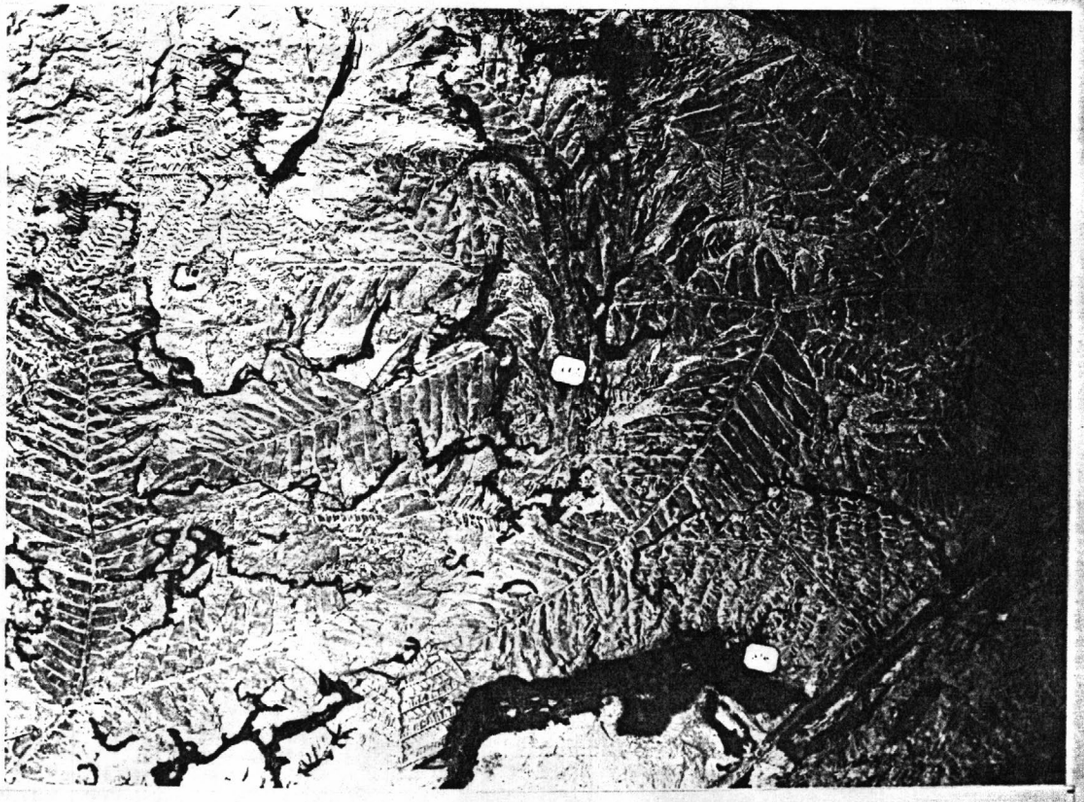
(SEGERSTROM, K. 668)
Boudinage and chevron folds in the El Doctor limestone, along the Rio Extorax between Bucareli and Las Medias. Queretaro, Mexico. ca. 1956.



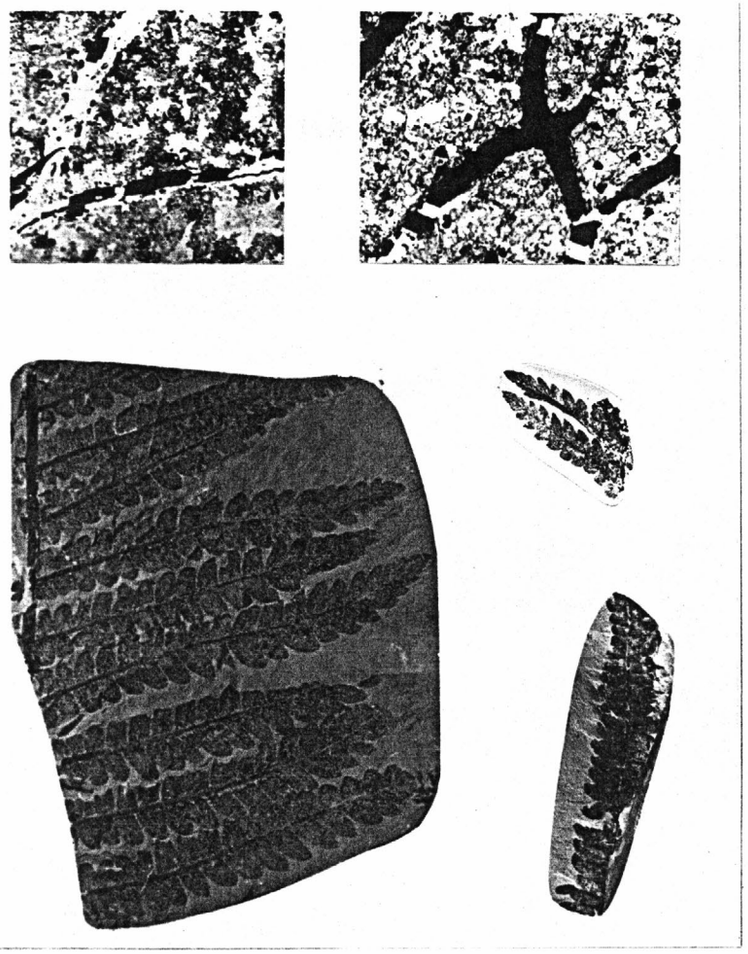
(BECRAFT, G. E. 2)
Metasequoia occidentalis (Newberry) Chaney. From tuffaceous sandstones of the Gerome andesite, Northwest Uranium mine. Stevens County, Washington. 1957.



(SCHMIDT, D. L. 23)
Fossil Glossopteris leaf associated with coal deposits and derived from glossopterid forests of Permian age. Polarstar Peak, Sentinel Range, Ellsworth Mountains. Ellsworth Land, Antarctica. 1965.



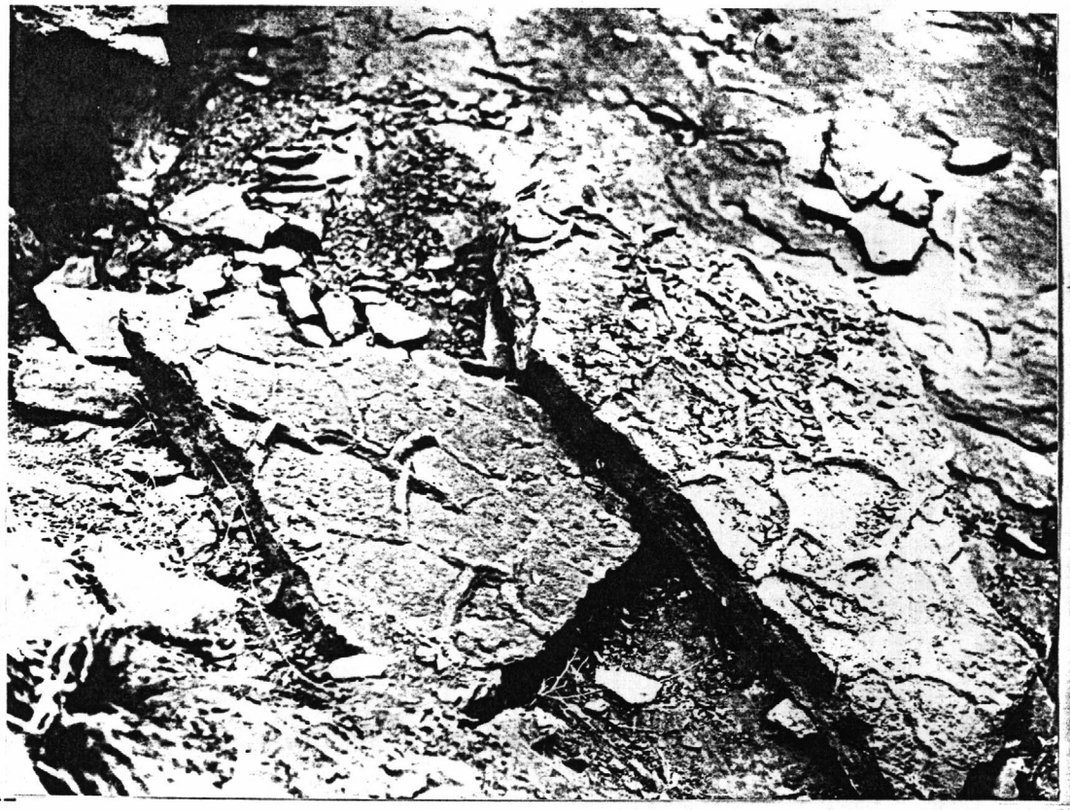
(HARDIN, E. B. 1569)
Fossil leaves Neuropteris clarksoni, in anthracite coal. Fayette County, Pennsylvania. n.d.



(ASH, S. R. 9)
Cynepteris Lasiophora Ash, n. gen., n, sp. Chinle formation (upper Triassic) Fort Wingate Area, New Mexico. n.d.



(HOBBS, S. W. 2)
Casts of shallow mud cracks on the underside of a bed of impure quartzite from the St. Regis Formation. Shoshone County, Idaho. n.d.



(DANE, C. H. 348)
Mud crack casts on slabs of Wingate Sandstone. Pocket watch shows scale. NW¼ sec. 33, T. 21 S., R. 25 E. Grand County, Utah. May 1929.



(HOBBS, S. W. 3)
Contorted mud cracks in argillitic bed in the lower part of the Wallace Formation. Shoshone County, Idaho. n.d.



(WEIR, G. W. 33)
Fossil mud cracks in micrograined limestone of the Rowland Member of the Drakes Formation. Faint ripple marks are visible on bed in foreground. South central Kentucky. ca. 1970.
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(SEGERSTROM, K. 586)
Fossil mud cracks and ripple marks, Lautaro Formation (Jurassic). Northern Chile. n.d.
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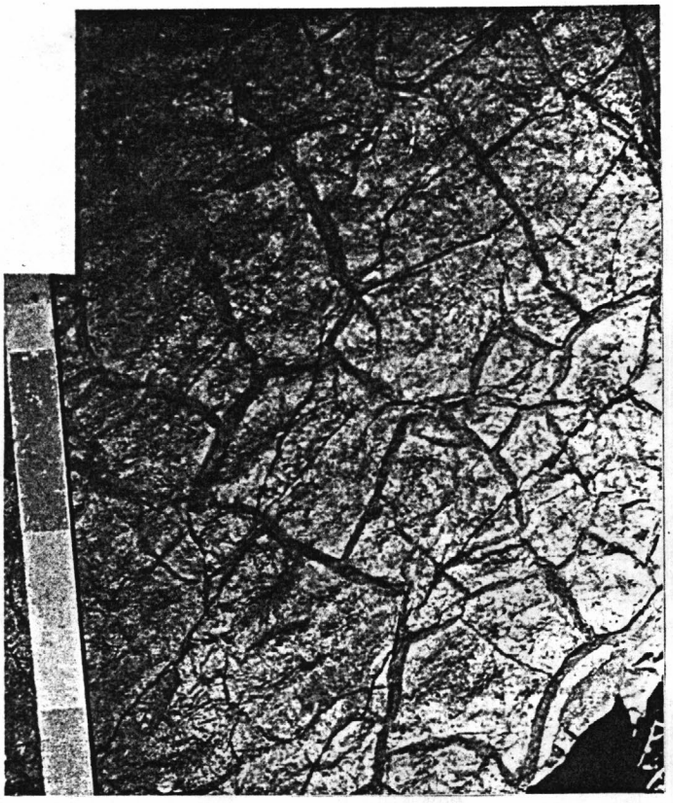

(PALMER, A. R. 55)
Outcrop of mud cracks in rippled upper surface of the Emigrant Pass Member, Desert Range section. Clark.County, Nevada. n.d.
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(HARDIN, E. B. 1572)
Fossil casts of Atrypa, Spinosa, Spirfer, Rhynchonella, Pelecypoda and Tentaculites.
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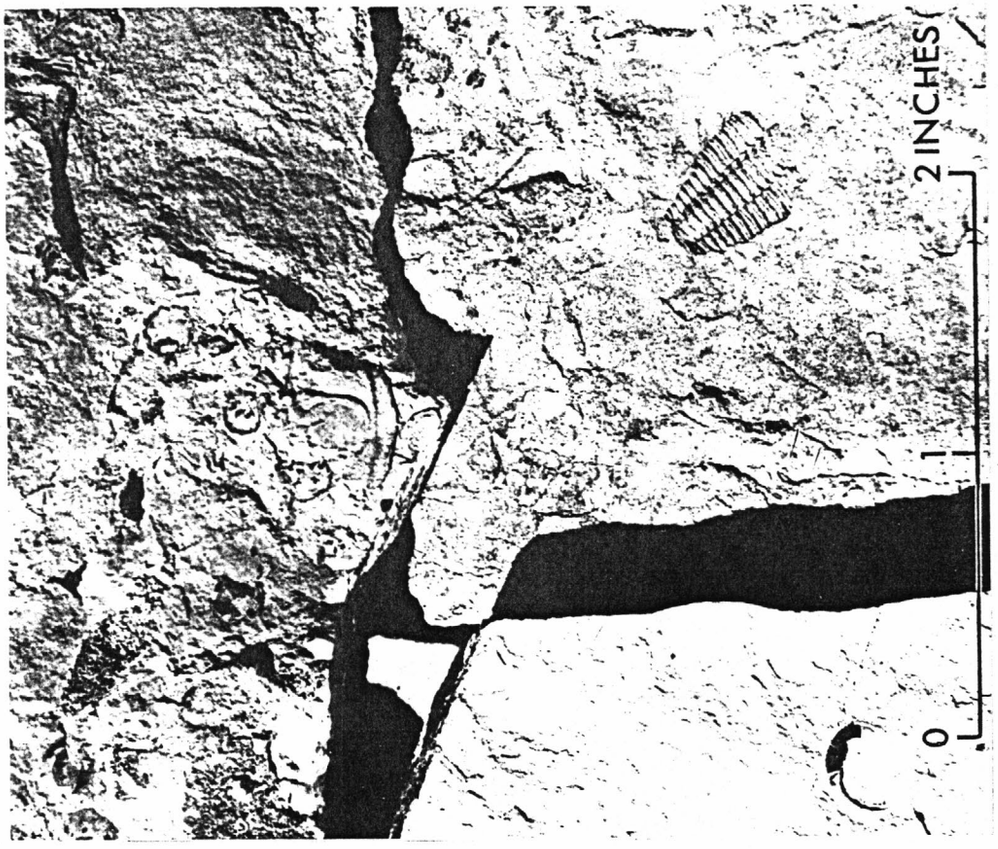
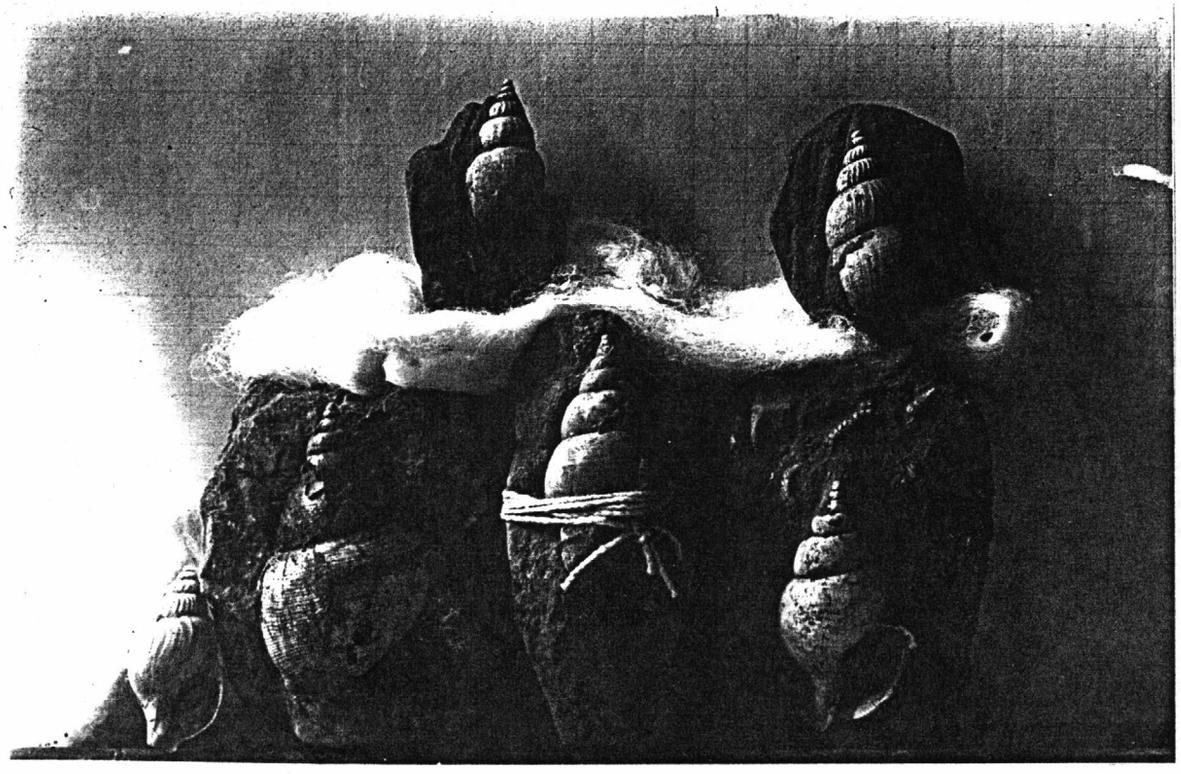
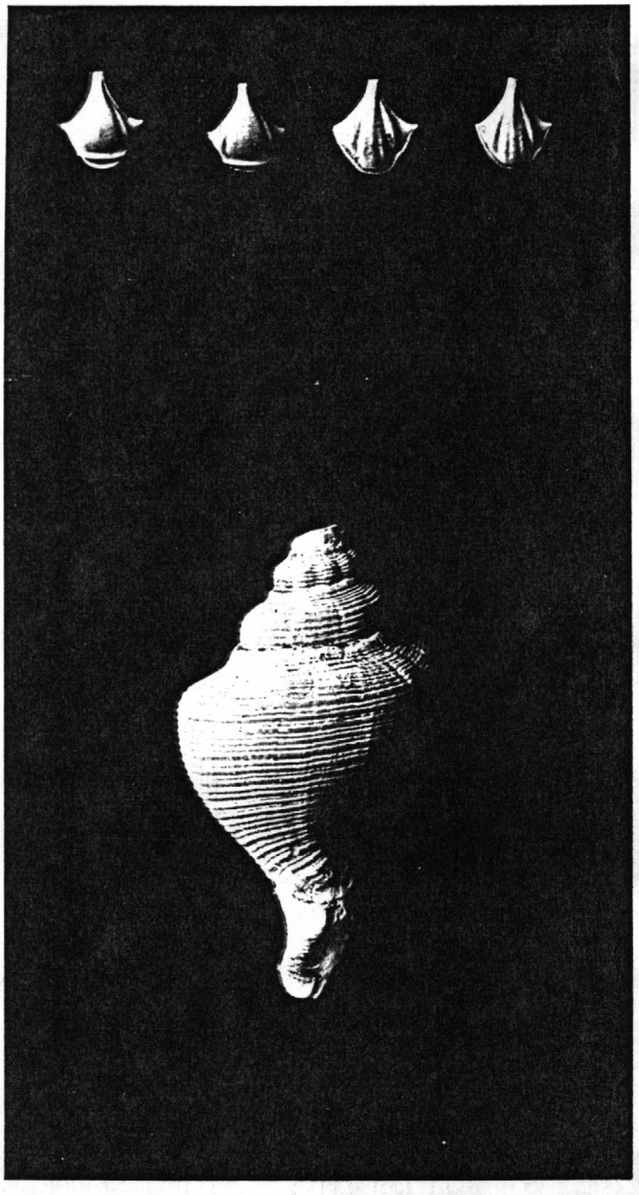


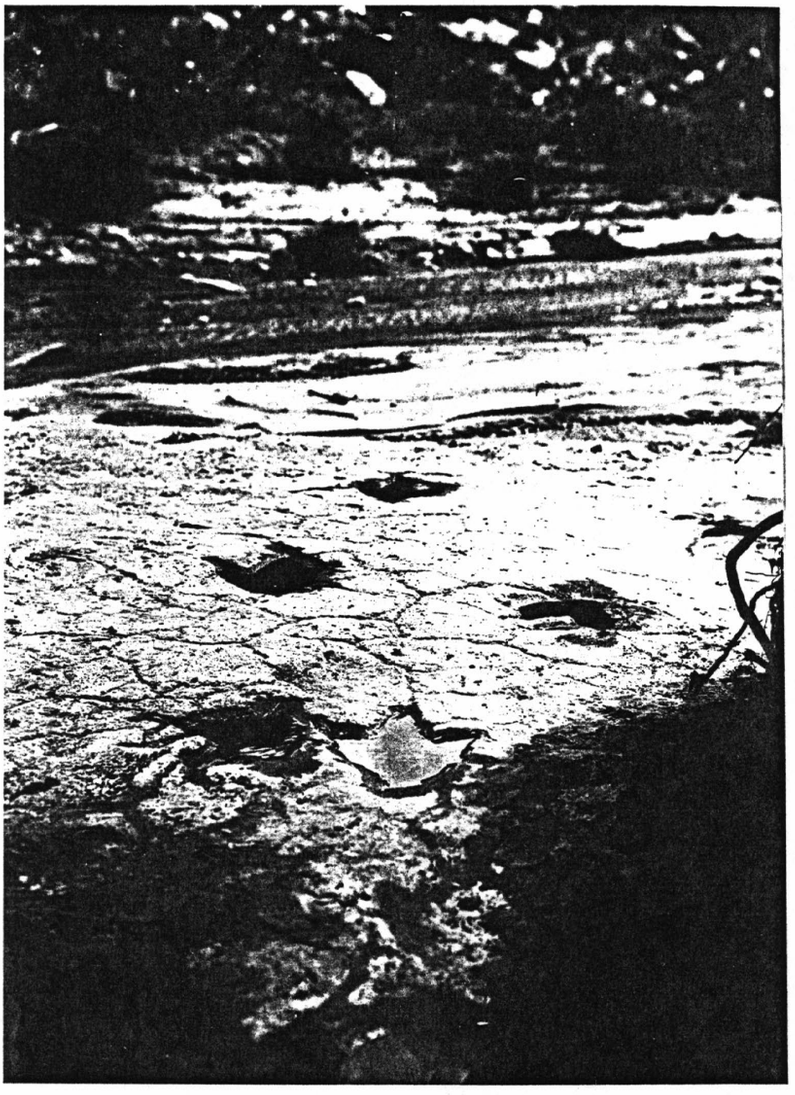
(HUNT, C. B. 911)
Linguloid brachiopods and trilobites from shaly zone near the middle of the Bonanza King Formation, Trail Canyon. Death Valley National Monument. Inyo County, California. ca. 1960.



(ARNOLD, R. 34)
Fossil casts of (top) Chrysodomus griceus and (bottom) Chrysodomus griceus, Chrysodomus merriami, Chrysodomus aphelus.



(ARNOLD, R. 207)
Fossil cast of Chrysodomus arnoldi Rivers, Pteropods from the Pliocene Santa Monica Canyon. Los Angeles County, California. n.d.



(GREGORY, H. E. 86)
Dinosaur tracks, Navajo Canyon. Coconino County, Arizona. July 1910.
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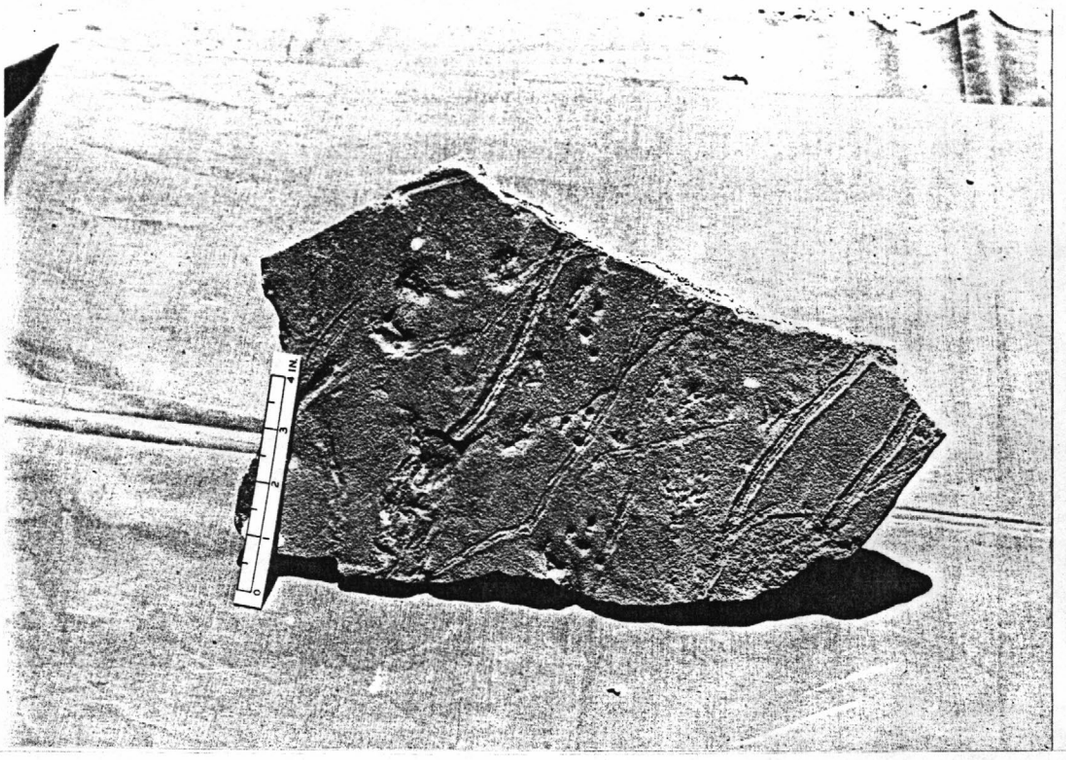
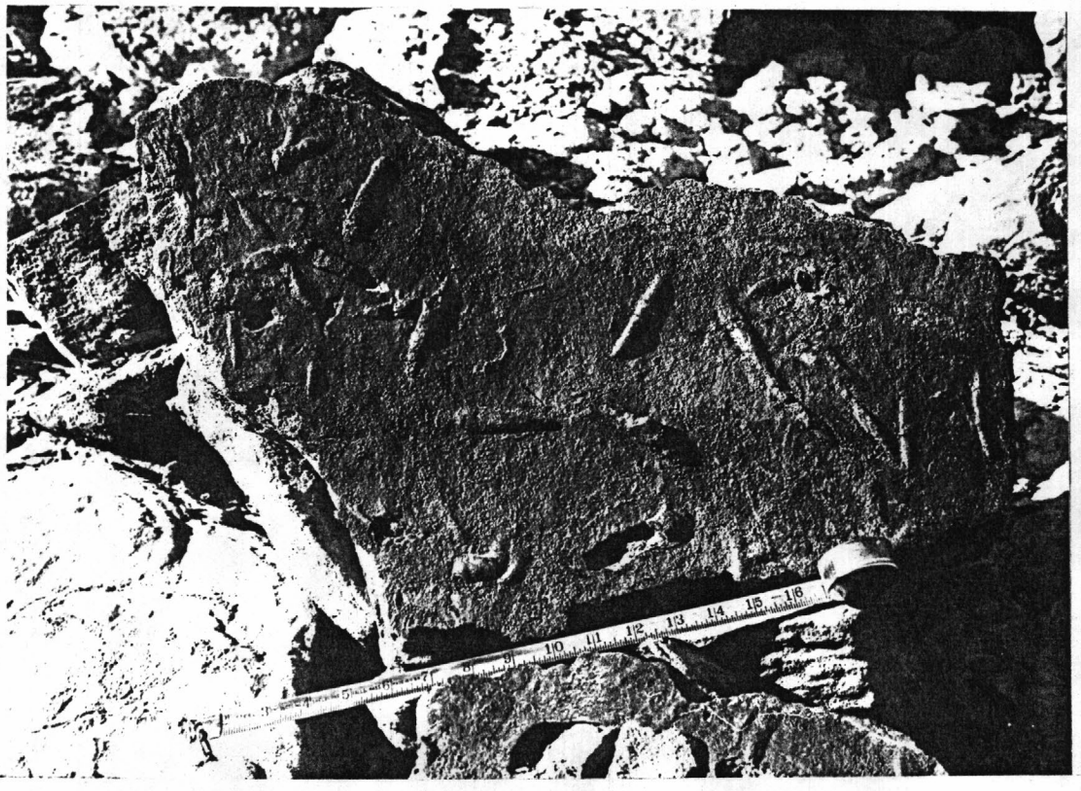
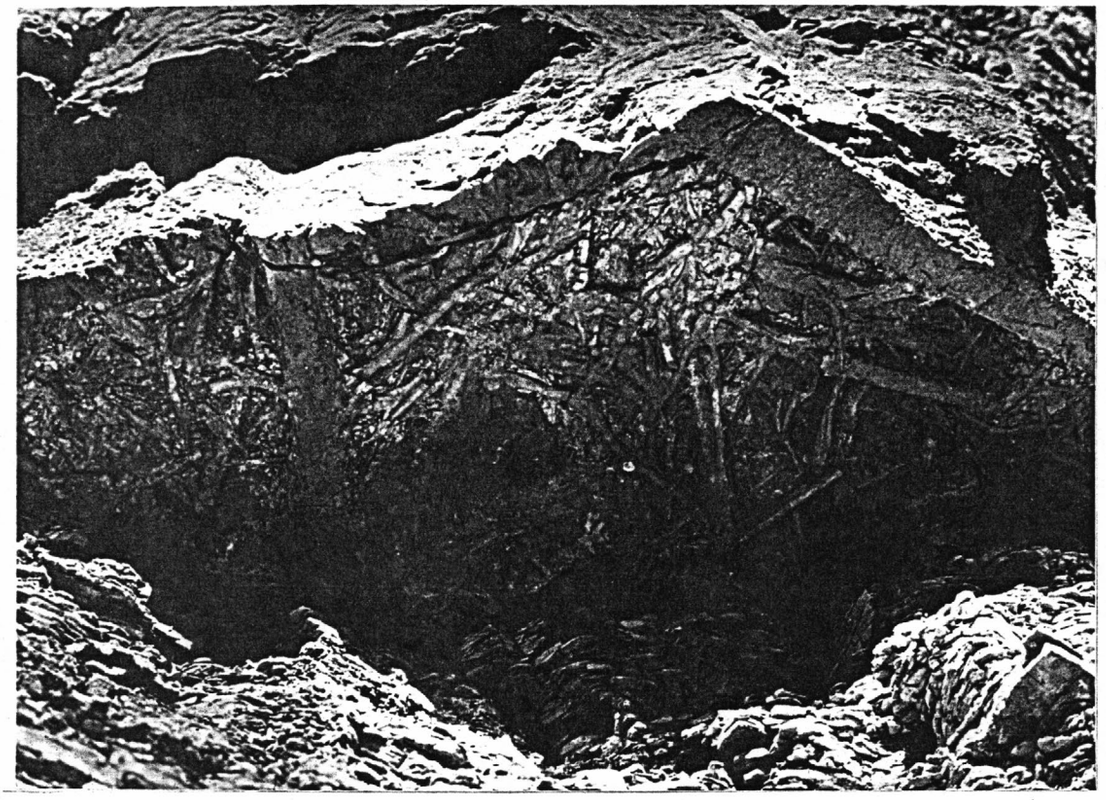


(MCKEE, E. D. 125)
Trails of millipedes, in Coconino sandstone, low-angle foresets near base. Scale in inches. Grand Canyon National Park. Arizona. ca. 1975.



(THAYER, T. P. 25)
Casts of bird tracks in Furnace Creek sandstones north of Cow Creek Wash, Death Valley National Monument. Inyo County, California. 1938.



(TEICHERT, C. 14)
Underside of siltstone bed showing casts of large invertebrate tracks. The Large straight track on the left is about 4 inches wide. Upper unit of Jerome Member. Gila County, Arizona. ca. 1960.



(STERRETT, D. B. 128)
Sections of a large petrified tree 5½ feet or more in diameter. Petrified Forest National Monument. Apache County, Arizona. n.d.
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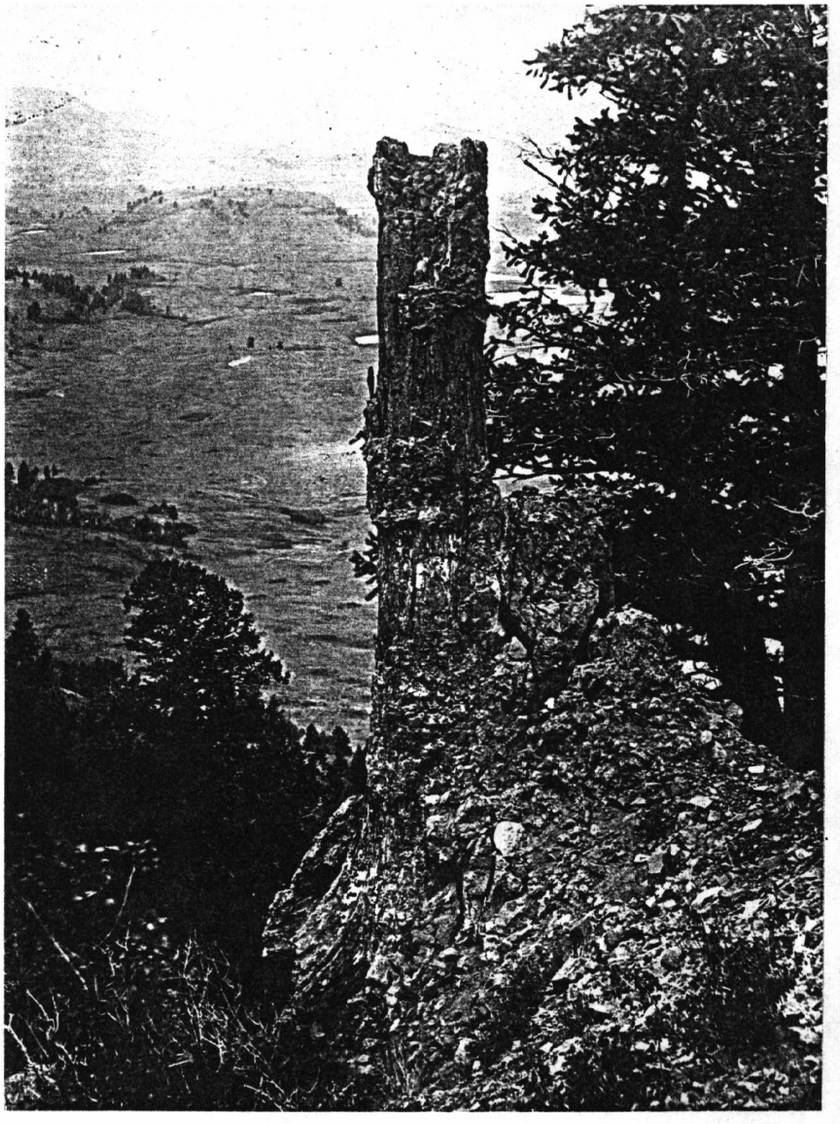

(IDDINGS, J. P. 328)
Specimen Ridge, view west to Junction Butte. Petrified tree trunk Pityoxylon amethystinum, Fossil Forest. Yellowstone National Park, Wyoming. ca. 1890.
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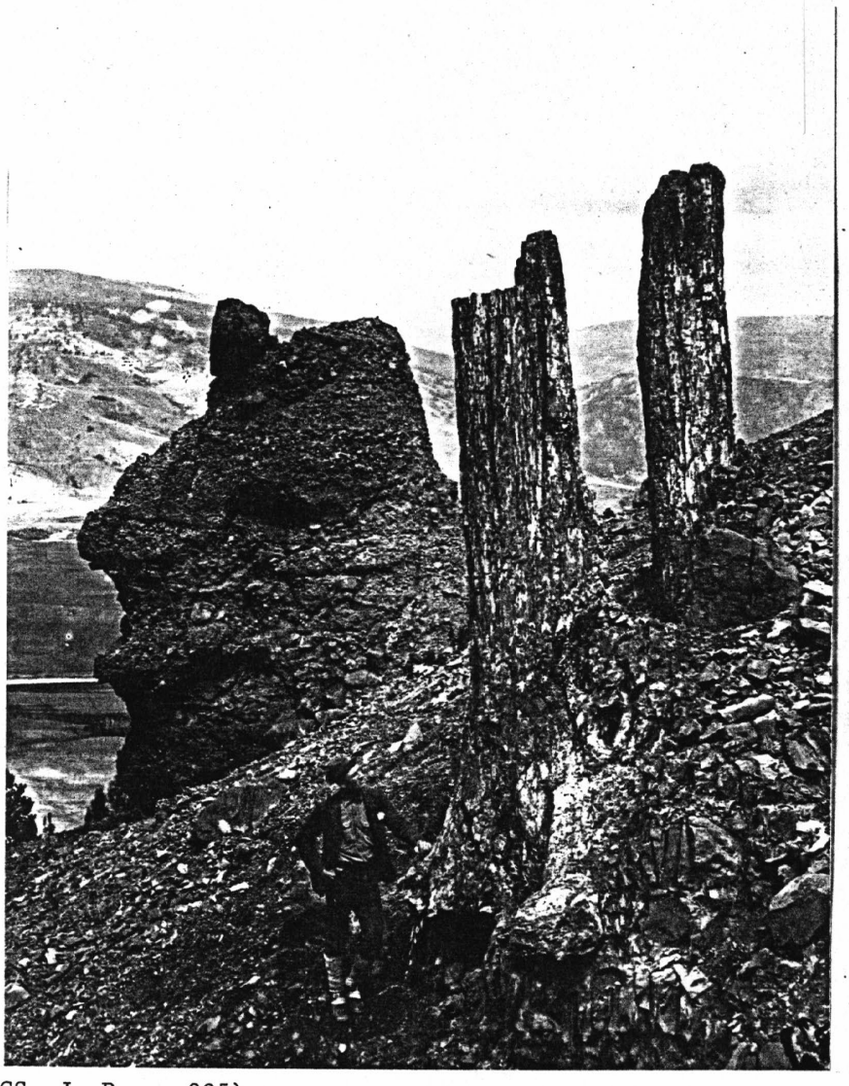
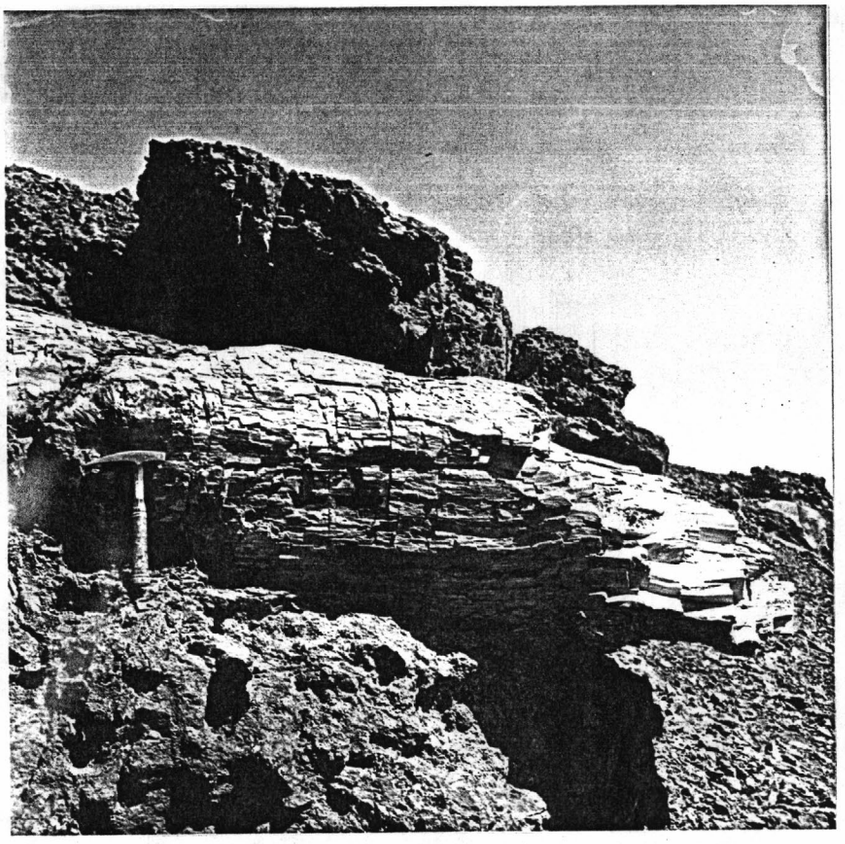
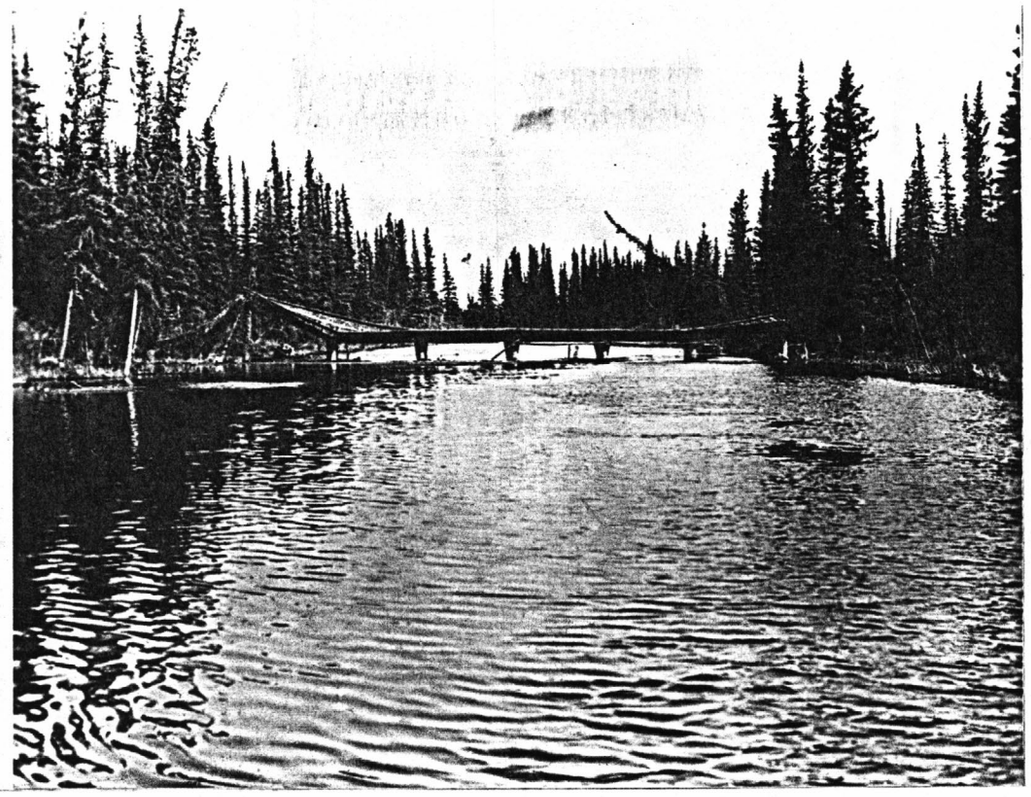


(IDDINGS, J. P. 325)
Fossil tree trunks Pilyoxylon aldersoni, Fossil Forest, Specimen Ridge. This view represents two fine specimens of fossil trees exposed by the erosion of the basic breccia in which the roots are firmly embedded. Yellowstone National Park. Wyoming. ca. 1890.



(DUFFIELD, W. A. 9)
Petrified log at the head of Steamboat Canyon. South Warner Wilderness Area. Modoc County, California. ca. 1973.

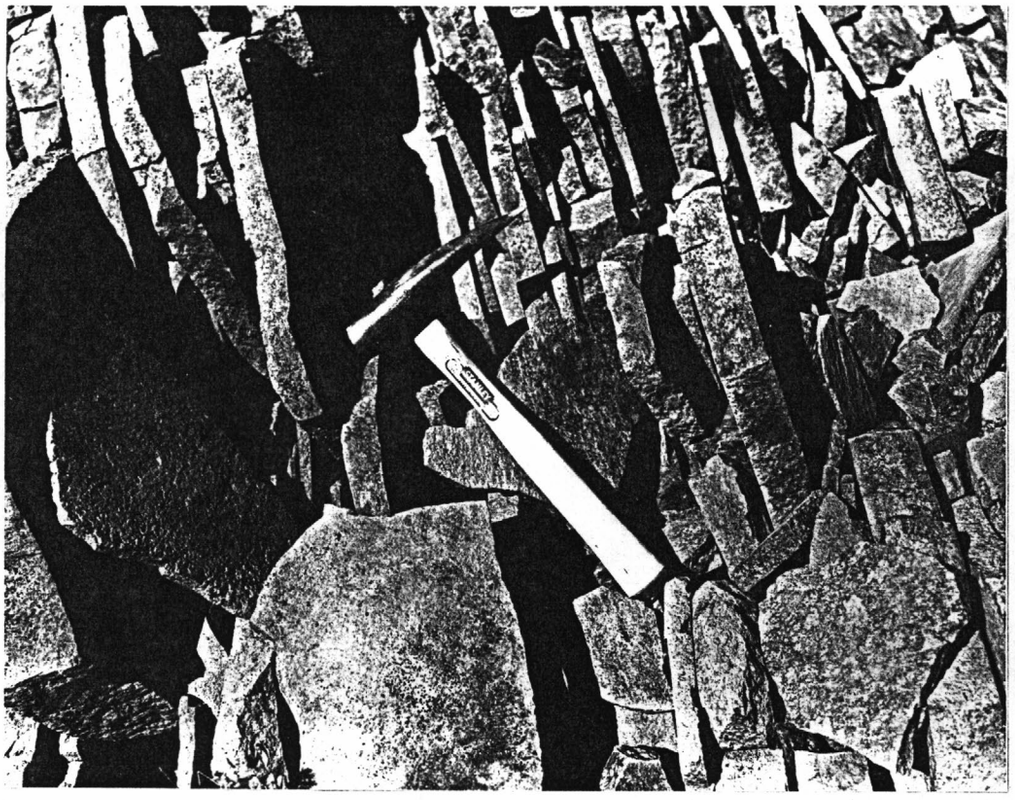




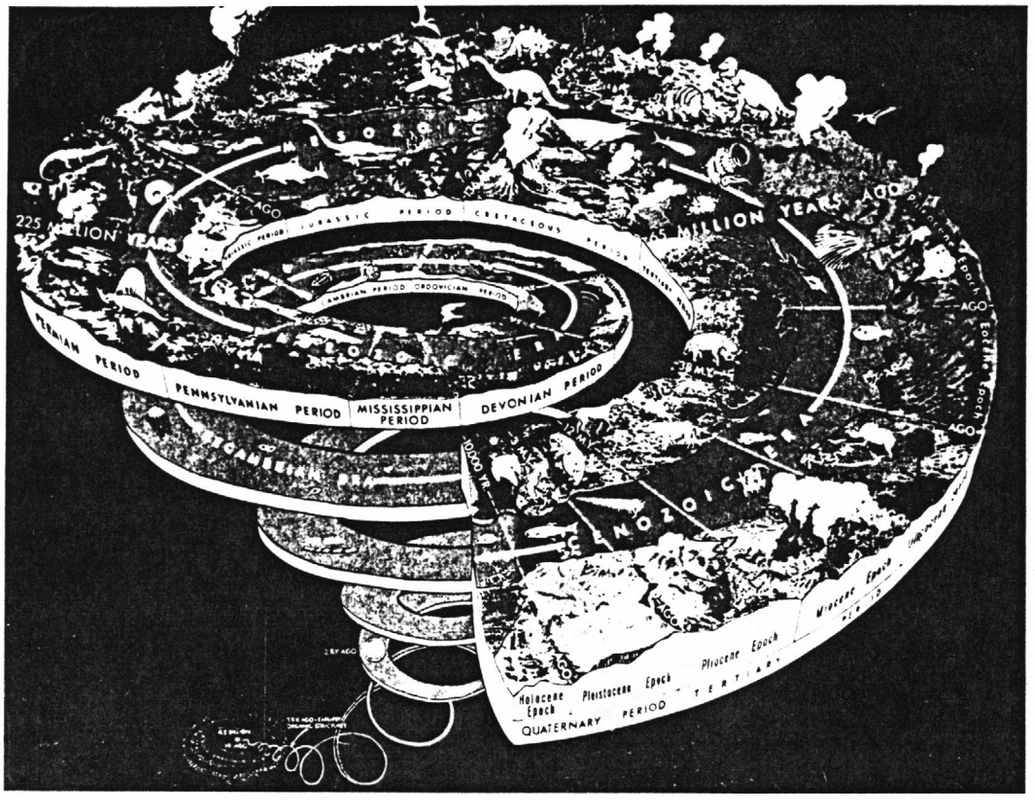
(PEWE, T. L. 837)
Frost-heaved piling of bridge spanning outlet of Clearwater Lake, 8 miles southeast of Big Delta. Donnelly district, Yukon region, Alaska. August 15, 1951.



(RUPPEL, E. T. 217)
Frost-riven angular blocks and slabs of rhyolite south of the Josephine Mine. Jefferson County, Montana. ca. 1960.



(THOMPSON, G. A. 7)
Platy parting in a flow of the Lousetown Formation west of Hunter Lake, Carson Range. Parting is unusually well developed, probably due to active frost weathering. Washoe County, Nevada. ca. 1950.



(EARTHQUAKE INFORMATION BULLETIN 214)
Geologic Time Spiral.
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(PATTERSON, E. F. 111)
Geologist examining leaves in porcellanite of Frontier formation (Cretaceous), east shore of Jackson Lake. Jackson Hole. Teton County, Wyoming. 1957.

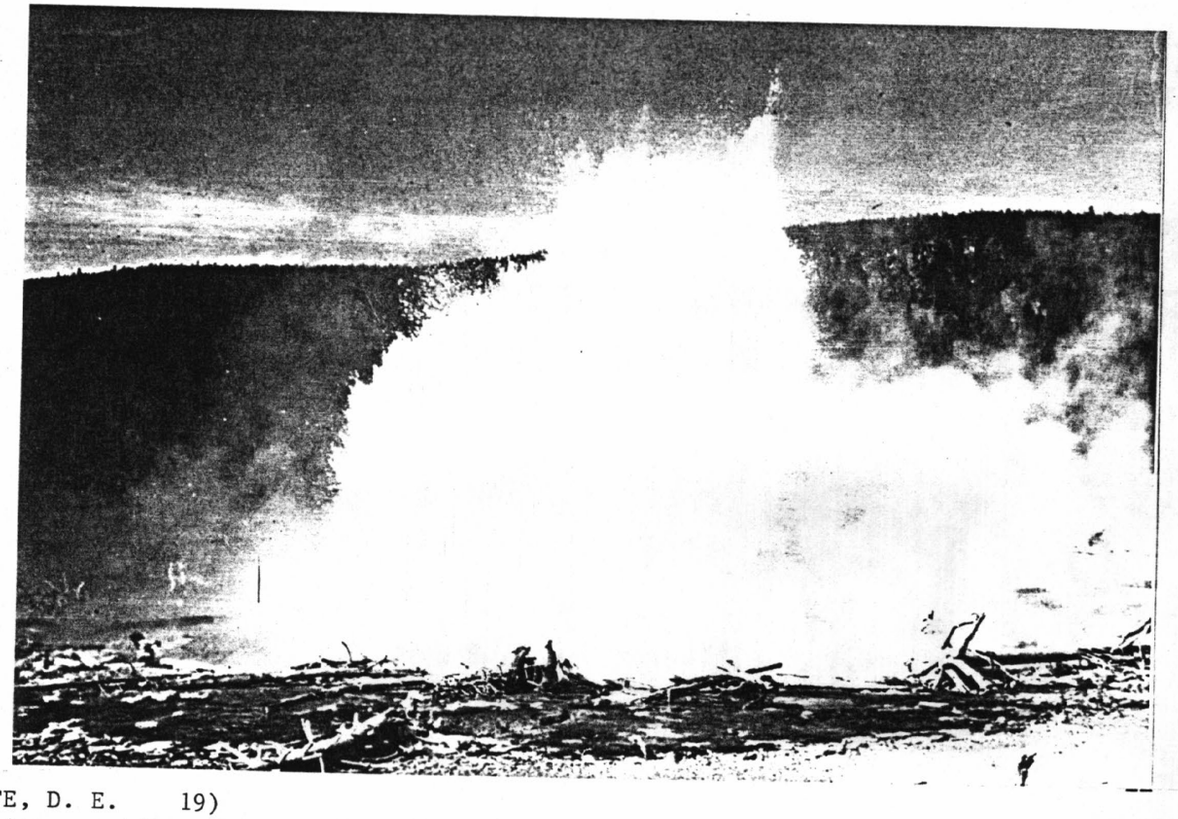


(HANSEN, W. R. 147)
A paleontologist carefully chips rock matrix from a column of dinosaur vertebrae. These bones will be left in place for the visitor to see them just as they were deposited. Dinosaur National Monument. Uintah County, Utah. n.d.

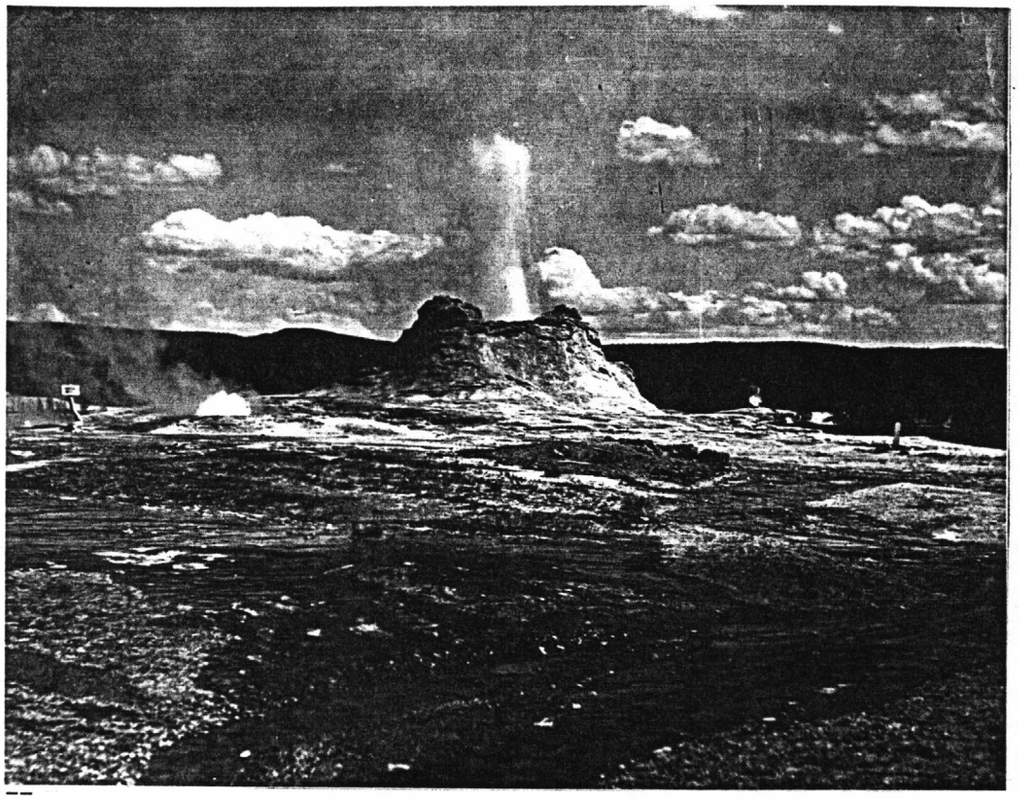
(WALLACE, R. E. 44)
Geologist examining Cretaceous outcrop. Alaska. August 1944.



(U. S. GEOLOGICAL SURVEY 9)
Geologist using Brunton compass to measure attitude of rock outcrop. United States.



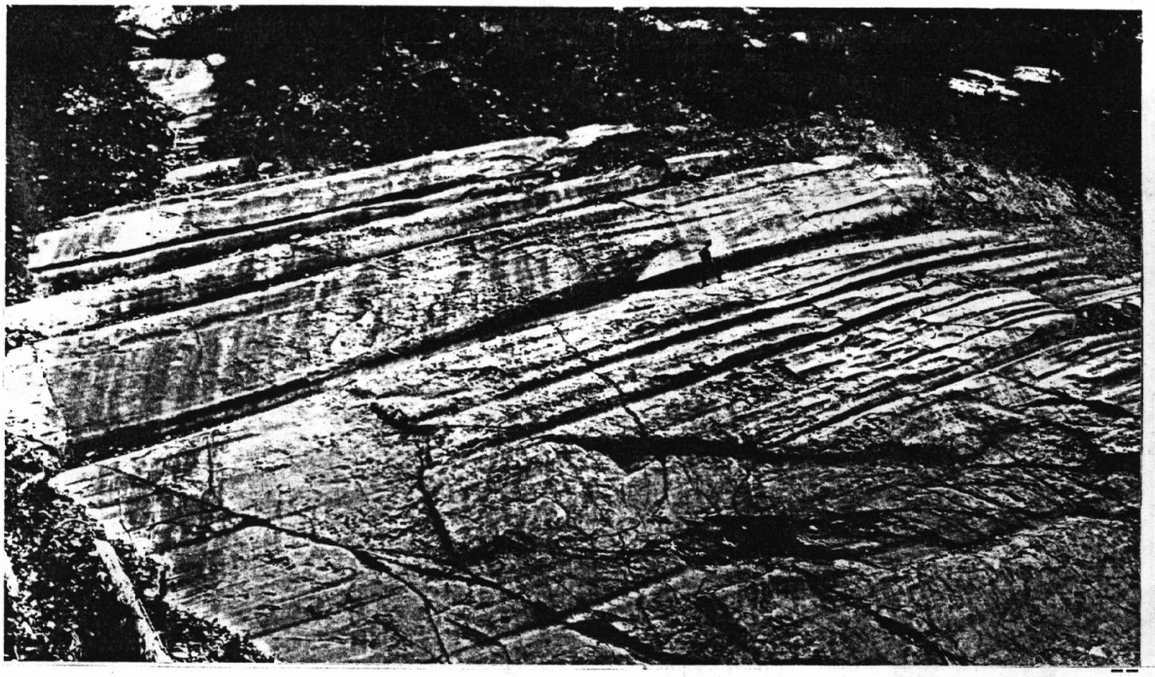
(WHITE, D. E. 19)
Bursting eruption of Seismic Geyser. Yellowstone National Park, Wyoming. August 1968.



(HILLERS, J. K. 958)
Castle Geyser in eruption. Yellowstone National Park, Wyoming. n.d.



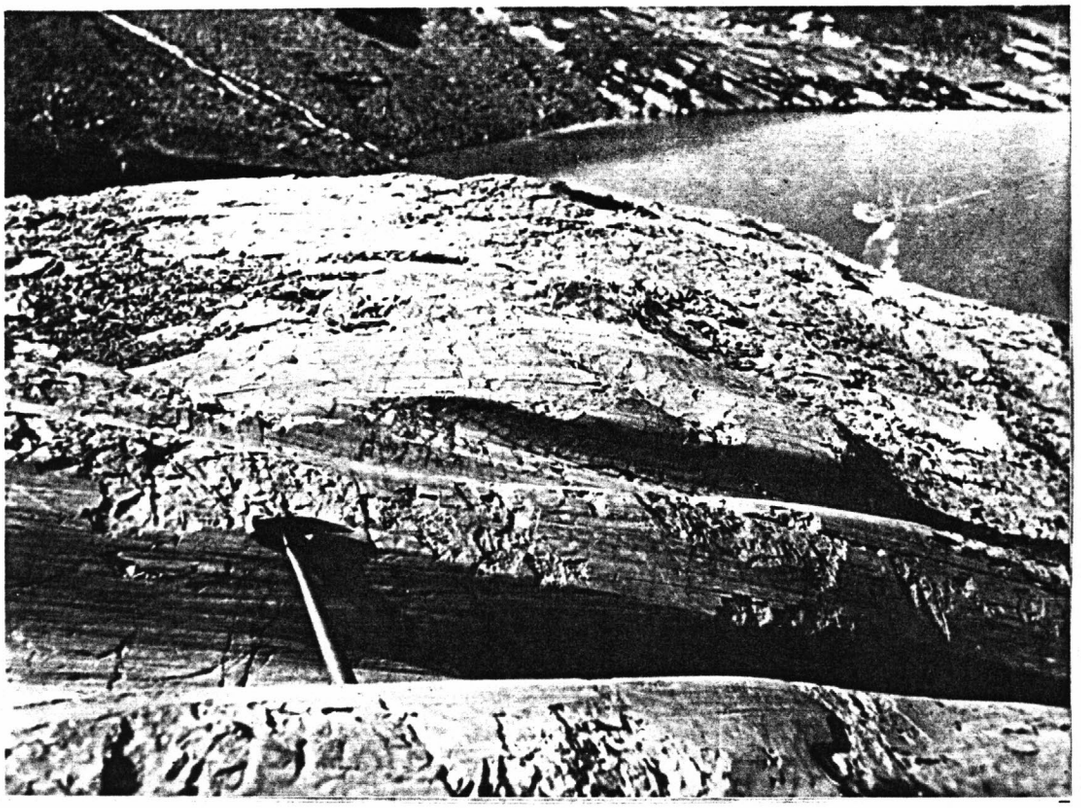
(WHITE, D. E. 15)
Explosive burst just breaking surface pool of Seismic Geyser with water level below level of discharge. Yellowstone National Park, Wyoming. May 30, 1966.



(VANDERWILT, J. W. 26)
Glacial grooves in Devonian dolomite in Yule Creek east of the Yule Colorado Quarry. Man for scale. Gunnison County, Colorado. n.d.



(REED, J. C. 596)
Glacial grooves and striae on basic dike cutting massive limestone on one of the Robber Islands. Wales district, Southeastern Alaska region, Alaska. August 1940.



(CAMPBELL, M. R. 1075)
Glacial grooves and striae on rocks east of Vulture Peak. Glacier National Park. Flathead County, Montana. 1913.



(MATTHES, F. E. 1105)
Glacial polish, striae and grooves, in the Upper Kern Canyon, above Milestone Creek. The ice direction was toward the right away from the camera. The aplite rock has been disrupted into angular blocks by frost action. Sequoia National Park. Tulare County, California. 1935.



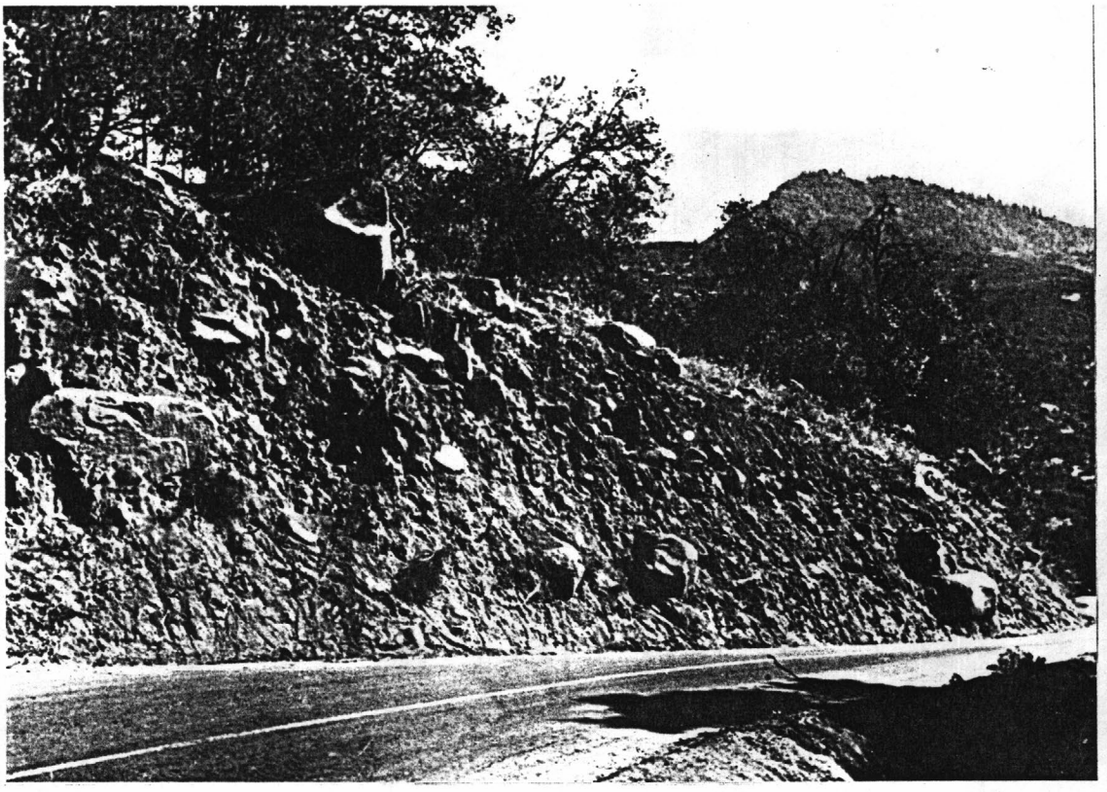
(LOHMAN, S. W. 320)
Terrace of glacial outwash exposed by Little Muncy Creek near Clarketown.
Lycoming County, Pennsylvania. August 25, 1935.



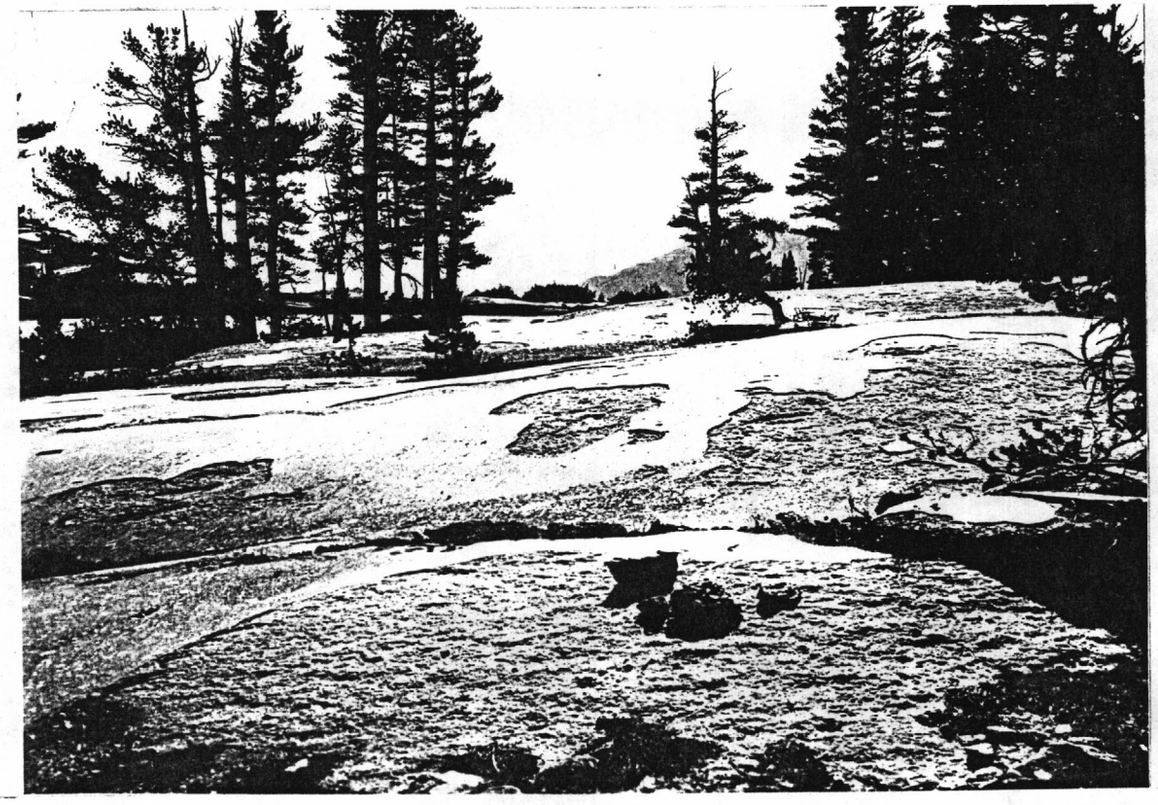
(ALDEN, W. C. 354)
Section of Wisconsin outwash sand and gravel terrace 30-35 feet high. Appears to be on 5 feet bed of till in the lower middle part of this section. Winnebago County, Illinois. June 22, 1908.



(LOHMAN, S. W. 94)
Glacial outwash in road cut south of Bushkill. Monroe County, Pennsylvania. 1930.

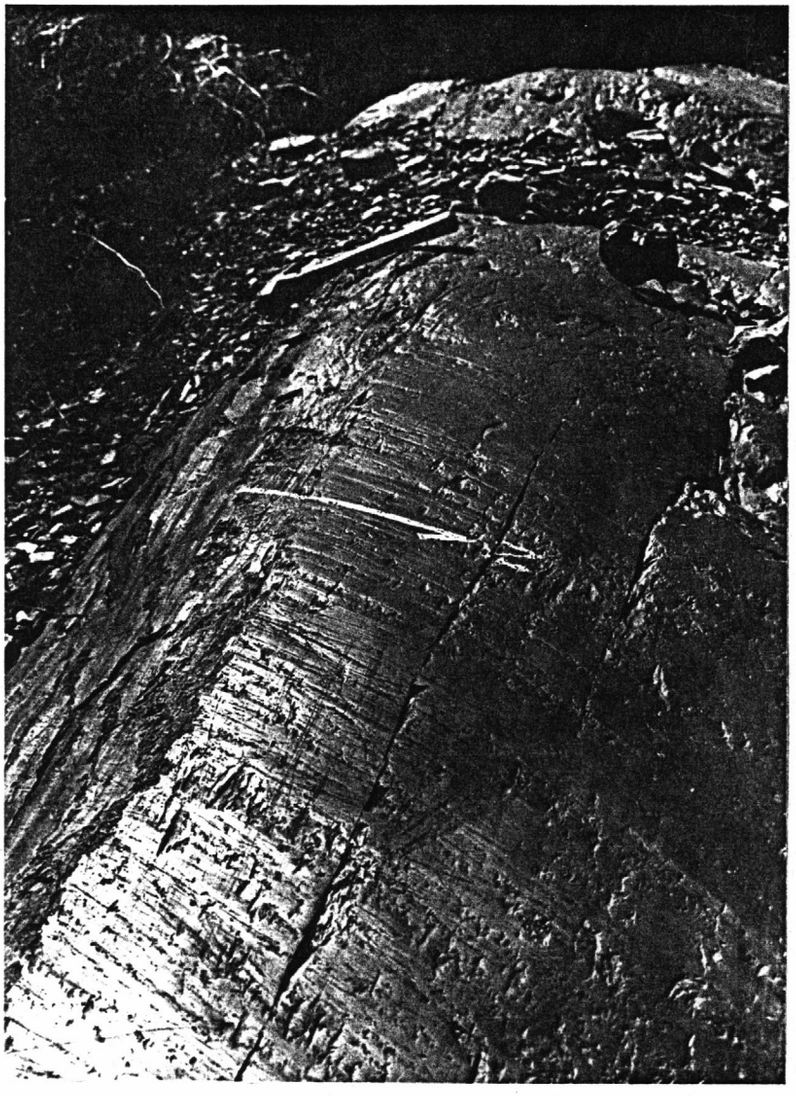


(MATTHES, F. E. 1058)
Outwash material of the El Portal Stage, revealed in a roadcut on the Generals Highway about 100 feet up the canyon side. This material was washed down by the Kaweah River from the glaciers in the upper canyons. Sequoia National Park, California. ca. 1935.



(GILBERT, G. K. 2050a)
Glacial polish and striae near Cathedral Lake, Sierra Nevada. Yosemite National Park, California. 1903.

GLACIAL POLISH - GLACIAL STRIAE



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(SCHMIDT, R. G. 27)
Polished and striated roches moutonnee of unoxidized thin-bedded Trommald formation exposed by stripping of glacial drift in Arko mine. The north arrow is 1 foot long. Cross Wing County, Minnesota. ca. 1953.

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(GILBERT, G. K. 2035)
Glacial striae and polish on granite, upper valley of Ireland Creek. Illustrates the leeward prolongation of hollows initiated by weak spots in the rock. This feature is diagnostic of the ice direction. Yosemite National Park, California. 1903.



(MATTHES, F. E. 1052)
Aplite glacially polished, striaed and grooved, above the head of Kern Canyon. Aplite weathers more slowly than the coarser granite and thus holds its glacial markings longer. The rock as been somewhat disrupted by frost action. Sequoia National Park. Tulare County, California. ca. 1935.



(MATTHES, F. E. 803)
Glacial grooves starting in small hollows and showing unmistakably the ice direction (right to left). On bench at south base of Mercur Peak. Yosemite National Park. Tuolumne County, California. August 2, 1937.
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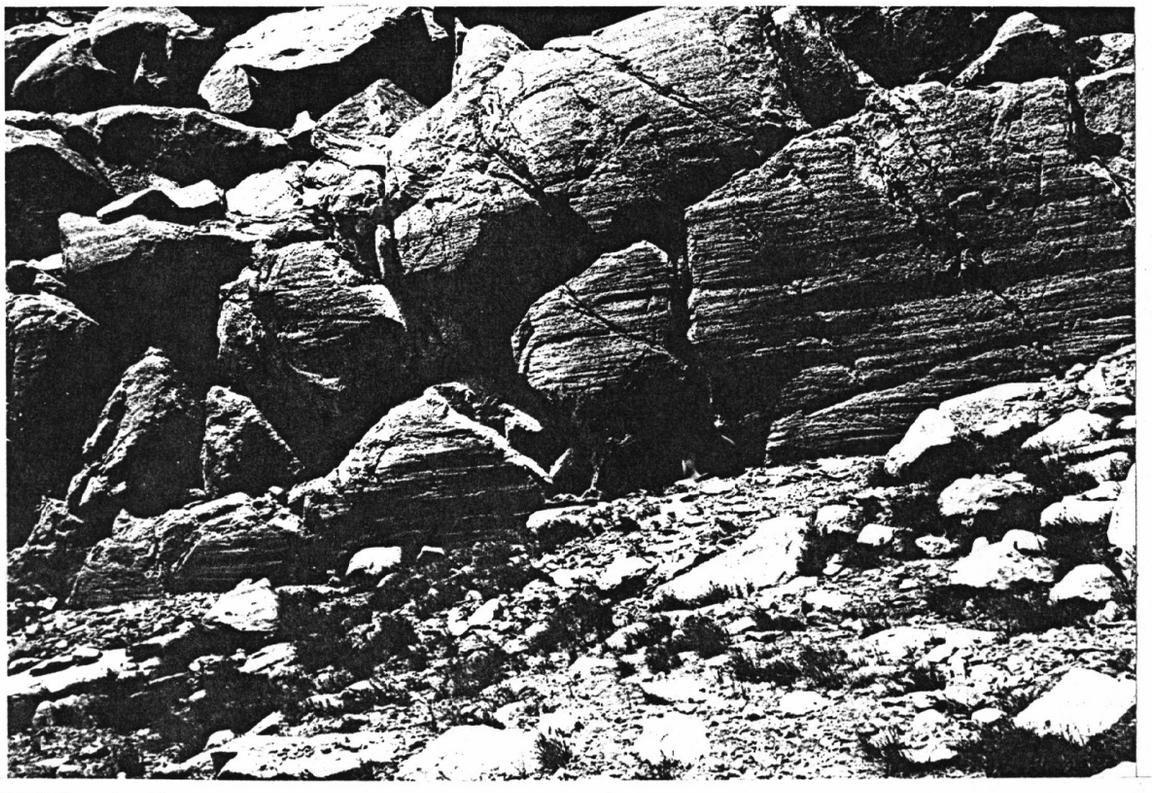

(GILBERT, G. K. 2034)
Glacial striae on a nearly vertical granite wall near McClure Glacier. The ice moved from left to right. Yosemite National Park. Tuolumne County, California. 1903.
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(WRIGHT, C. W. 378)
Terminus of Rendu Glacier in Rendu Inlet. Glacier Bay National Monument. Glacier Bay district, Southeastern Alaska region, Alaska. July 31, 1906.



(MALDE, H. E. 62)
Saskatchewan Glacier, a tongue of the Columbia Ice Field, from Parker Ridge, southeast of Mount Athabaska. Province of Alberta, Canada. August 2, 1954.
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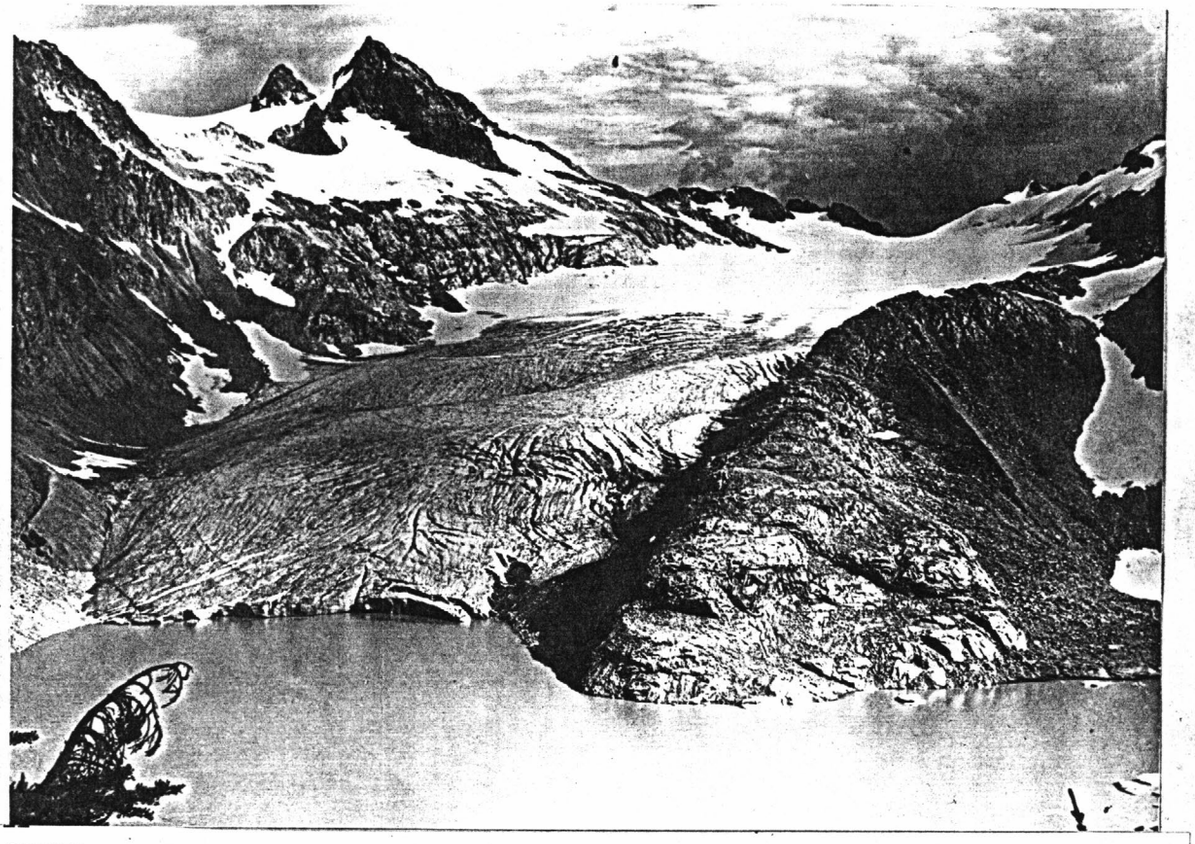

(MEIER, M. F. 19)
South Cascade Glacier, as seen from the north; Sentinel Peak in left background. Chelan and Skagit Counties, Washington. August 13, 1961.
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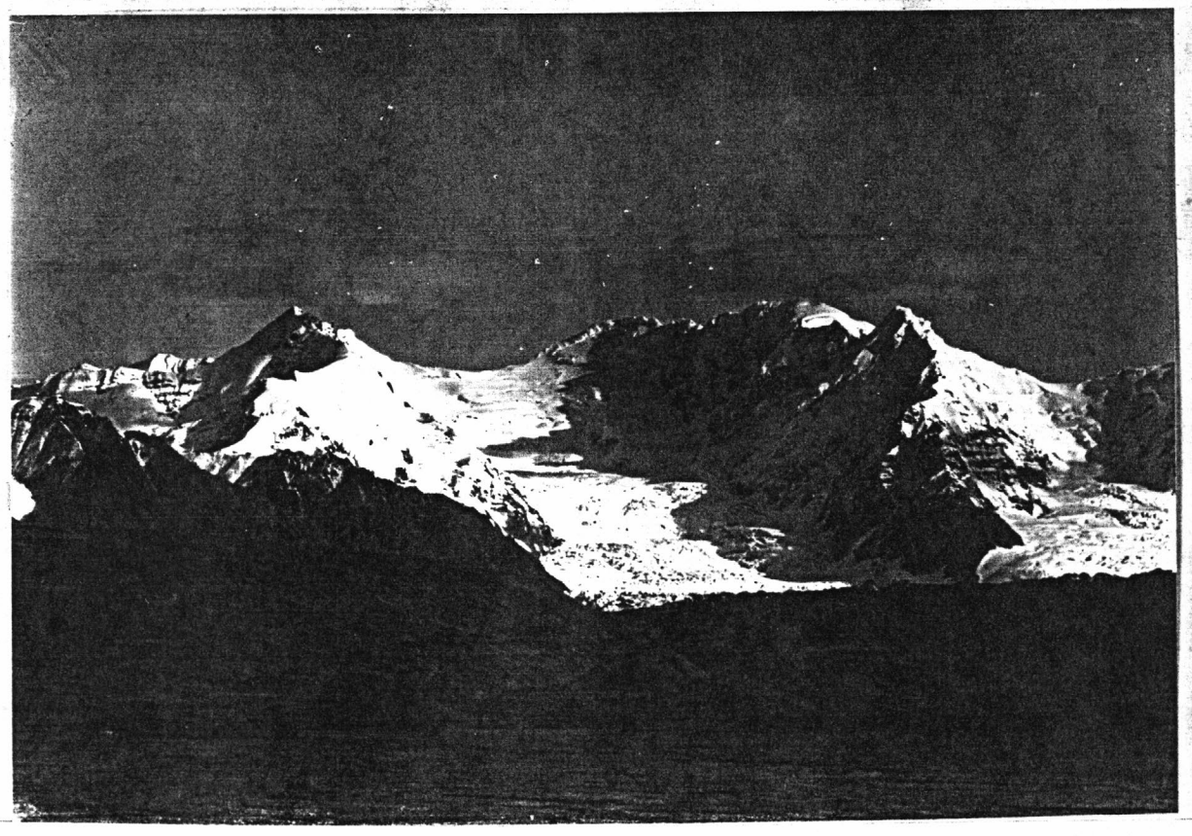

(MENDENHALL, W. C. 374)
An unnamed glacier in the Alaska Range. Copper River region, Alaska. September 4, 1906.
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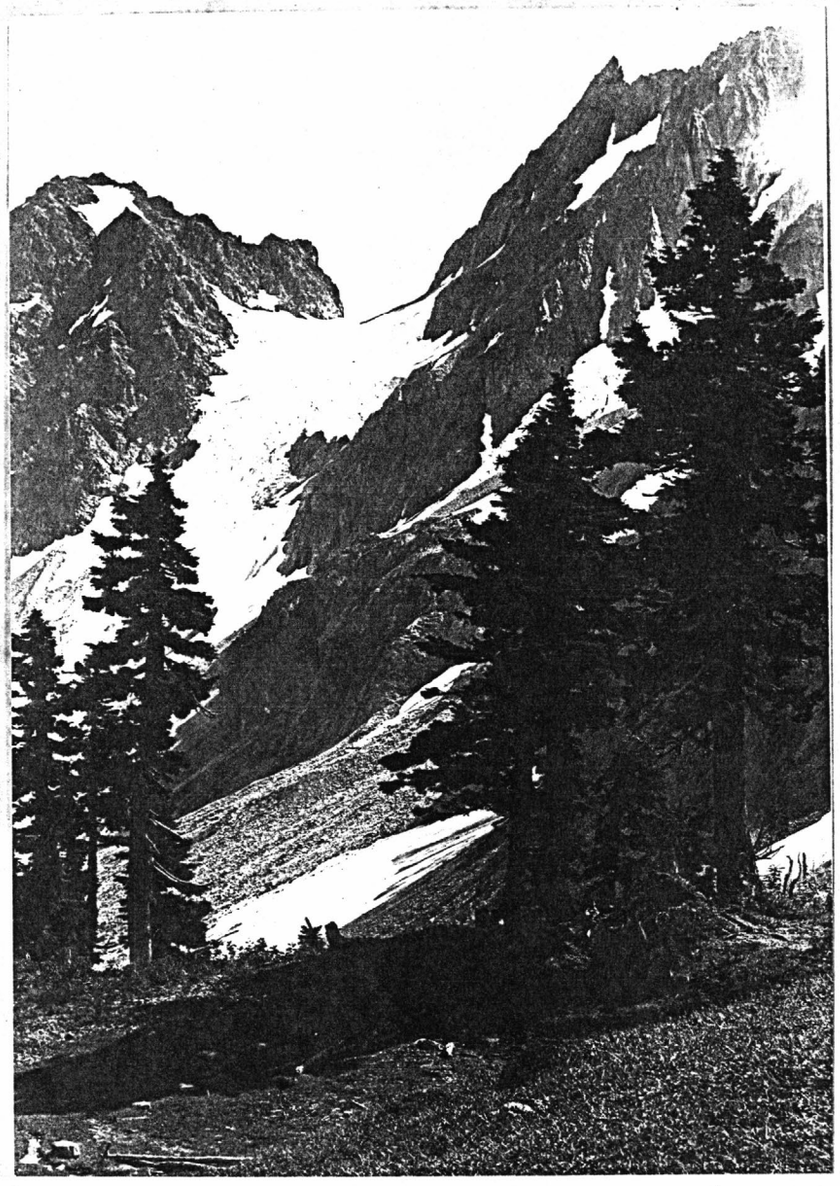
(DARTON, N. H. 930)
Glacier at foot of Cloud Peak, looking west-northwest. Big Horn Mountains. Johnson County, Wyoming. August 1902.



(POST, A. 5)
Boston Glacier. This largest single glacier in the North Cascades occupies a broad cirque northwest of Buckner Mountain. Its terminus advanced rapidly between 1950 and 1955, its area increased 17 percent during this period. North Cascades National Park. Skagit County, Washington. September 27, 1960.



(WILLIS, B. 202)
Cascade Pass glacier. Chelan County, Washington. September 10, 1900.
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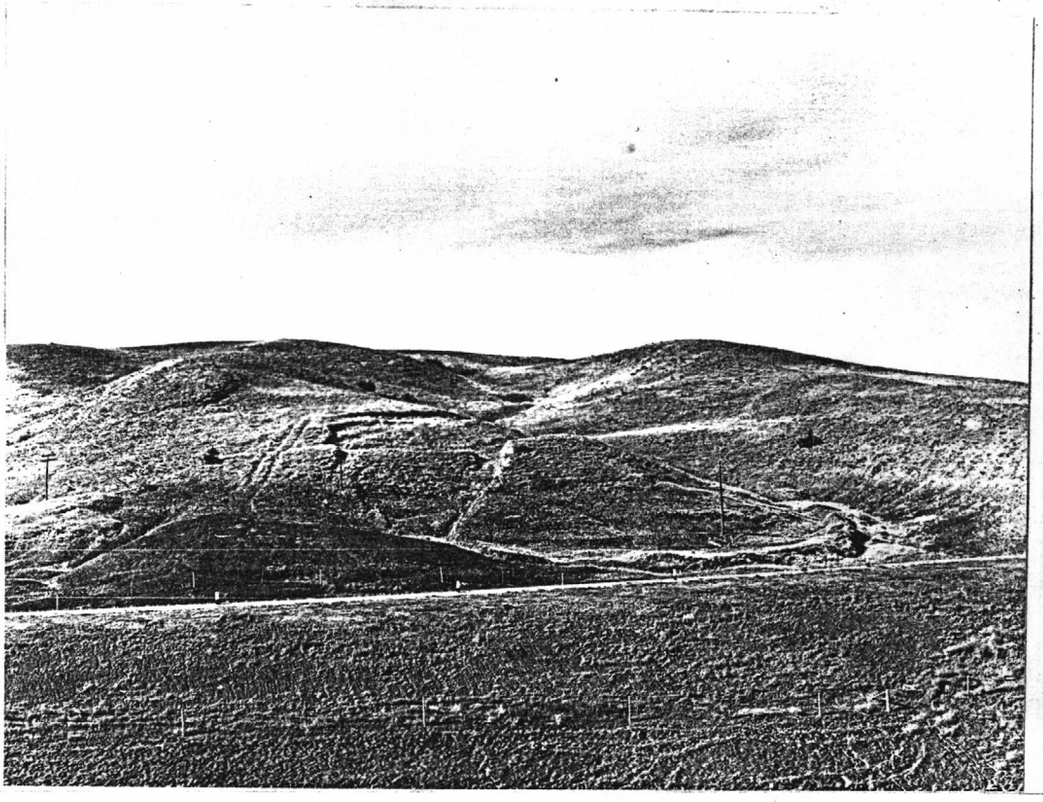
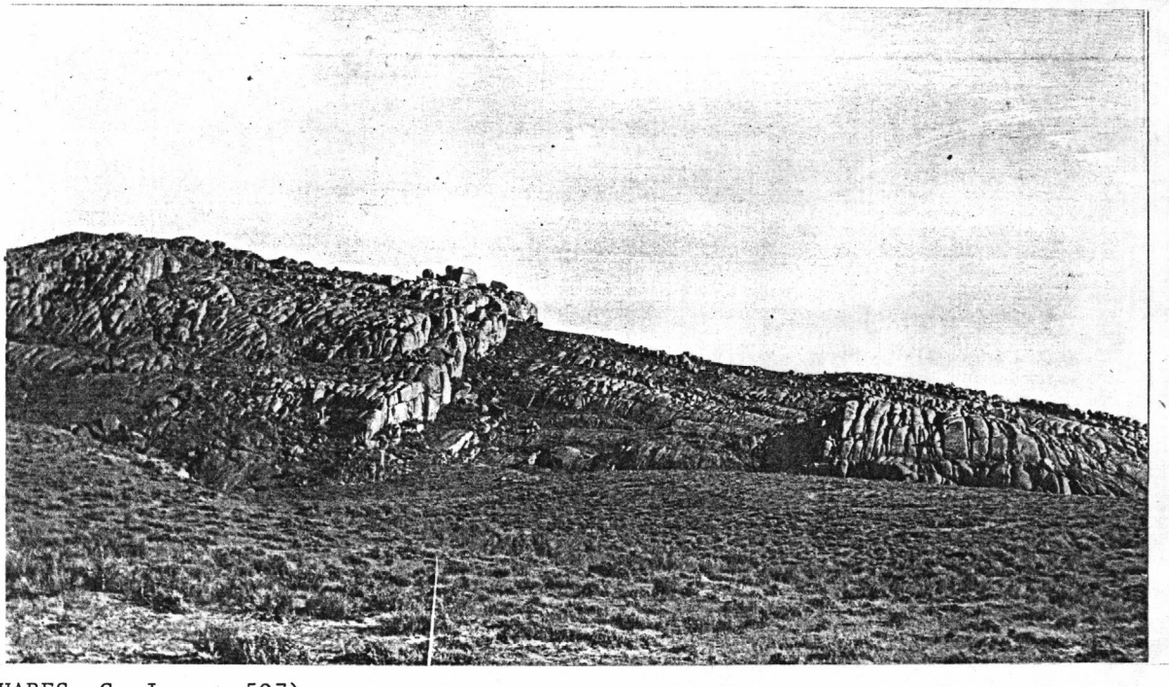


(ERSKINE, C. F. 3)
Highway 16 slump. The upper part is a graben formed by collapse after the original slump block moved and left it unsupported. The lower part of the slump, with a pressure ridge caused by forward and upward thrusting of the slump block at the toe, is inferred to be the original slump block. Brule County, South Dakota. 1954.



(HARES, C. J. 507)
Graben formed by dropped block of granite. Vertical joints are well developed. Sec. 33, T. 30 N., R. 85 W. Natrona County, Wyoming. n.d.
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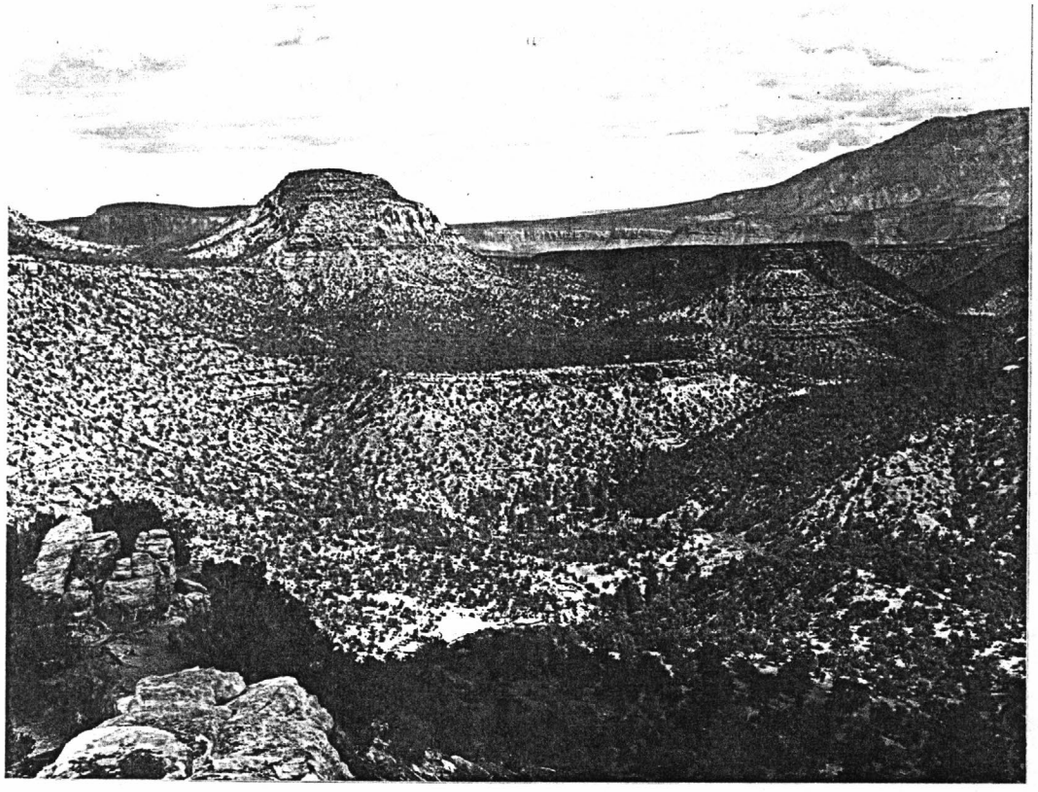

(LEWIS, R. Q., SR. 5)
Bridger Jack graben as viewed from north rim above head of Davis Canyon.
San Juan County, Utah. 1955.
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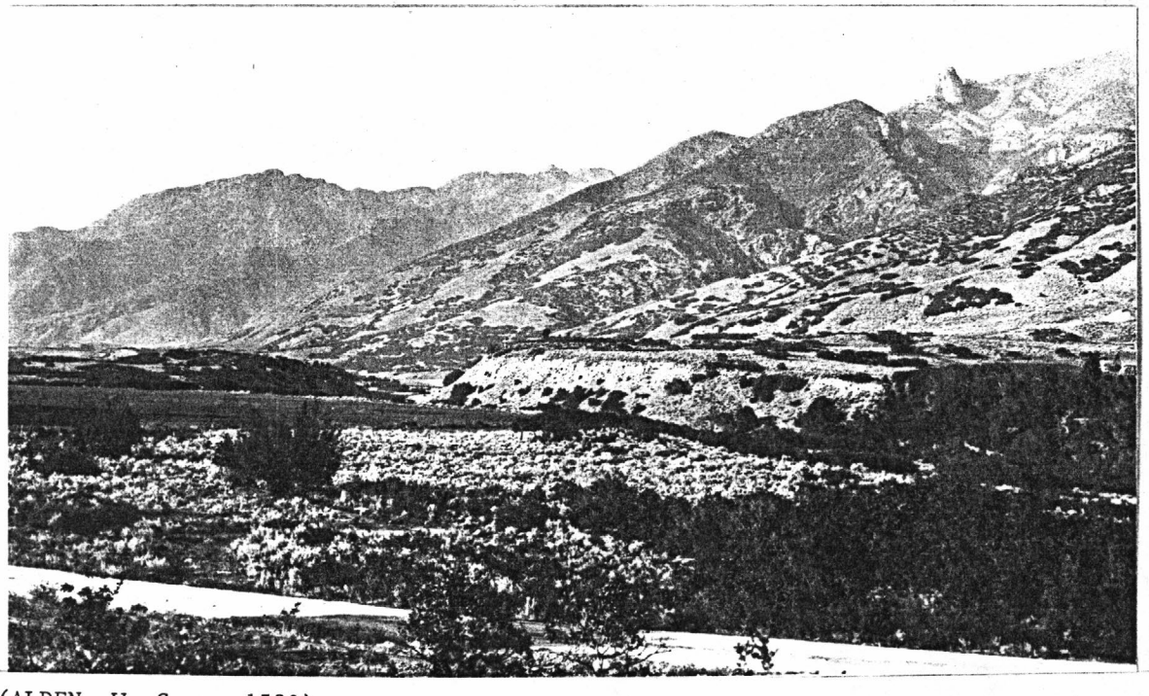

(ALDEN, W. C. 1580)
View from Bonneville terrace showing east fault scarp of graben crossing Little Cottonwood Creek (right middle). Wasatch Mountains. T. 3 S., R. 1 E.
Salt Lake County, Utah. August 28, 1925.
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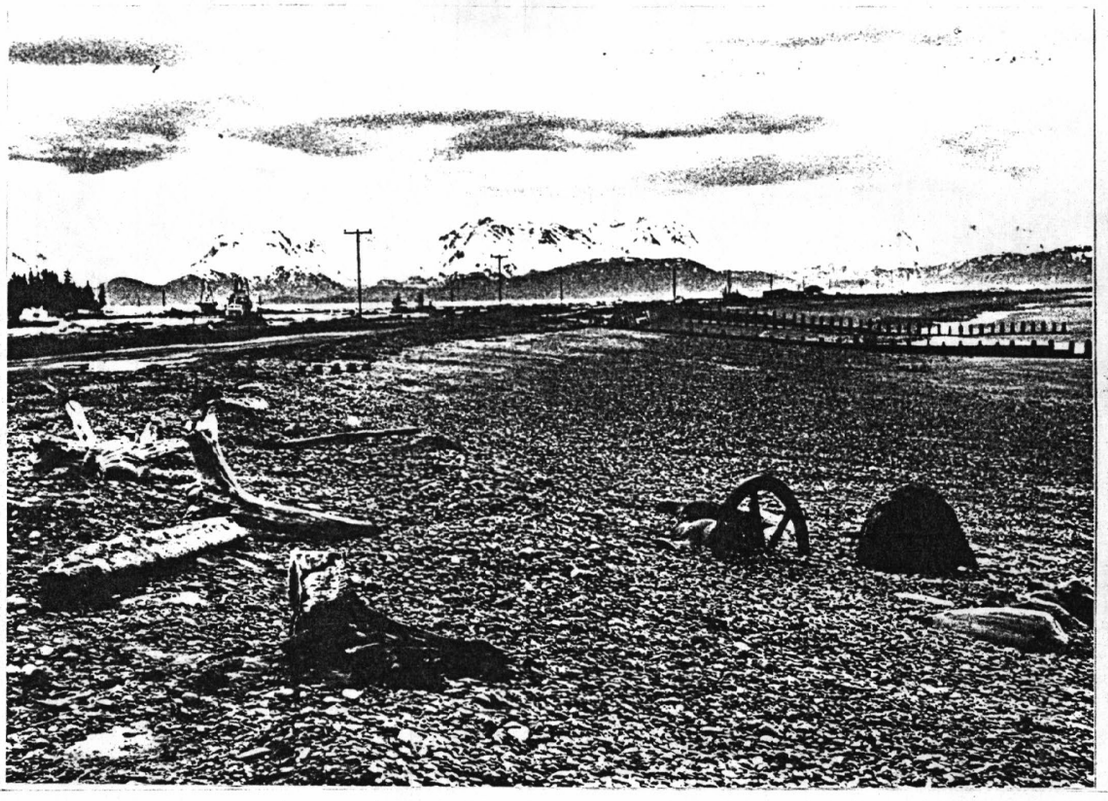
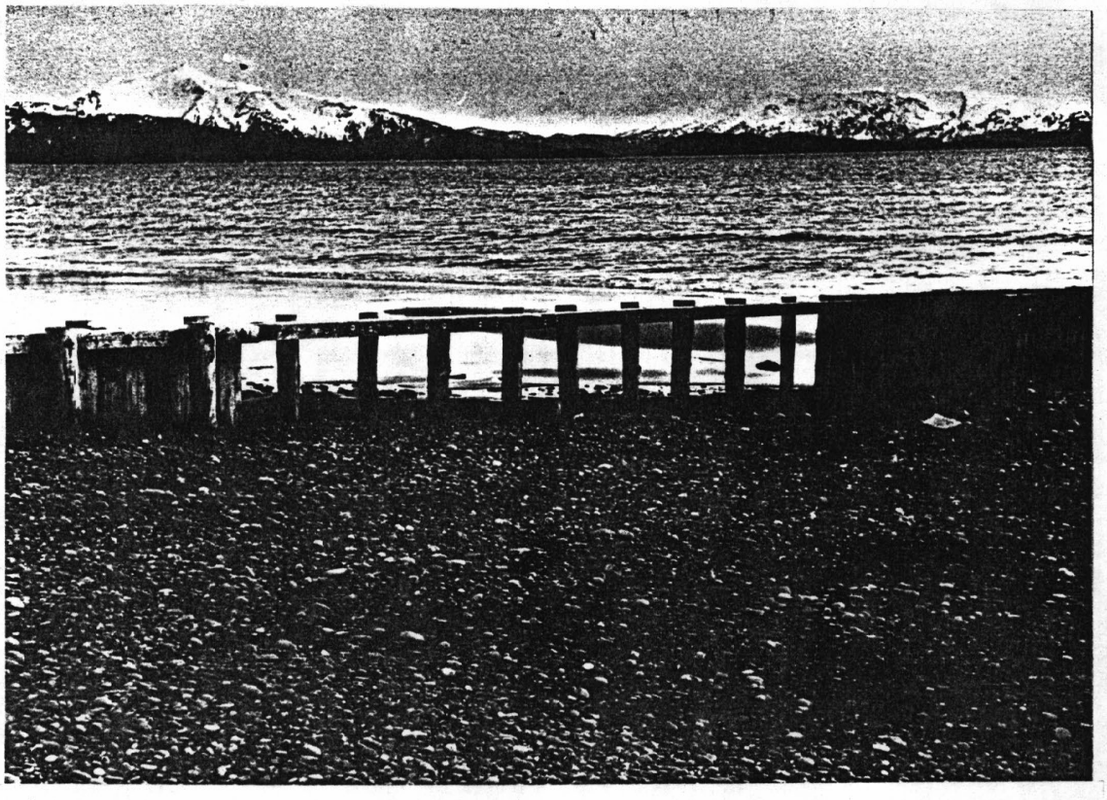


(ALASKA EARTHQUAKE 102)
Groins rebuilt one year after the earthquake of March 27, 1964. Seldovia district, Cook Inlet region, Alaska. 1965.



(ALASKA EARTHQUAKE 100)
Section removed from seaward end of groin to allow bypassing of material. Seldovia district, Cook Inlet region, Alaska. March 1964.



(DOLAN, R. 11)
Oblique aerial view of groin field along Fenwick Island. Worcester County, Maryland. n.d.
--



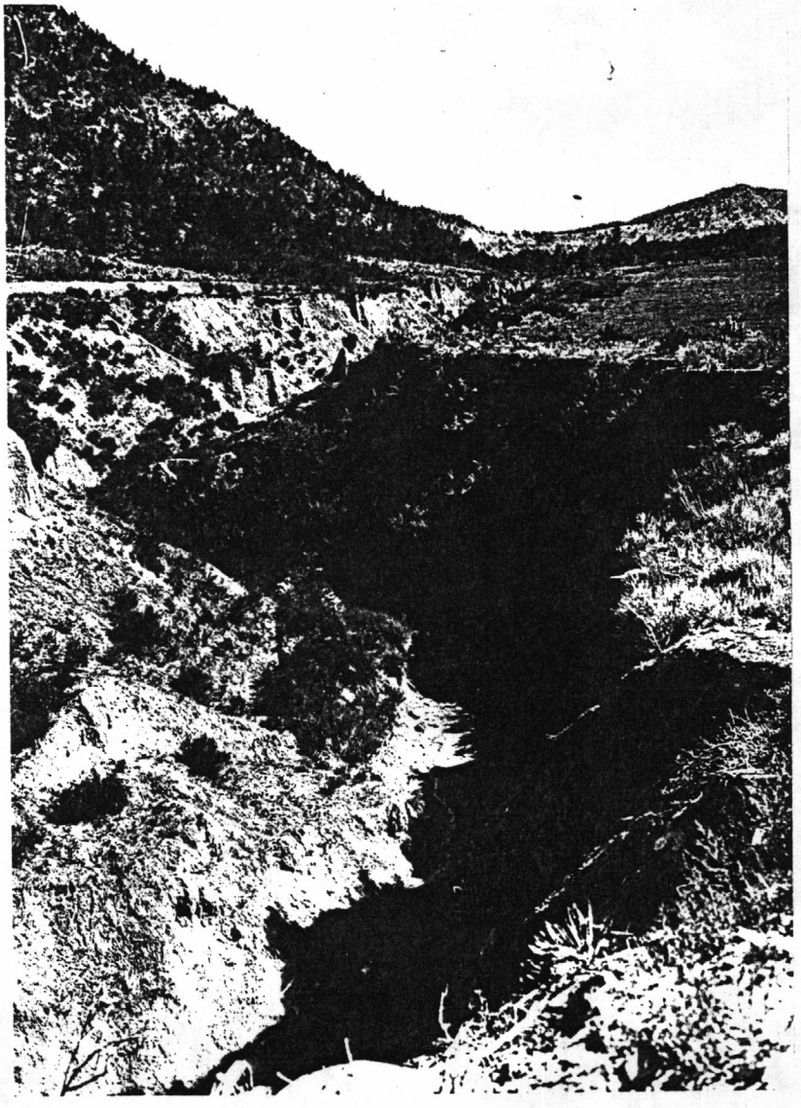
(MALDE, H. E. 1206)
Moorcroft terrace incised in upland Kaycee alluvium and in turn incised by a gully of Lightning age. Divisions on pole (left of center) are ½ meter. SE cor. sec. 15, T.36 N., R. 65 W. Niobrara County, Wyoming. June 26, 1981.



(ERDMANN, C. E. 363)
Head of a tributary of Soda Creek gullying mature Pleistocene slope which stands about 2,800 feet. Note flat alluvial floor of main gulch, this now being trenched. Secs 29, 30, T. 18 N., R. 45 E. McCone County, Montana. June 23, 1928.



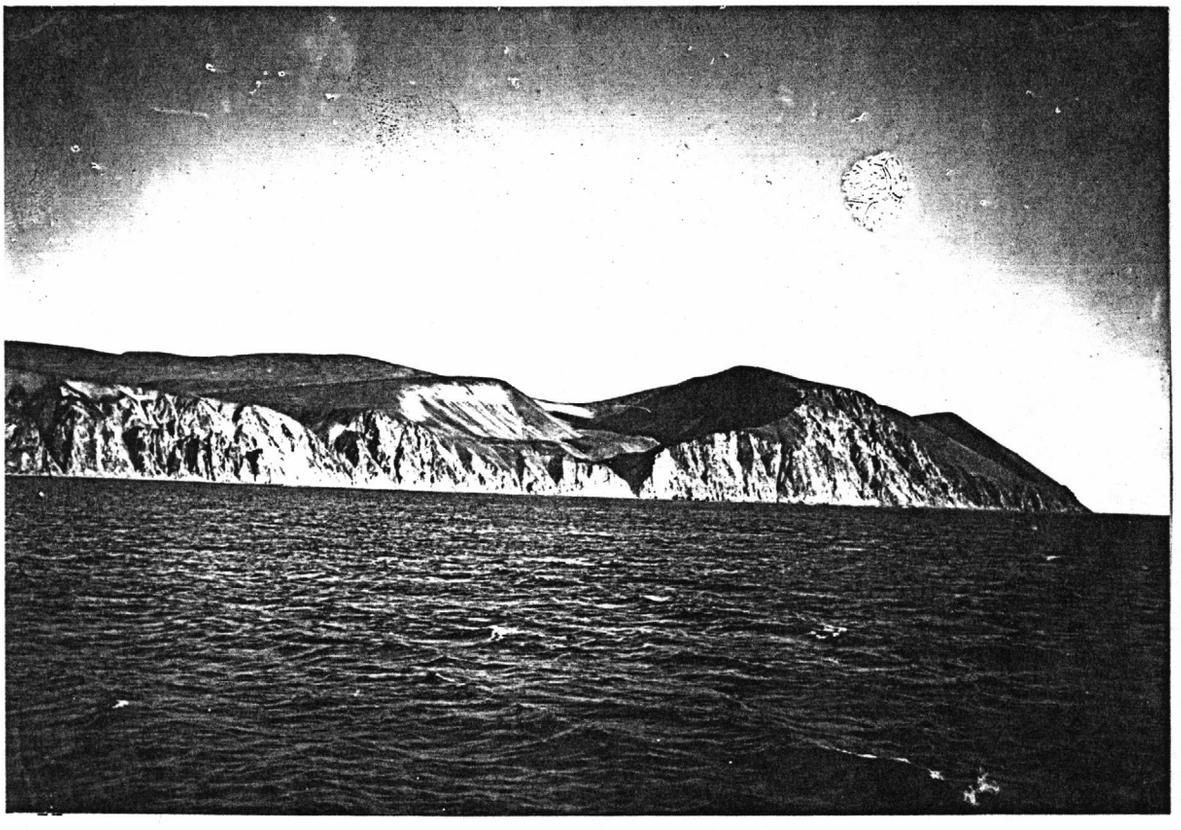
(SCHUMM, S. A. 6)
Gullying in soils formed on sedimentary rocks of Ordovician age north of Hume Highway, southeast of Wantabadgery. New South Wales, Australia. ca. 1965.



(ANDERSON, J. C. 71)
Gully cut into alluvium, Meadow Brook. Kane County, Utah. 1938.



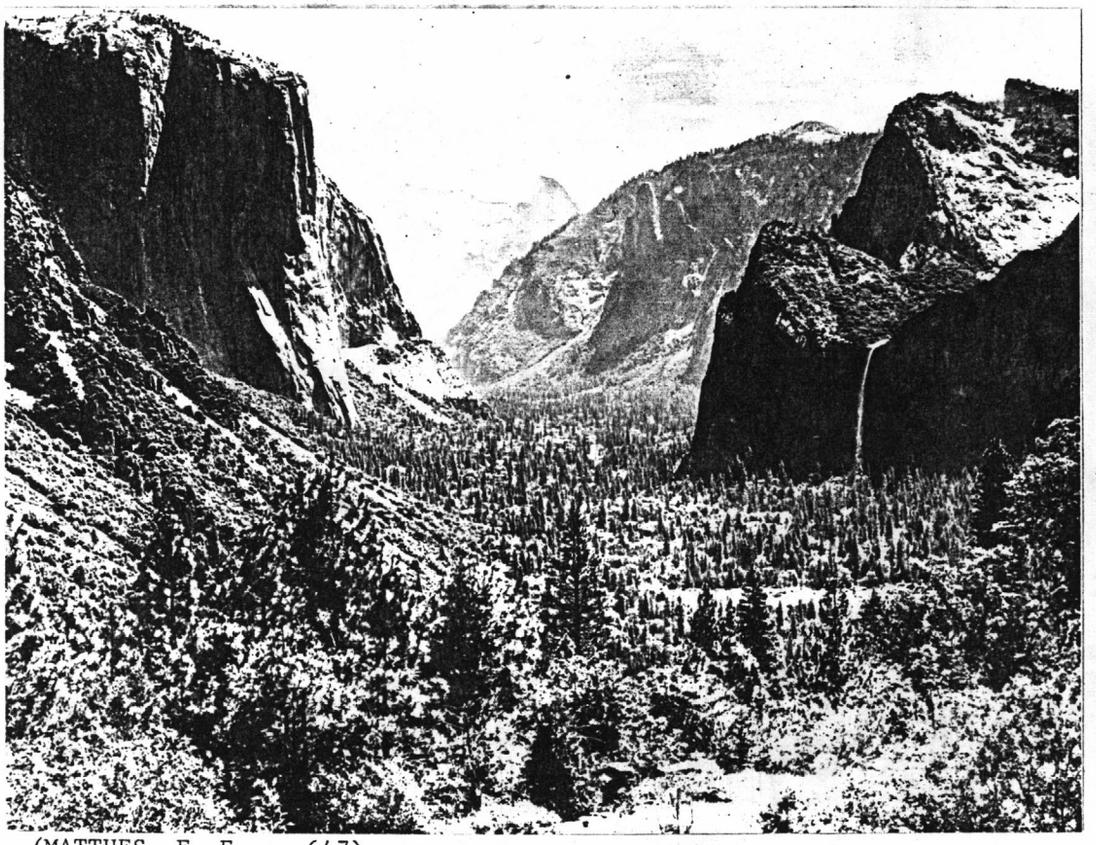
(HILLERS, J. K. 34)
View up Yosemite Valley with El Capitan on the left and Bridal Veil on the right. Yosemite National Park. California. n.d.



(COLLIER, A. J. 486)
Hanging valley east side of Plover Bay. Alaska. n.d.



(MALDE, H. E. 88)
Mouth of Allen Creek Valley, upper part, which hangs above the valley of Canyon Creek; seen from the northwest spur of Wynn Mountain. Glacier National Park. Glacier County, Montana. August 12, 1954.



(MATTHES, F. E. 647)
View up Yosemite Valley from vicinity of Artist Point. El Capitan at left, the Cathedral Rocks and Bridal Veil falls at right. Yosemite National Park. California. 1923.



(DARTON, N. H. 1512)
Looking north along hogback of Niobrara limestone west of Colorado Springs. Gate to Garden of the Gods park in left background.
El Paso County, Colorado. n.d.



(LOVERING , T. S. 5a)
Oblique aerial view northward of the Dakota hogback near Morrison.
Jefferson County, Colorado. 1935.
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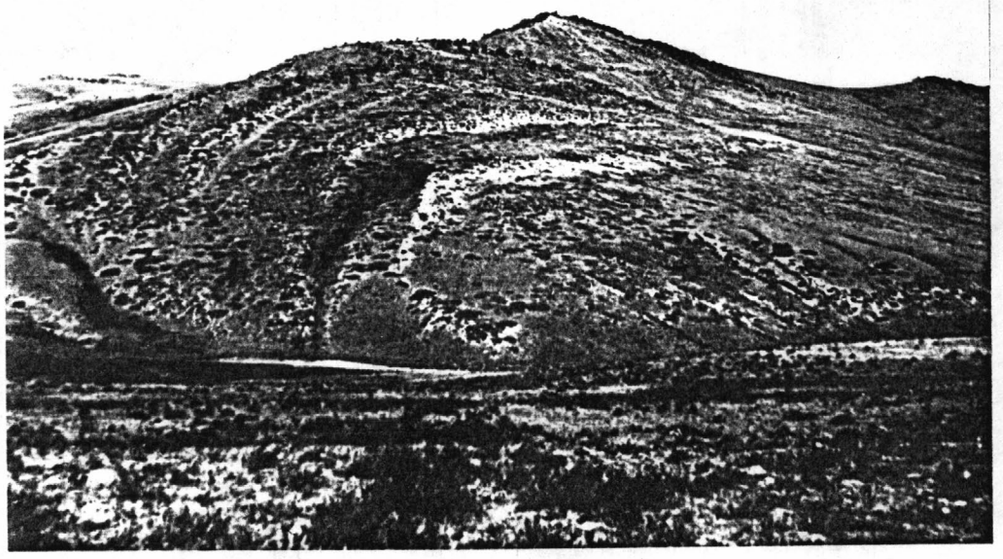
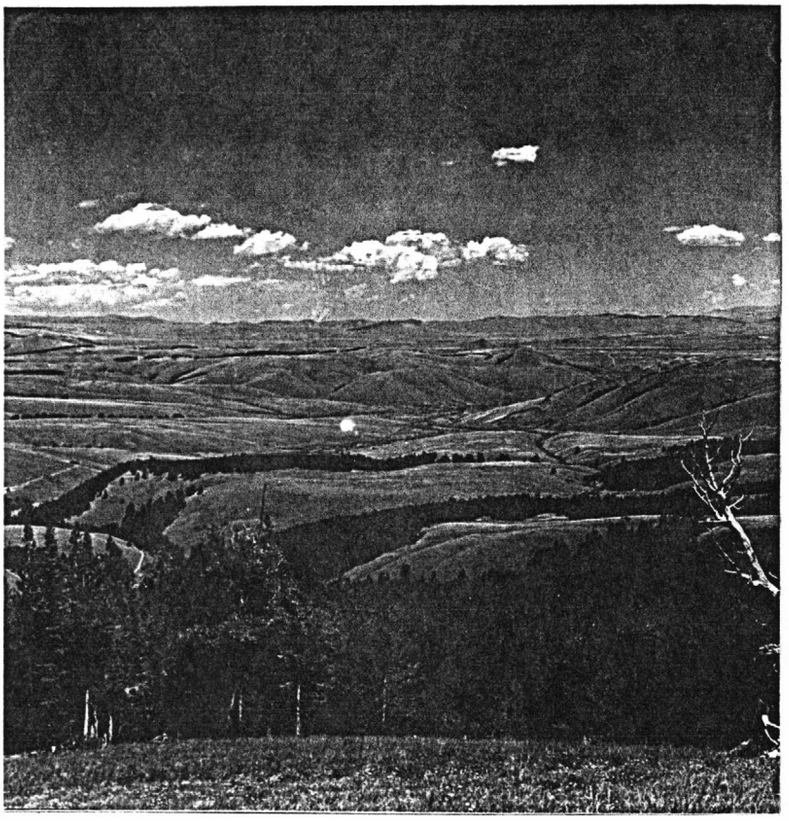
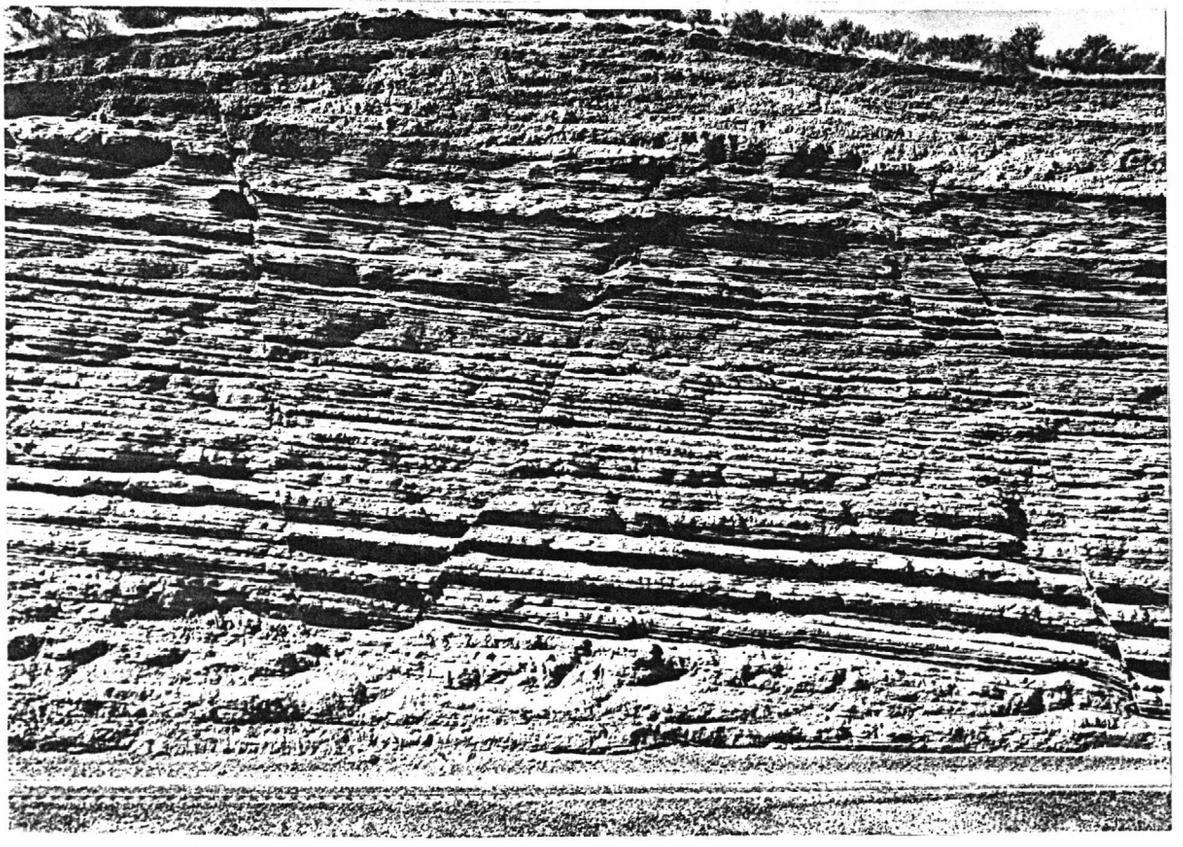
(CAMPBELL, M. R. 1759)
North end of Dakota hogback north of Morrison. Jefferson County, Colorado. 1926.



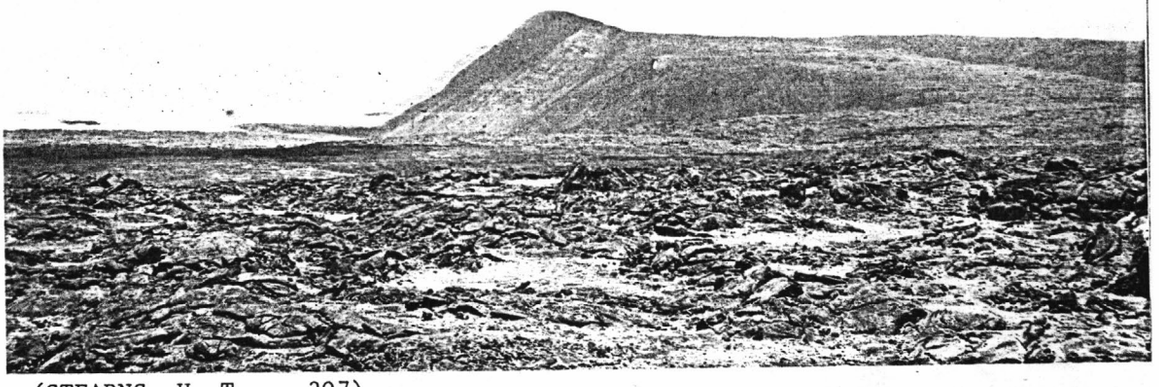
(VINE, J. D. 57)
Hogback formed by the Amsden formation. In the center of the photograph the light-colored limestone beds in the upper part of the formation dip steeply to the north. Sec. 10, T. 18 N. R. 16 E. Judith Basin County, Montana. n.d.



(STAATZ, M. H. 245)
A horst of quartzite of the Belt Supergroup, bounded by the Challis Volcanics is brought up on the Bull Moose and Dan Patch faults. Lemhi Pass fault is in background. Beaverhead County, Montana. ca. 1968.



(MALDE, H. E. 290)
Horst and graben in inclined alternating beds of sand and silt of Bruneau formation (mid-Pleistocene) exposed along King Hill Canal at Deer Gulch. NENW sec. 21, T. 6 S., R. 11 E. Elmore County, Idaho. September 22, 1960



(STEARNS, H. T. 307)
Looking west from Keauhou to the horst of Puu Kapukapu. Hawaii County, Hawaii. July 31. 1924.
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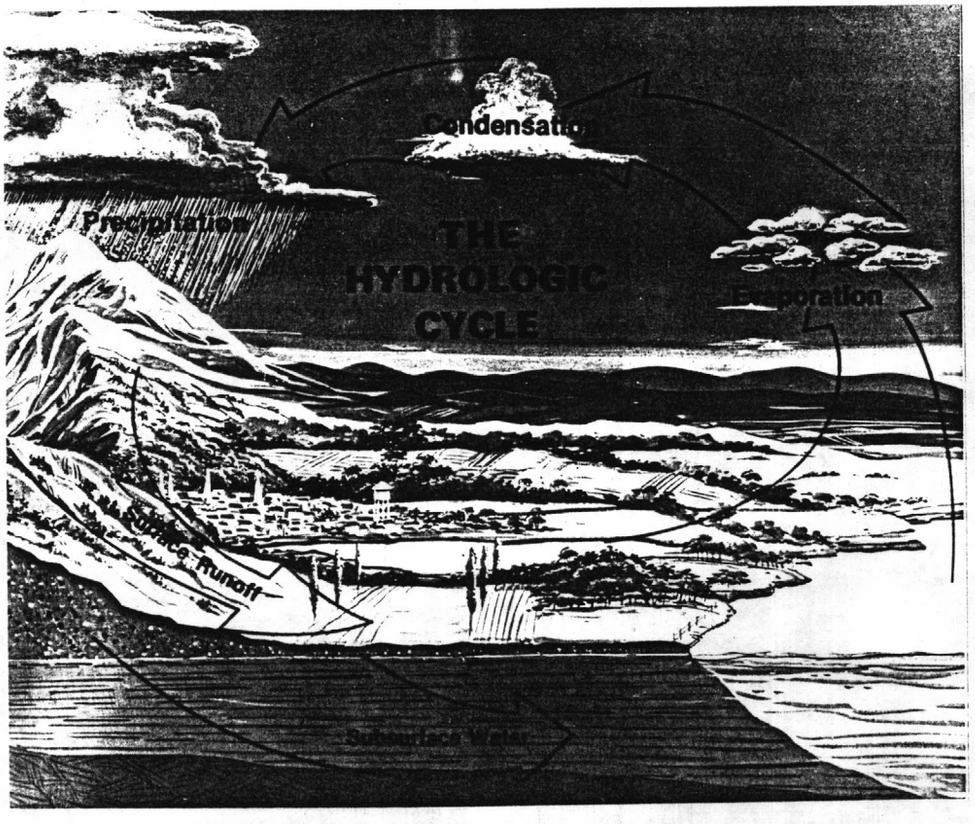

(U. S. GEOLOGICAL SURVEY 714)
The Hydrologic Cycle.
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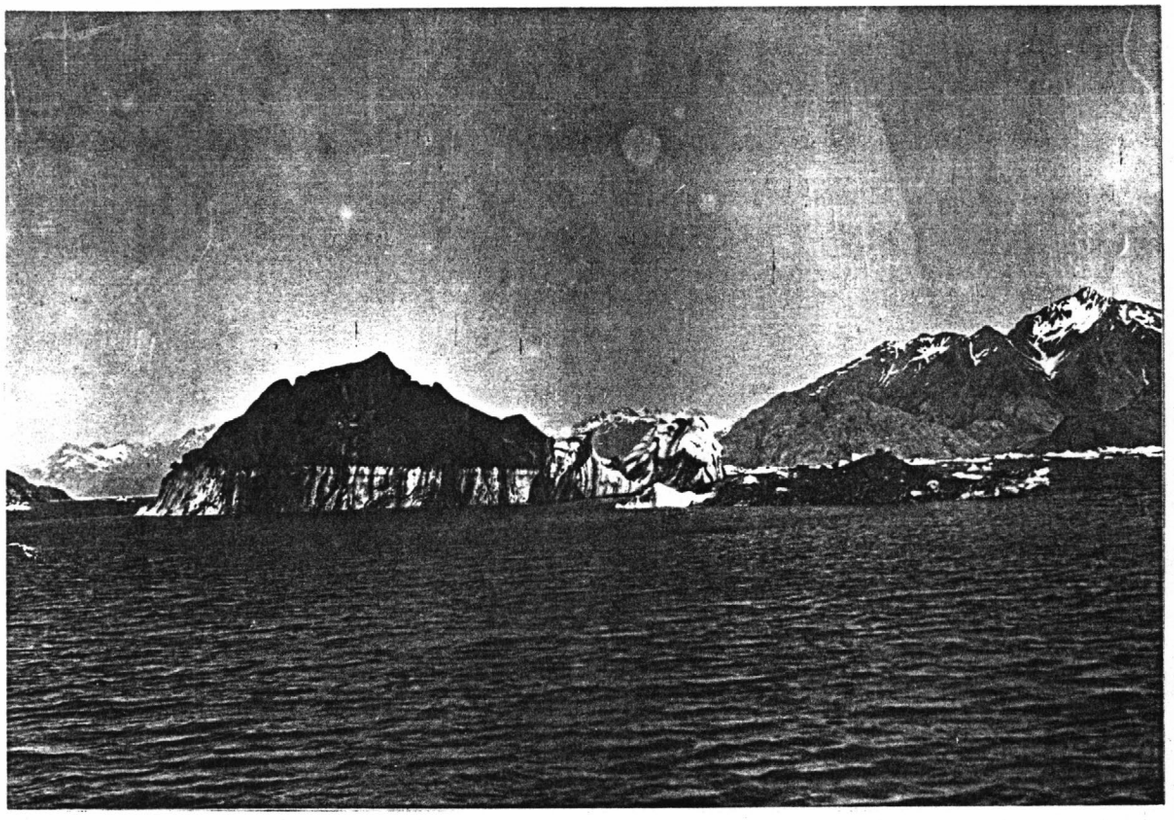
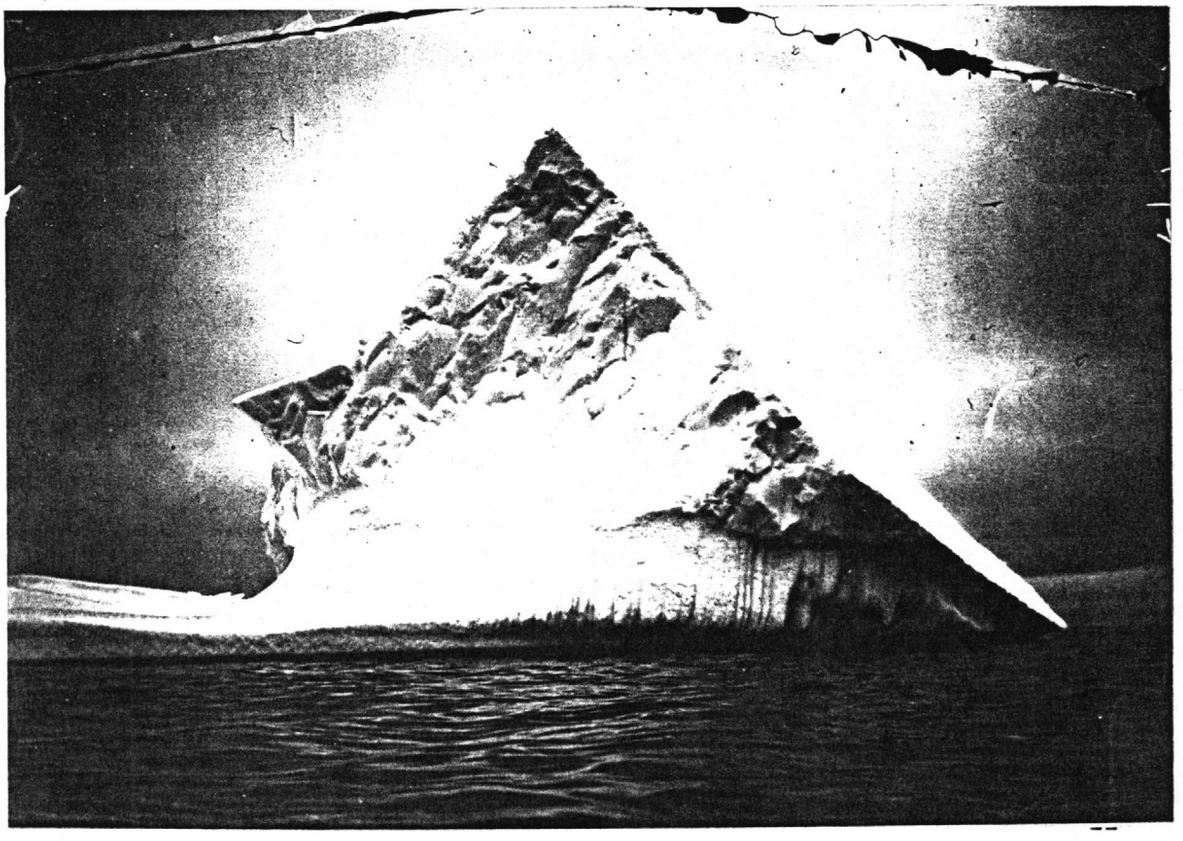


(MERTIE, J. B. 715)
Icebergs near entrance to Reid Inlet. Glacier Bay district, Southeastern Alaska region, Alaska. July 24, 1919.



(WALCOTT, C. D. 579d)
Iceberg near head of Trinity Bay. Province of Newfoundland, Canada. 1899.



(GILBERT, G. K. 274)
Iceberg in Glacier Bay National Monument. Glacier Bay district, Southeastern Alaska, Alaska. 1899.



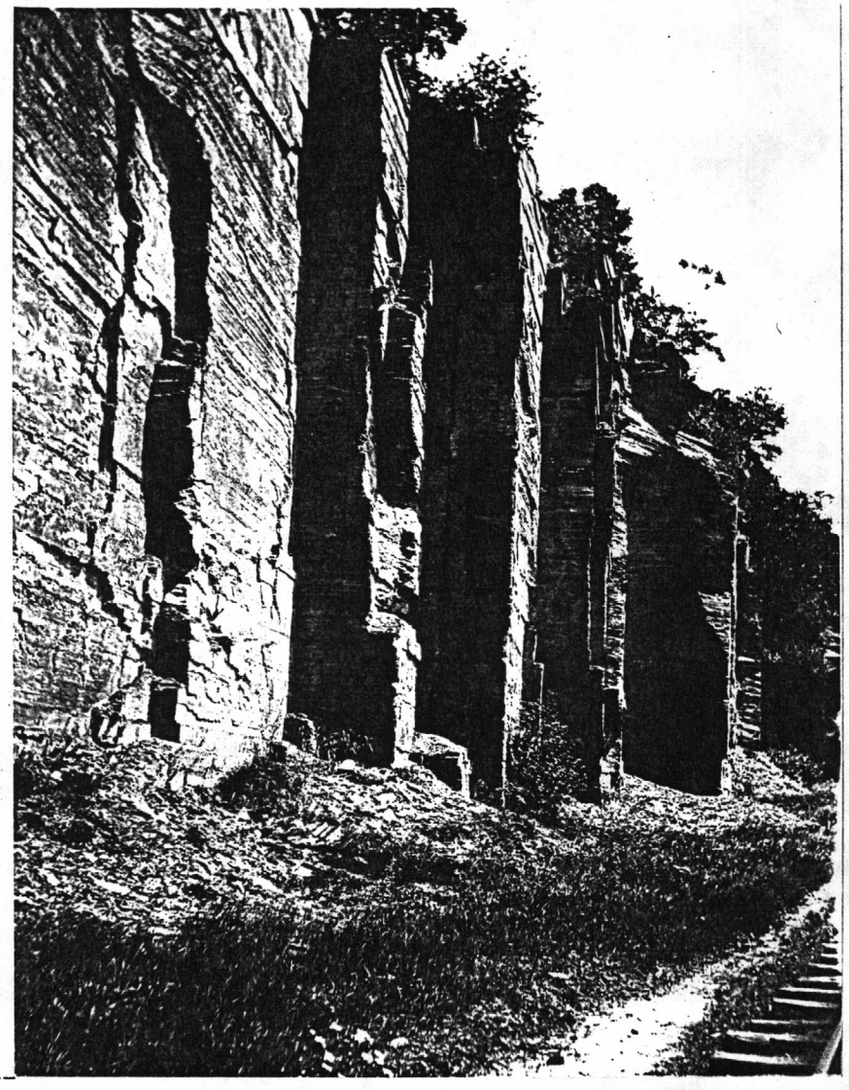
(WRIGHT, C. W. 328a)
Icebergs in Reid Inlet, Glacier Bay National Monument. Glacier Bay district, Southeastern Alaska region, Alaska. 1906.



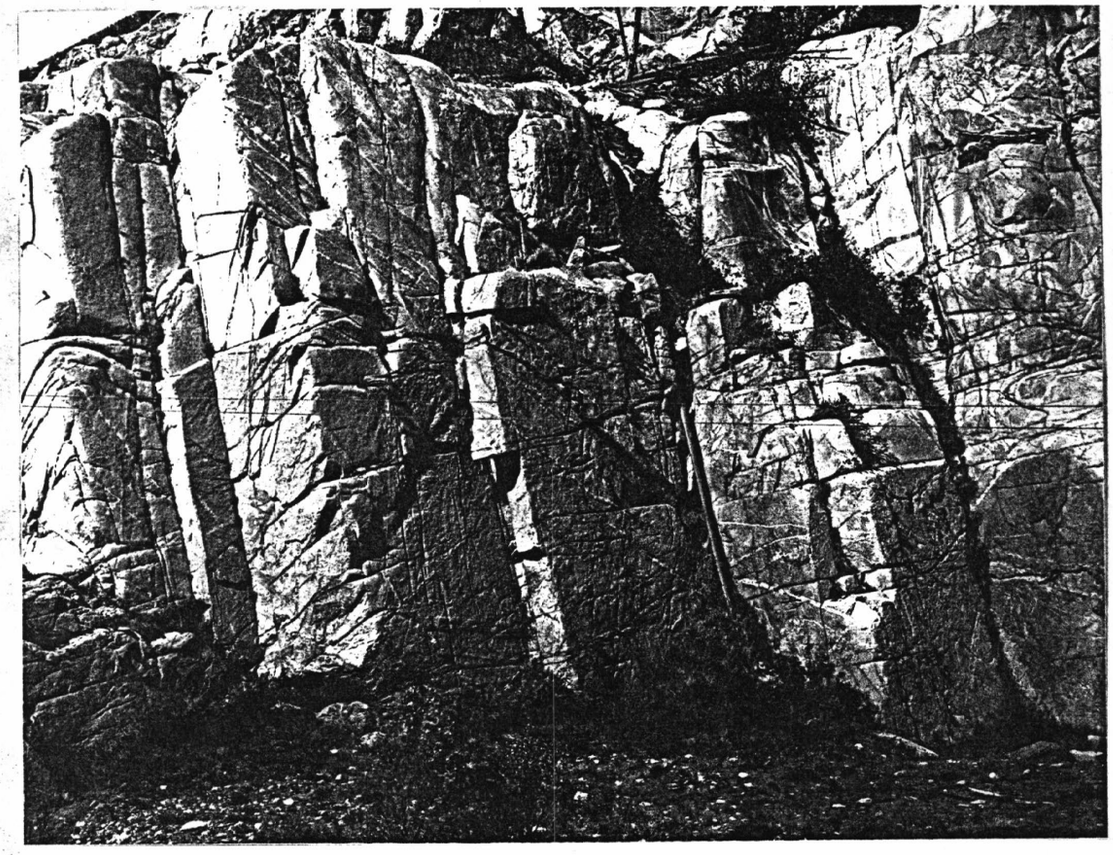
(STOSE, G. W. 391)
Rectilinear jointing in Chemung sandstone 1½ miles west of Stotlers crossroads. Morgan County, West Virginia. n.d.



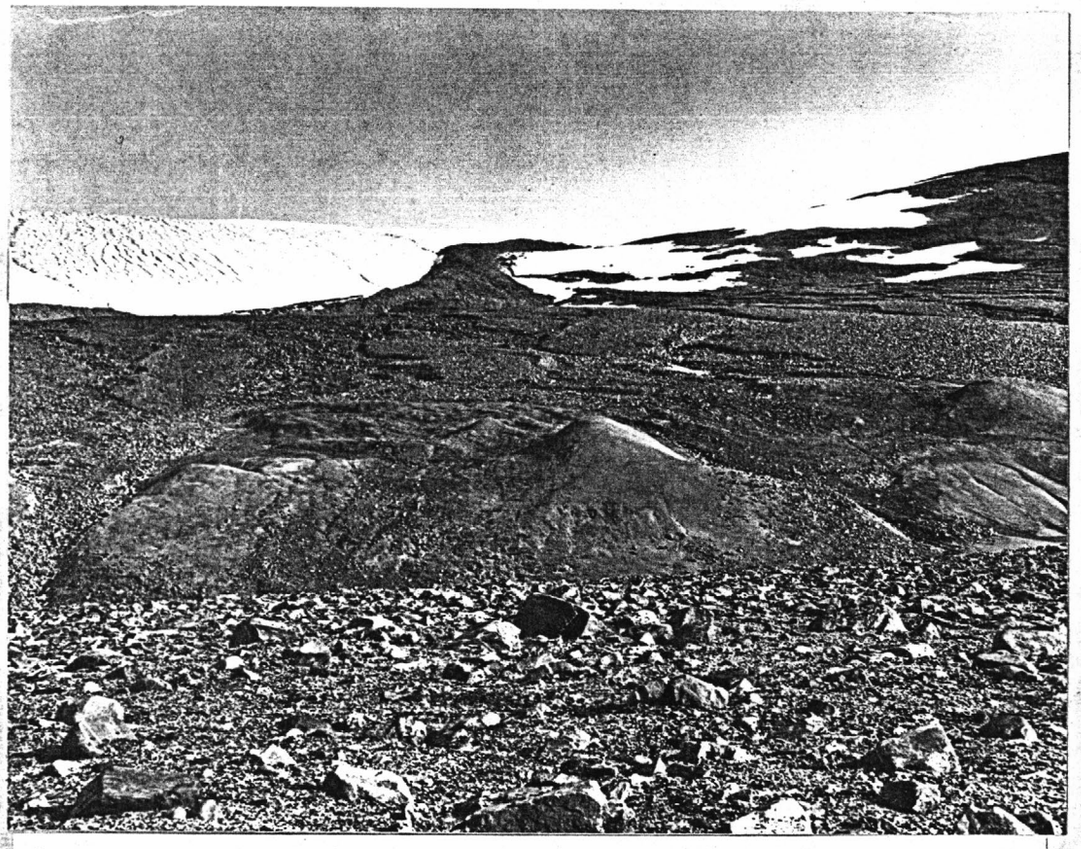
(CALKINS, F. C. 6)
Joints in Prichard shale, near mouth of Elk Creek. Shoshone County, Idaho. n.d.



(KINDLE, E. M. 9)
Joint planes in the Portage, north of McKinney, Lake Cayuga.
Tompkins County, New York. n.d.



(CROSS, W. 453)
Joints in granite cut by veins of quartz, feldspar and biotite, opposite Ten Mile Creek, Las Animas canyon. San Juan County, Colorado. October 10, 1900.



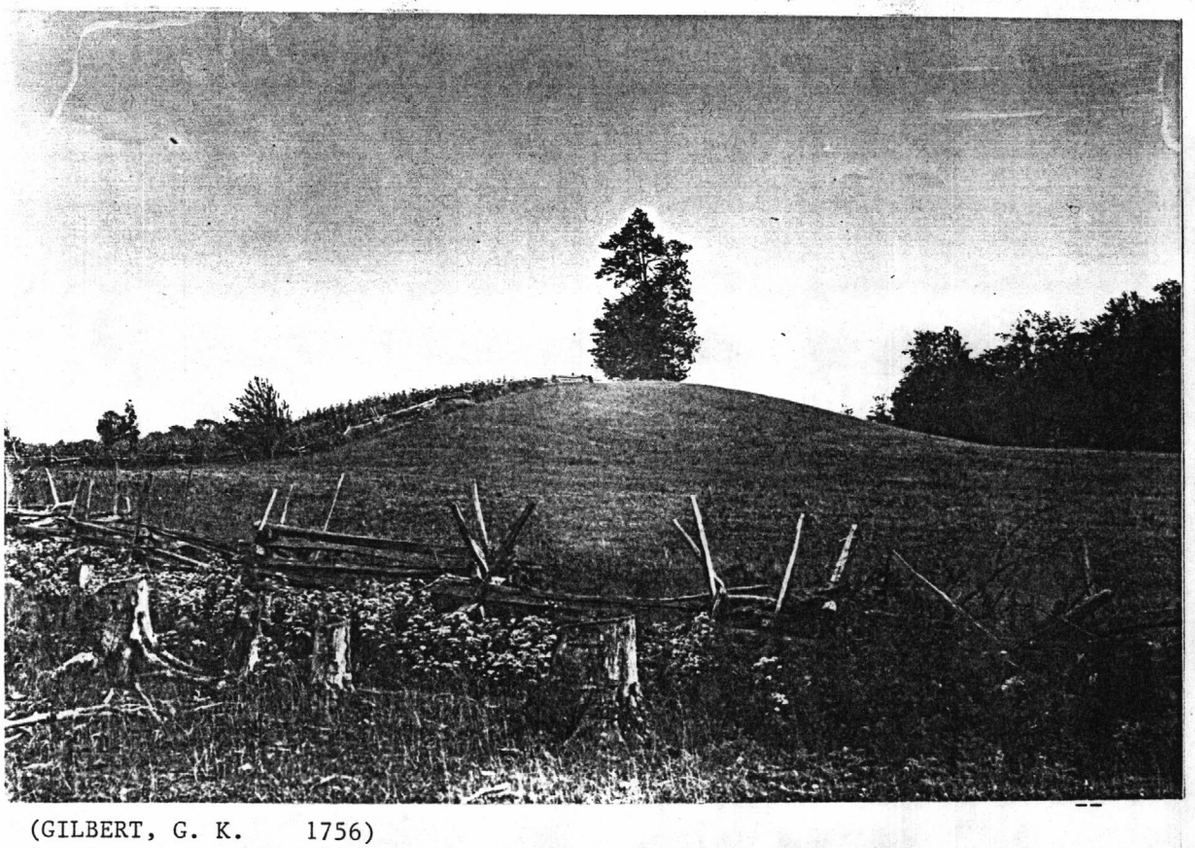
\(COLTON, R. B. 106)
Kames on the north side of Happy Valley Creek. Greenland. August 8, 1953.



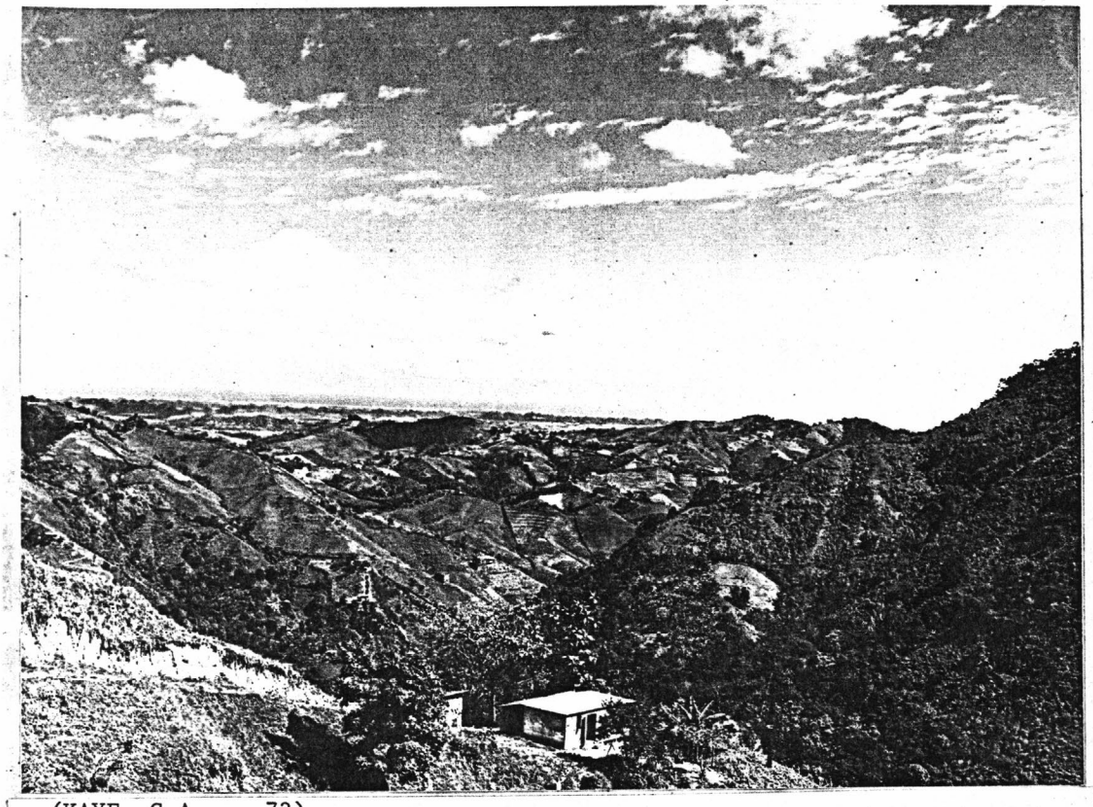
(MILLER, R. D. 35)
Kame in sec. 18, T. 12 N., R. 3 W. Anchorage district, Cook Inlet region, Alaska. n.d.



(GILBERT, G. K. 648)
Kame moraine in Ninemile Valley 1½ miles south of Marcellus, looking south. Onondaga County, New York. 1902.



(GILBERT, G. K. 1756)
A solitary kame. Orleans County, New York. ca. 1889.



(KAYE, C.A. 73)
Distant view of karst topography, from about 1 mile west of Naranjito. Naranjito quadrangle, Puerto Rico. 1952.



(MONROE, W. H. 382)
Mogotes rising out of pineapple fields in plain of blanket sand near Coto Sur. Quarry in left background is 1 km east of Manati. Manati quadrangle, Puerto Rico. n.d.



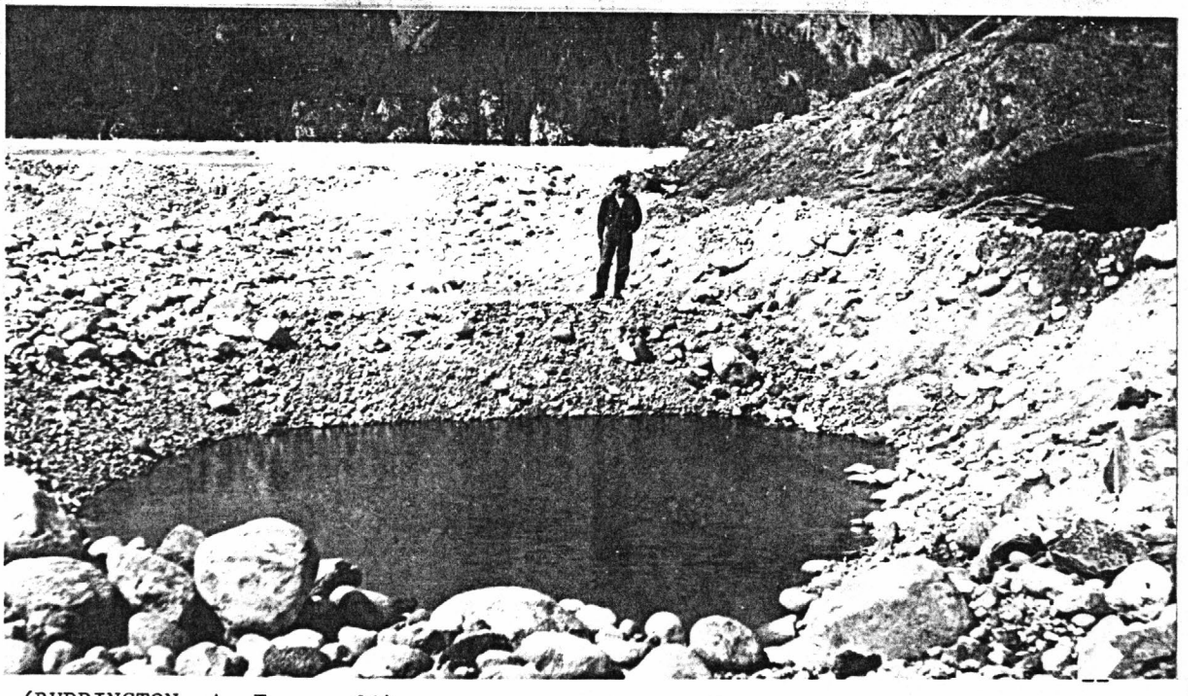
(MONROE, W. H. 386)
Zanjones at Torrecillas, 4 km northwest of Morovis. The zanjones rise up the sides of hills, but commonly coalesce to form linear valleys. Ciales quadrangle, Puerto Rico. 1963.



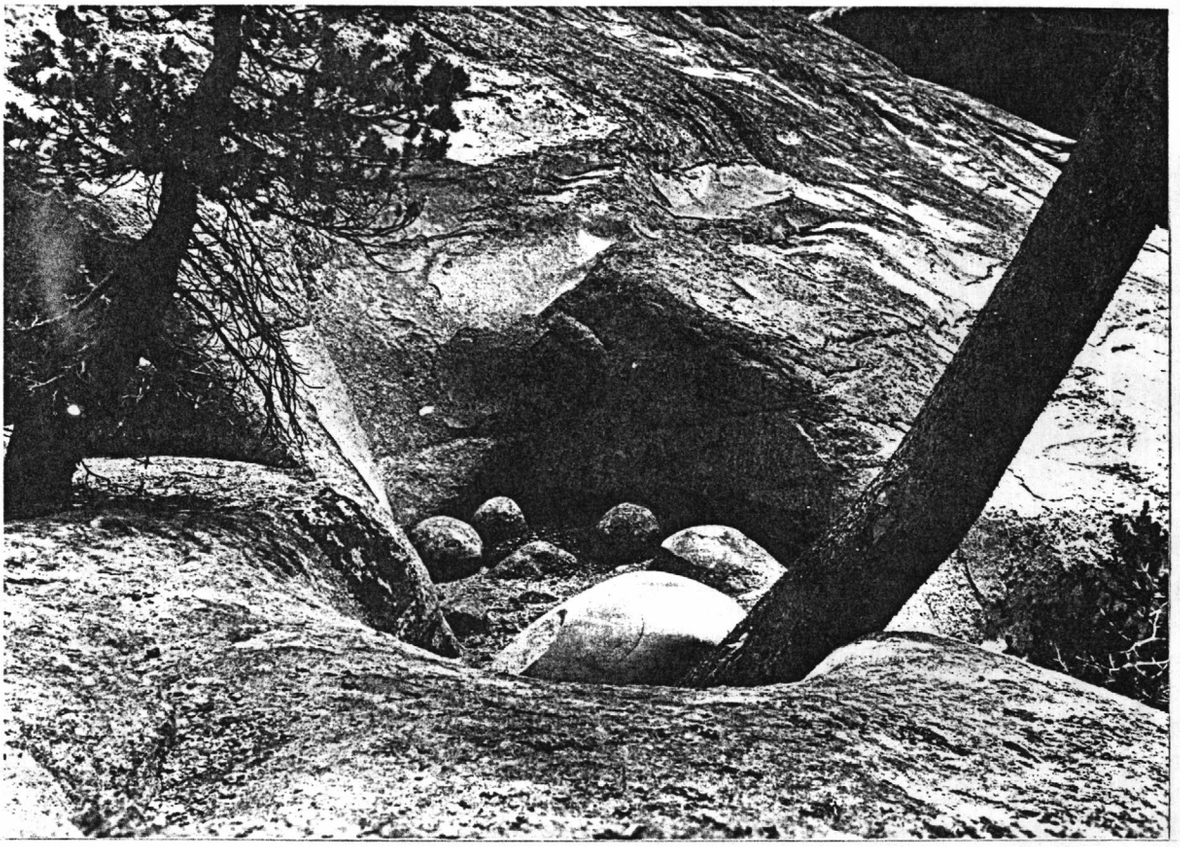
MONROE, W. H. 474)
Dolines in Aguada Limestone, 2 km south of Coto Sur. Manati quadrangle. Manati, Puerto Rico. January 16, 1964.



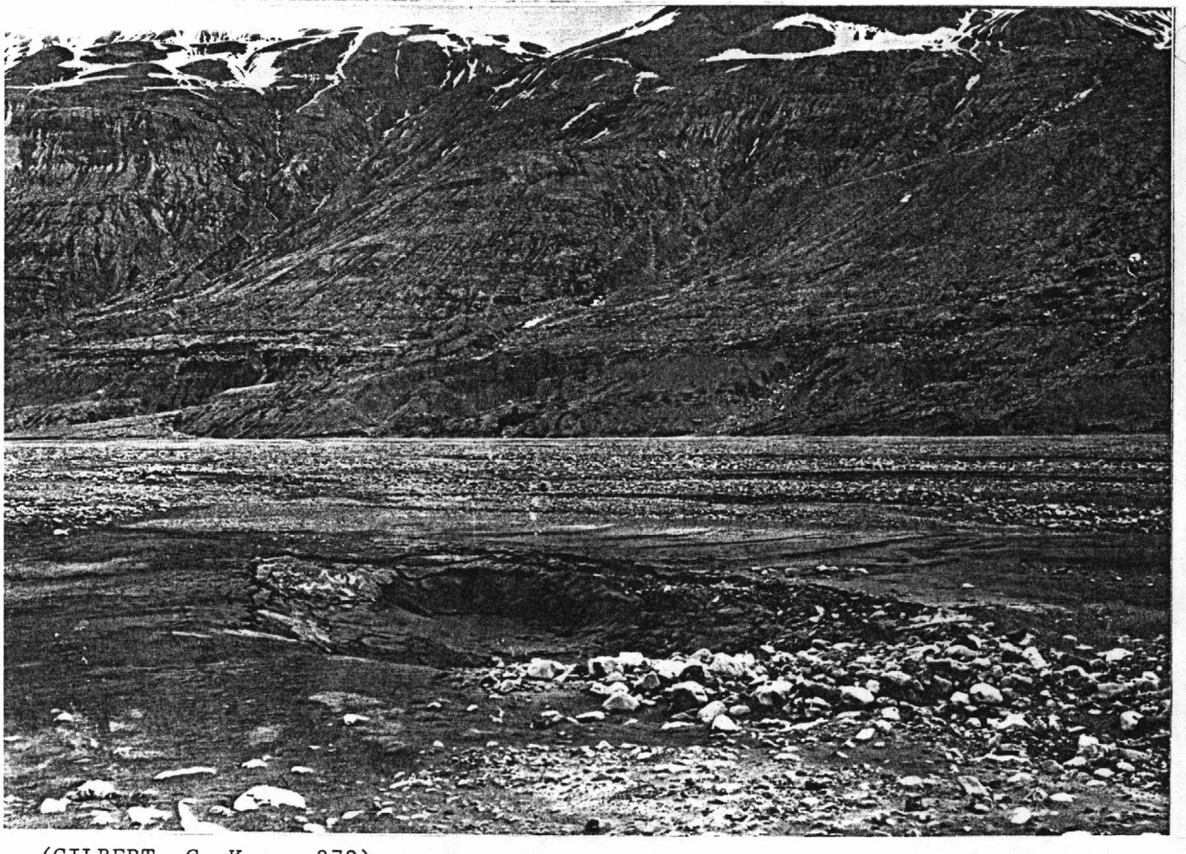
(CLAPP, F. G. 204)
Kettle hole, Buckfield. Oxford County, Maine. n.d.



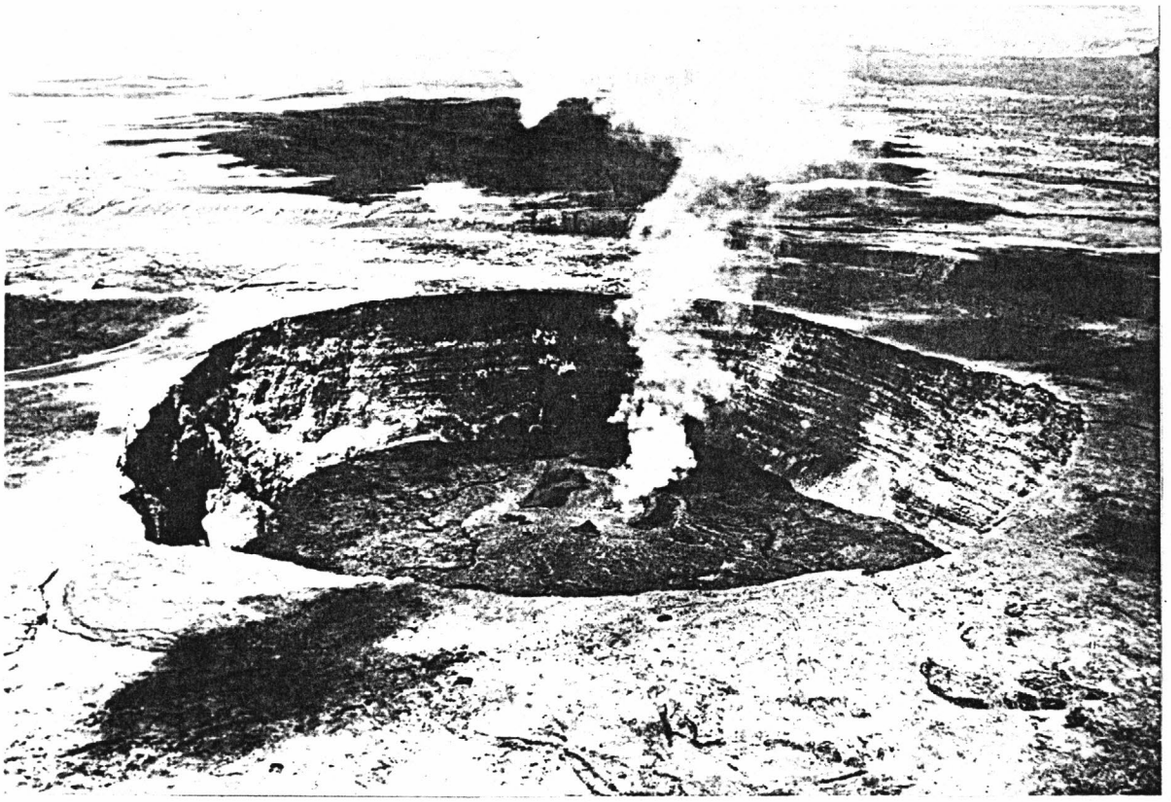
(BUDDINGTON, A. F. 29)
Kettle hole in gravels near terminus of Baird Glacier, Thomas Bay. Petersburg district, Southeastern Alaska region, Alaska. n.d.



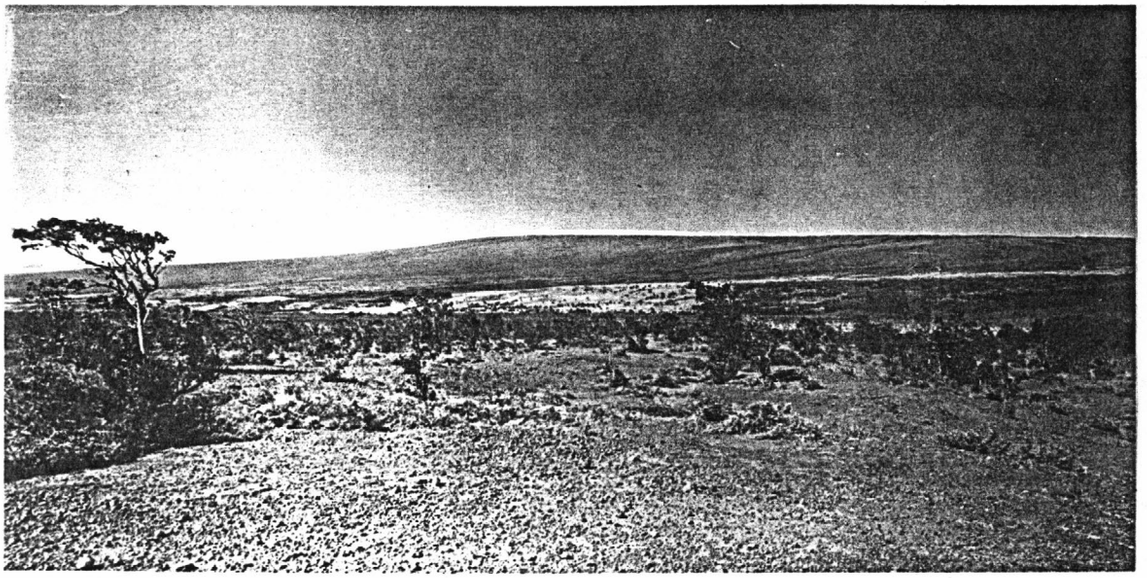
(GILBERT, G. K. 3124)
Glacial pothole or kettle near Tuolumne Meadows. Yosemite National Park, California. ca. 1907.



(GILBERT, G. K. 372)
Incipient kettle hole, alluvial plain of Hidden Glacier. Yakutat district, Alaska Gulf region, Alaska. June 20, 1899.



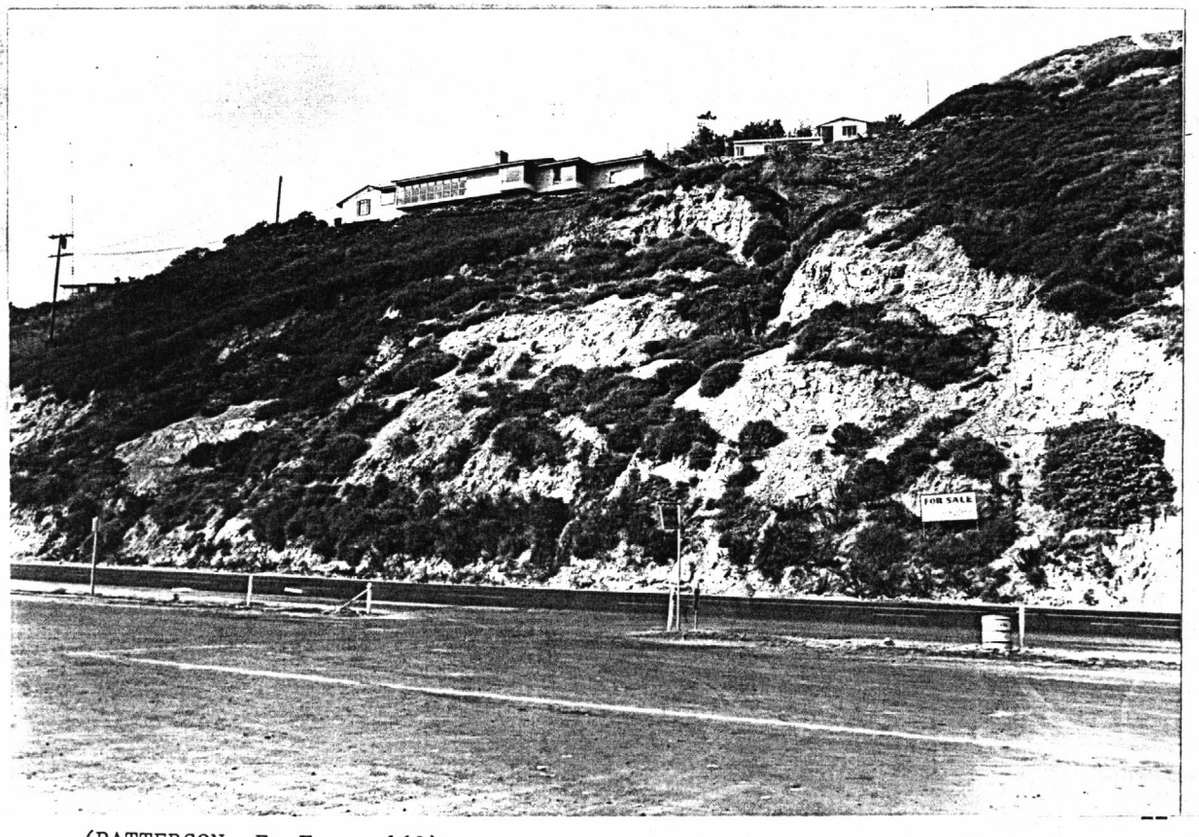
(MACDONALD, G. A. 54)
Halemaumau looking southeastward. Note the broad fountain pit in the cinder cone and large (lava) rivers draining from it. Boundary cliffs of the Kilauea caldera are in the right background. Hawaii Volcanoes National Park. Hawaii County, Hawaii. July 28, 1952.



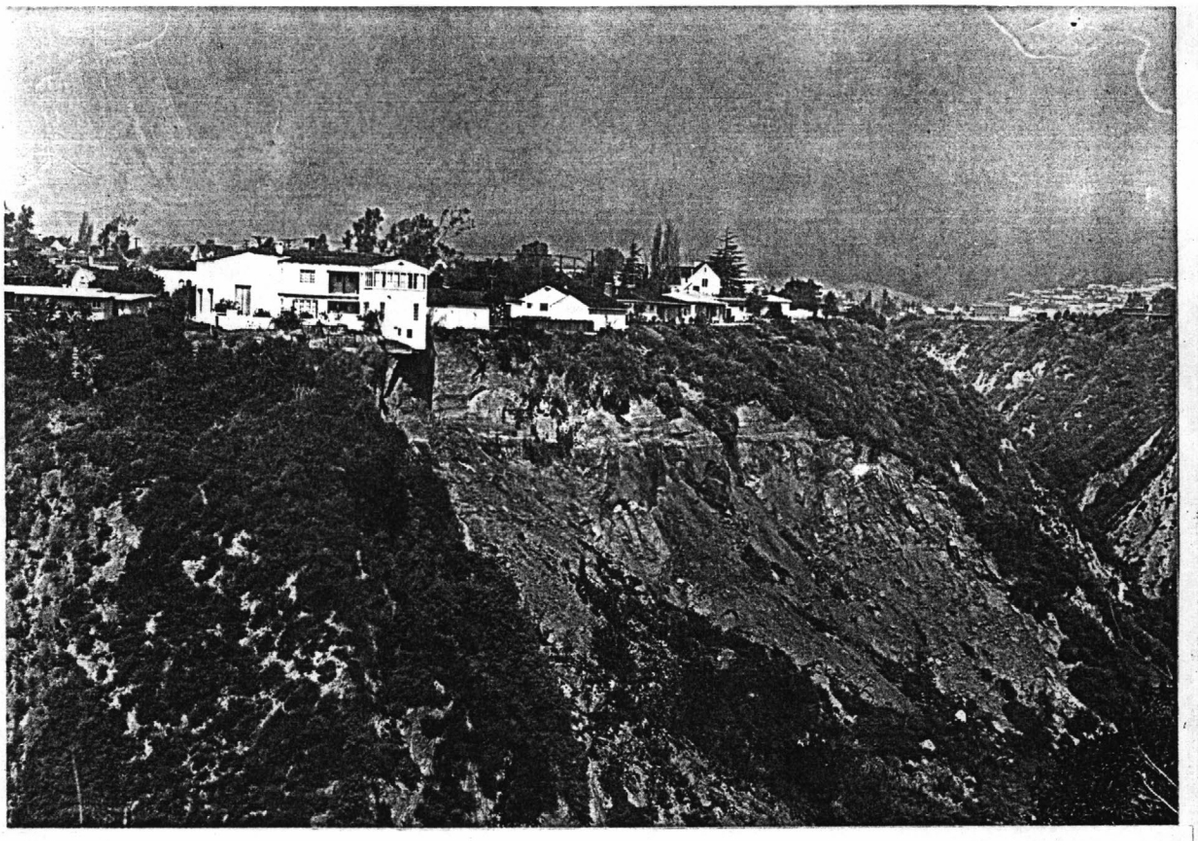
(U. S. GEOLOGICAL SURVEY/HAWAII VOLCANO OBSERVATORY [HVO] 6)
Snow capped Mauna Loa as seen from Hawaii Volcano Observatory on Kilauea. Offers an excellent profile of a shield volcano. Hawaii Volcanoes National Park. Hawaii County, Hawaii. January 18, 1979.



(WEEKS, F. B. 198)
Landslide in Weber quartzite on road from Wolf Creek to the iron mines, west of upper Duchesna Canyon. Duchesne County, Utah. 1906.



(PATTERSON, E. F. 160)
Landslide in Pacific Palisades. Los Angeles County, California. 1957.



(MCGILL, J. T. 9)
View of slump at rear of 15205 DePauw Street from vicinity of Alma Real Drive and Camarosa Drive. In scarp 35 ft of upper Pleistocene terrace gravels and sands overlie Pliocene siltstone. Los Angeles County, California. March 9, 1955.



(GILBERT, G. K. 3007)
Freshly-formed landslide on a northward slope, Berkeley Hills, 2 miles east of Berkeley. Alameda County, California. February 27, 1907.
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(EARTHQUAKE INFORMATION BULLETIN 453)
Lake Chalice occupies a river valley that was dammed by a prehistoric landslide (foreground). South Island, New Zealand. n.d.



(U. S. GEOLOGICAL SURVEY 197)
Homes damaged by landslides. United States. n.d.
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(ALASKA EARTHQUAKE 328)
Compressional ridge formed at toe of L Street landslide. Anchorage district, Cook Inlet region, Alaska. 1964.
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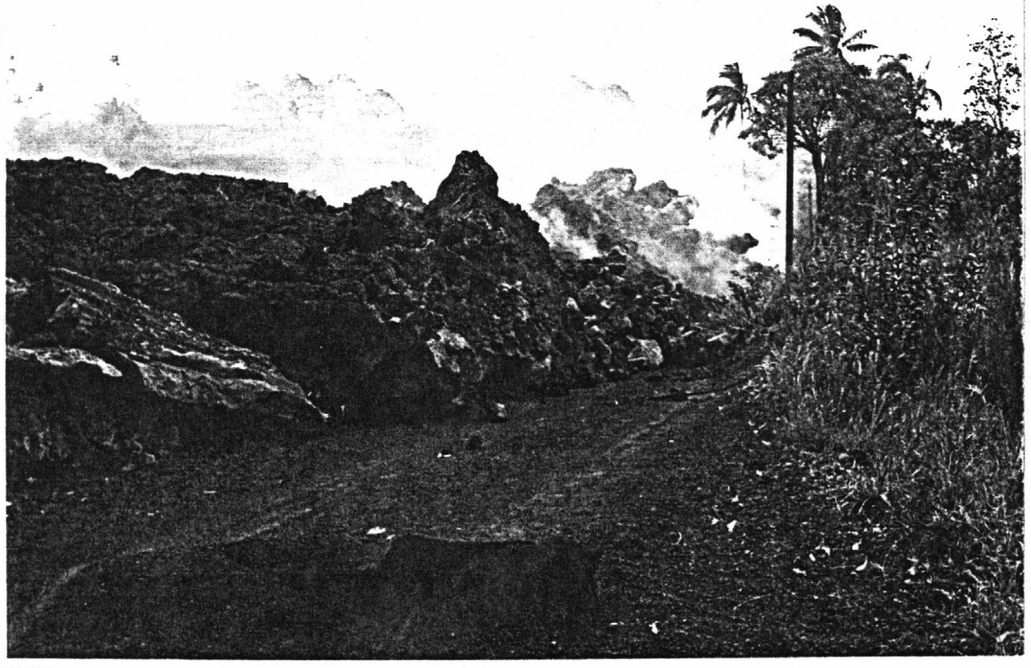
(ALASKA EARTHQUAKE 324)
Oblique aerial view of east part of of the Turnagain slide. Anchorage district, Cook Inlet region, Alaska. 1964.



(CORNWALL, H. R. 23)
Aa flow top. Plates are oriented perpendicular to direction of flow and tops of up-ended plates bend toward its source. Sunset Crater National Monument. Coconino County, Arizona. 1949.



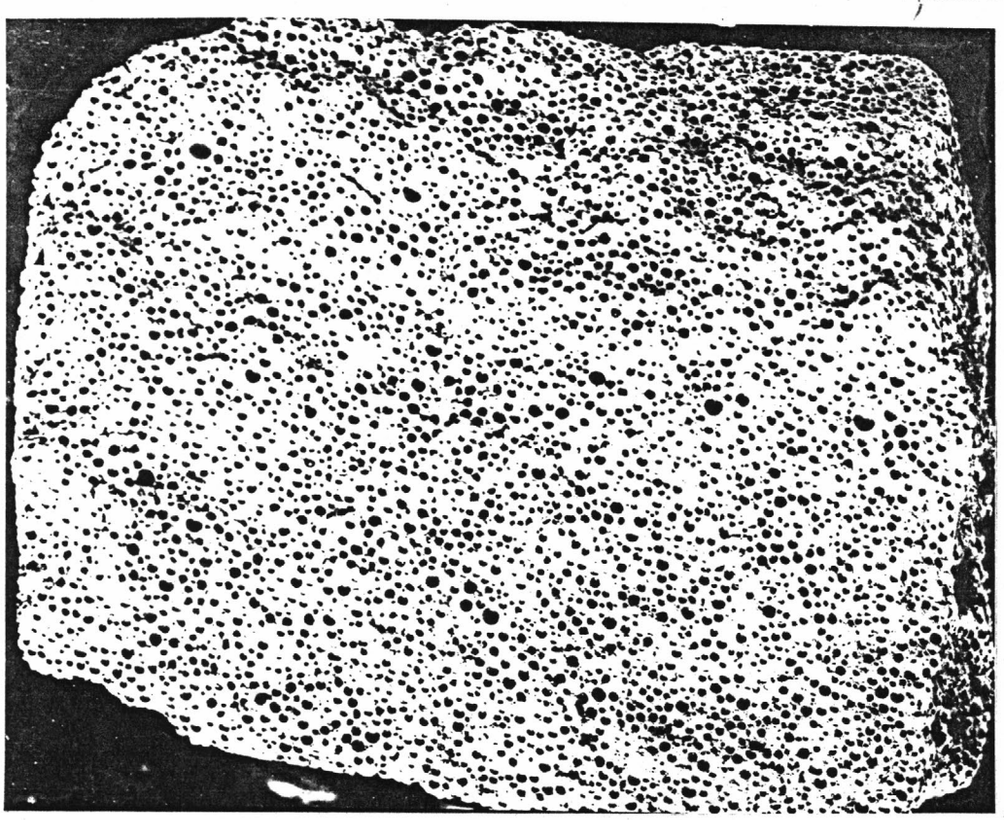
(RICHTER, D. H. 105)
Massive blocky aa flow crossing Kapoho road east of the village. Note burning telephone pole and buckled pavement thrust forward by the flow. The 1959-60 eruption of Kilauea Volcano. Hawaii County, Hawaii. January 27, 1960.



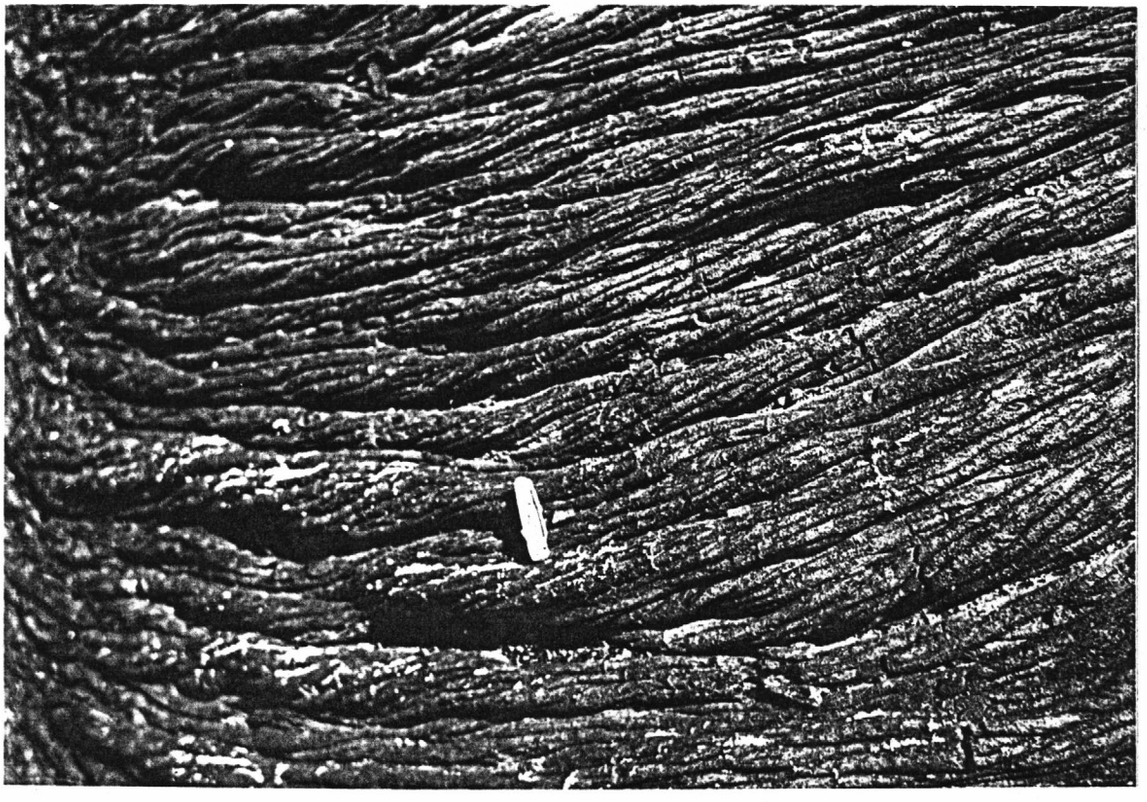
(RICHTER, D. H. 104)
Massive, blocky aa flow east of Kapoho overriding and shoving 8- to 10-foot high manmade barrier before it. The 1959-60 eruption of Kilauea Volcano. Hawaii County, Hawaii. January 27, 1960.



(U. S. GEOLOGICAL SURVEY. 348)
Aa lava, a basalt with a rough, blocky appearance, much like furnace slag. "Aa" is a Polynesian term used to identify this kind of Hawaiian lava flow. Hawaii Volcanoes National Park. Hawaii County, Hawaii. n.d.



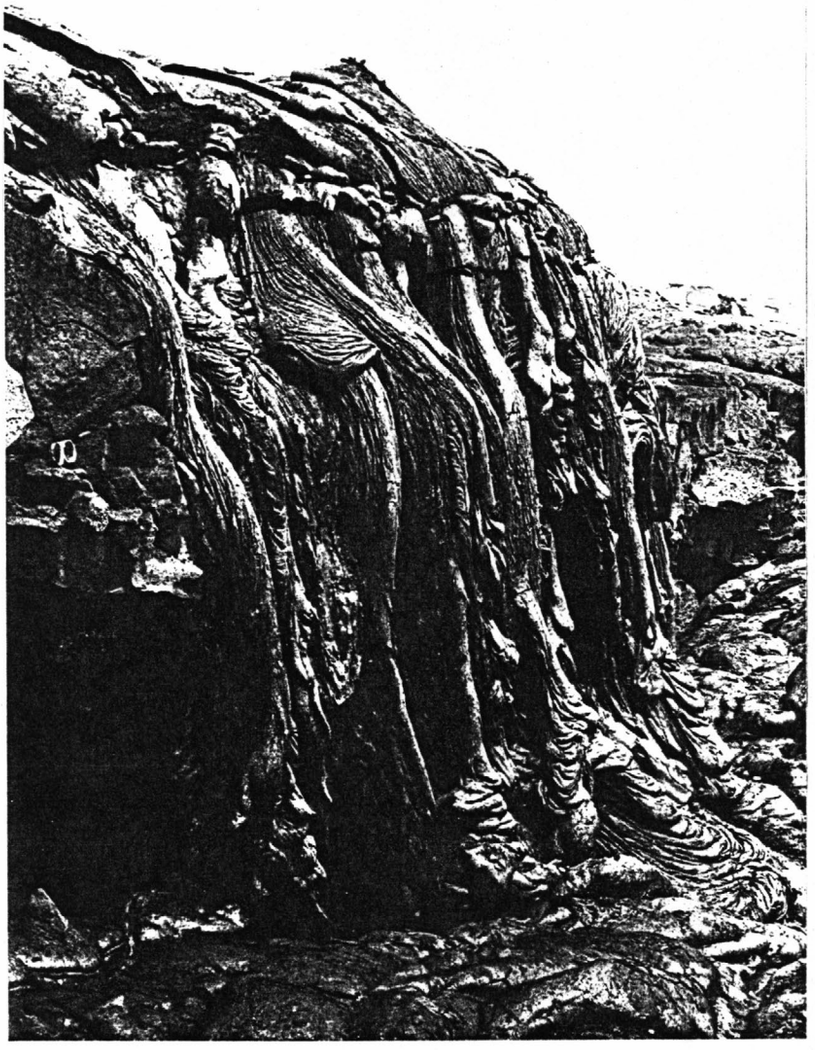
(STEARNS, H. T. 348b)
Typical pahoehoe basalt from P. Pahala flow near Pakanaka Hill. Natural size specimen. Hawaii County, Hawaii. 1924.



(JOESTING, H. R. 13)
Ropy crust of pahoehoe lava on crater floor near the Crater Trail. Kilauea Volcano. Hawaii Volcanoes National Park. Hawaii County, Hawaii. 1950.



(STEARNS, H. T. 578)
Ropy lava surface of pahoehoe about one-half mile northeast of Surprise Cave. Craters of the Moon National Monument. Idaho. October 6, 1926.



(SWANSON, D. A. 3)
Pahoehoe drapery over pre-1971 sea cliff on the south coast of Kealakomo, formed during an eruption of Kilauea. The lava flowed through tubes from a vent 12 km away. Hawaii County, Hawaii. n.d.
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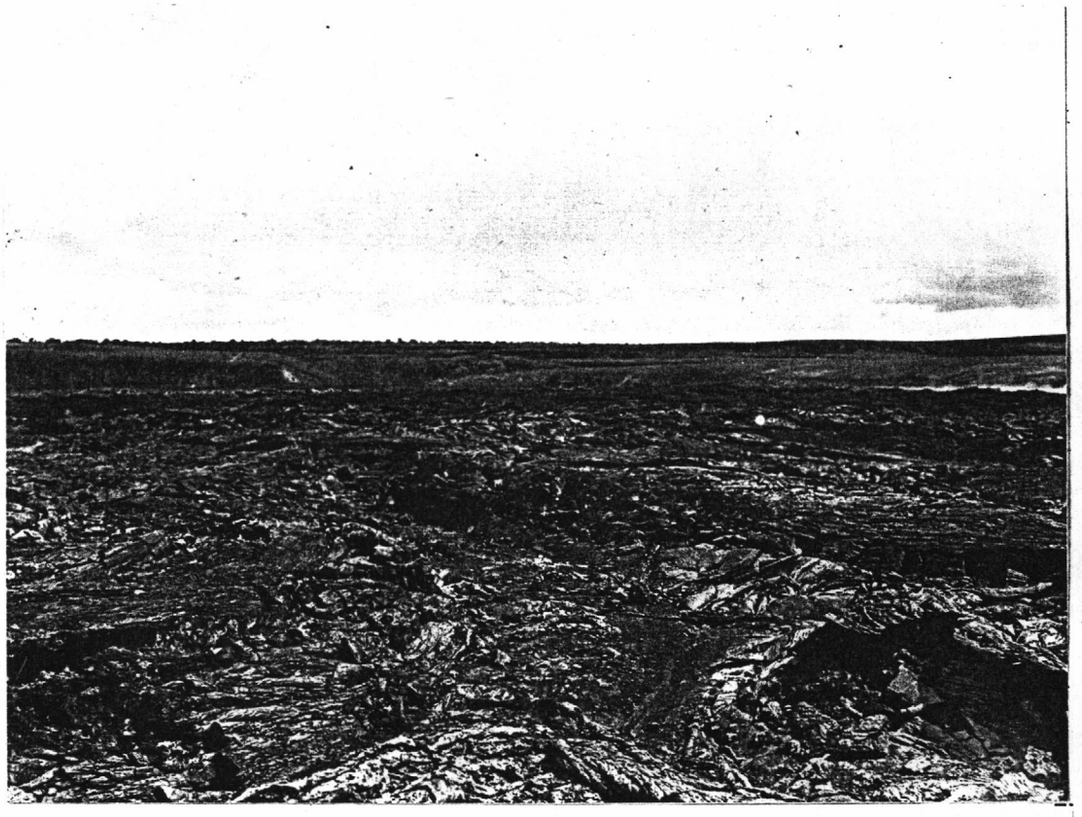
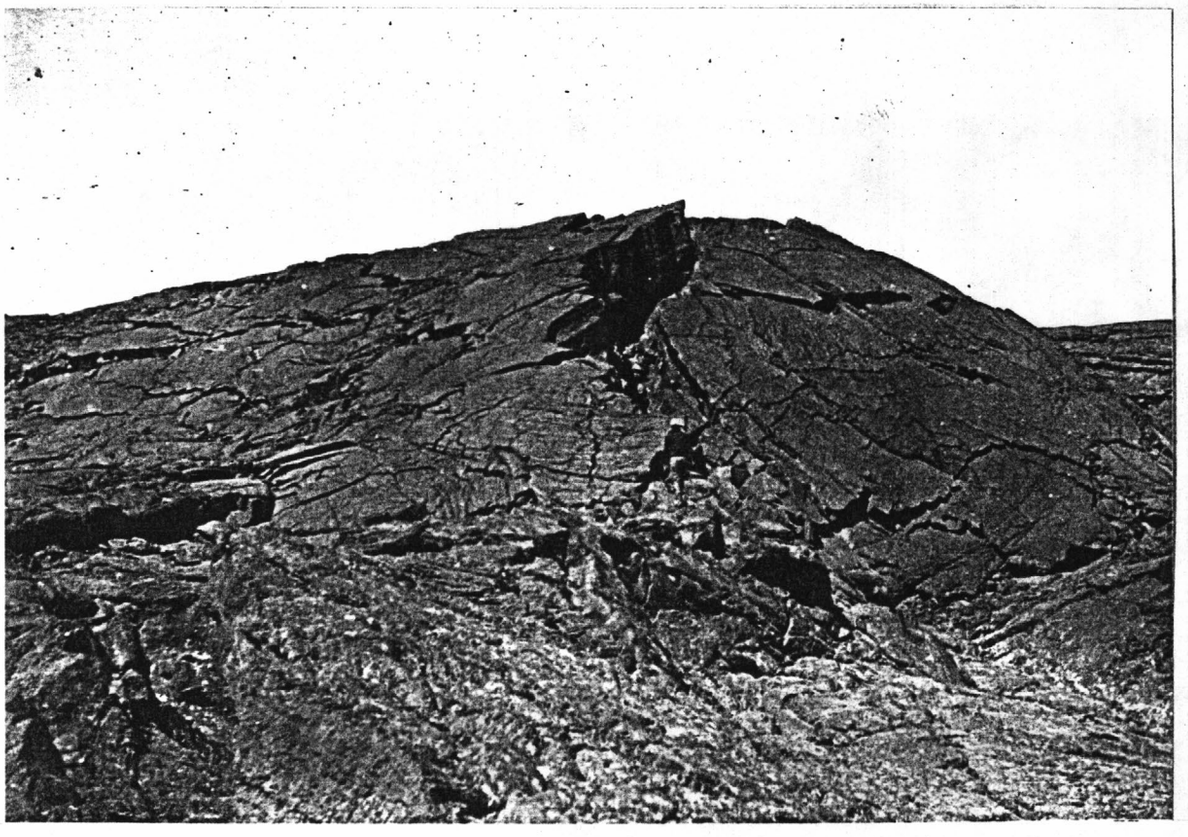
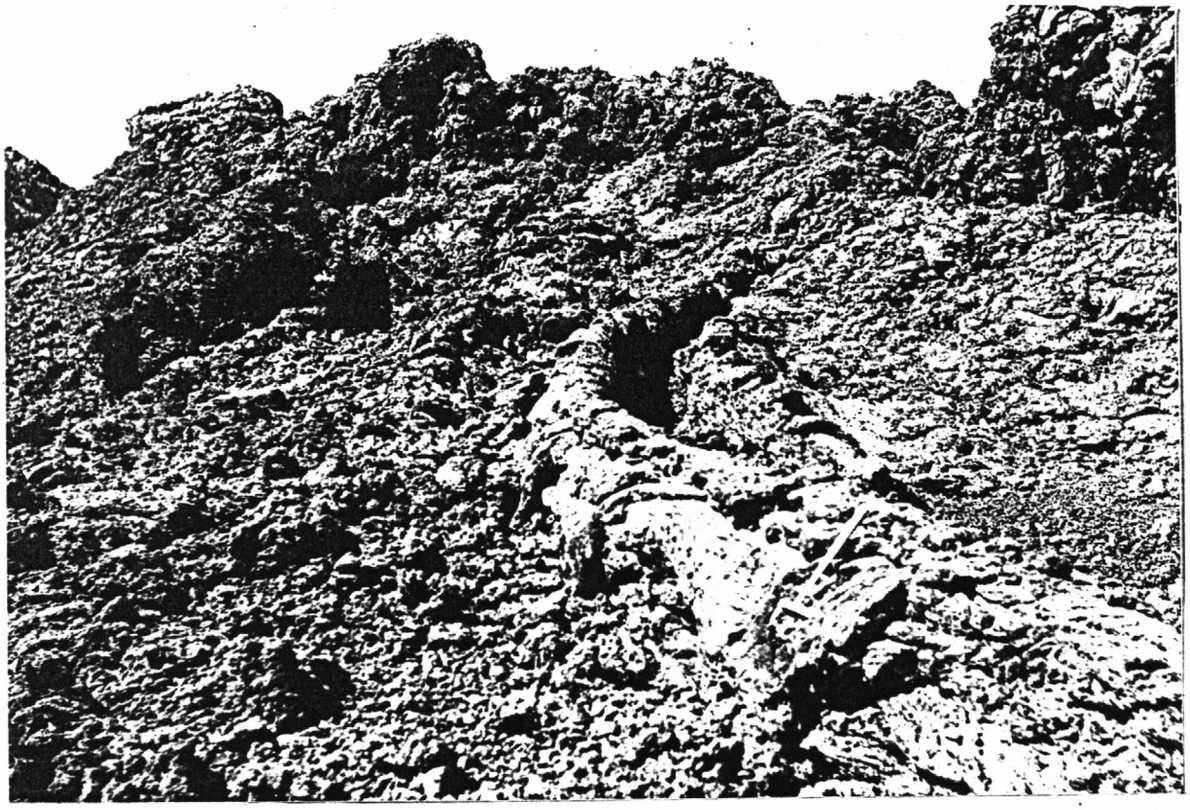


(CROSS, W. 646)
Lava flows Kilauea caldera looking west from eastern edge of Halemaumau. Hawaii County, Hawaii. 1902.



(RUSSELL, I. C. 725)
Pressure ridge in recent lava flow, Jordan craters. Malheur County, Montana. 1902.



(RUSSELL, I. C. 735)
Gutter formed by overflowing lava. Malheur County, Oregon. 1902.
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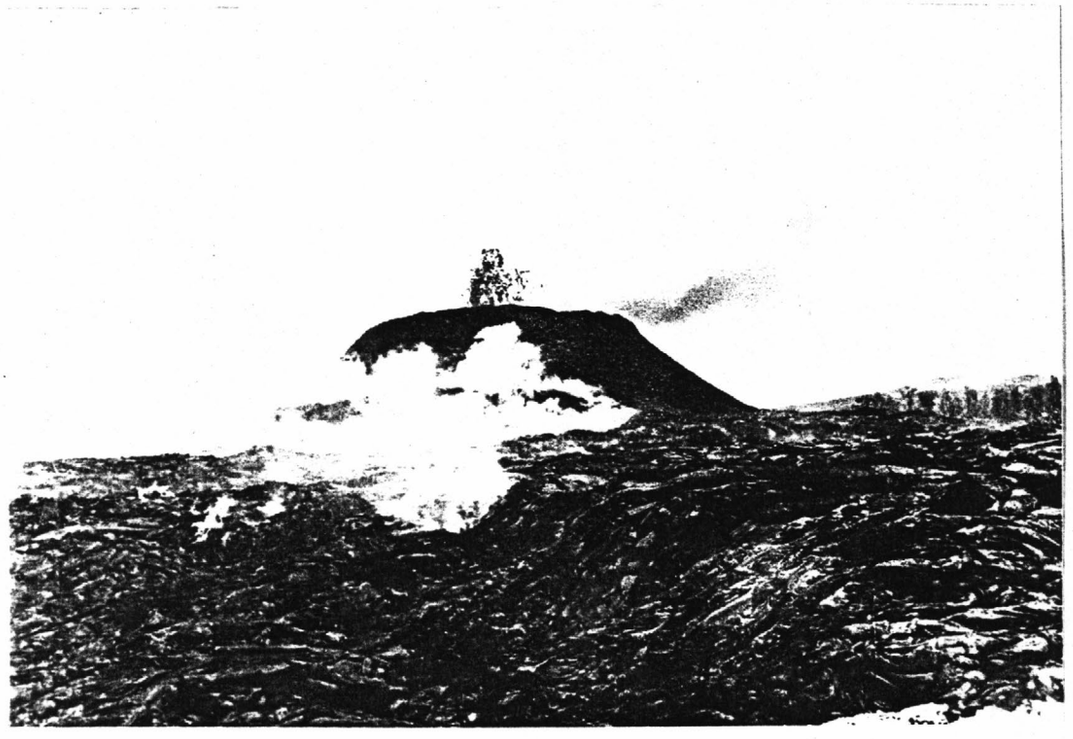

(MACDONALD, G. A. 28)
Cinder and spatter cone, about 100 feet high, Kilauea Volcano. The top of the fountain is in the background, in the foreground is part of the broad lava pond that formed northeast of the cone. Hawaii Volcanoes National Park. Hawaii County, Hawaii. 1955.
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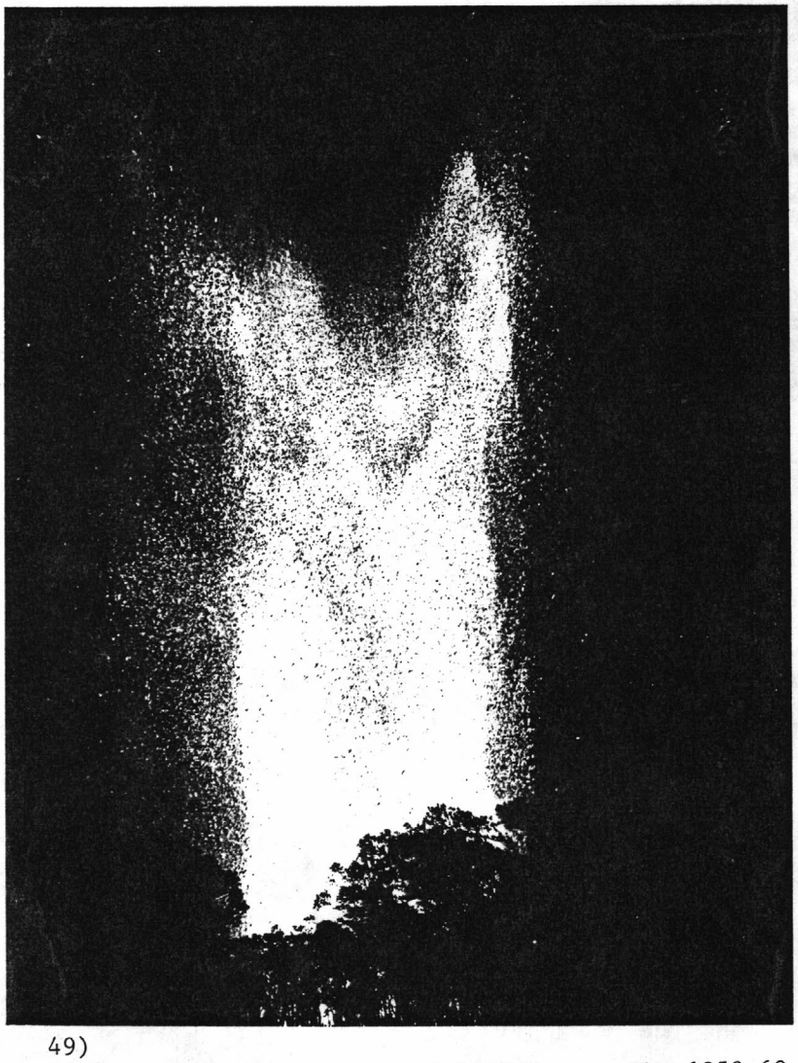


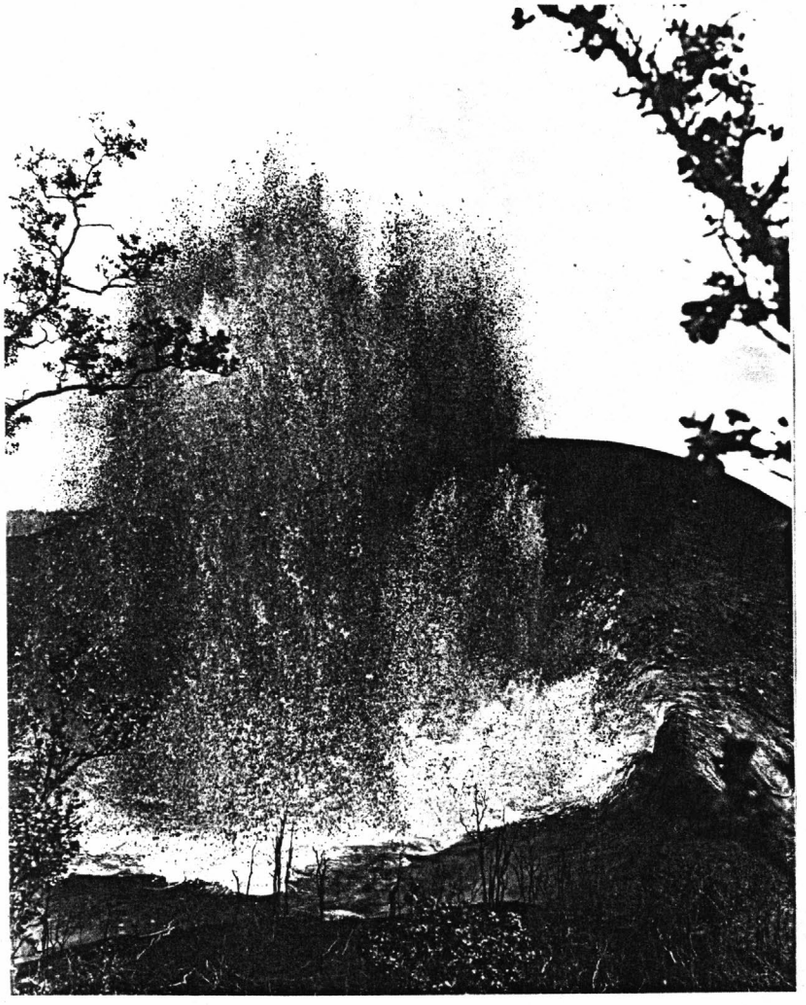
(RICHTER, D. H. 49)
Twin vertical jets of lava shoot to heights of 1200 feet. The 1959-60 eruption of Kilauea Volcano. Hawaii Volcanoes National Park. Hawaii County, Hawaii.

CATALOG OF SELECTED PHOTOGRAPHS PERTAINING TO GEOLOGY AND GEOMORPHOLOGY.

Part 2

Compiled by
J. K. McGregor Jr.

U. S. Geological Survey. Photographic Library. 1989.



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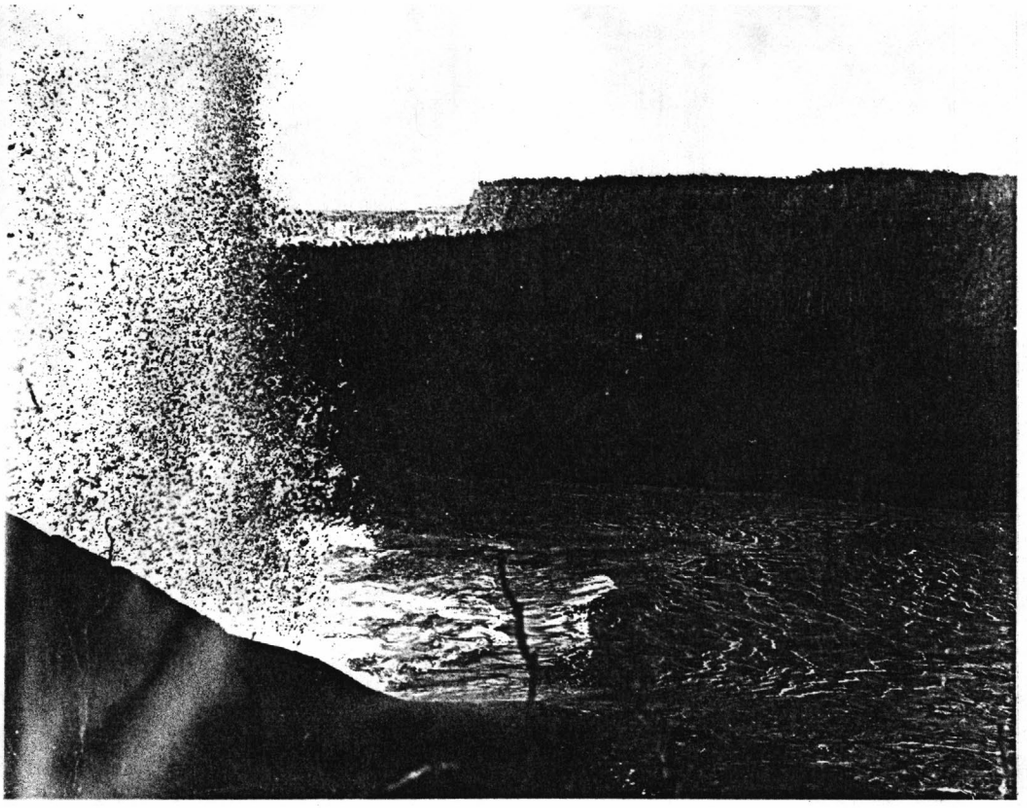
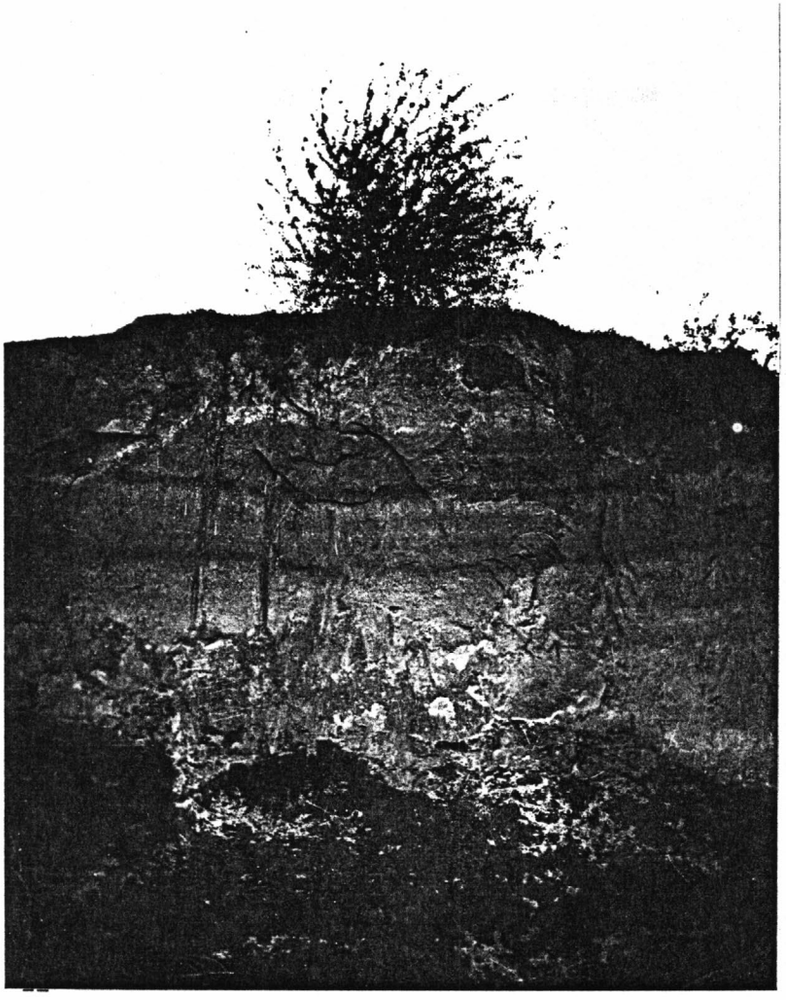
(RICHTER, D. H. 75)
Development of 1900-foot high fountain during the 15th phase of activity as seen from the crater rim. Fountain roars out of vent is splashing entire vent area with liquid spatter. Hawaii Volcanoes National Park. Hawaii County, Hawaii. 1959.



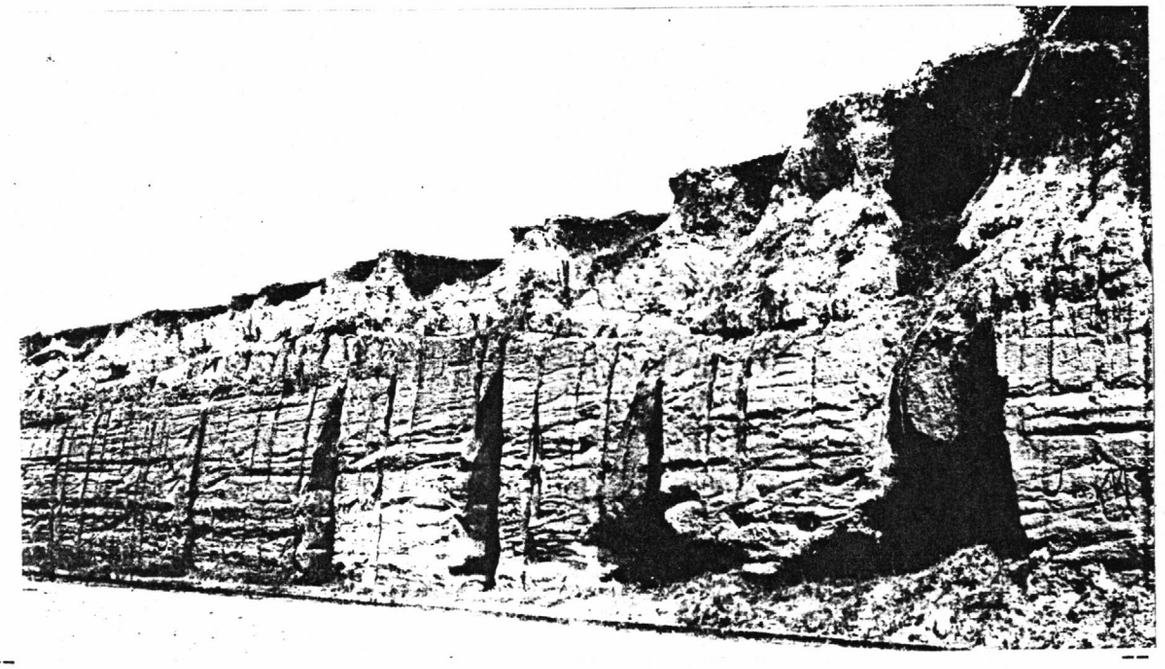
HTER, D. H. 69)
fountain and lake west end of Kilauea Iki overlook showing development of
waves at base of fountain in high lake. The 1959-60 eruption of Kilauea
ano. Hawaii Volcanoes National Park. Hawaii County, Hawaii.



(MILLER, R. D. 49)
Excavation in Peorian and Bignell loesses in bluffs near center sec. 30, T. 75 N., R. 43 W., Council Bluffs. Note humic layer above first terrace level from bottom. Pottawattamie County, Iowa. May 1960.



(CRIDER, A. F. 42)
Stratified loess, Helena. Phillips County, Arkansas. May 1905.



(SHAW, E. W. 1281)
This exposure of loess shows how well it will stand in vertical cliffs, yet erodes where a trickle of water seeps over the cliff top. The upper one-third is stratified and distinct from the lower part. Warren County, Mississippi. 1915.



(LEE, W. T. 122)
Crooked Creek, near Long Valley damsite. Mono County, California. 1904.
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(WALCOTT, C. D. 556)
Meanders of Trout Creek, Hayden valley, Yellowstone National Park. Wyoming.
1898.
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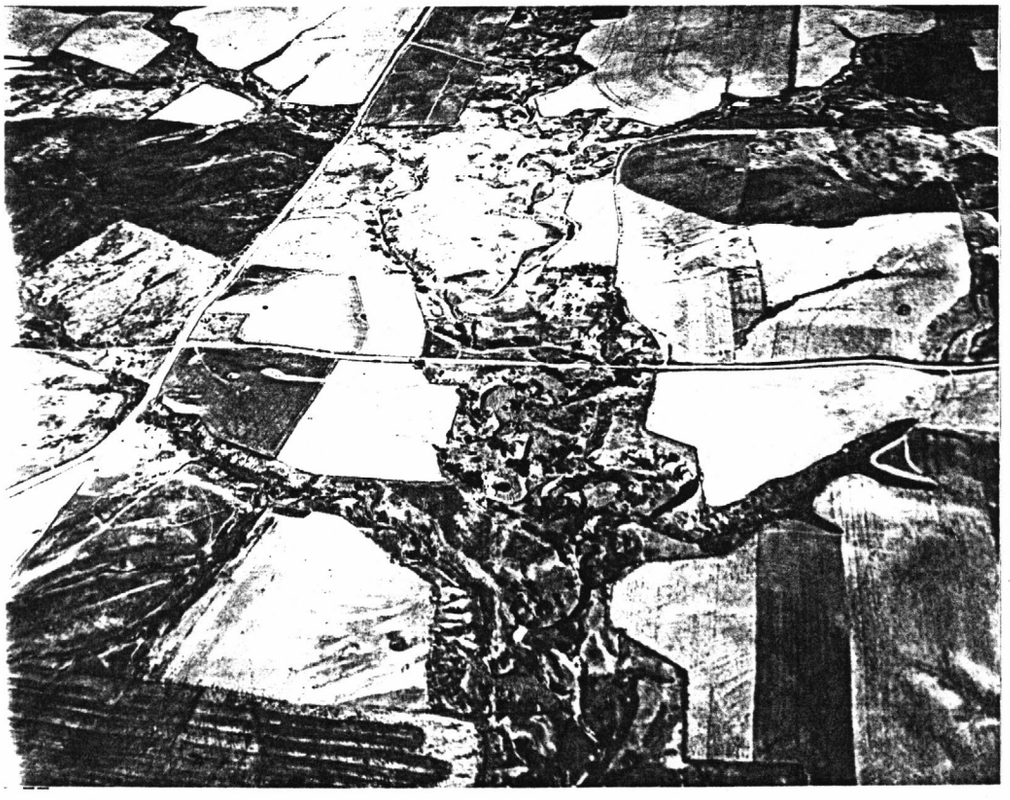
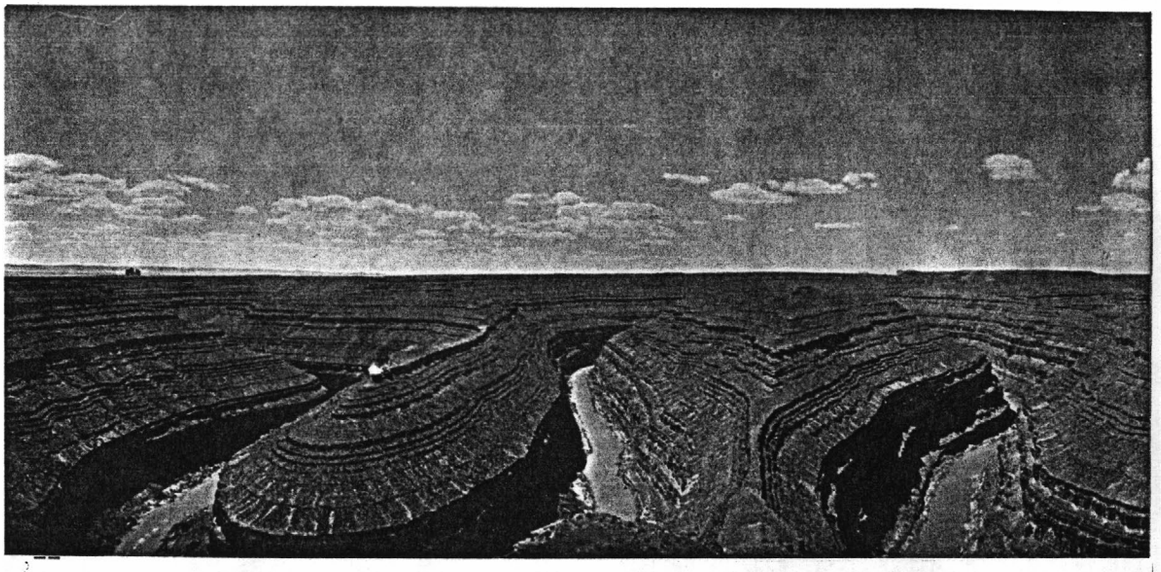
(GILBERT, G. K. 3119)
Meanders of Leevining Creek above Rinedollar Lake. The lake and meadow occupy a glacial rock basin. The landforms, except for the distant uplands, are all glacial in origin. Mono County, California. ca. 1907.



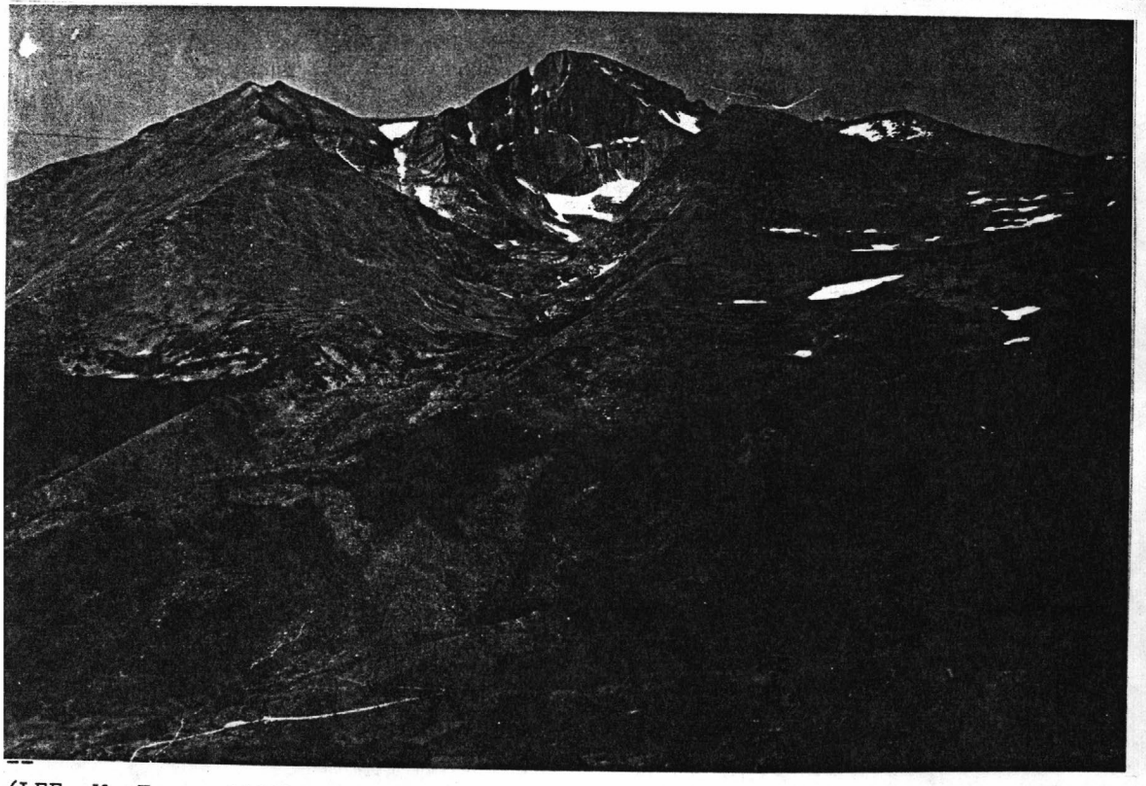
(STACY, J. R. 597)
View looking up the Colorado River at The Loop about 6 miles above the junction with the Green River. The gorge is about 500 feet deep. River deposits correlated with glacial deposits in the La Sal Mountains indicate about 500 feet of canyon deepening during Quaternary time (2-3 million years ago). San Juan County, Utah. 1965.



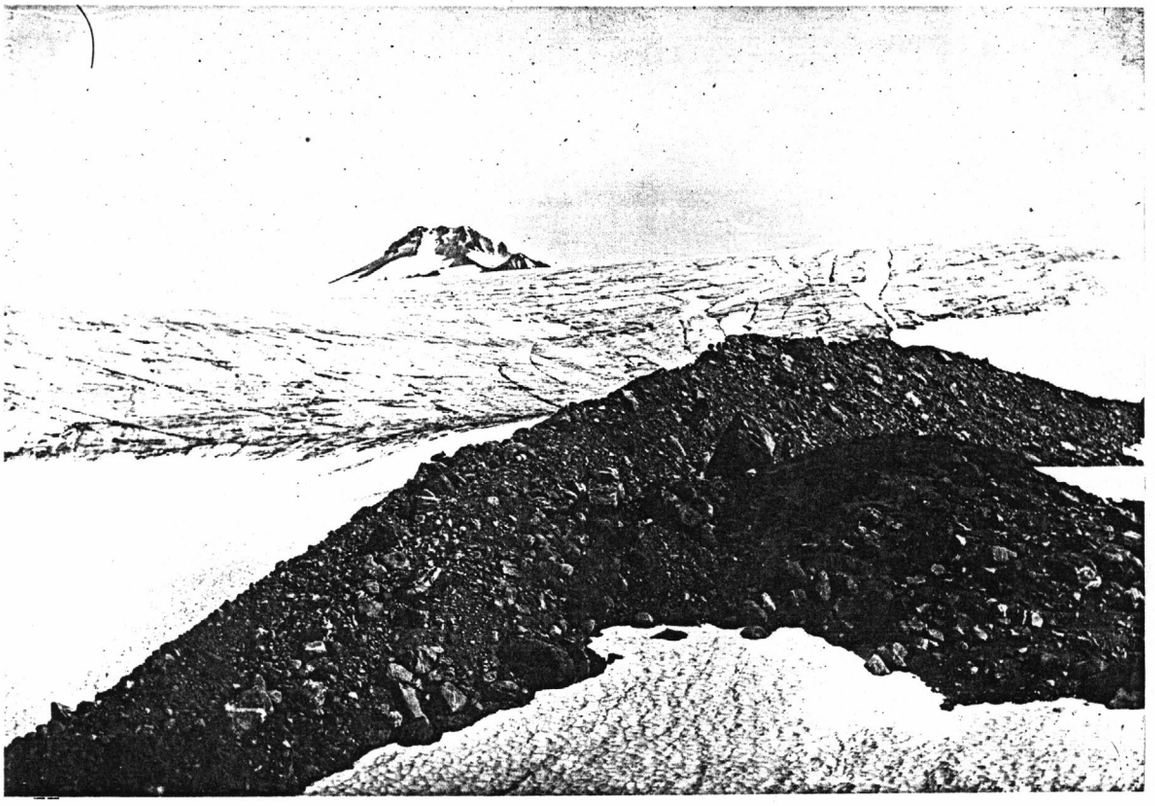
(BALSLEY, J. R. 12)
Incised meanders near Loup City. Sherman County, Nebraska. 1949.



(LA RUE, E. C. 802)
The Goosenecks of the San Juan River, entrenched meanders. San Juan County, Utah. n.d.



(LEE, W. T. 1068)
The Chasm, Mills moraine of Longs Peak as seen from the top of Twin Sisters. Rocky Mountain National Park. Larimer County, Colorado. June 19, 1916.



(RUSSELL, I. C. 323)
Glacier and moraine, Glacier Peak. Snohomish County, Washington. 1897.



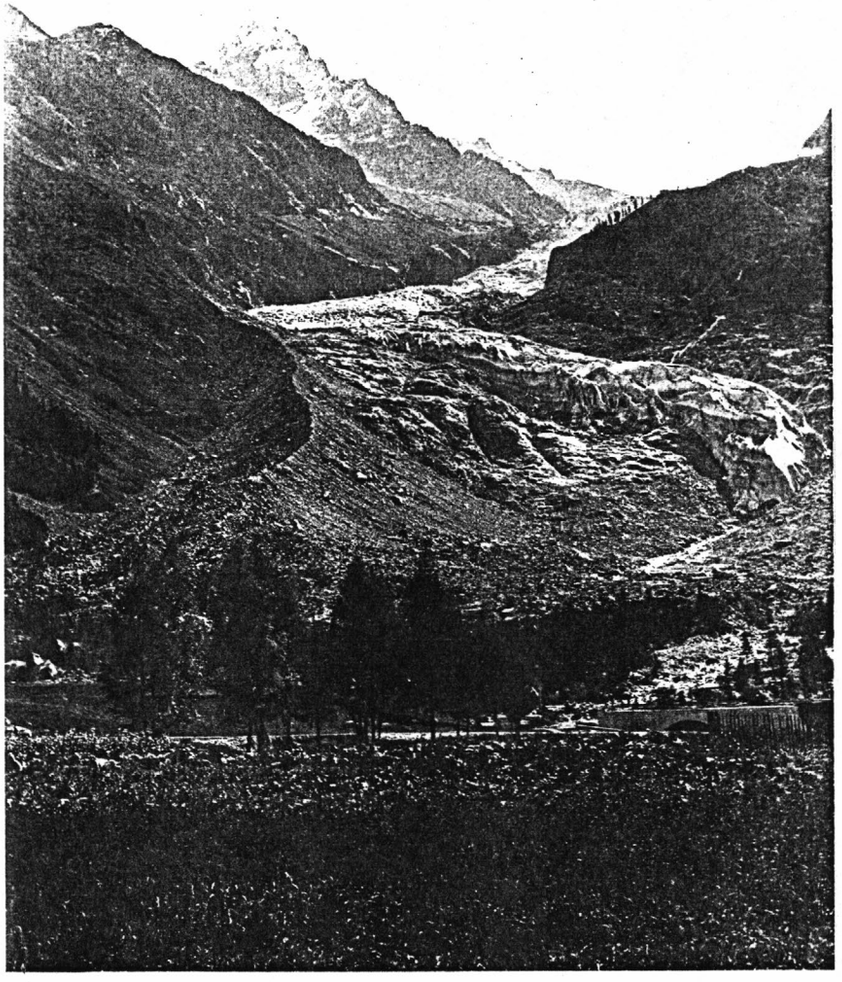
(RUSSELL, I. C. 812)
Margin of glacier and terminal moraine. Deschutes County, Oregon. 1903.



(BRYANT, B. H. 546)
Cirque moraines at 3,260-3,290 m altitude northeast of Hunter Peak. Pitkin and Gunnison Counties, Colorado. ca.1965.



(JONES, F. O. 94)
Mount Athabaska and the lateral moraine along the right side of Athabaska Glacier. Lateral moraines are also evident directly in front of the mountain. Province of Alberta, Canada. August 1954.



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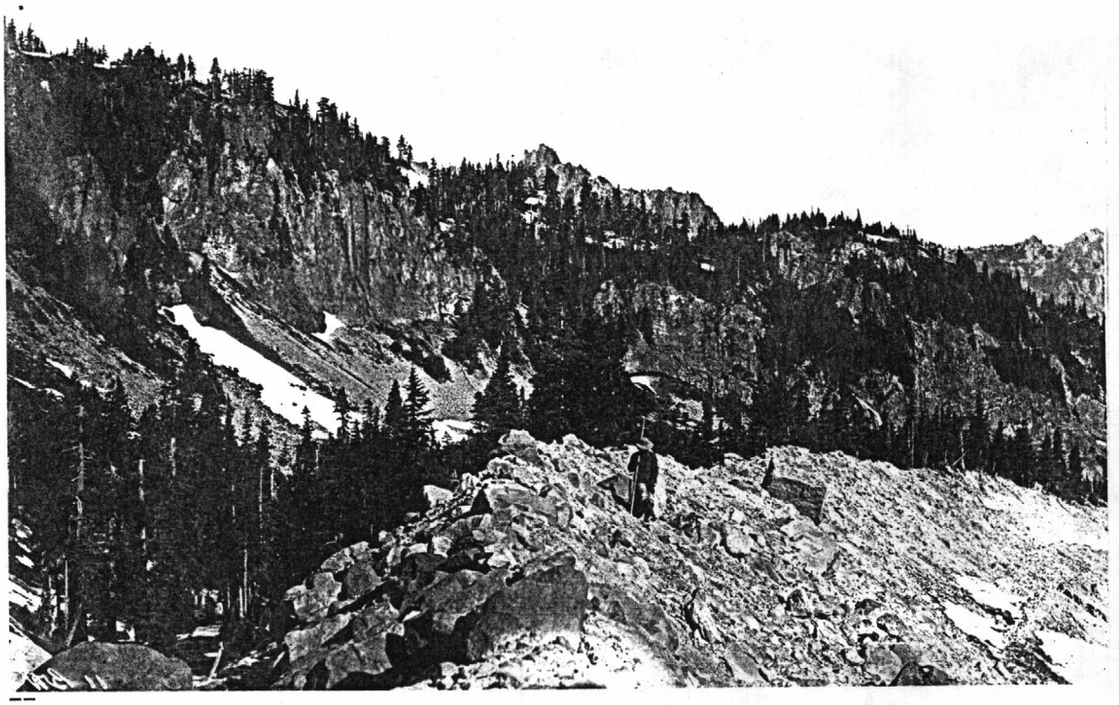
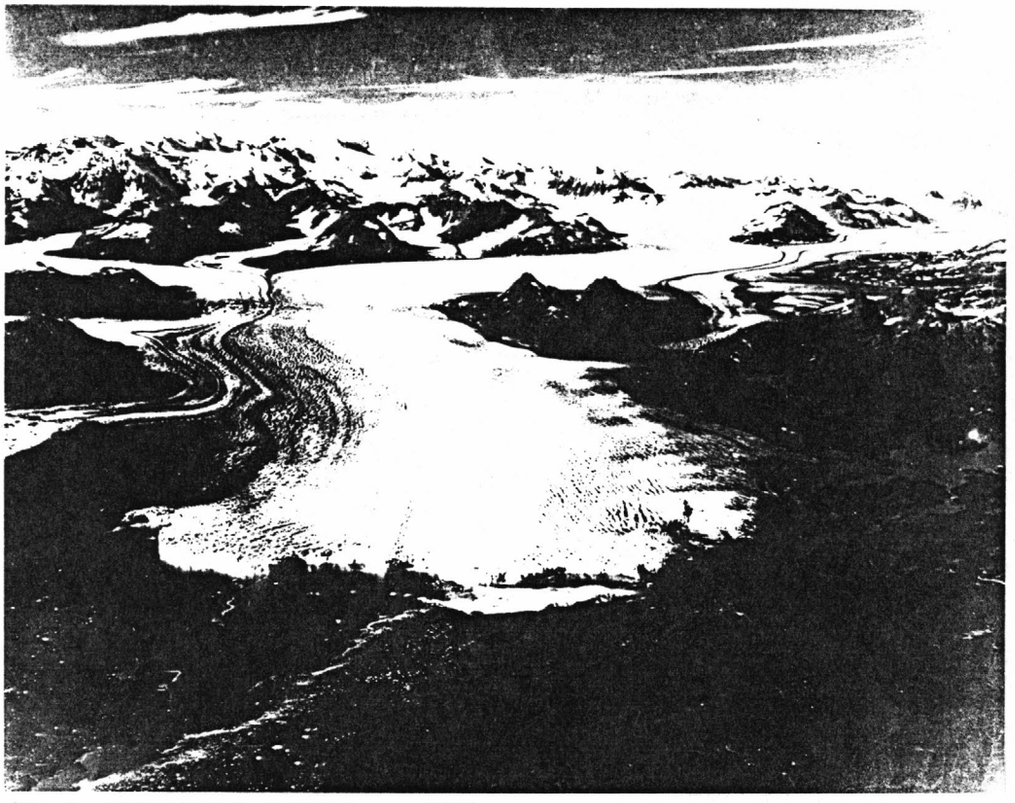
(HOLMES, J. A. 65)
Terminus of the Mer de Glace glacier, Chamouni valley. Note lateral and terminal moraines. France. n.d.



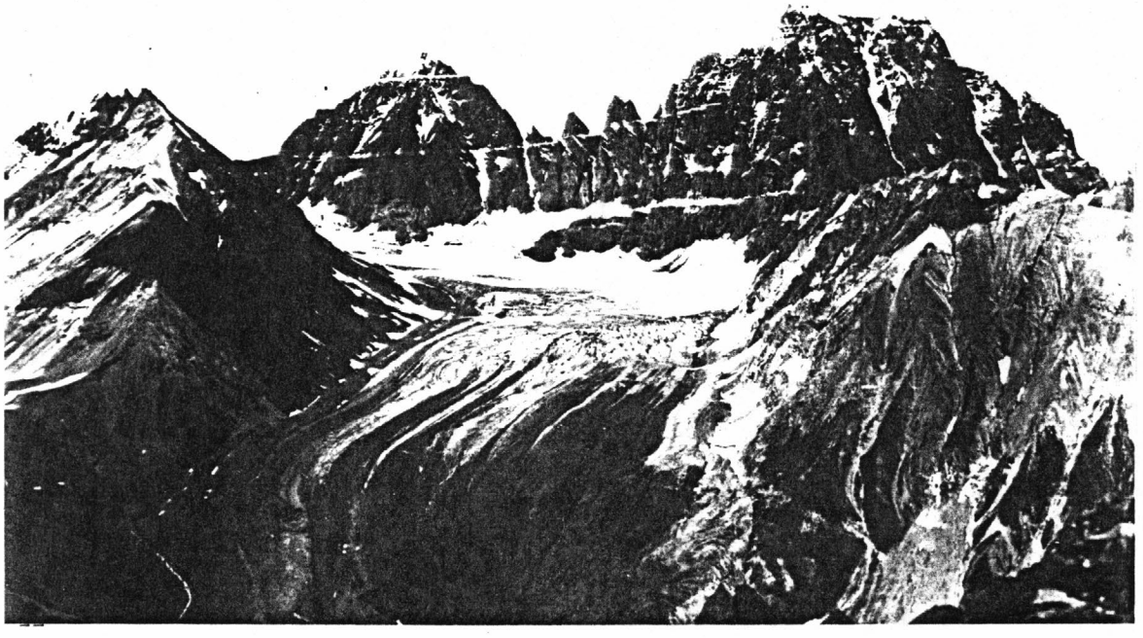
(WILLIS, B. 11)
Lateral moraine on the eastern side of Carbon River Glacier. Mount Rainier National Park. Pierce County, Washington. n.d.



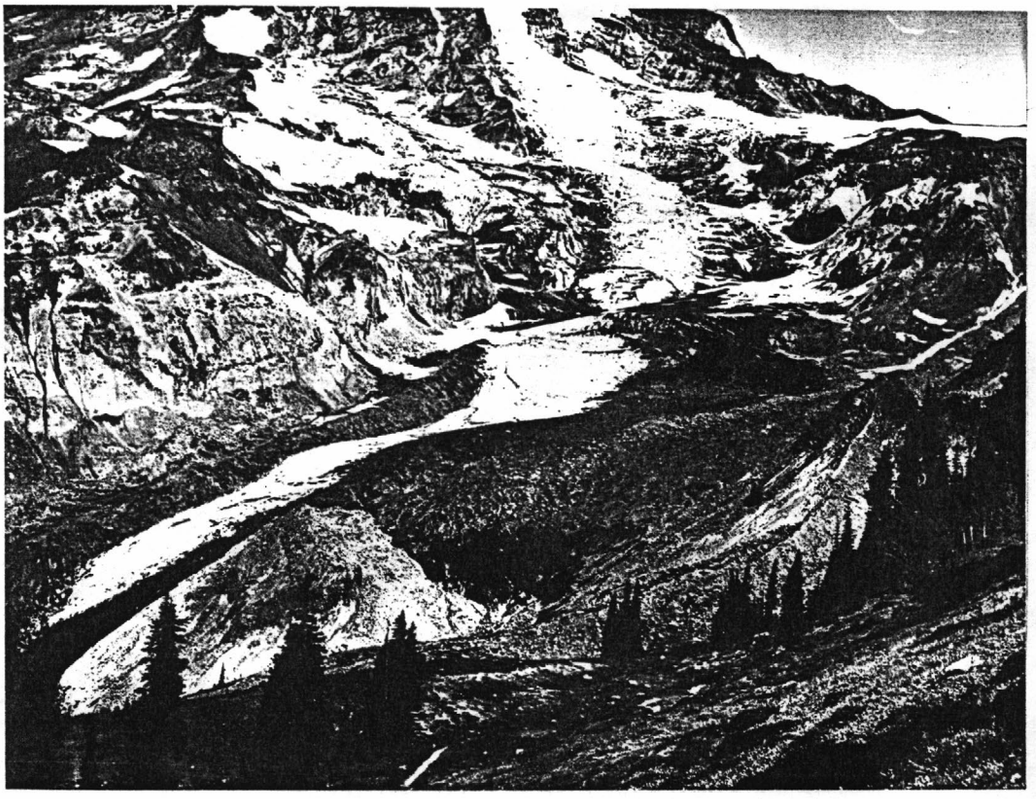
(MEIER, M. F. 6)
Gulkana Glacier. Ice flowing from four tributaries unites to form the main glacier. Irregular and folded medial moraines suggest that this glacier surges. Donnelly district, Yukon region, Alaska. August 31, 1967.



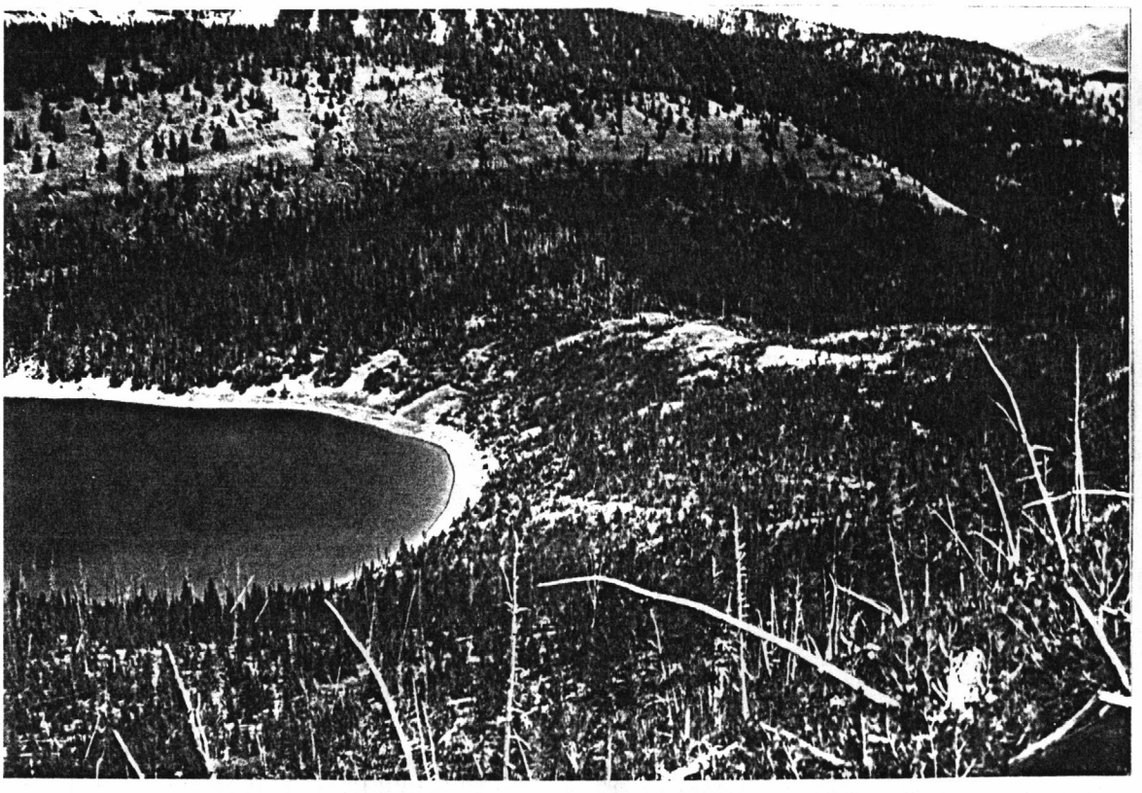
(U. S. GEOLOGICAL SURVEY 585)
Oblique aerial view of terminus of Columbia Glacier, showing a number of medial moraines. By 1986 the glacier is expected to recede 5 miles, resulting in a large number of icebergs being discharged into the Valdez shipping lanes. Valdez district, Alaska Gulf region, Alaska. August 1, 1976.



(SPENCER, A. C. 74)
Medial moraines in Castle Mountains from ridge between Gilahina and Lakina. Kuskulana district, Copper River region, Alaska. August 8, 1900.



(VEATCH, F. M. 5)
Nisqually Glacier, from confluence with Wilson Glacier to the nunatak. Note the light-colored medial moraine approaching the nunatak from upper right; large ice-cored moraine along west edge of glacier. Mount Rainer National Park. Pierce County, Washington. August 22, 1945.



(MUDGE, M. R. 457)
Terminal moraine of Temple Lake glaciation forms dam; Bear Lake at left. Lewis and Clark County, Montana. 1965.
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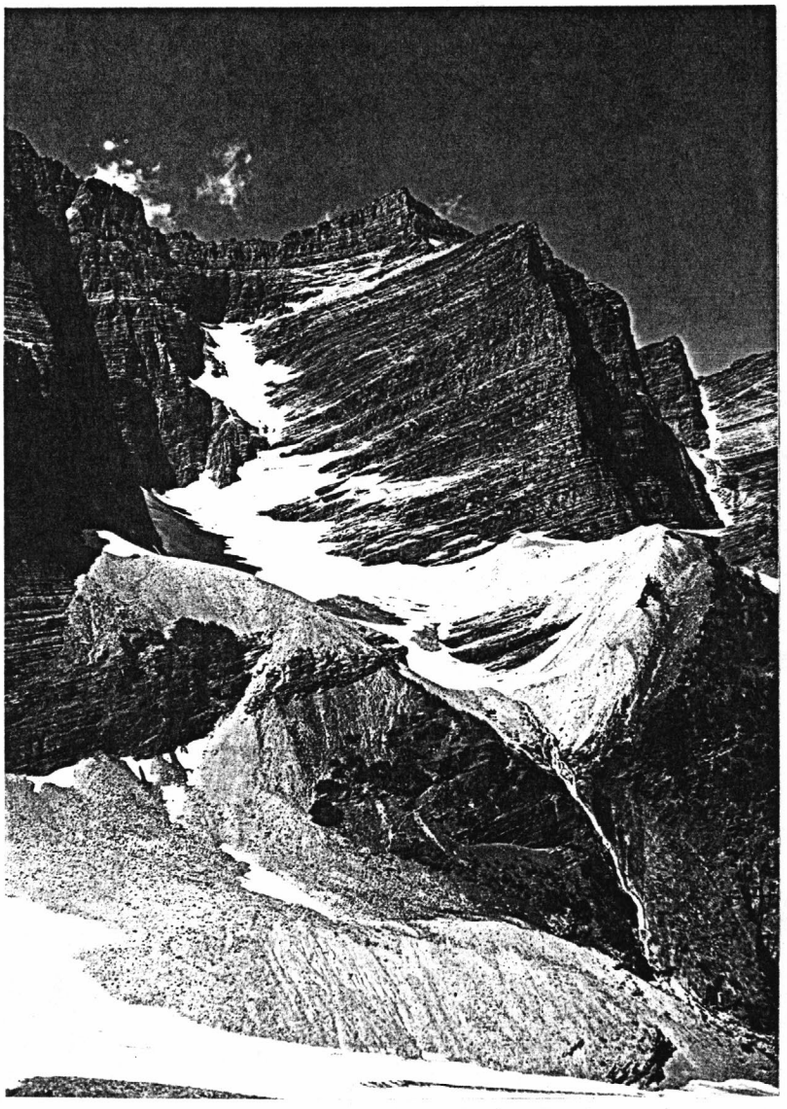

(MALDE, H. E. 58)
Hanging cirque west of Siyeh Glacier; terminal moraines of early and late recent shown on right of cirque. Glacier National Park. Glacier County, Montana. July 29k 1954.
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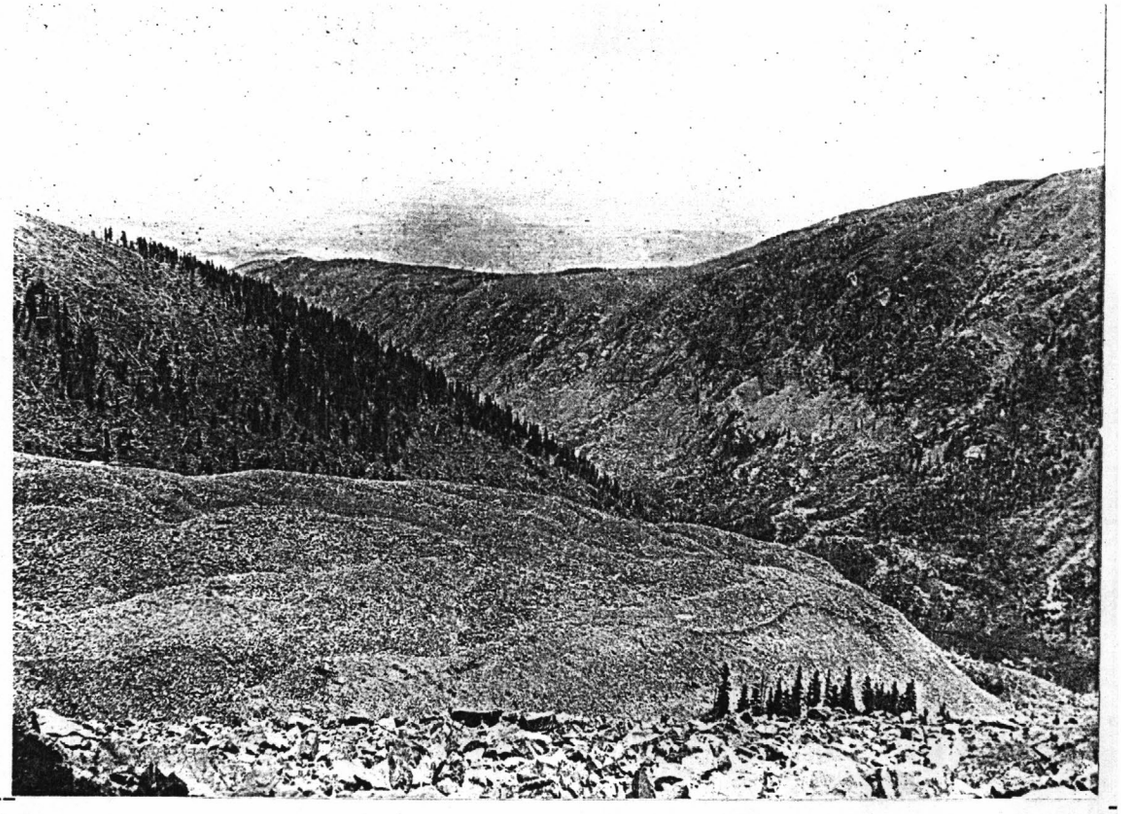
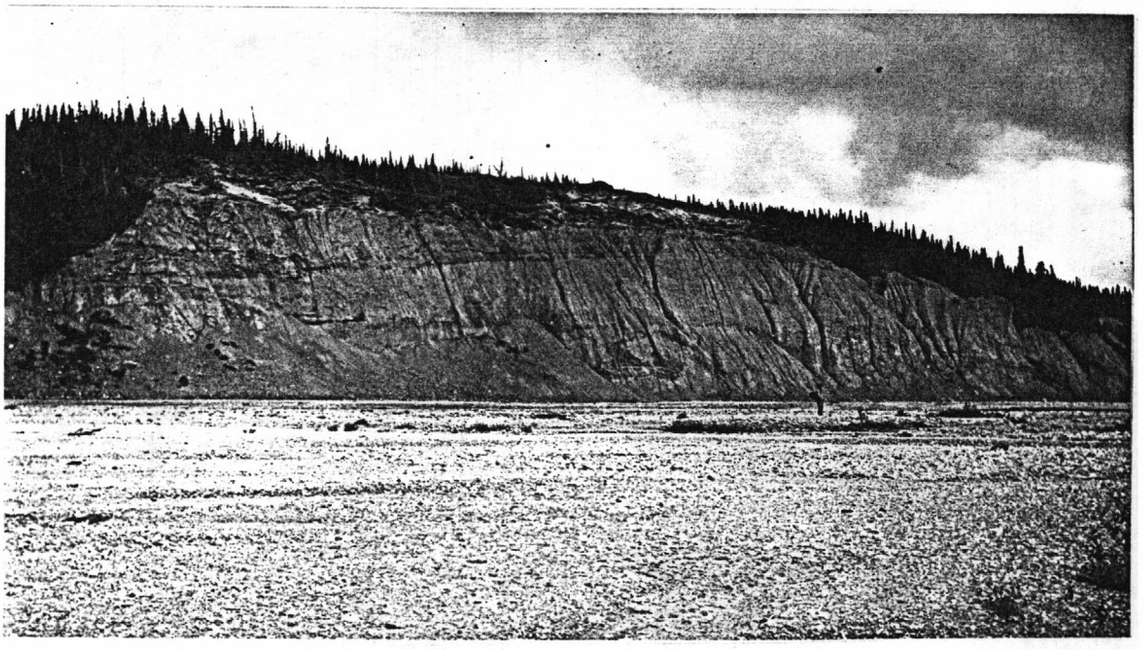


(LEE, W. T. 574)
Terminal moraine of a recent glacier on the east side of Mount Blanca. Size is shown by trees in the foreground which are about 50 feet high. Costilla County, Colorado. n.d.



(HICKCOX, C. A. 125)
Cut bank in terminal moraine on Jarvis Creek opposite mouth of Sargent Creek. Donnelly district, Yukon region, Alaska. June 24, 1946.



(U. S. GEOLOGICAL SURVEY 542)
Mount St. Helens from the south, with Mt. Rainer barely visible in the background. Note logged area visible in foreground. Skamania County, Washington. 1978.



(MOUNT ST. HELENS 26)
Northwest across devastated area to snow covered crater of Mt. St. Helens. Skamania County, Washington. April 17, 1981.



(MSH-SCHUSTER, R. L. 63)
Debris avalanche and debris flow below crater of Mount St. Helens. Skamania County, Washington. July 10, 1980.
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(MOUNT ST. HELENS 54)
Looking south across landscape into crater; steaming dome in center. Spirit Lake at left. Skamania County, Washington. May 24, 1982.
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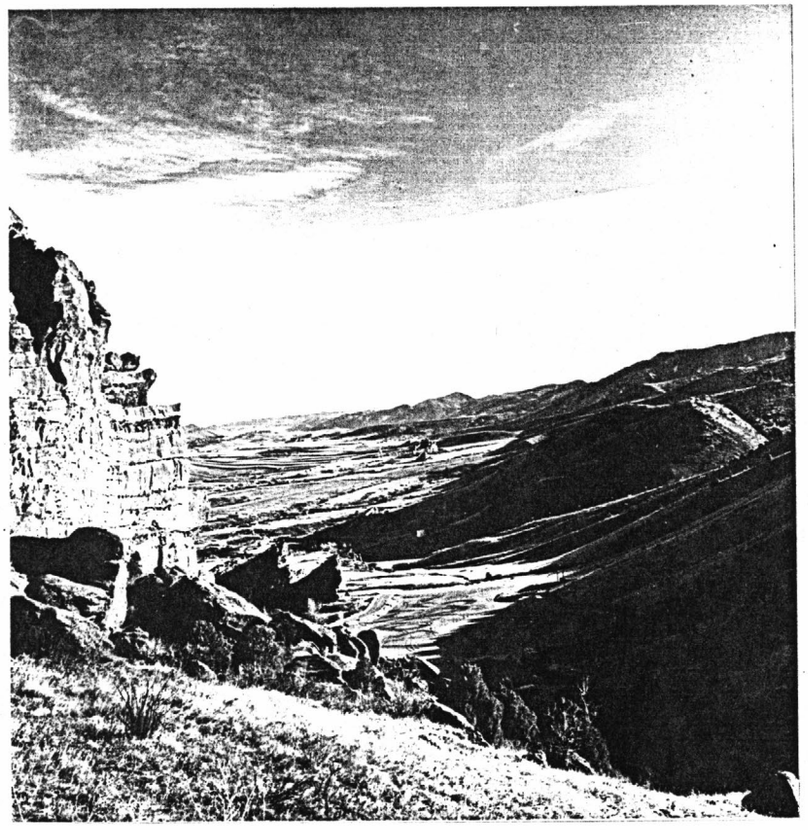

(STACY, J. R. 585)
Mountain front south from Red Rocks Theater with pediments in the distance. Jefferson County, Colorado. October 16, 1966.



(WAHRHAFTIG, C. 161)
North front of the Brooks Range and the plains and pediments of the southern section of the Arctic foothills. Isolated mountains of Mississippian limestone rise from rolling tundra plains carved on highly deformed yet soft late Paleozoic and Mesozoic rocks. Northern Alaska region, Alaska. n.d.



(HAMILTON, W. B. 187)
Newfound Gap, viewed from Mount Le Conte, Great Smoky Mountains National Park.
Tennessee-North Carolina. April 1953.
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(HAMILTON, W. B. 191)
Balsam Point and west from Mount Le Conte. Great Smoky Mountains National Park.
Sevier County, Tennessee. April 1953.
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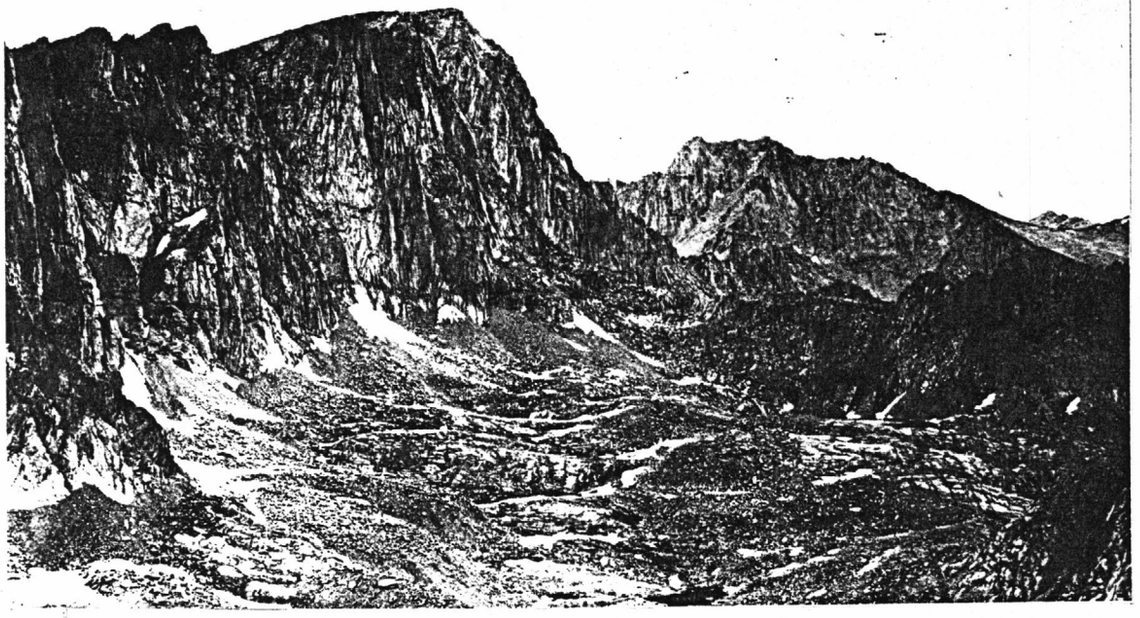
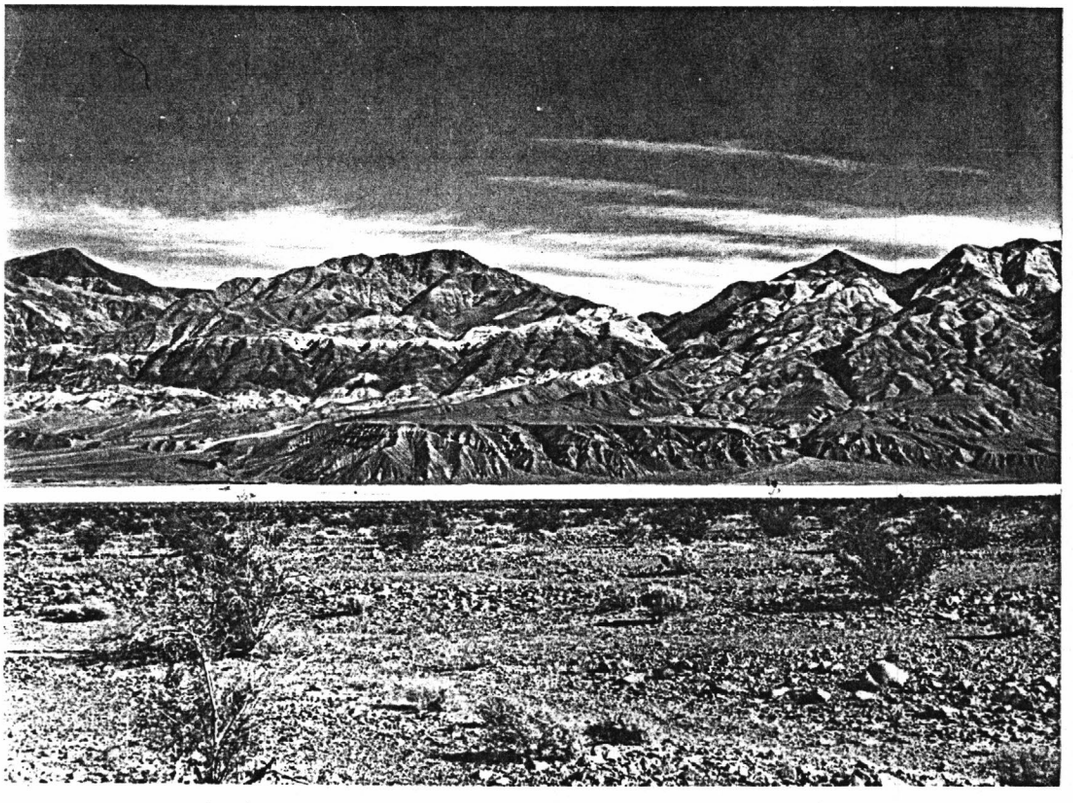


(KNOPF, A. 126)
Mount Whitney, Sierra Nevadas, as seen from near Whitney Pass. Inyo County, California. July 24, 1913.



(THAYER, T. P. 190)
Uplifted pediment and segment of valley sediments at west base of Panamint Mountains, near Ballarat. Relief about 8,000 feet. Inyo County, Californina. 1938.



(ARNOLD. R. 416)
Cracked mud in sump of Hobbs well. California. August 3, 1906.
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(LEE, W. T. 194)
Mud cracks, great Colorado River valley near Parker. Yuma County, Arizona. n.d.
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(GILBERT, G. K. 3097)
Mud cracks in clay freshly deposited by the Colorado River, delta of Colorado River, Baja California, Mexico. April 1907.
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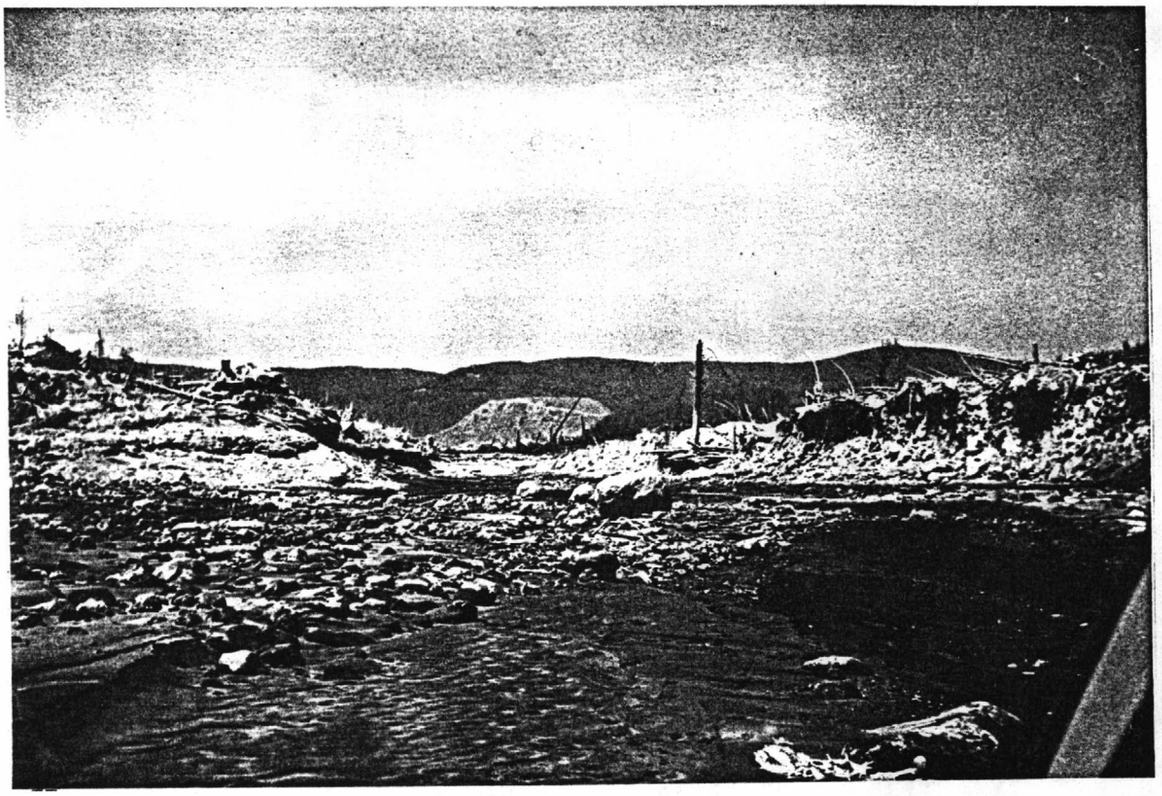
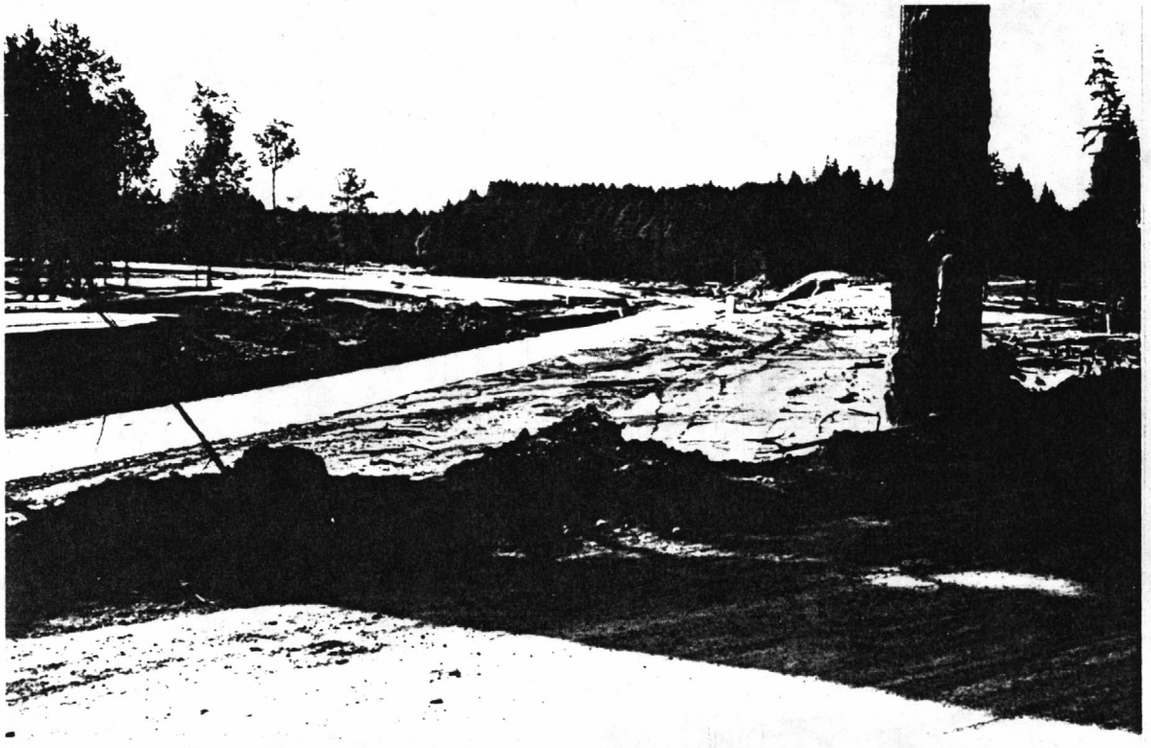
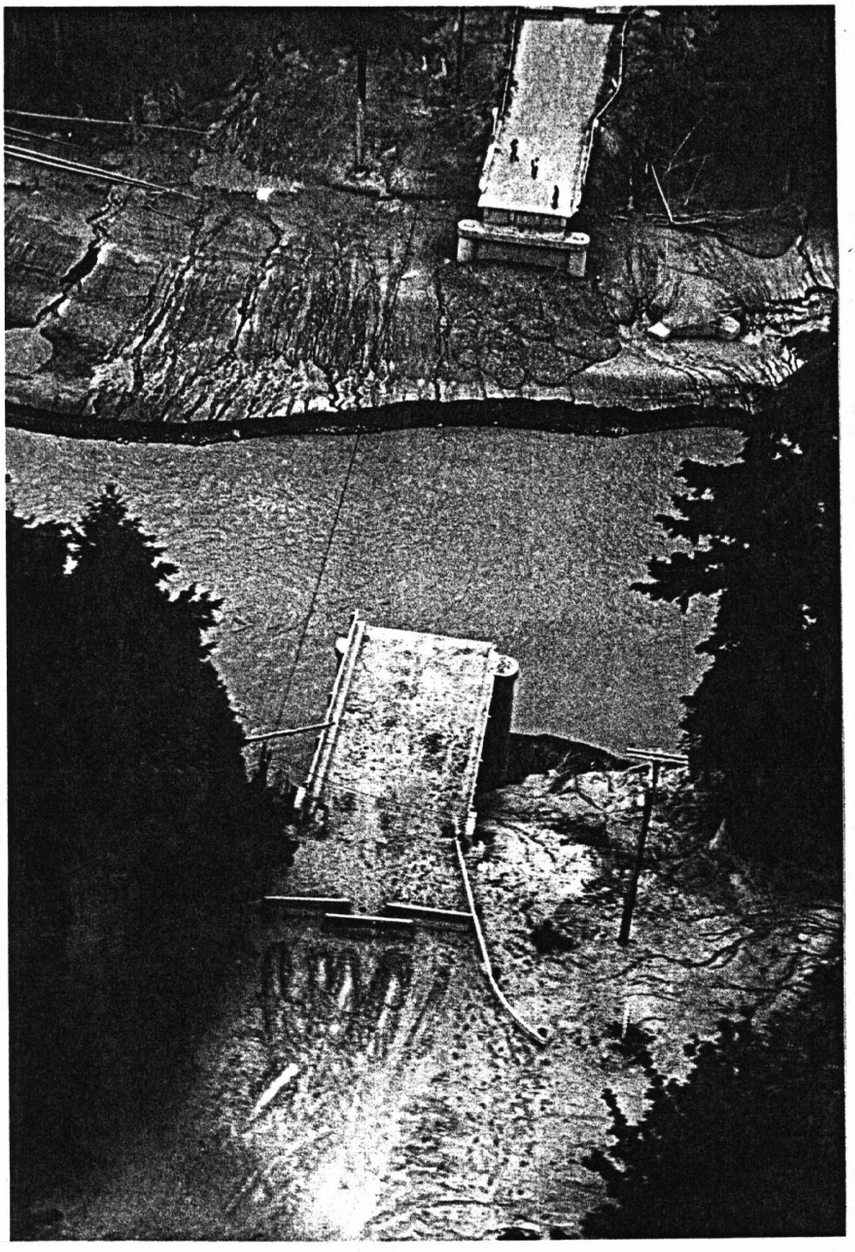
(GILBERT, G. K. 3086)
Mud cracks near salton station. Riverside County, California. ca. 1907.



(MSH-FUSTE, L. A. 1)
Castle Creek, showing damage caused by the mudflow triggered by the May 18, 1980 eruption. Cowlitz County, Washington.



(MOUNT ST. HELENS 13)
Mud flow deposits, North Fork Toutle River along SR 504. Coal Bank bridge remains in the background. Cowlitz County, Washington. July 5, 1980.



(MSH-SCHUSTER, R. L. 7)
Destroyed Tower Road bridge, North Fork Toutle River. Cowlitz County, Washington. July 2, 1980.
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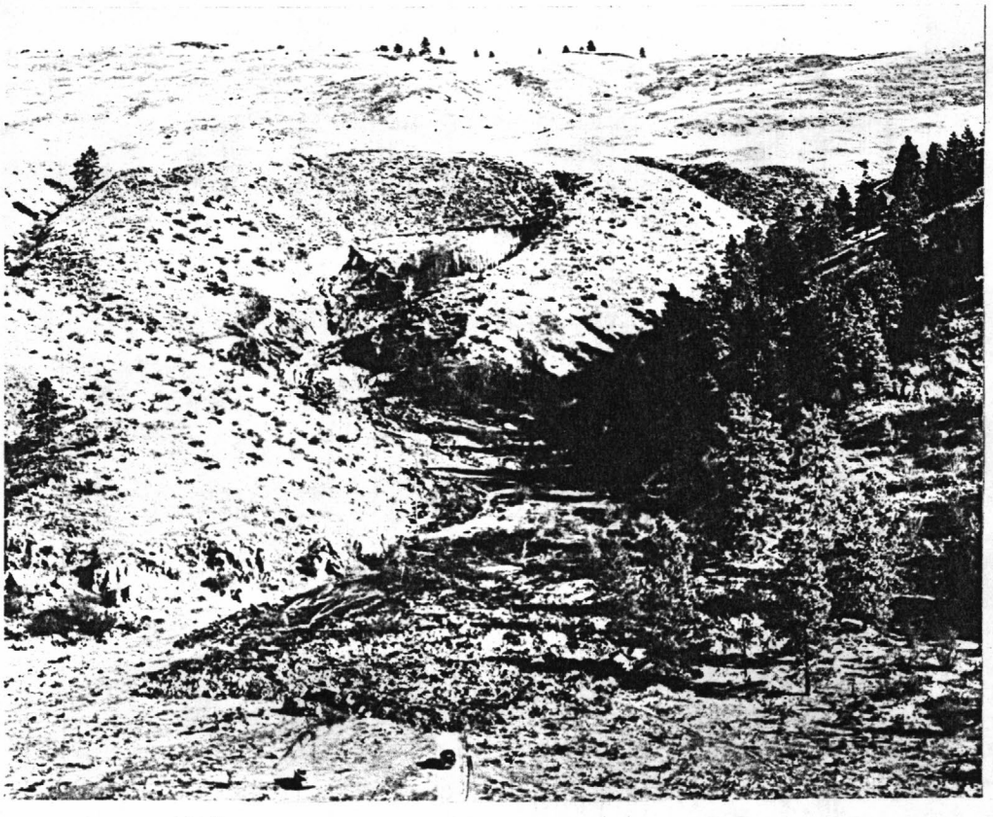
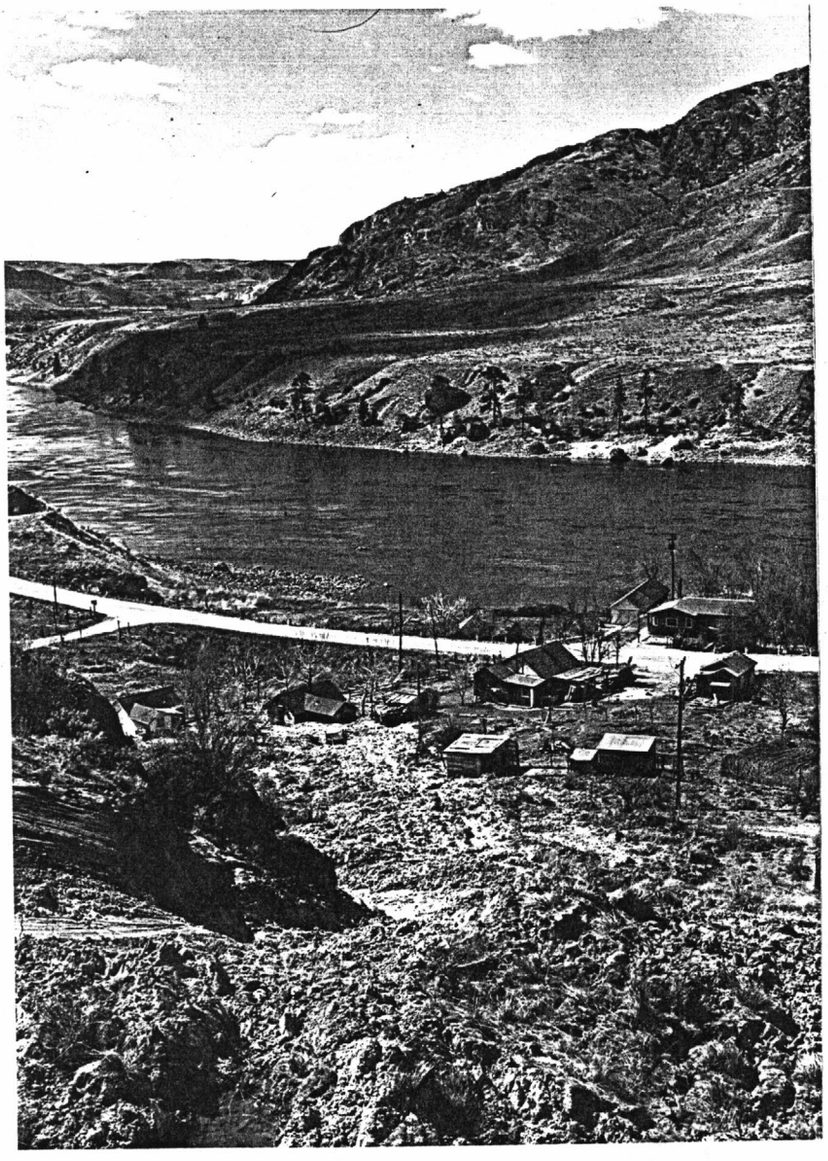
(MSH-SCHUSTER, R. L. 11)
Remanent of St. Helens bridge in mudflow of May 18. Cowlitz County, Washington. July 2, 1980.



(JONES, F. O. 218)
Mudflow in Hopkins Canyon occurred about midnight February 2, 1953. It lasted 7 minutes and destroyed a small house. The flow originated in the alcove in the background which before the mudflow was an area of seeps. Slide 295, Nespelem River-Omak Lake Valley area. Okanogan County, Washington. 1953.



(JONES, F. O. 188)
Mudflow at Seatons Grove, in the foreground, occurred at 6:30 P. M., March 17, 1949. Striations at extreme left were formed as the flow crossed undisturbed material. Grand Coulee Dam, Belvedere area. Washington.



(CROSS, W. 765)
Slumgullion mud flow as seen from a point on the east slope of Roundtop. Lake San Cristobal is in the lower right. Hinsdale County, Colorado. 1905.



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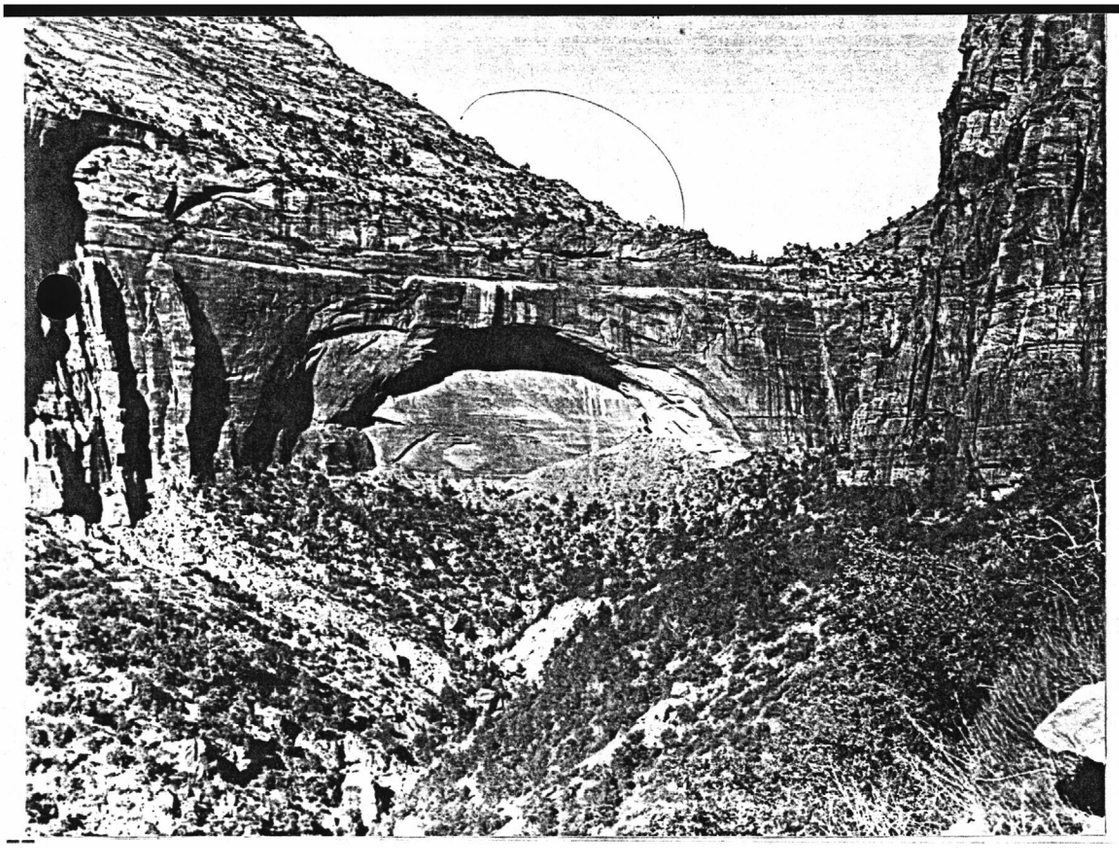
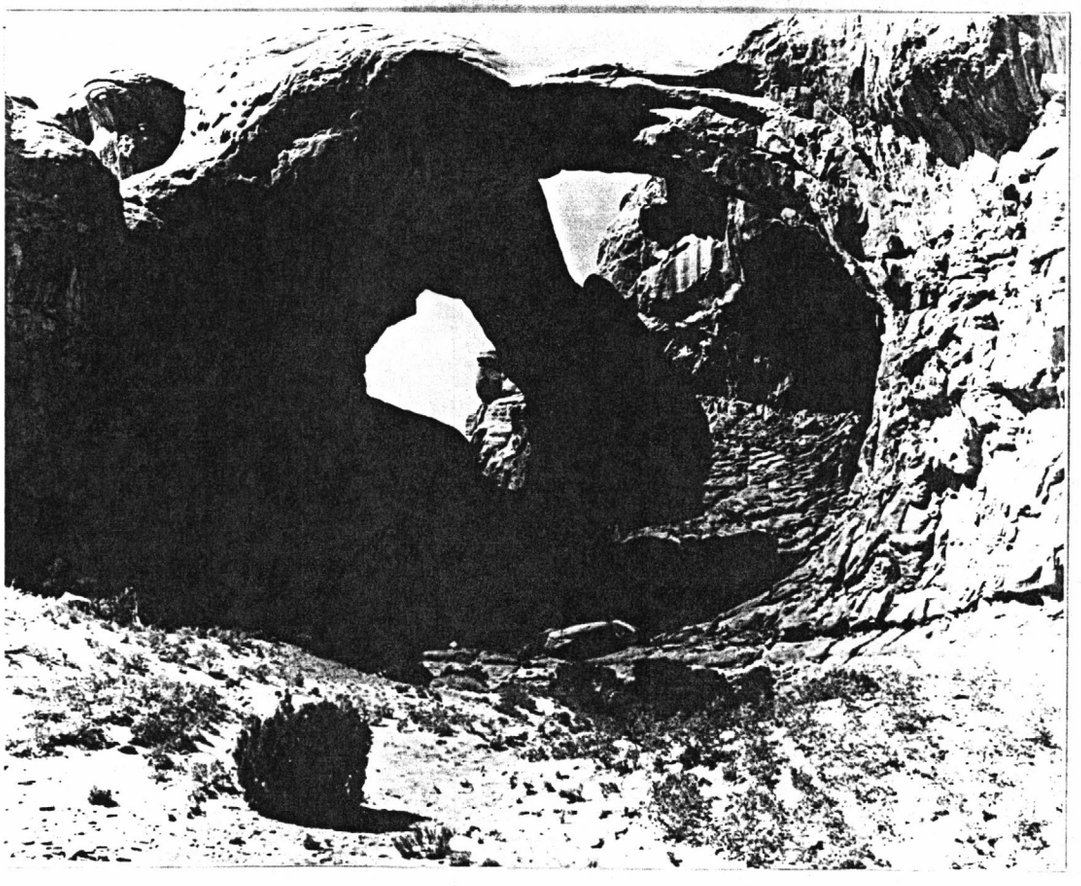
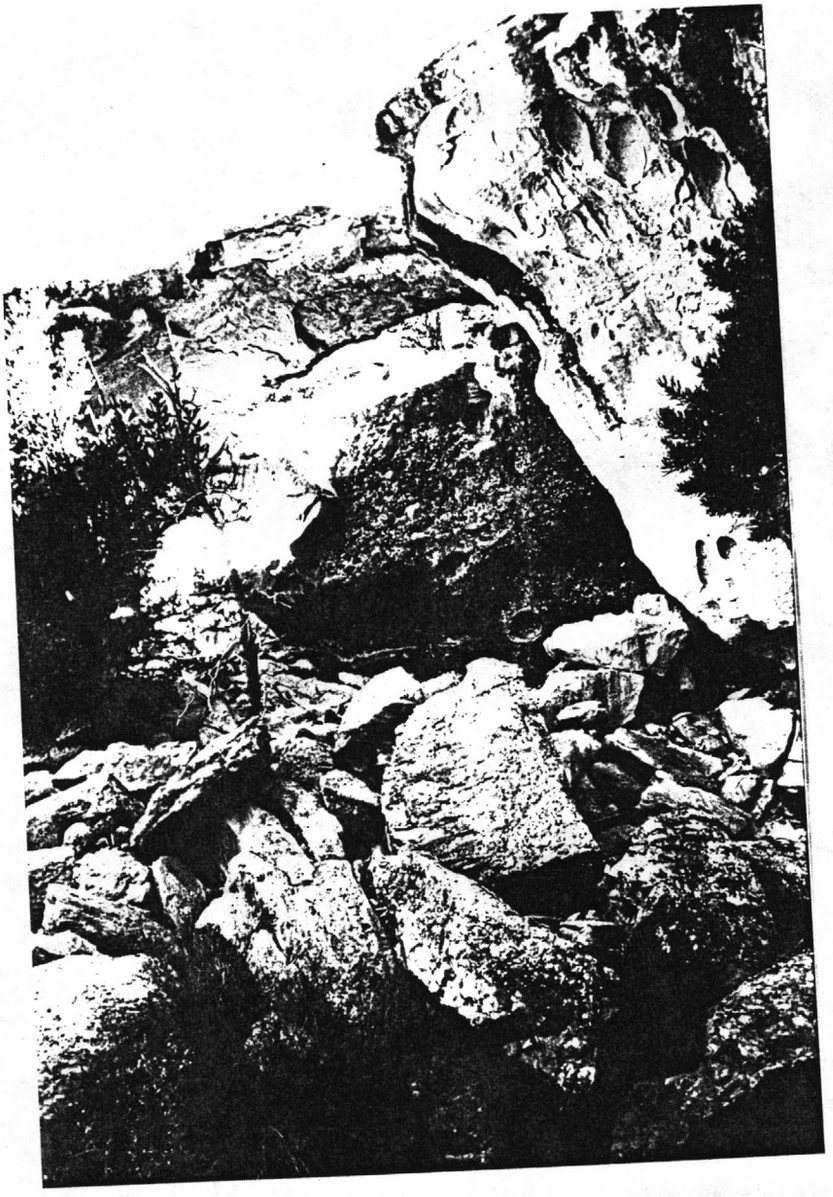
(CRANDELL, D. R. 66)
Mudflow levees on bank of Pierre shale near Pierre. South Dakota. 1950.



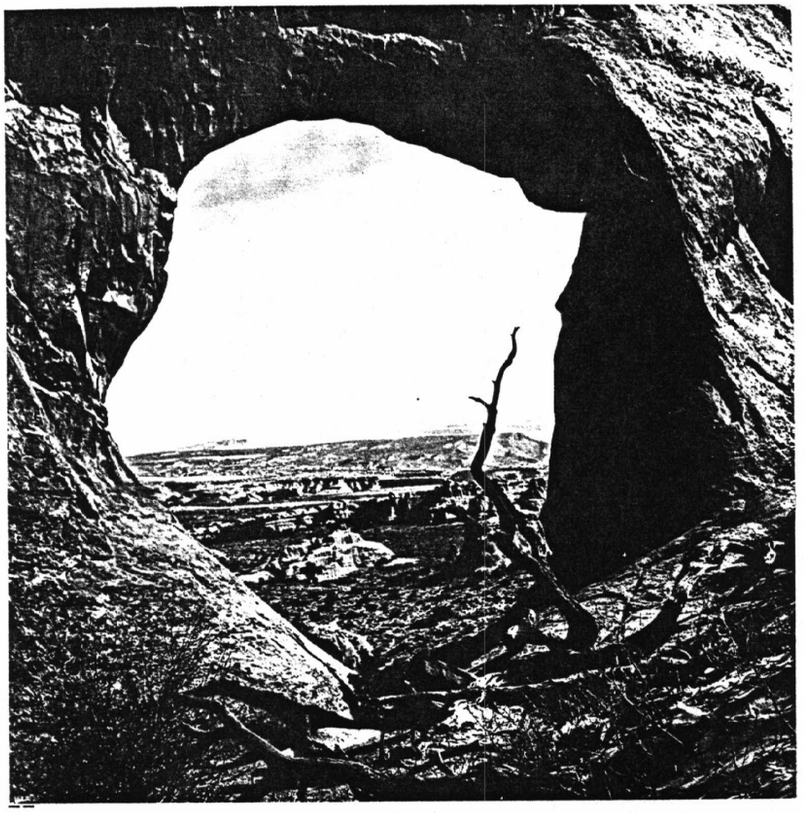
(ANDERSON, J. C. 20)
Pine Creek Arch, from tunnel road, Navajo sandstone. Zion National Park. Washington County, Utah. 1936.



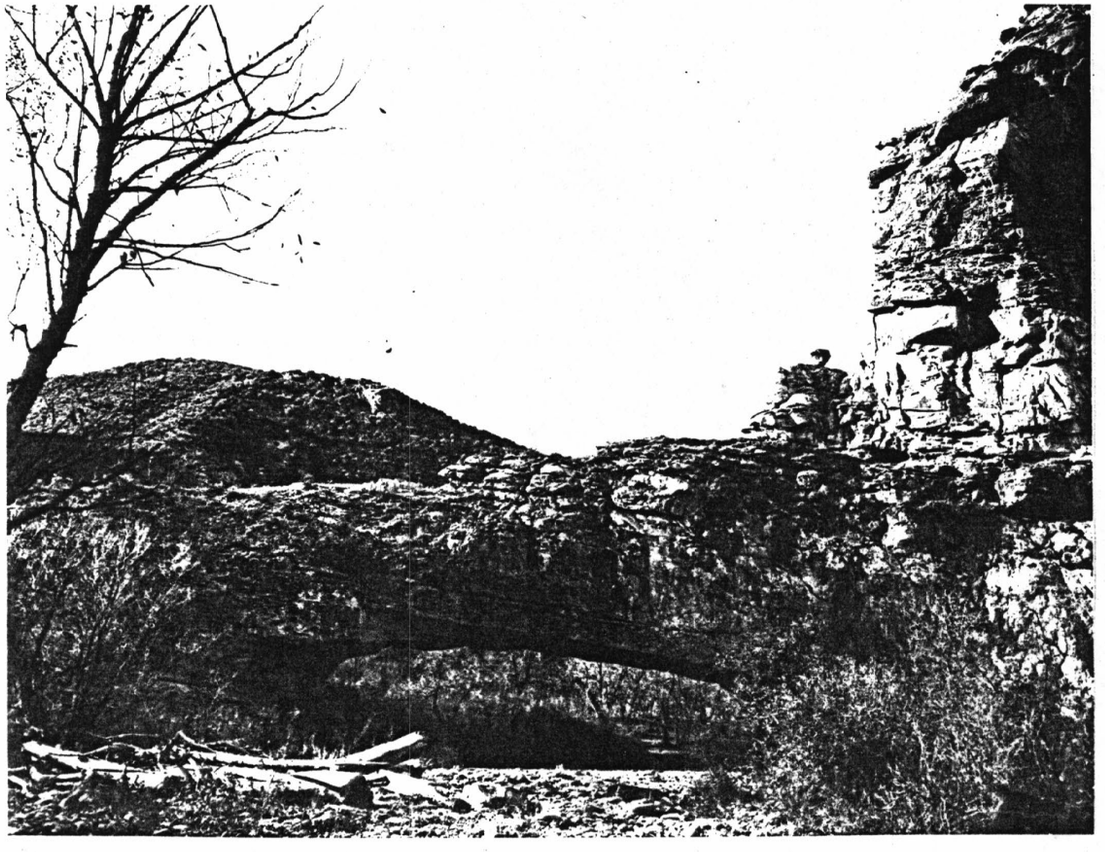
(CARROLL, DON 2)
Double Arch in the Windows section. Arches National Park. Grand County, Utah. n.d.



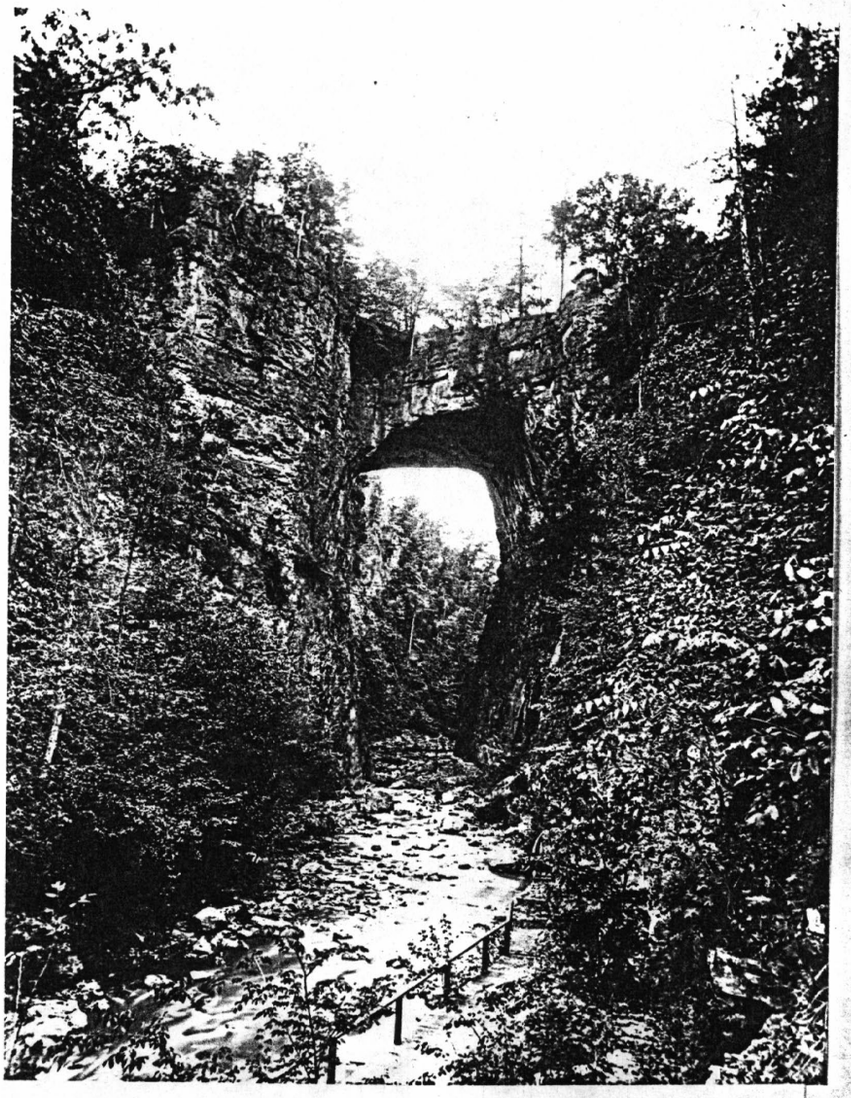
(SARGENT, K. A. 19)
Unnamed natural bridge near junction of Alvey Wash and Calf Canyon, southwest of Escalante. Garfield County, Utah. 1979.



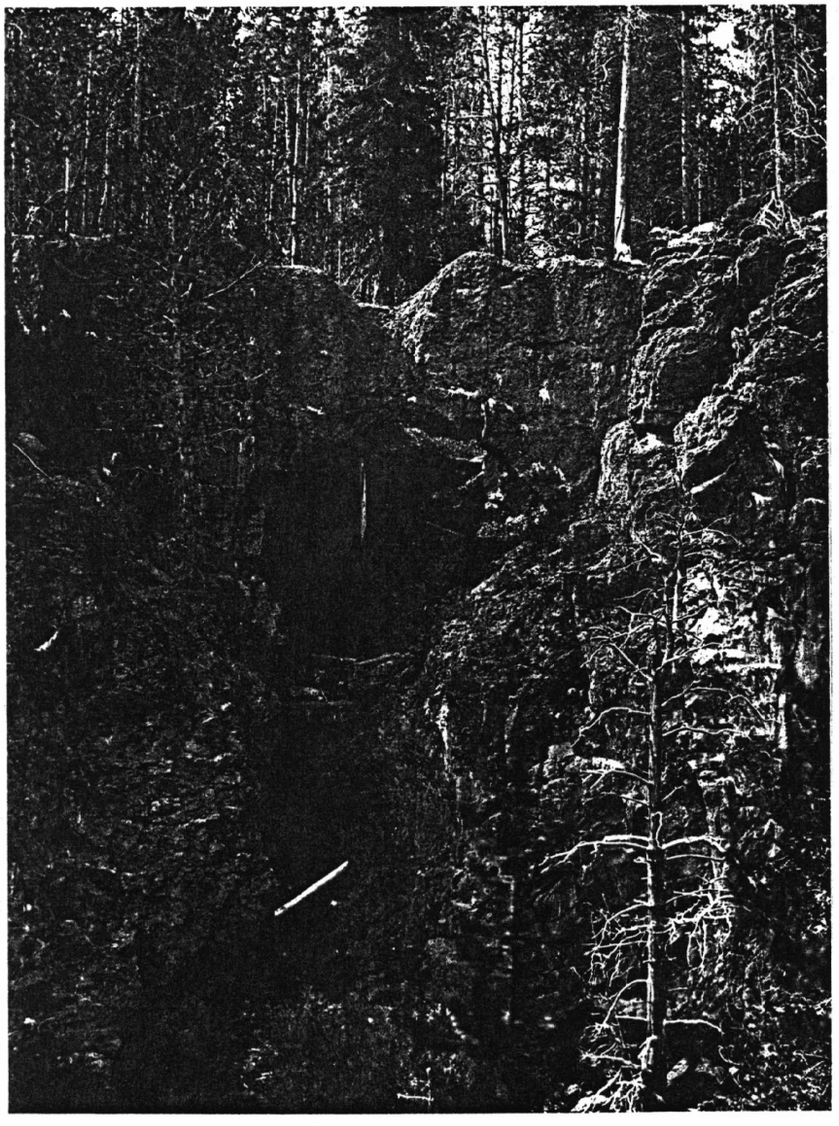
(LOHMAN, S. W. 698)
Partition Arch, viewed from near Devils Garden trail. Arch frames part of south wall of Salt Valley and on skyline mesas south of Moab Valley. Opening is 27½ feet wide and 26 feet high. Arches National Park. Grand County, Utah.



(Darton, N. H. 934b)
Natural bridge, upper Carboniferous sandstone, La Prele Creek southwest of Douglas. Converse County, Wyoming. 1902.



(HILLERS, J. K. 164)
Natural Bridge. Rockbridge County, Virginia. n.d.



(IDDINGS, J. P. 81)
Natural bridge of rhyolite, Bridge Creek, east side of Yellowstone Lake. Yellowstone National Park. Wyoming. ca. 1890.



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(WALCOTT, C. D. 127)
Distant view looking west of Natural Bridge. Rockbridge County, Virginia. 1891.

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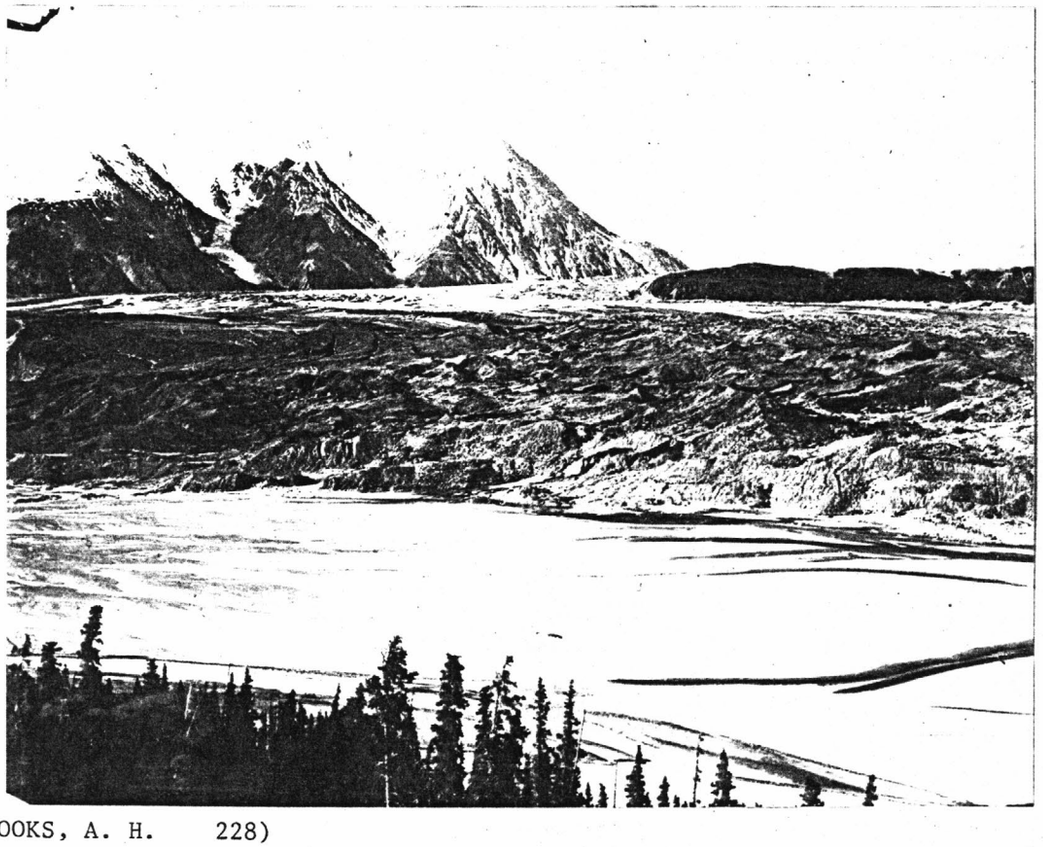
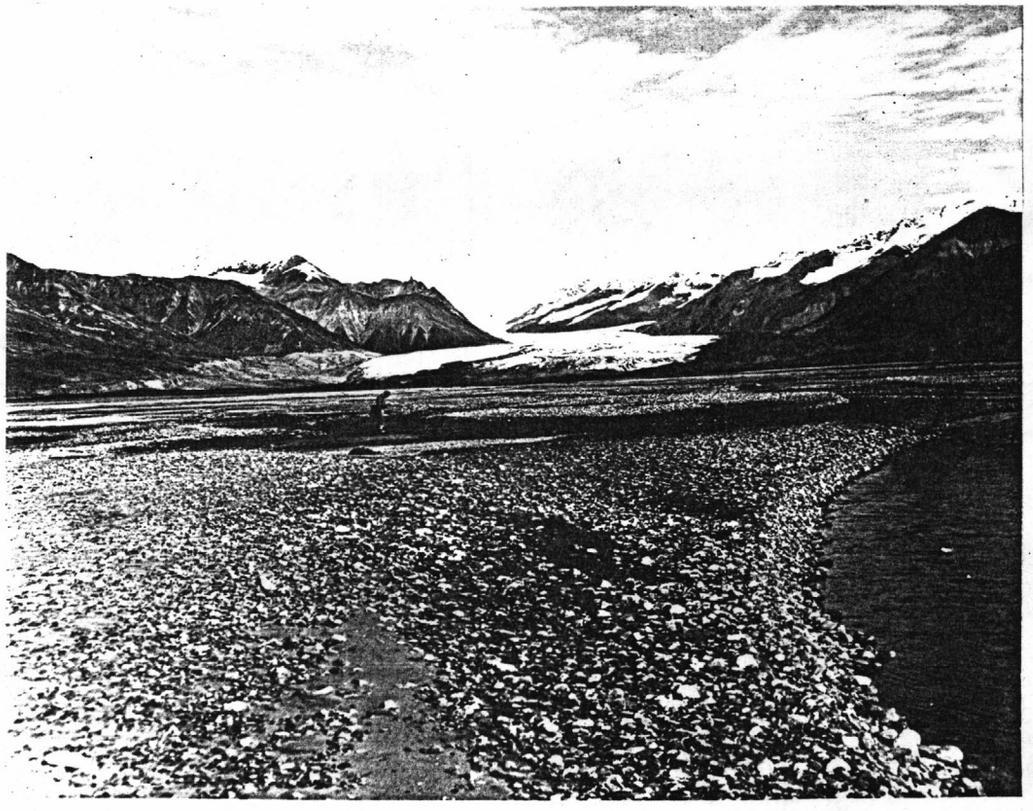
(WILLIAMS, J. R. 608)
Outwash plain of Tazlina Glacier looking west from roche moutonne in center of outwash, about ¼ mile south of south end of Tazlina Lake. Klutina district, Copper River region, Alaska. July 19, 1952.



(BROOKS, A. H. 228)
View across outwash of O'Connor Glacier and mountains. Yukon Territory, Canada. 1899.



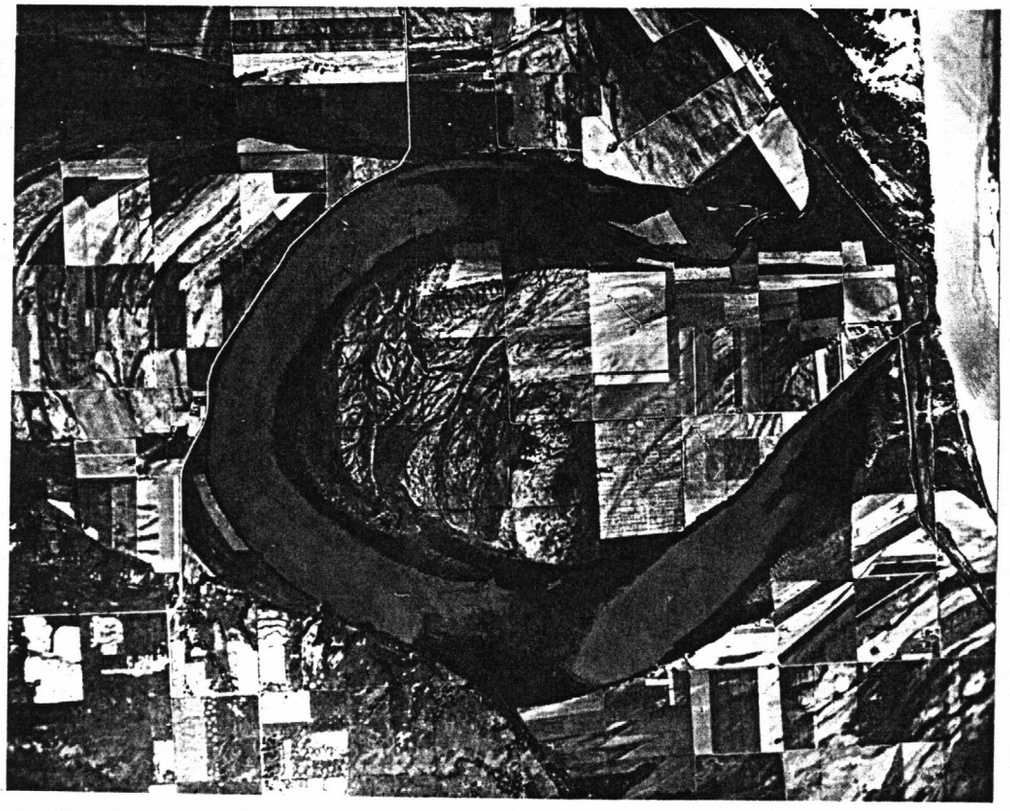
(MARTIN, G. C. 549)
View across outwash plain and glacial stream of Skilak Glacier. Tustumena district, Cook Inlet region, Alaska. n.d.



(NICHOLS, D. R. 113)
Distant view of terminus of Maclaren Glacicer from its outwash plain. Valdez Creek district, Cook Inlet region, Alaska. September 10, 1953.



(HOPKINS, D. M. 13 Left)
High altitude vertical aerial photograph of oxbow lakes and stream meanders in northern Seward Peninsula. York district, Seward Peninsula region, Alaska. n.d.



(HENDRICKS, T. A. 3)
Ned and Hollis lakes, the two lakes are parts of an old oxbow lake in a cut-off meander of the Arkansas River, 4 miles southeast of Van Buren. Note meander scars on the flood plain. Crawford County, Arkansas. 1936.



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(BALSLEY, J. R. 19)
Oxbow lakes and White River, Des Arc. Prairie County, Arkansas. 1949.
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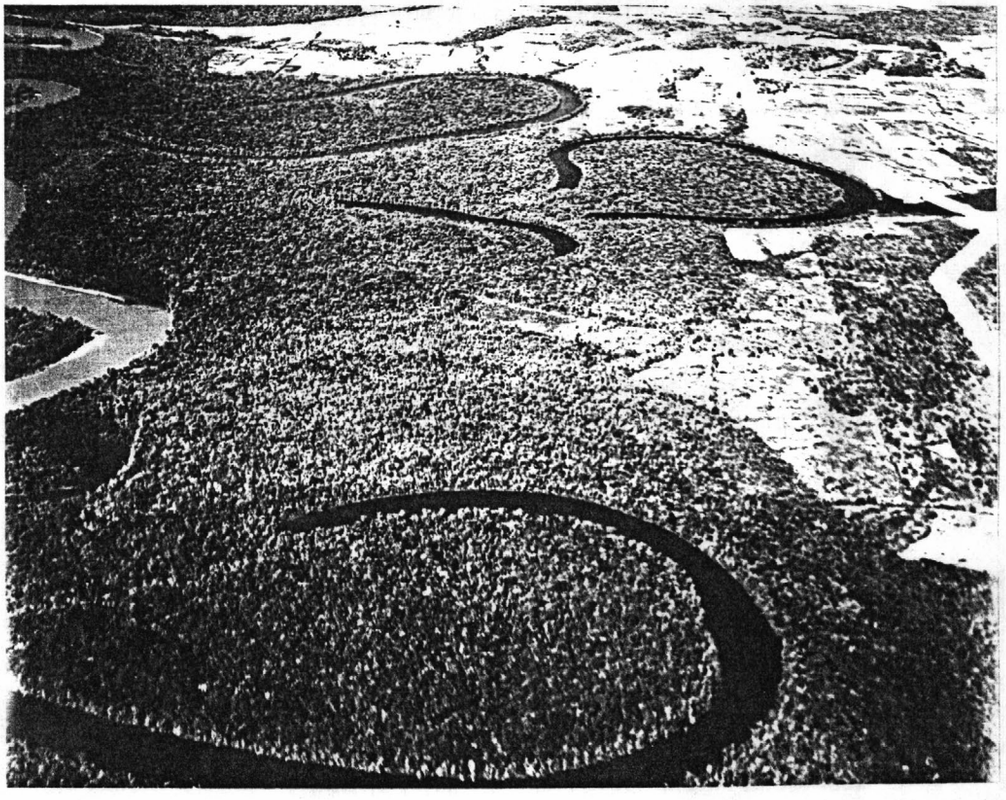

(BALSLEY, J. R. 21)
Oxbow lakes and White River, Des Arc. Prairie County, Arkansas. 1949.
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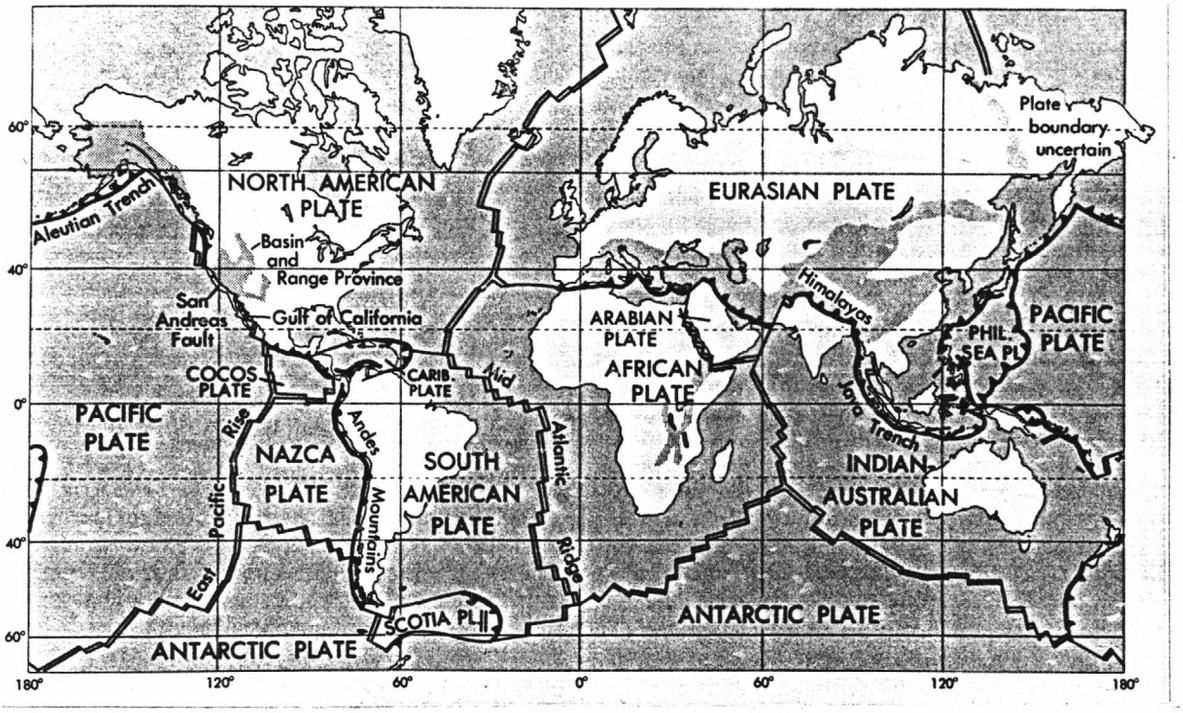
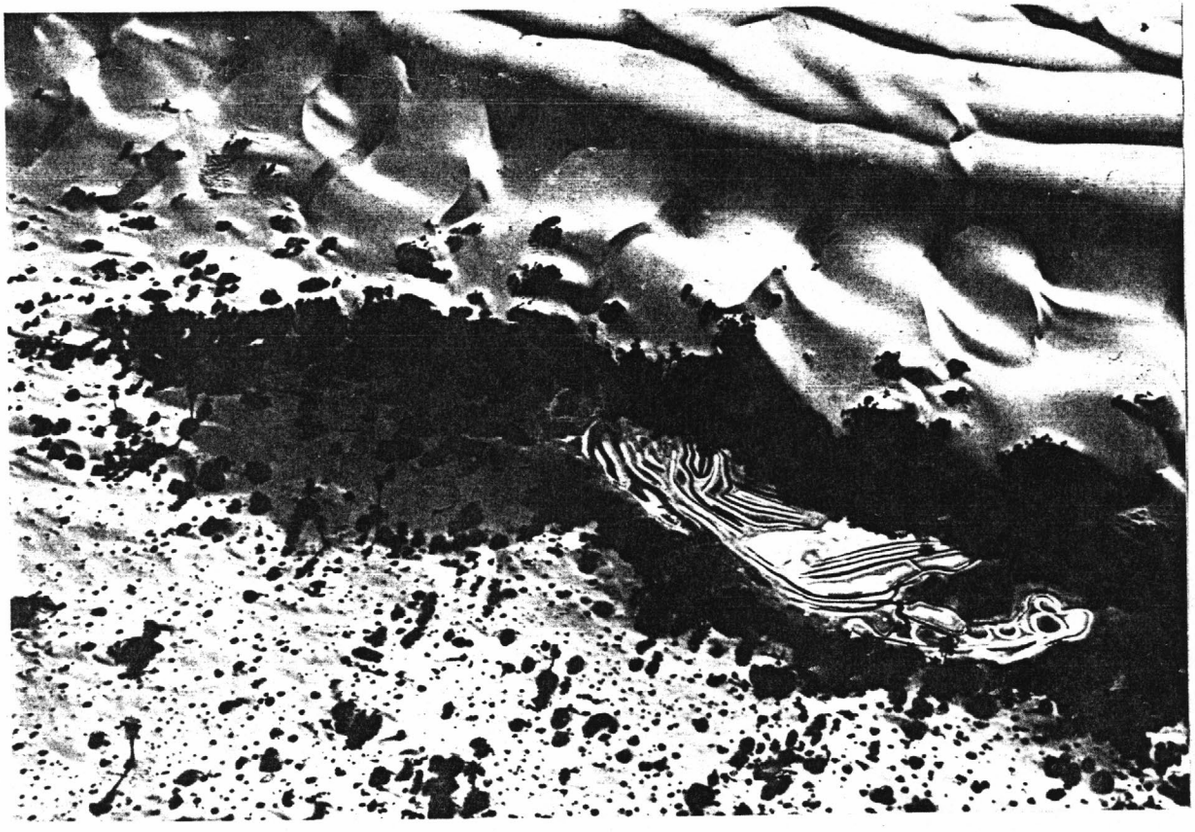
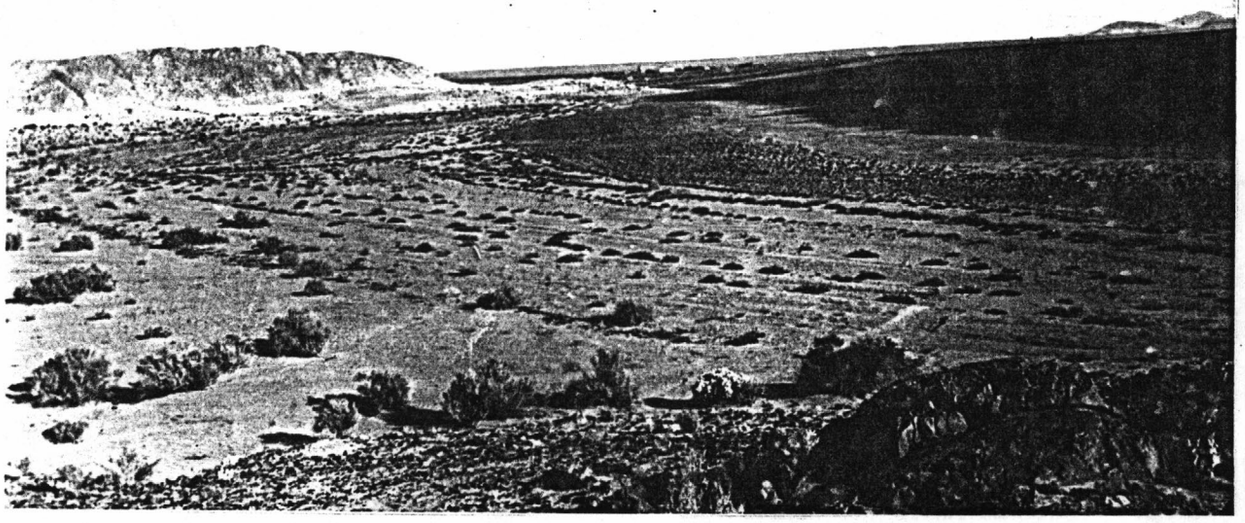


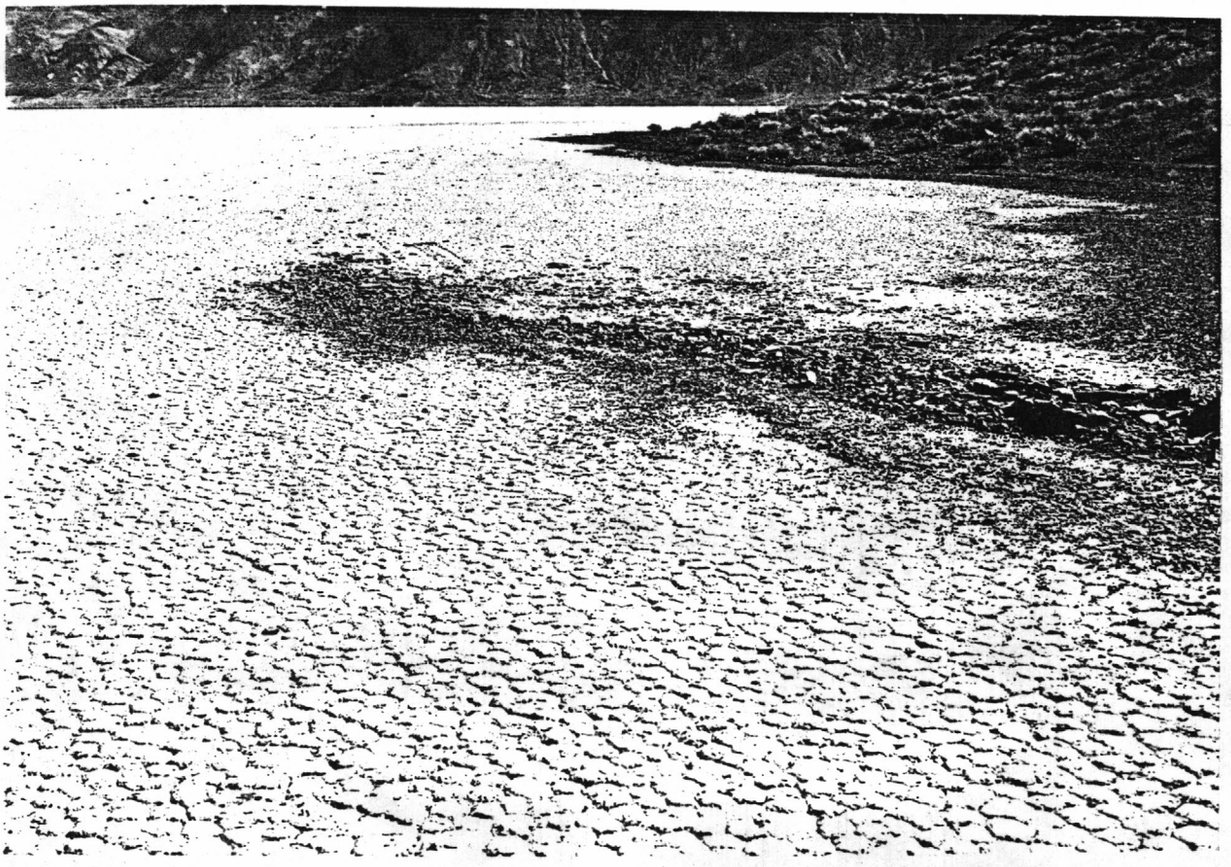
(U. S. Geological Survey 626)
Much simplified map of lithospheric plates of the world, showing boundaries that are presently active. Double line: spreading zones. Line with barb: zones of subduction. Single line: strike-slip faults. Stippled area: Continental area of active extensional, compressional or strike-slip faulting, exclusive of plate boundaries. ca. 1982.



(GOUDARZI, G. H. 19)
Playa lake in Fezzan. Aerial view of the saline lake at Nashnusha, about 60 km northwest of Umm Al Abyad in the Ubari Sand Sea. In the background are the high sand dunes in step from several tens of meters high. The striped pattern results from troughs dug in the lake to concentrate the sodium carbonate. Libya. ca. 1958.



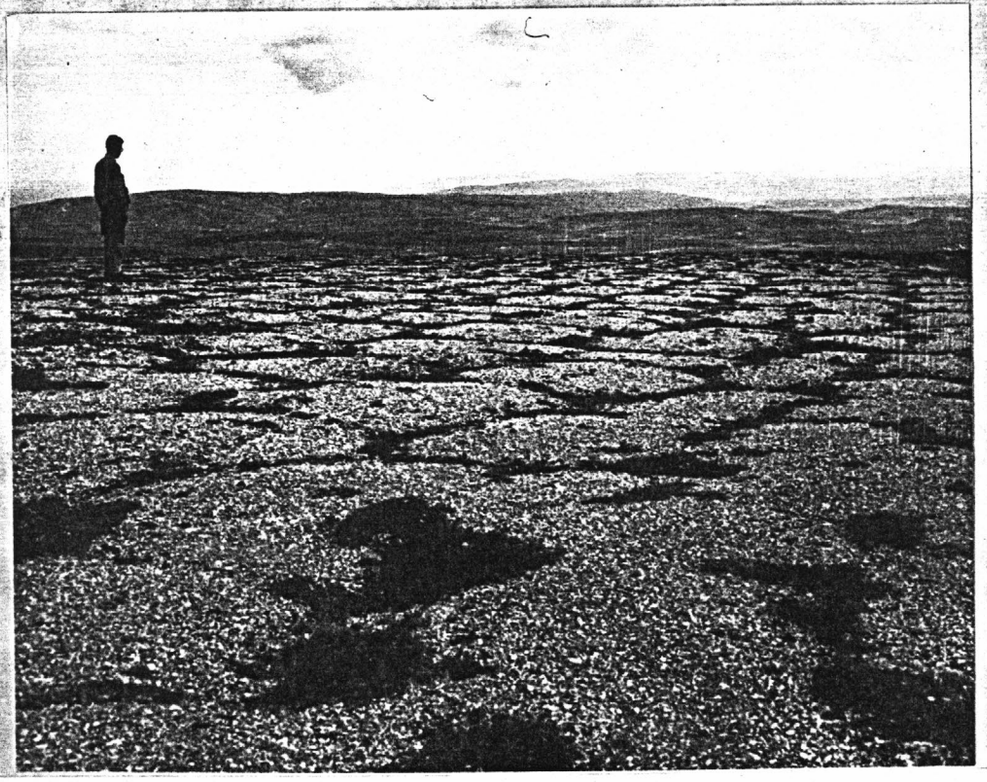
(THOMPSON, D. G. 39a)
Silver Lake playa. Shows wave-cut cliff and terrace at end of limestone hill. Town of Silver Lake in background. It is believed that the 1916 flood did not reach above the lowest black strand line. San Bernardino County, California. 1917.



(MCALLISTER, J. F. 1)
The Racetrack playa, spit of dolomite rock fragments on mud-cracked playa from which surficial mud curls were stripped by wind. Note pebble-size playa scrappers that dug furrows (left of center). Death Valley National Monument. Inyo County, California. n.d.



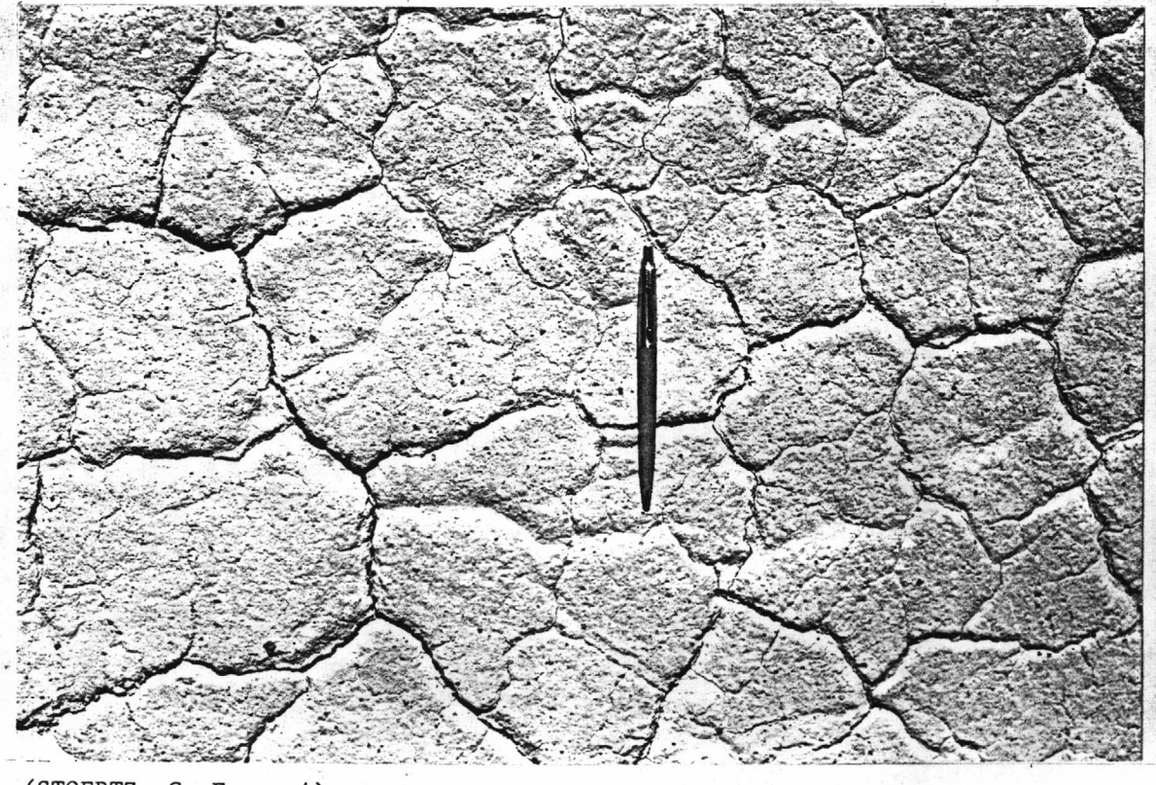
(LUSTIG, L. K. 21)
Playa in southeastern part of Deep Spring Valley. Note the apron of alluvium produced by the merger of fans, beyond the playa and to the right. Inyo County, California. ca. 1961.



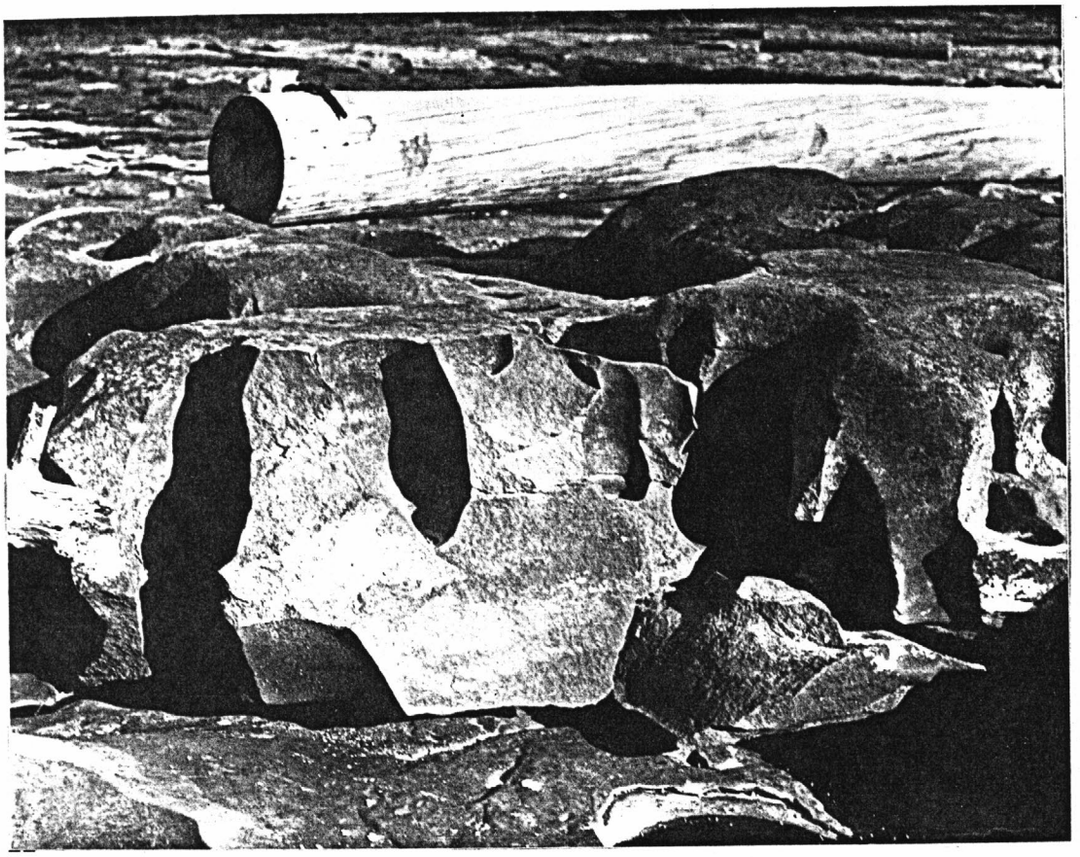
(WAHRHAFTIG, C. 136)
Polygonal ground, mountaintop east of Rex Dome, Alaska Range. The clay-rich centers swell and collapse sufficiently from freezing and thawing ice that they destroy the roots of any plants that grow on them. Plants gain footholds only along the relatively clay-free borders. Nenana district, Yukon region, Alaska. n.d



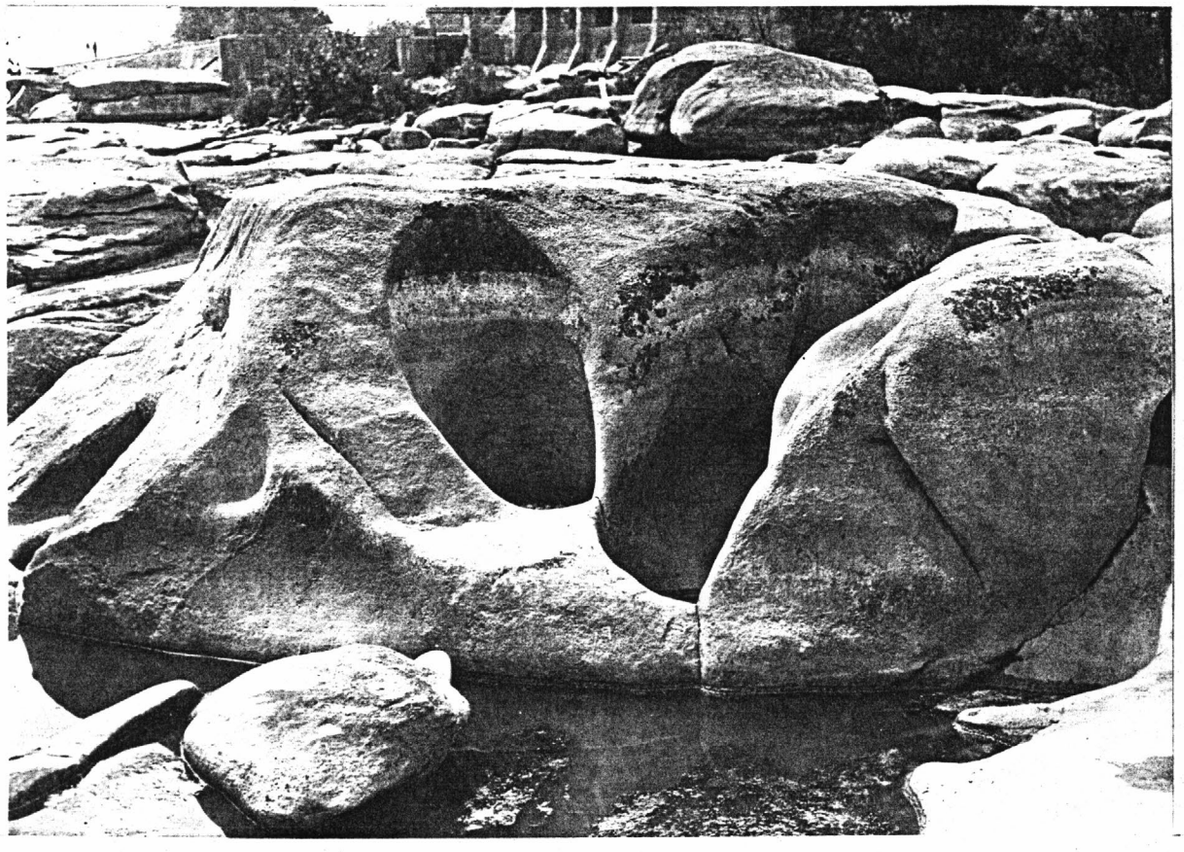
(WAHRHAFTIG, C. 137)
Stone polygons, east of Maclaren River, Clearwater Mountains. Note the complete sorting between the clay-rich centers and the bordering lines of coarse boulders. Valdez Creek district, Cook Inlet region, Alaska. n.d.



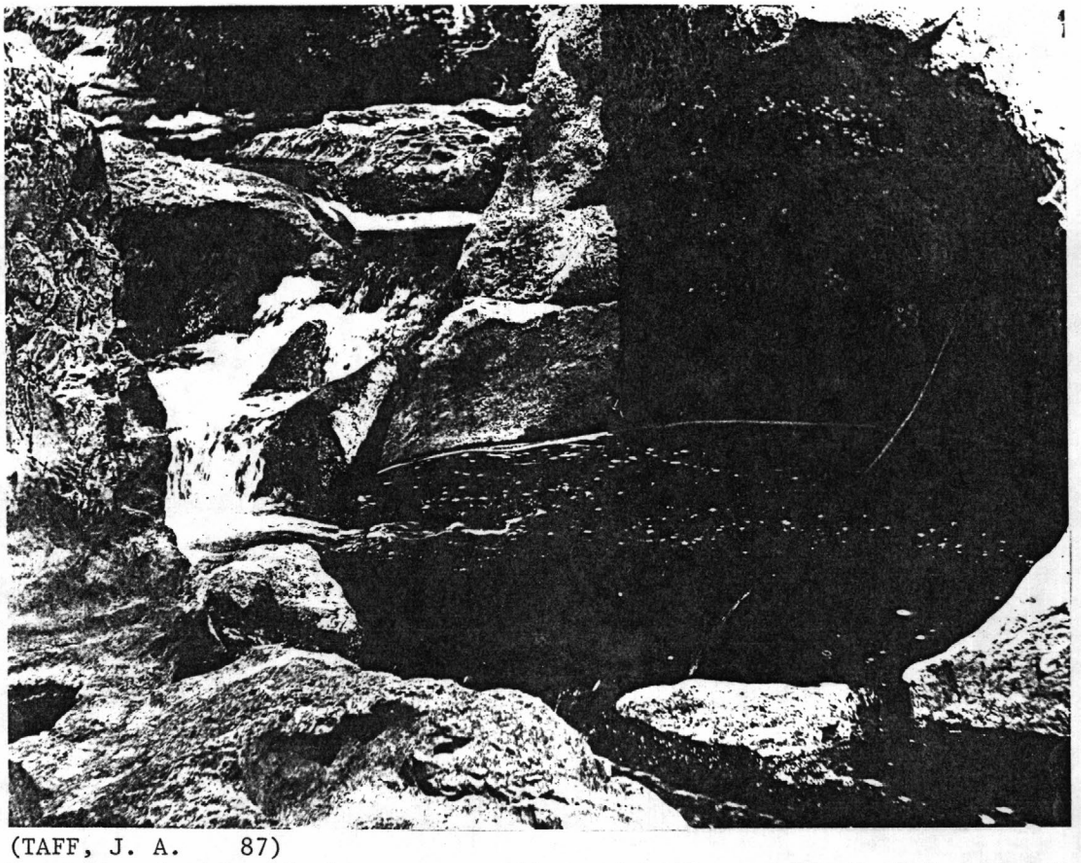
(STOERTZ, G. E. 4)
Active mud-cracked dry-clay playa near the Lacalle railroad station. Surface of playa showing randomly oriented mud-crack polygons. Antofagasta Province, Chile. ca. 1962.



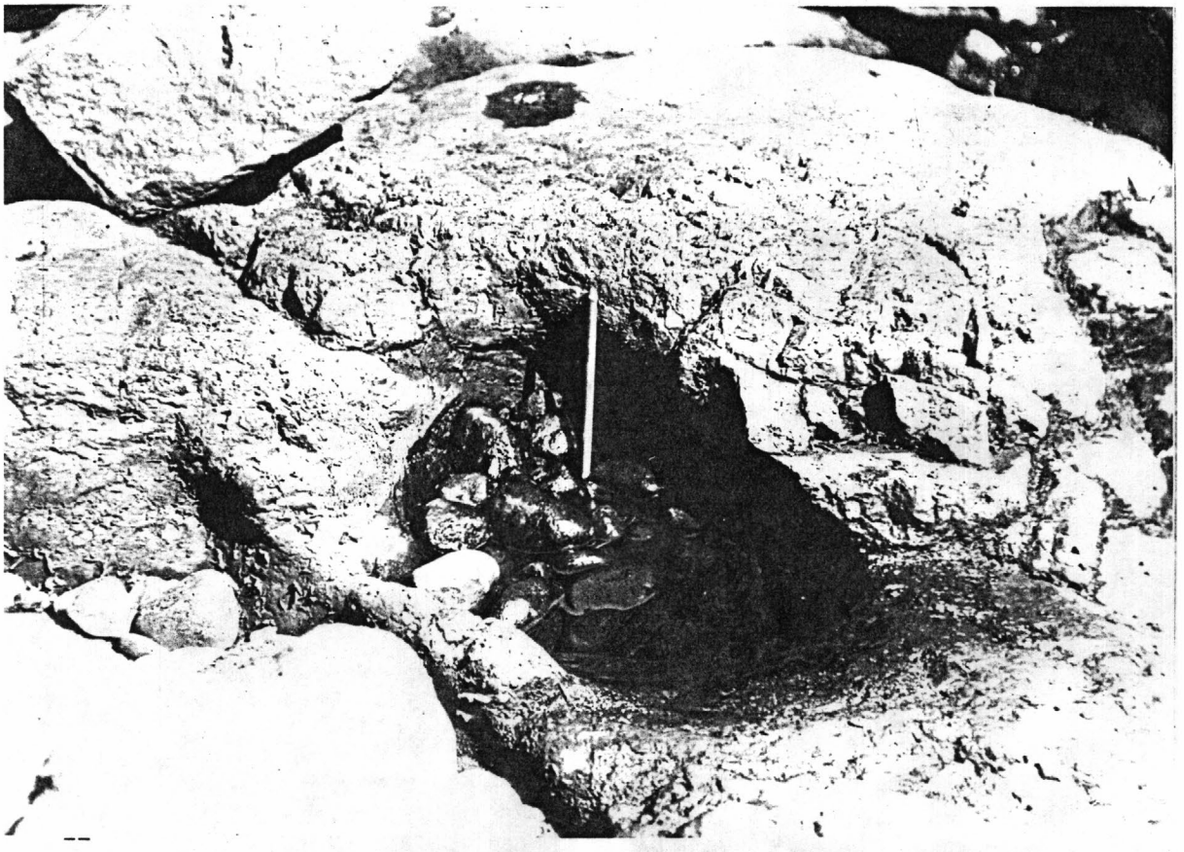
(BUTTS, C. 147)
Pot holes showing splitting of rock. Warrior River bed above mouth of Blue Creek. Tuscaloosa County, Alabama. n.d.



(WENTWORTH, C. K. 632)
Potholes in granite ledges in James River. Henrico County, Virginia. 1926.



(TAFF, J. A. 87)
Pot holes in Arbuckle limestone, Mill Creek, NW¼ sec. 31, T. 3 S., R. 5 E. Oklahoma. n.d.



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(ALDEN, W. C. 230)
Pothole containing pebbles, bed of Blackstone River, below the dam. Blackstone. Worcester County, Massachusetts. September 26, 1906.
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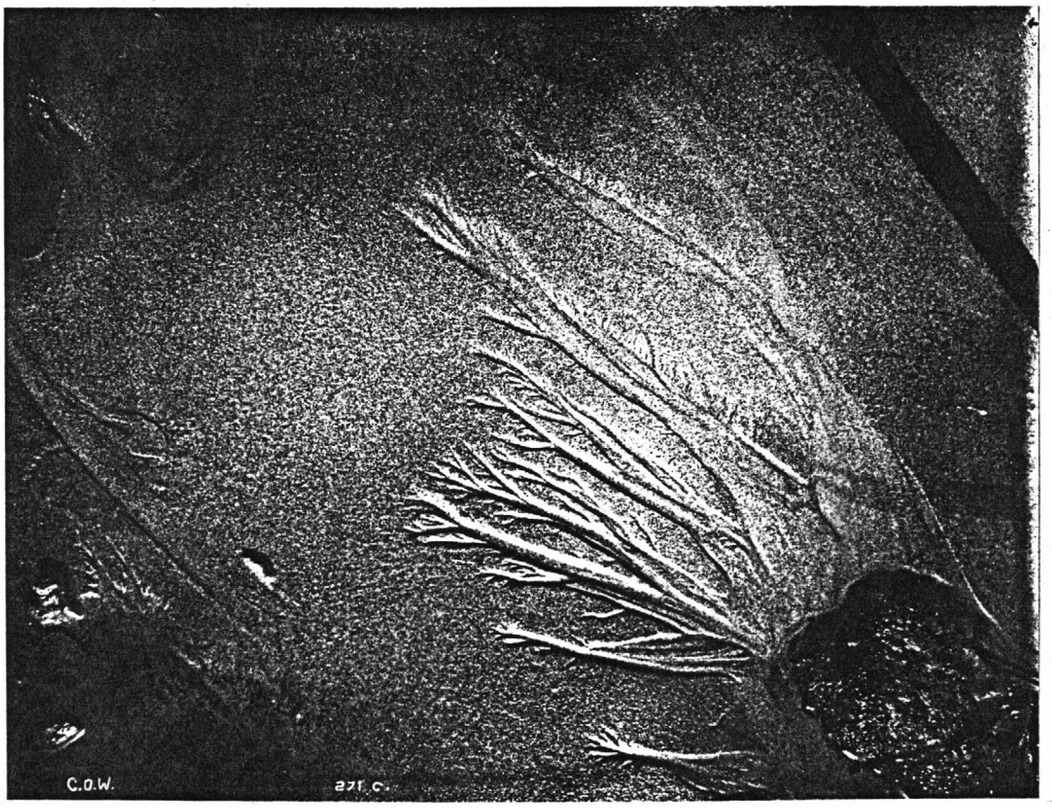
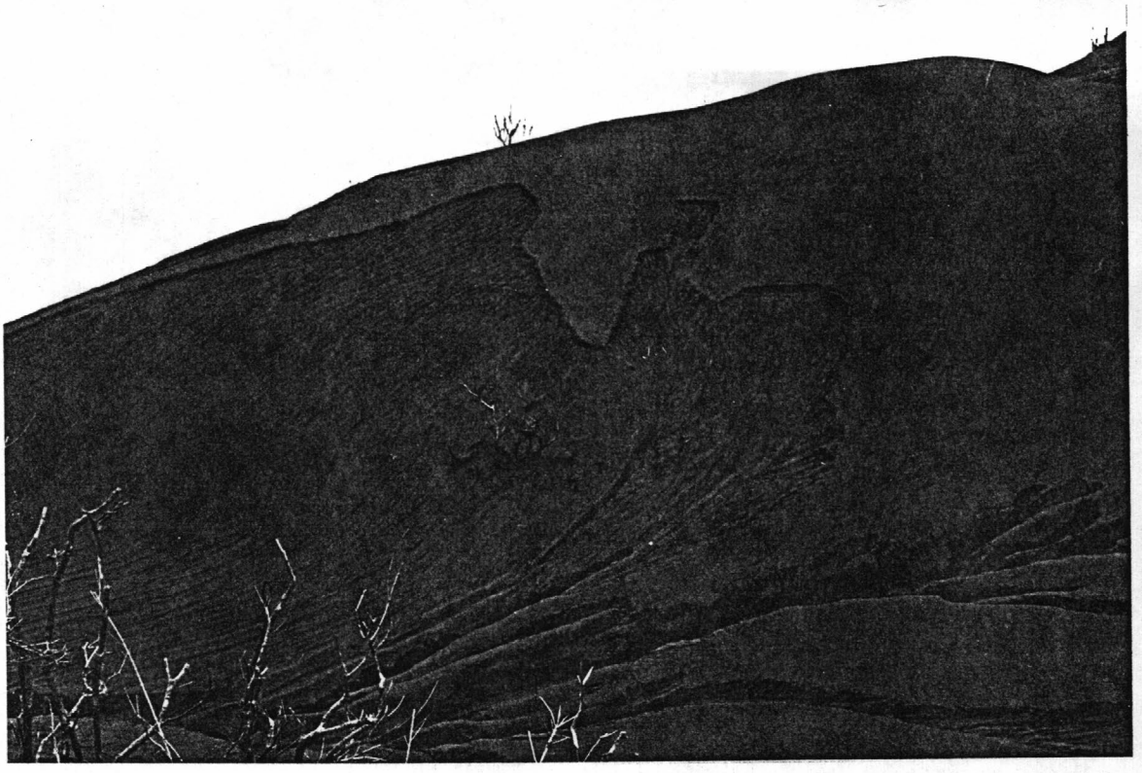
(GUY, H. P. 136)
Rill erosion on and deposition at the base of a cut slope for a highway near Fairfax. Fairfax County, Virginia. n.d.



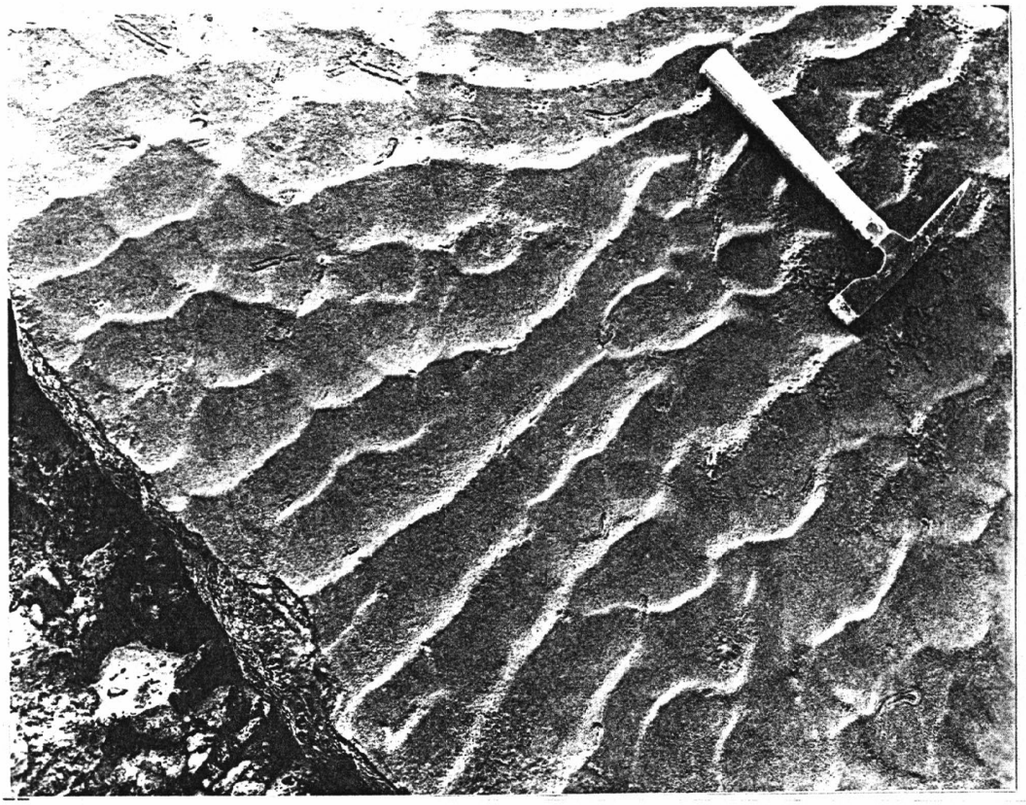
(WALCOTT, C. D. 271c)
Rill-marks on beach west of Noyes Point, Washington County, Rhode Island. n.d.



(WALDRON, H.H. 4)
Sheet and rill erosion of ash from upper slopes of Irazu volcano. Costa Rica. 1964.



(SEGERSTROM, K. 197)
Rills that were formed during the wet season in dunes of ash by one hard rainstorm. Lesser rains only soaked into the highly permeable surface without run-off. Parcutin volcano. Michocan, Mexico. 1946.



(GORDON, M., JR. 49)
Current ripple marks and invertebrate tracks preserved in ferruginous sandstone from the base of the sand facies of the Saline formation. Saline County, Arkansas. n.d.



(HARSHMAN, E. N. 7)
Ripple-marked mudstone characteristic of the upper part of the middle unit of the Cloverly Formation in the Shirley Basin area, NW¼ sec. 24, T. 27 N., R. 77 W. Albany County, Wyoming. ca. 1964.



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(CURRIER, L. W. 38)
Red shales of the Rome formation showing characteristic ripple marks and sun cracks. Along the highway at Shale Spring School. Wythe County, Virginia. ca. 1931.
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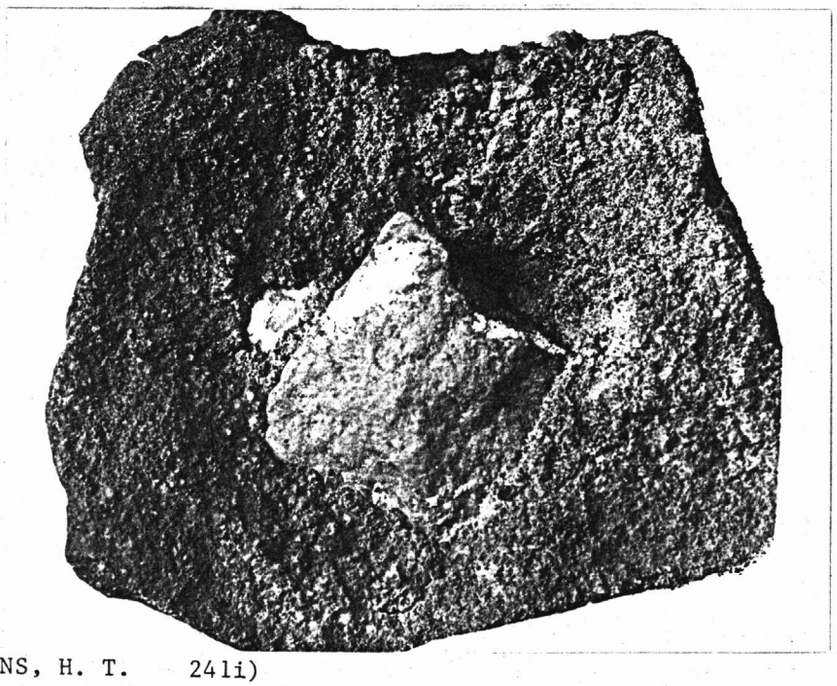
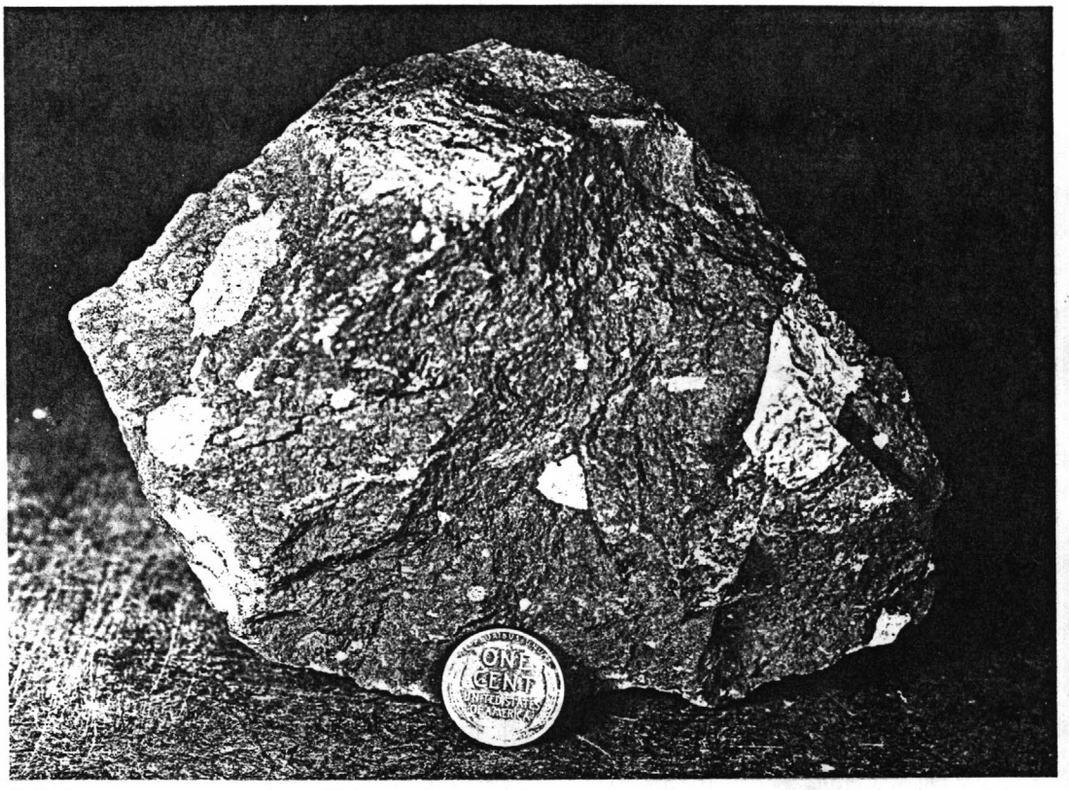
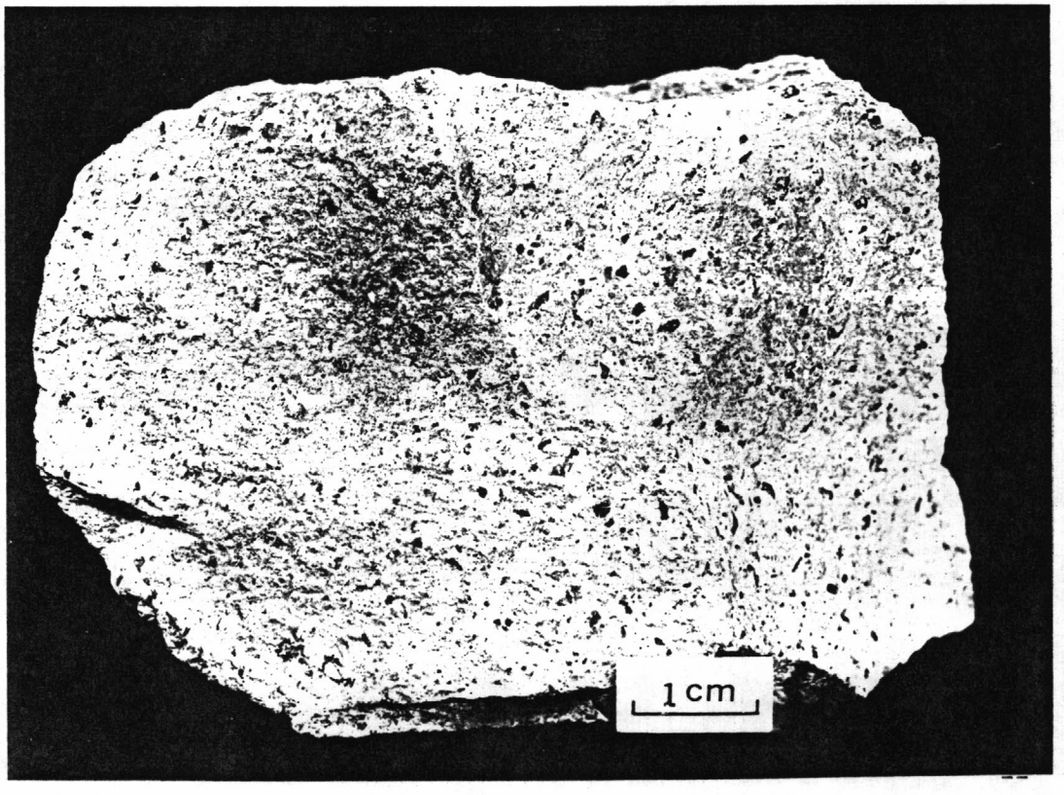
(GILBERT, G. K. 1022)
Ripple marks on sandstone, Berea. Cuyahoga County, Ohio. ca. 1870.



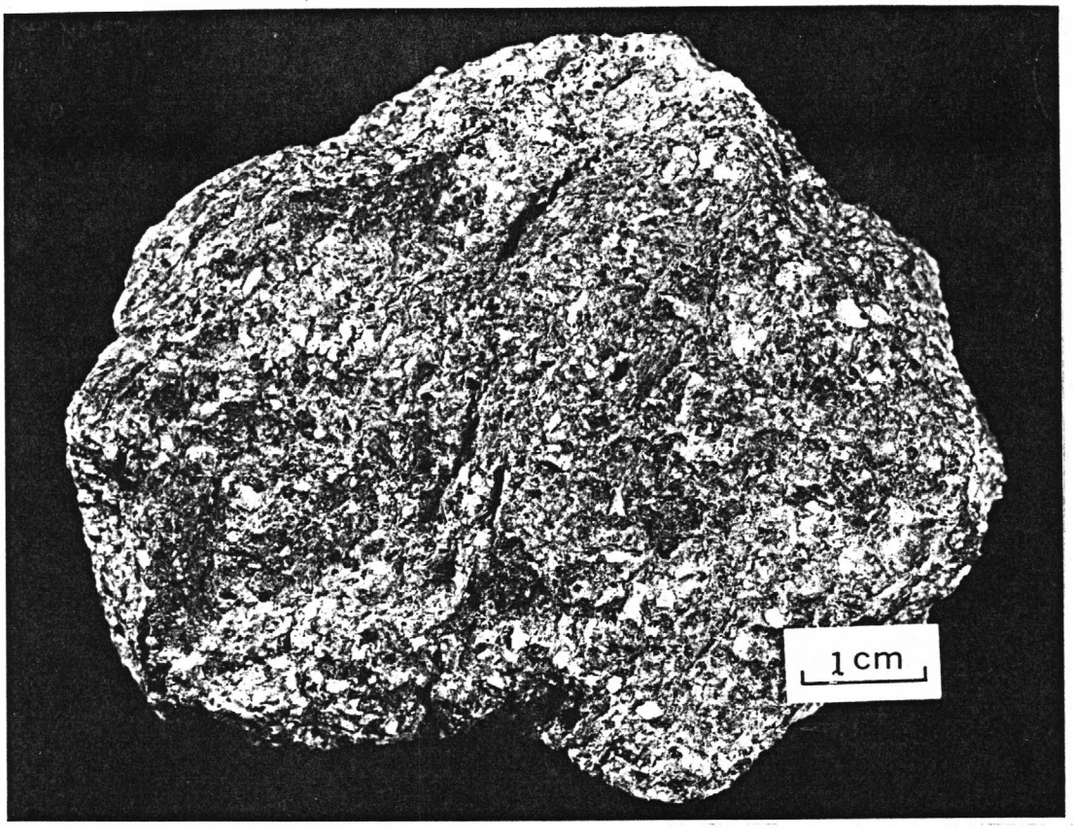
(STEARNS, H. T. 241i)
Pisolitic ash from Tanner's Quarry, Menan Butte. Note bedding plane depressed by fall of quartzite pebble. Natural size. Jefferson County, Idaho. 1921.



(BYERS, F. M., JR. 24)
Hand specimen of dark-gray welded andesitic agglomerate with fragments of medium-gray aphyric and plagioclase basalts. Collected from headwaters of New Jersey Creek. Umnak Island, Aleutian region, Alaska. 1947.



(HAYES, P. T. 51)
Specimen of fine-grained biotite-rich tuff from lower member of Canelo Hills Volcanics. Bisbee County, Arizona. ca. 1968.



(HAYES, P. T. 53)
Specimen of crystal-rich welded tuff from member of Canelo Hills Volcanics. Bisbee County, Arizona. ca. 1968.
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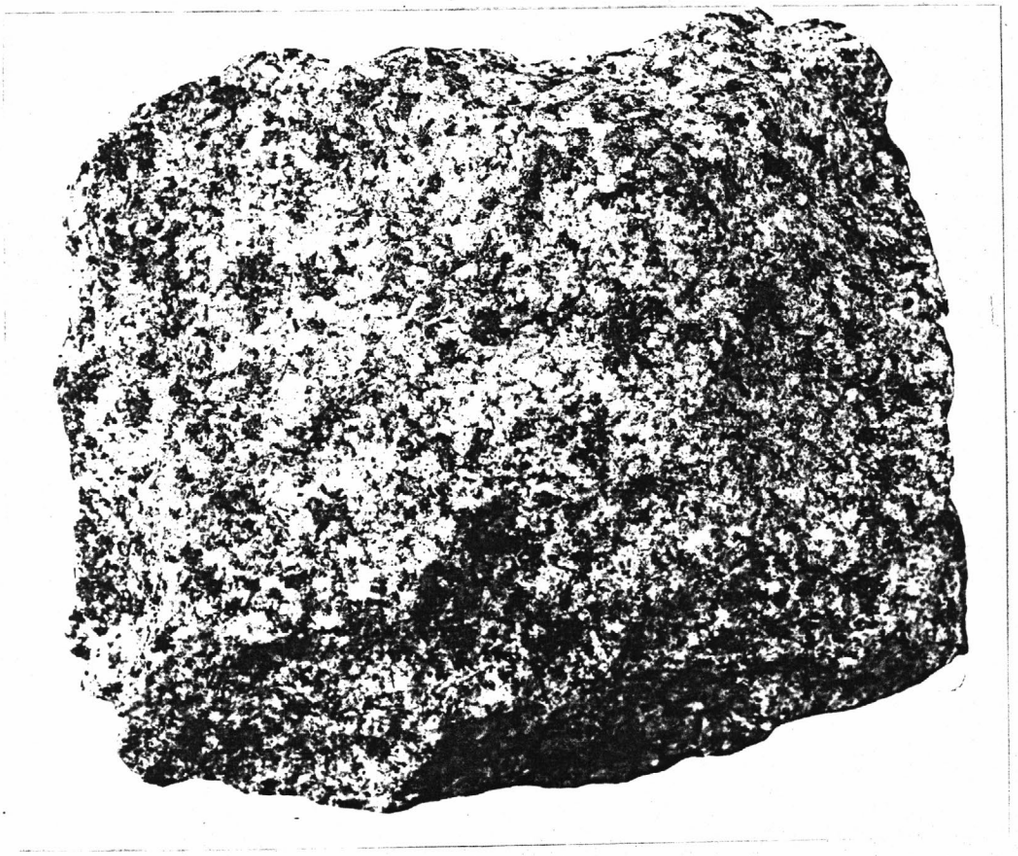
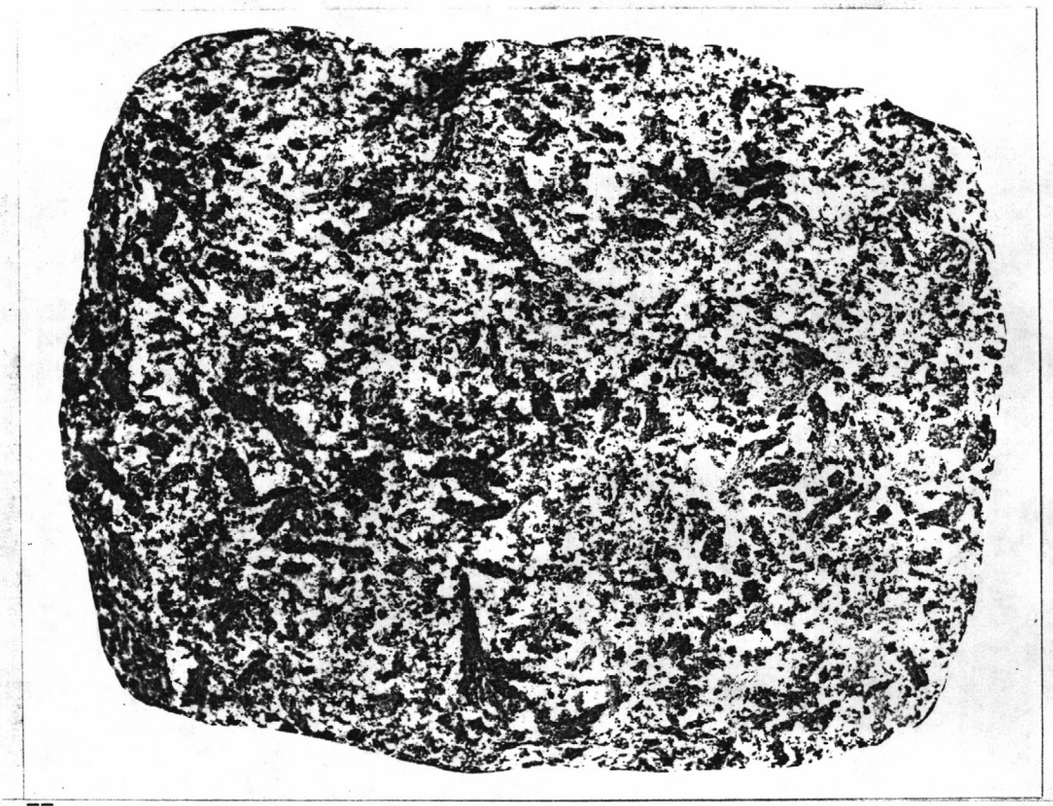
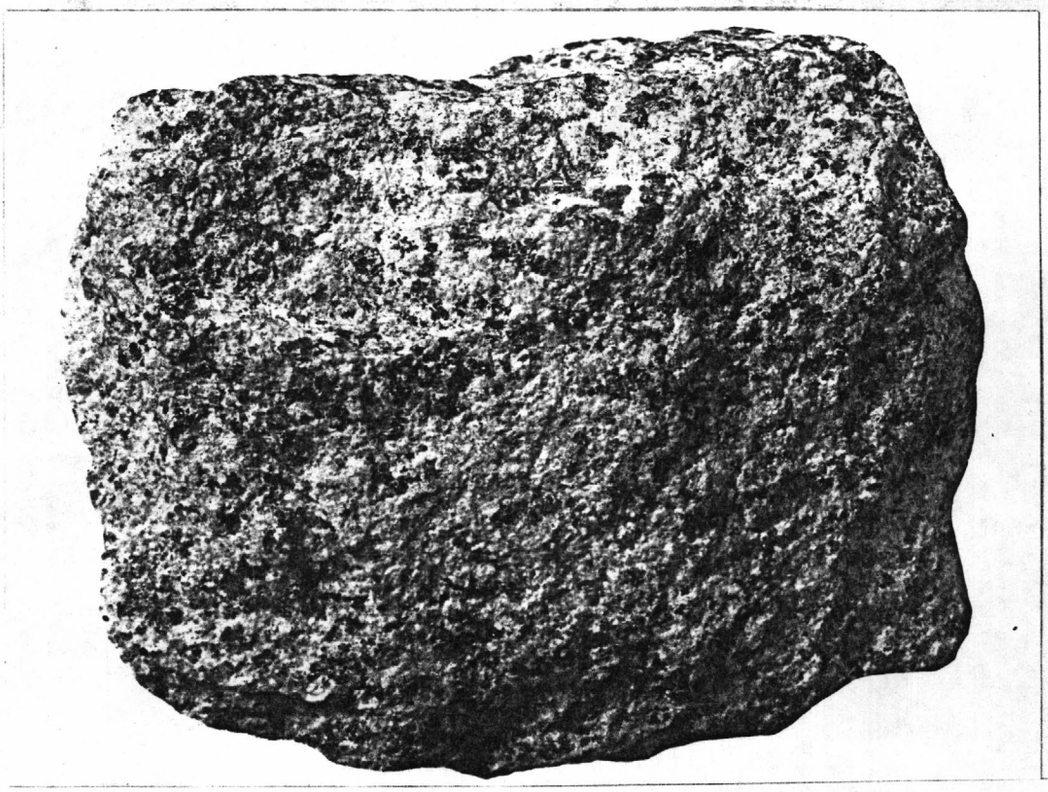


(CALKINS, F. C. 689)
Hornblende gabbro from Oak Flat road on the rockslides. Facies with irregular hornblende. Mariposa County, California. n.d.



(CALKINS, F. C. 704)
Hornblende gabbro, facies with frismatic hornblende. California. n.d.



(CALKINS, F. C. 680)
Mount Clark granite from cirque north of Mount Clark. Mariposa County, California. ca. 1923.



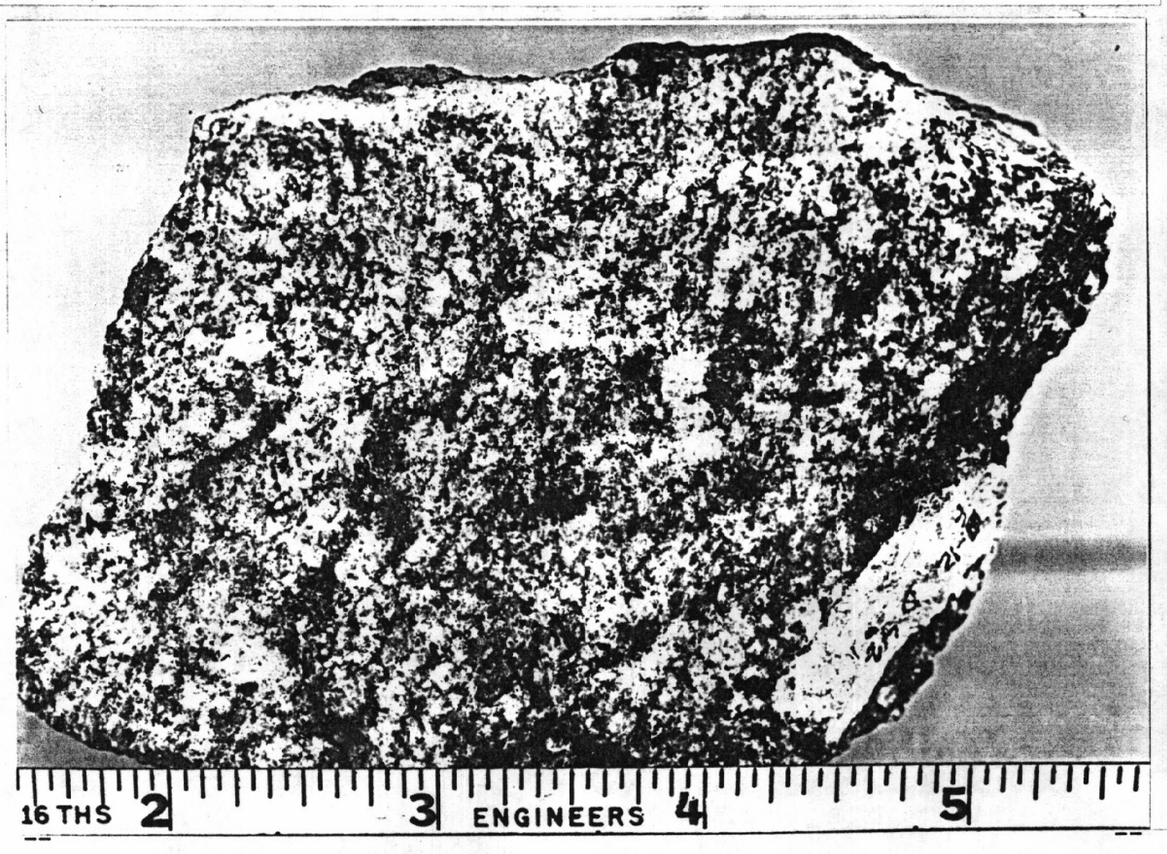
(REEVES, R. G. 12)
Specimen of highly metamorphosed itabirite, showing sharp separation of quartz and hematite into distinct bands. Minas Gerais, Brazil. ca. 1958.



(HANSEN, W. R. 123)
Contorted gneiss, north rim of Black Canyon. Light-colored bands are mostly feldspar and quartz, dark bands are mostly quartz and biotite. Complicated structures such as these are confined to the Precambrian rocks. Black Canyon of the Gunnison National Monument. Colorado. n.d.



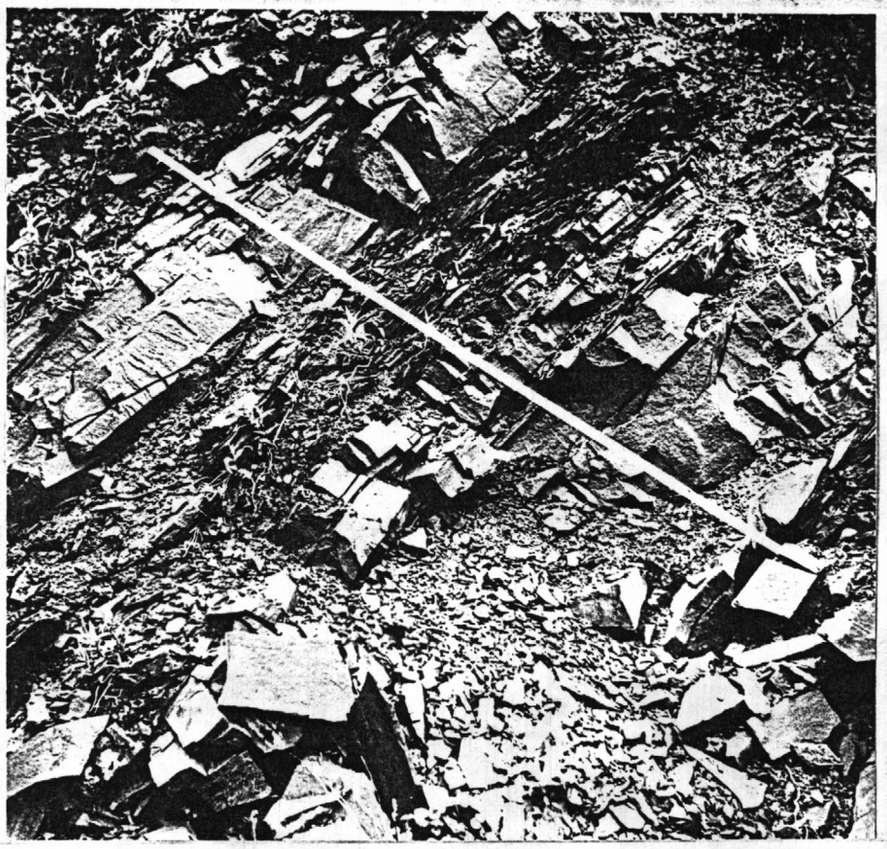
(HADLEY, J. B. 12)
Migmatitic hornblende gneiss. White plagioclase-rich layers intercalated with dark layers of biotite, hornblende, and small plagioclase porphyroblasts. Eastern Great Smoky Mountains. Haywood County, North Carolina. ca. 1950.



(PARKER, R. L. 11)
Orthoclase-quartz-oligoclase gneiss. Foliation is marked by thin irregular layers of biotite and lenticular masses of quartz and feldspar. Ferry County, Washington. ca. 1958.



(KING, P. B. 460)
Specimen of Pigeon Siltstone from outcrop on Norton Creek. Shows characteristic thin light and dark sedimentary lamination. Scale in inches. Sevier County, Tennessee. 1957.



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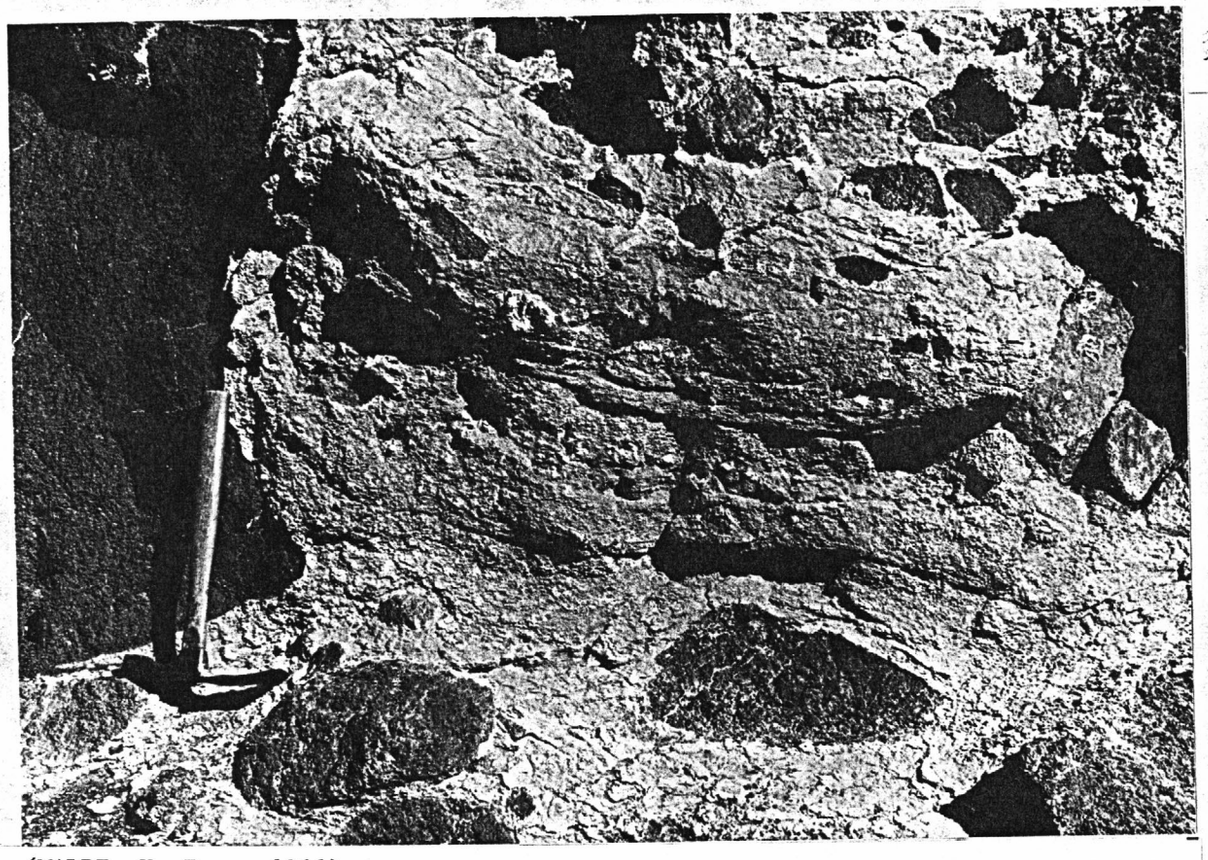
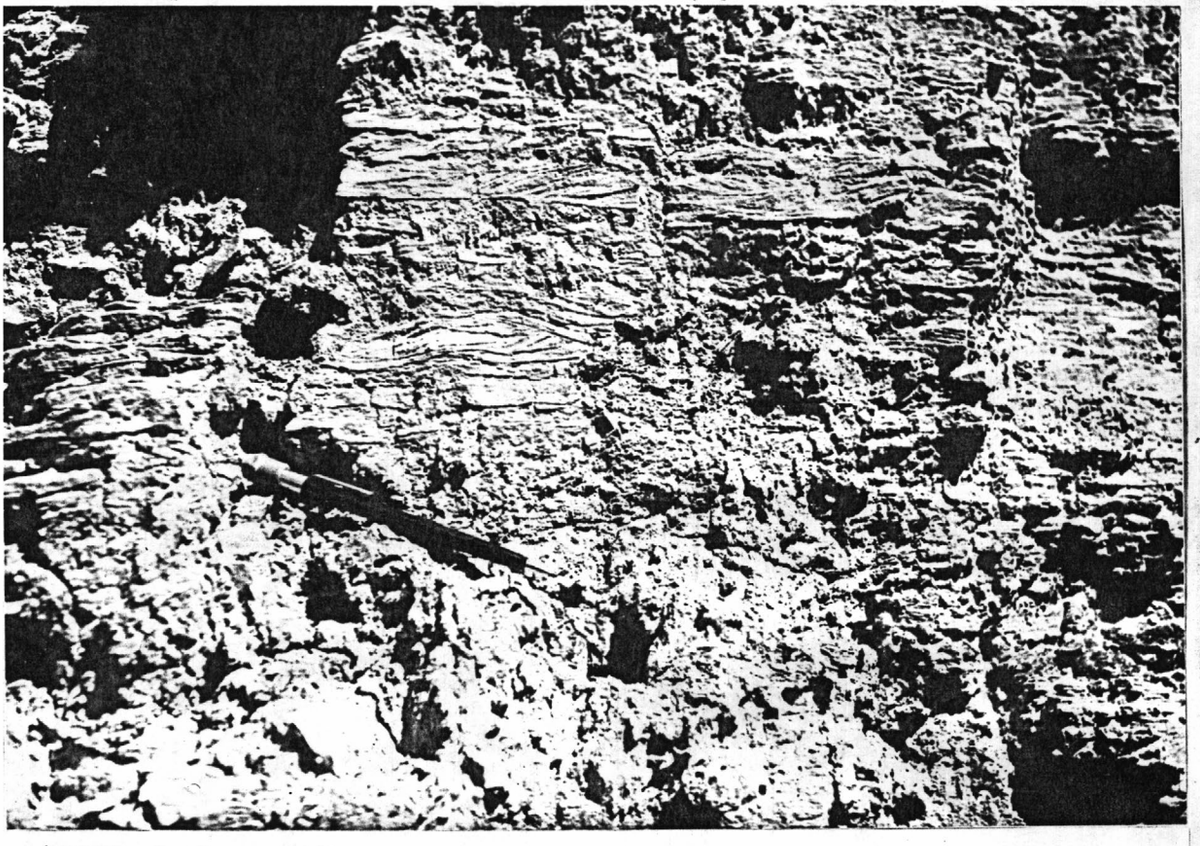
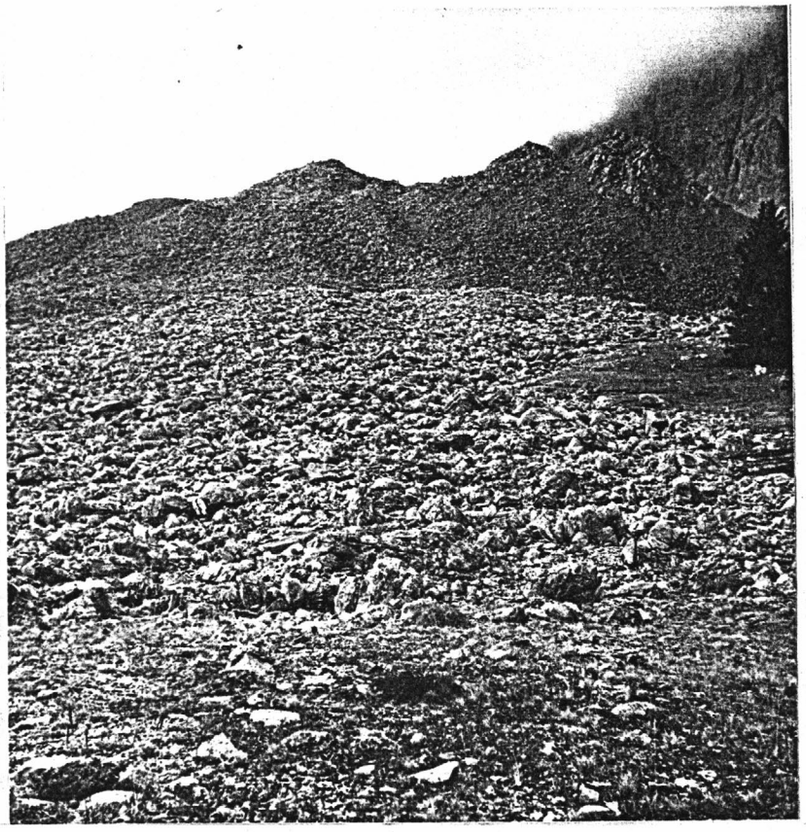
(CAMPBELL, R. H. 2)
Thick-bedded sandstone and interbedded slaty mudstone. Steel measuring tape is extended about 3½ feet. Bedding characteristic of the Ogotoruk Formation. Lisburne district, Northern Alaska region, Alaska. ca. 1959.



(MALDE, H. E. 1011)
Laminated clay, silt and sand in a more or less coherent block of sedimentary material in the debris found below McKinney pillow lava, which seems to have survived as a fragment of Glenns Ferry Formation. Gooding County, Idaho. 1980.



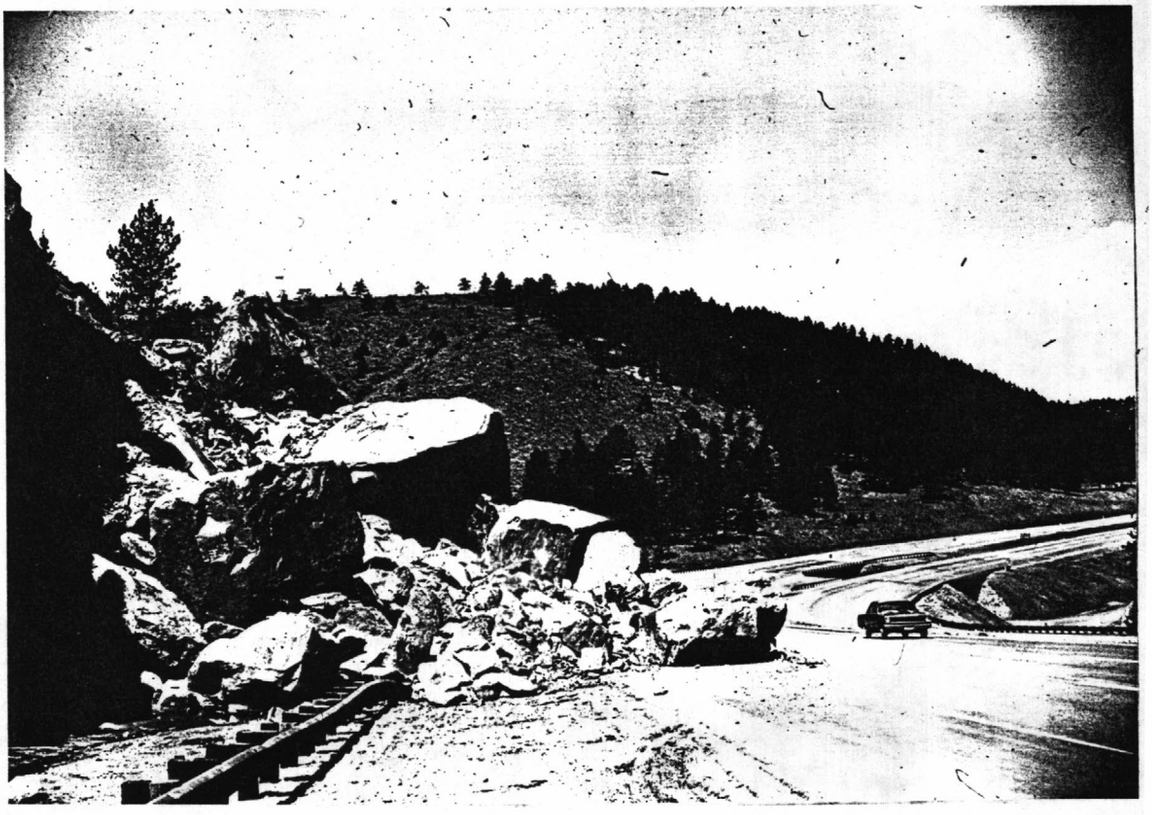
(MCKEE, E. D. 212)
Minor sedimentary structures in Watahomigi Formation, Grand Canyon.
Ripple laminae in siltstone near base of formation at Navajo Falls, Havasu canyon. Grand Canyon National Park. Coconino County, Arizona. n.d.



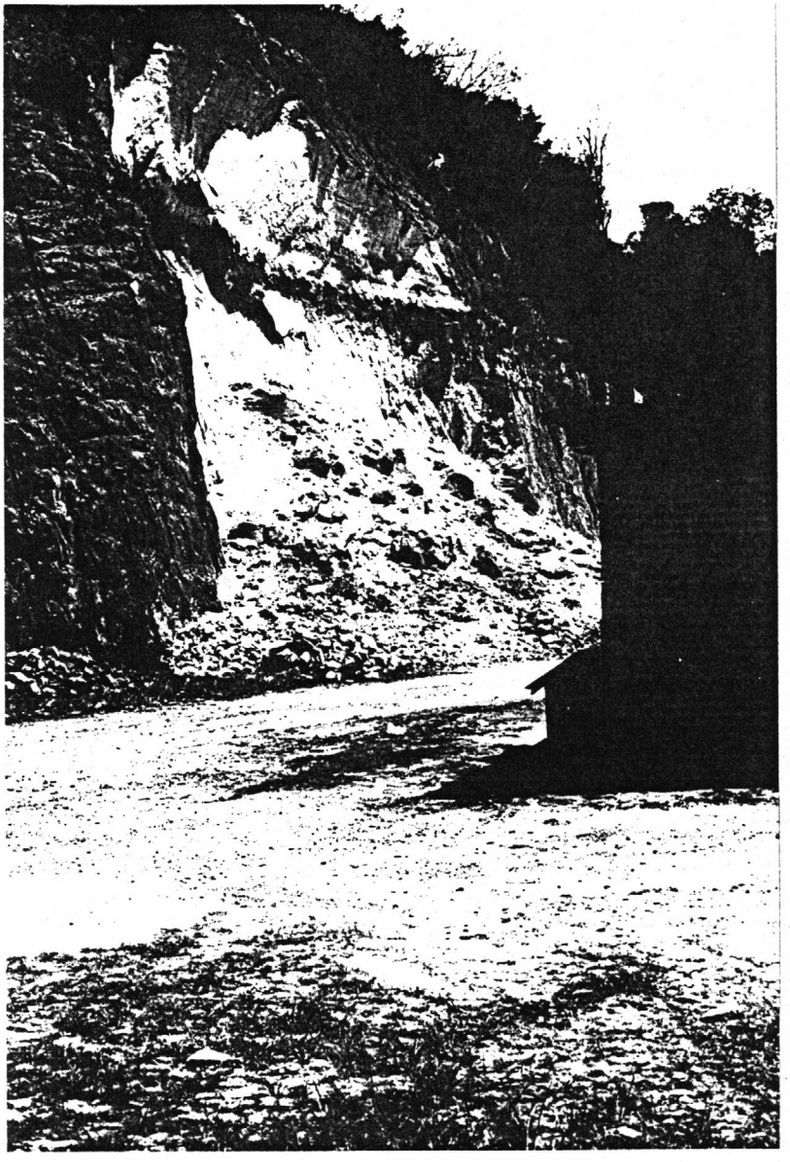
(MUDGE, M. R. 411)
Rockfall avalanche debris in front (east) of Sawtooth Ridge in SE¼ sec. 19, T. 21 N., R. 8 W. Lewis and Clark County, Montana. 1957.



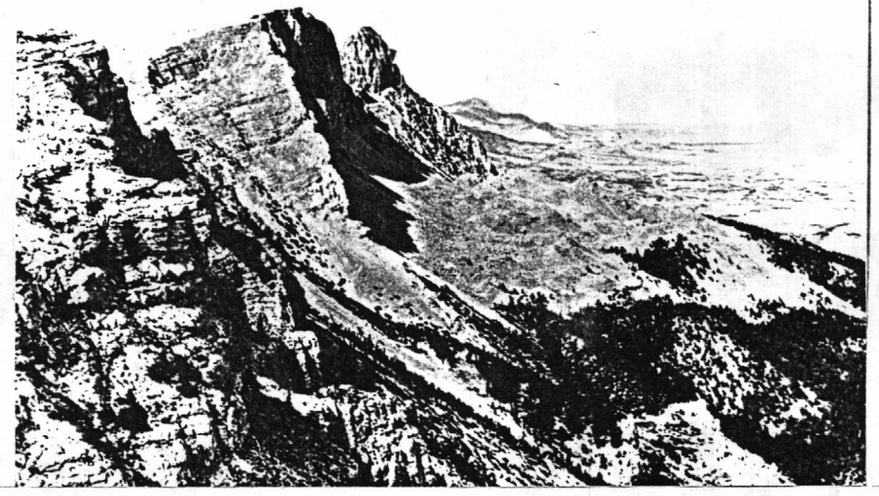
(WITKIND, I. J. 791)
Cambrian strata exposed in south flank of Bacon Rind cirque, showing the general mode of outcrop of the Flathead Sandstone, the Wolsey Shale and the Meagher Limestone. Rockfalls at the base of the Meagher have nearly covered the Wolsey Shale. Gallatin County, Montana. ca. 1960.



(HANSEN. W. R. 174)
Rockfall on eastbound lane of Interstate 70, 2 miles west of El Rancho interchange. Failure was along joints and foliation planes in Precambrian gneiss. Estimated weight of largest boulders exceeded 200 tons. Jefferson County, Colorado. May 8, 1973.



(HARP, E. L. 6)
Typical seismically induced rock fall in pumice deposits along canyon margin near Puente Belize in Guatemala City. Failure is no thicker than 1 to 2 m and is overall concave outward. Guatemala Earthquake. Department of Guatemala, Guatemala. February 1976.



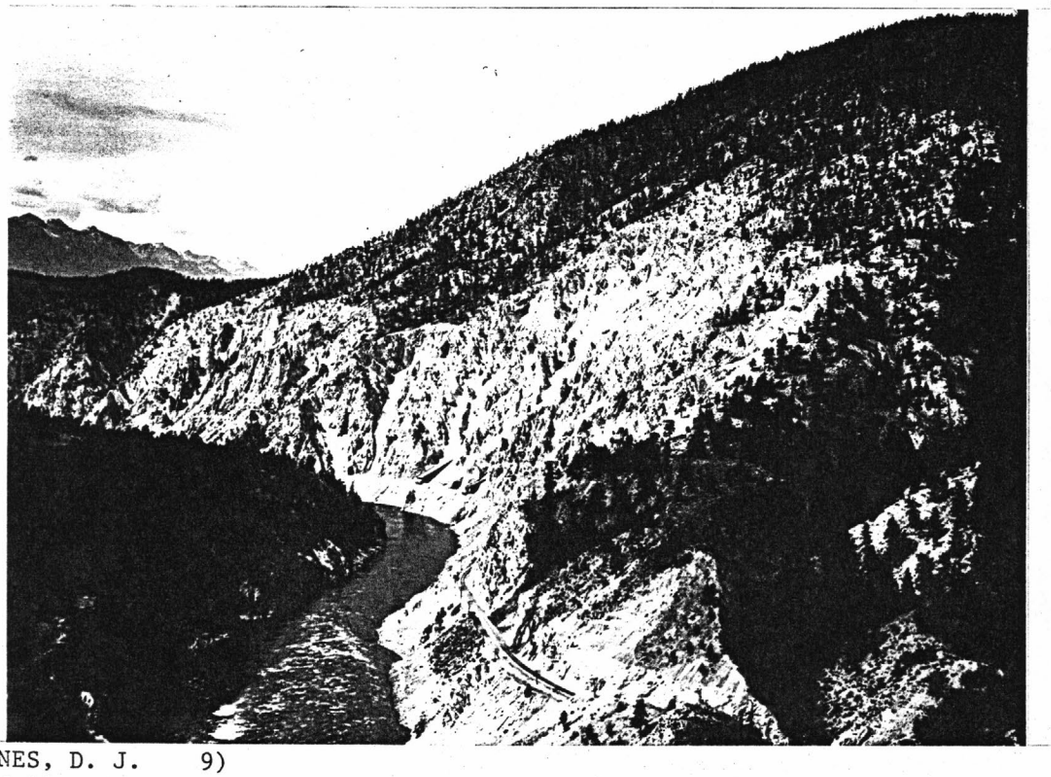
(MUDGE, M. R. 71)
View north of the steep scarp in the northern part of Sawtooth Ridge. East of the scarp the barren area is covered by the youngest deposit. Lewis and Clark County, Montana. 1957.



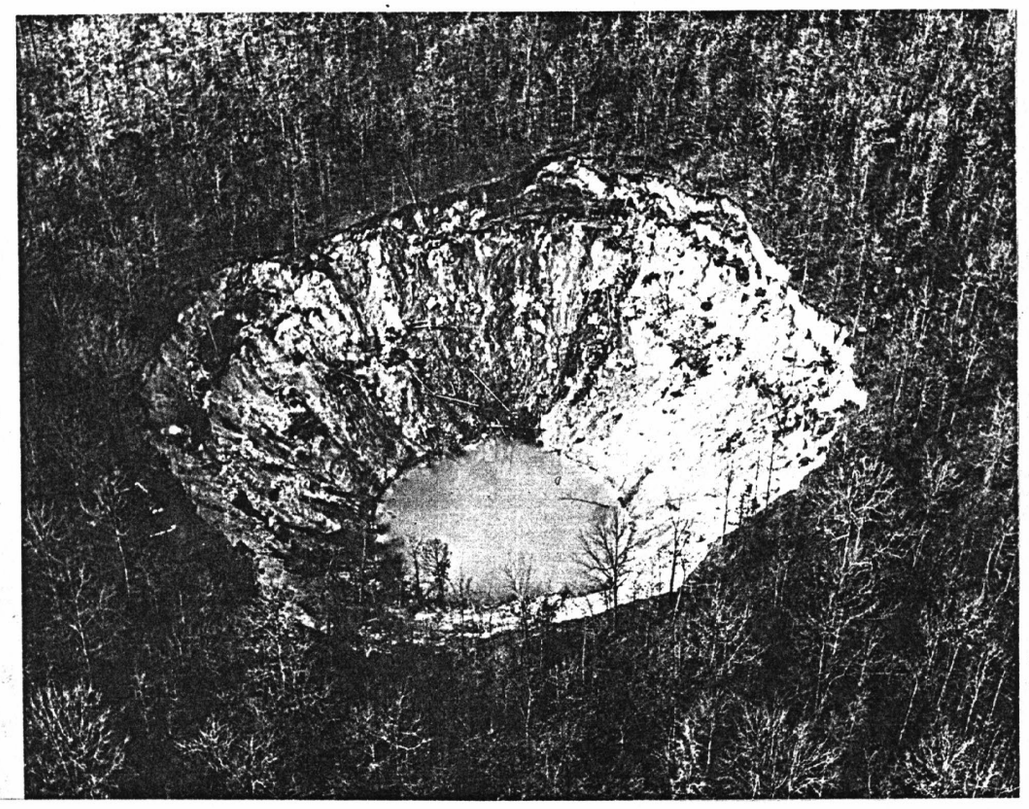
(NILSEN, T. H. 15)
A small rock slide west of Pleasonton. Note that the sliding has taken place along the bedding planes of the sandstone. Alameda County, California. 1971.



(ALASKA EARTHQUAKE 239)
Rockslide avalanche on Sherman Glacier. The avalanche was formed by the collapse of Shattered Peak in the middle distance. The debris shows flowlines and terminal digitate lobes. Cordova district, Alaska Gulf region, Alaska. August 24, 1964.



(VARNES, D. J. 9)
Rockfall and rockslide near Skihist, British Columbia. Note the bare, active slopes, the closely-spaced jointing of the rocks, the rock chutes and absence of water. Canada. n.d.



(U. S. GEOLOGICAL SURVEY. 140)
Possibly the nation's largest recent sinkhole - the "December Giant", measuring 425 feet long, 350 feet wide and 150 feet deep - formed in Shelby County, Alabama. December 2, 1972.

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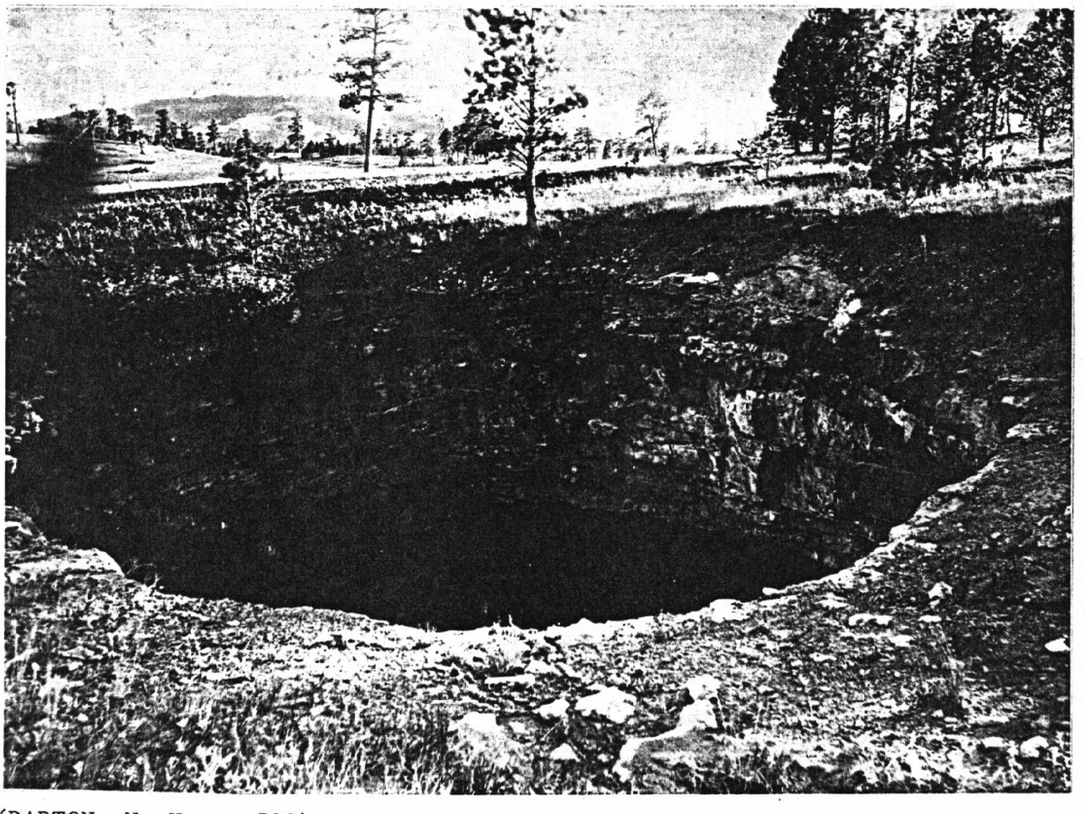

(DARTON, N. H. 593)
Sinkhole in Minnekahta limestone, east-northeast of Cambria. Weston County, Wyoming. 1899.

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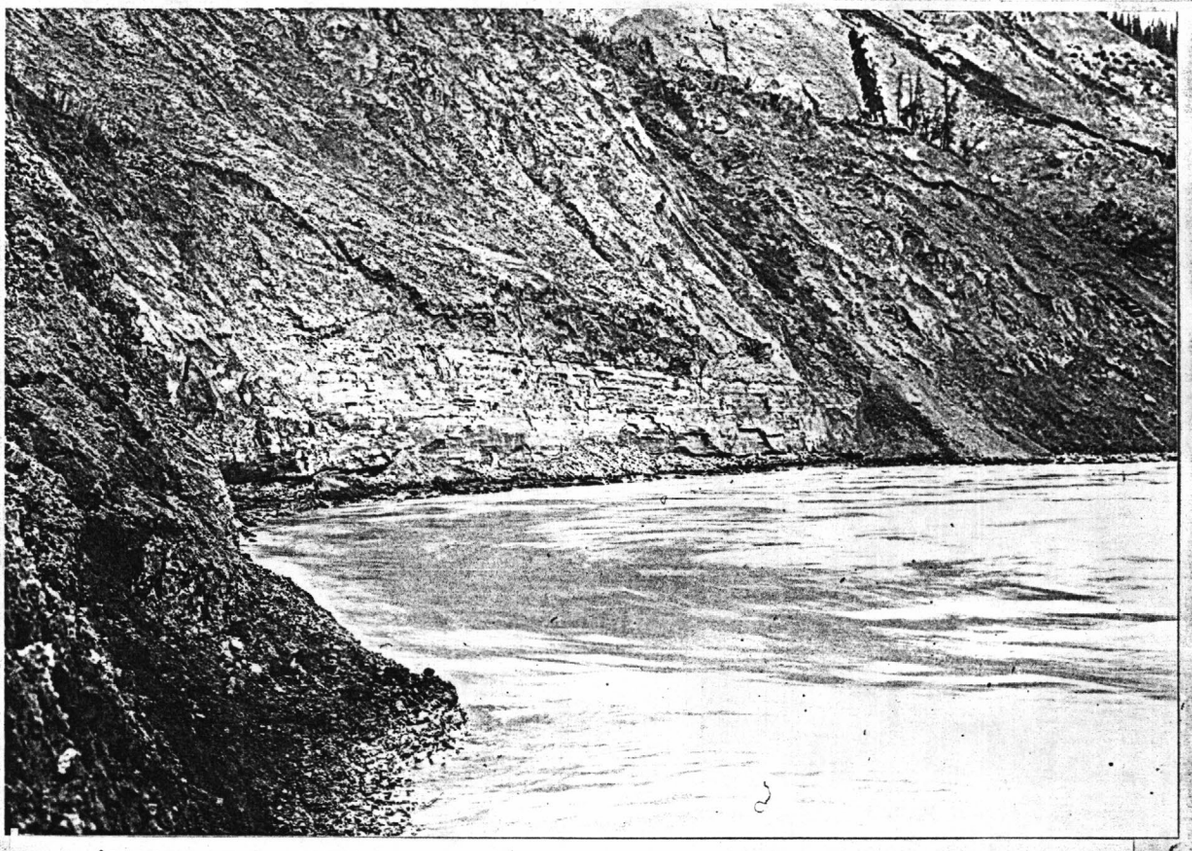
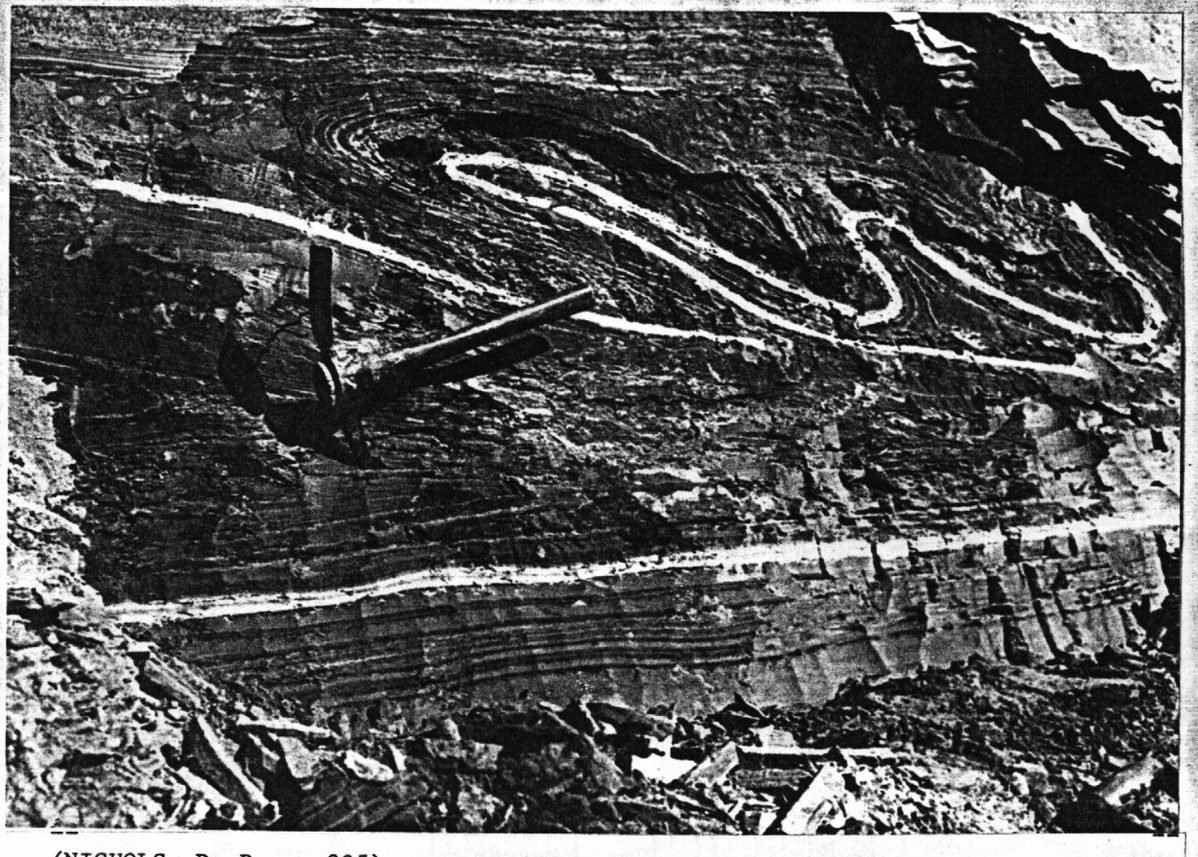


(CHAPIN, T. 224)
Silt bluffs at base of cliffs, Tazlina River. Klutina district, Copper River region, Alaska. 1914.



(NICHOLS, D. R. 205)
Ash beds included in varved silts and clays in 125 foot bluff on east side of road at mile 75 Richardson Highway. Ash points up high contortion of beds within undisturbed horizontal varves. Copper River region, Alaska. 1954.

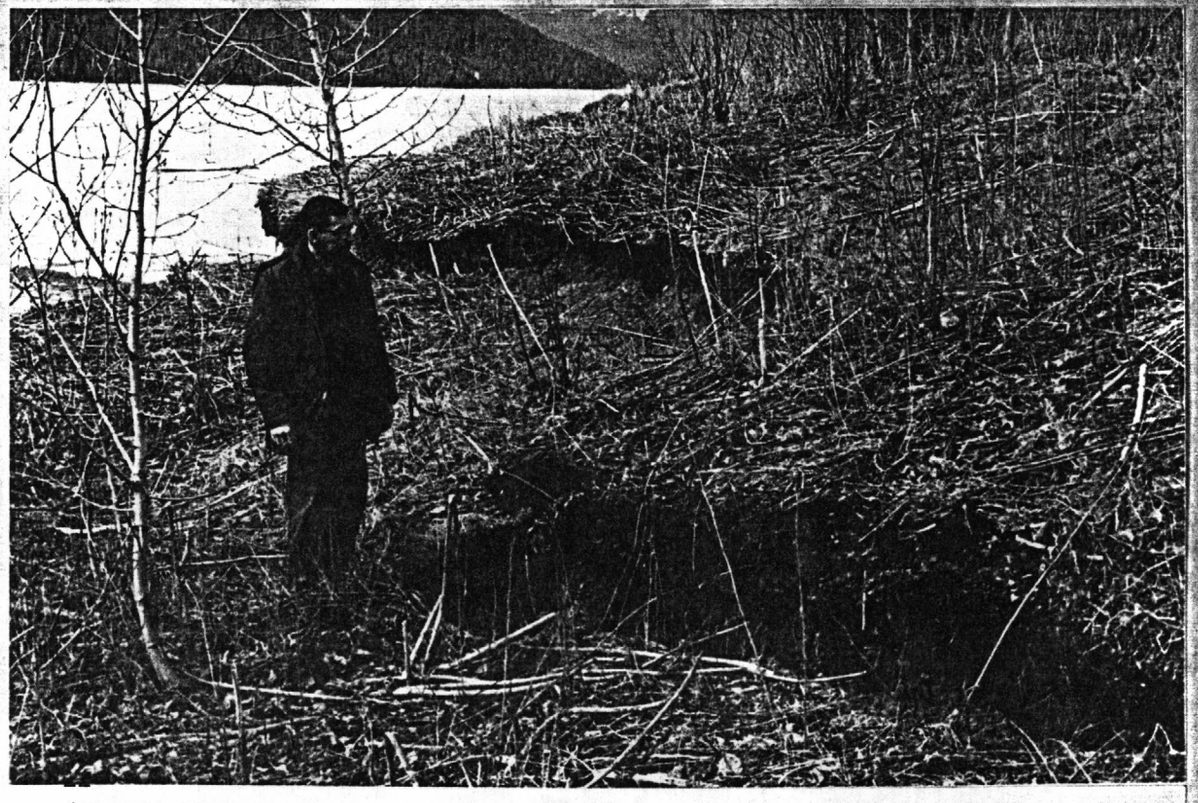
SILT - SLUMP



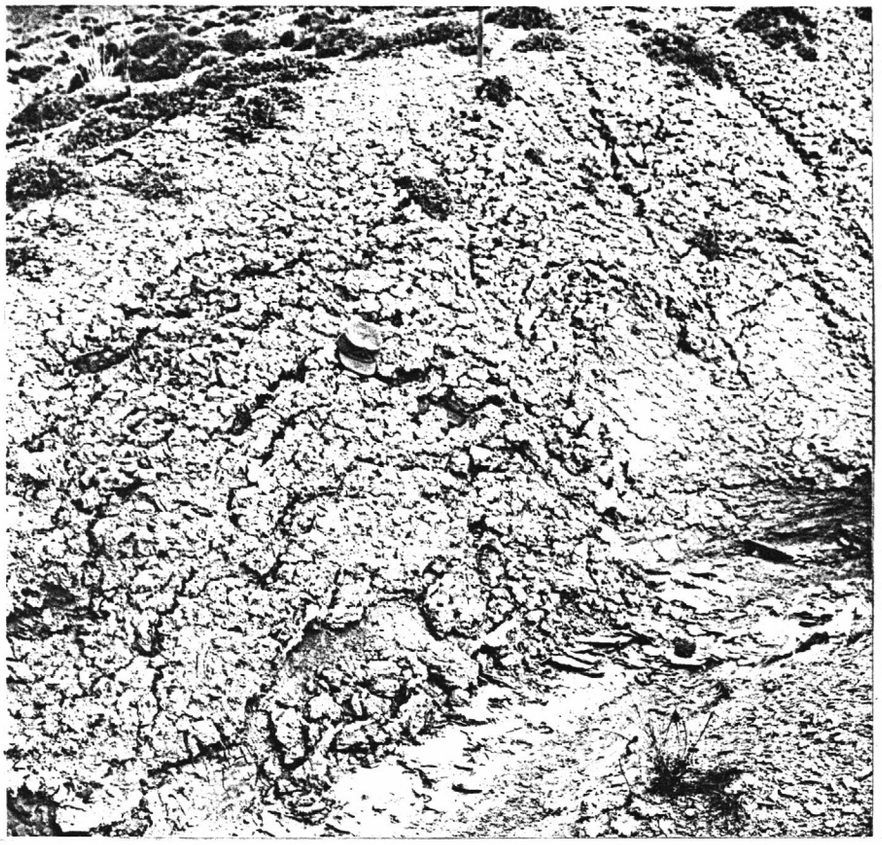
(WILLIAMS, J. R. 672)
Non-stratified silty gravel which is crudely stratified at base and overlain by silt, outwash till, outwash and till north bank Nelchina River. Klutina district, Copper River region, Alaska. n.d.



(EARTHQUAKE INFORMATION BULLETIN 3)
Spruce forest killed by inundation and burial by intertidal silt. More than 1.5 meters of silt has accumulated at this location since 1964. Portage Wells district, Alaska Gulf region, Alaska. n.d.



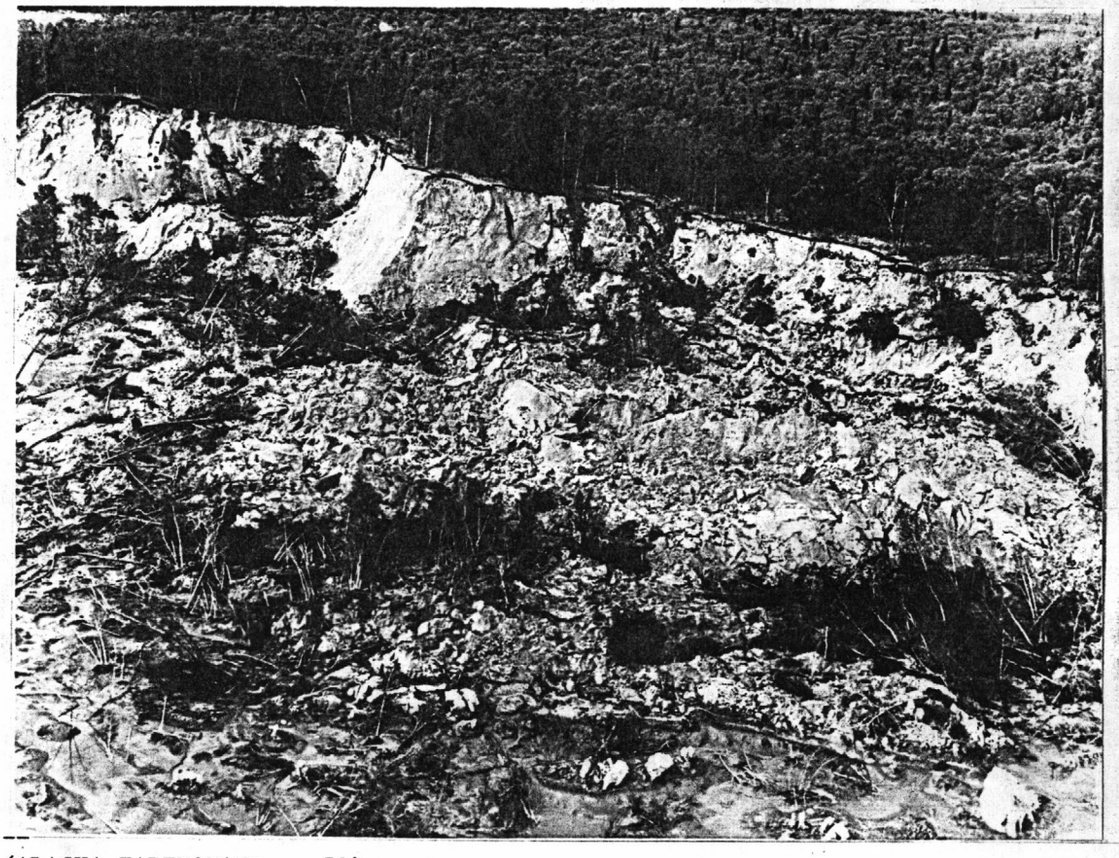
(ALASKA EARTHQUAKE 298)
Slump block having some rotation and horizontal separation at the edge of Rocky Creek delta. Tustumena district, Cook Inlet region, Alaska. n.d.



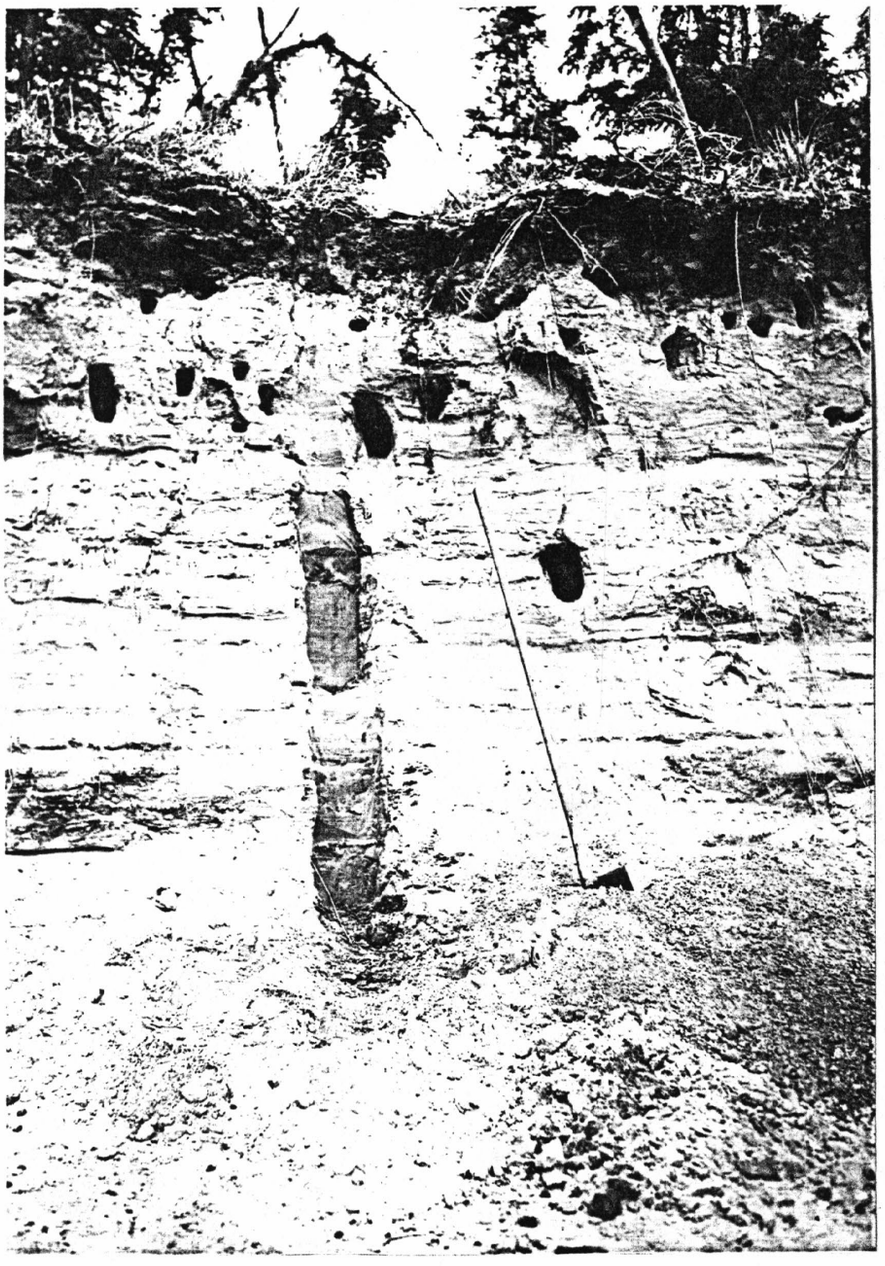
(LUSBY, G. C. 3)
Surficial mantle slumping into channel. Note the crescent-shaped slippage pattern and the material previously removed. Delta County, Colorado. ca. 1964.



(CRANDELL, D. R. 25)
Slump in Verendrye member of the Pierre shale in NE¼ SE¼ sec. 34, T. 4 N., R. 29 E. Width of the slump is 450 feet. Stanley County, South Dakota. 1950.



(ALASKA EARTHQUAKE 59)
Rotational slump near Sleeper Landing Strip on the west side of Knik Arm opposite Point. At its foot the slump passed into an earthflow. Tidewater in foreground. Scarp to left of upper center is about 80 feet high. Cook Inlet region, Alaska. 1964.



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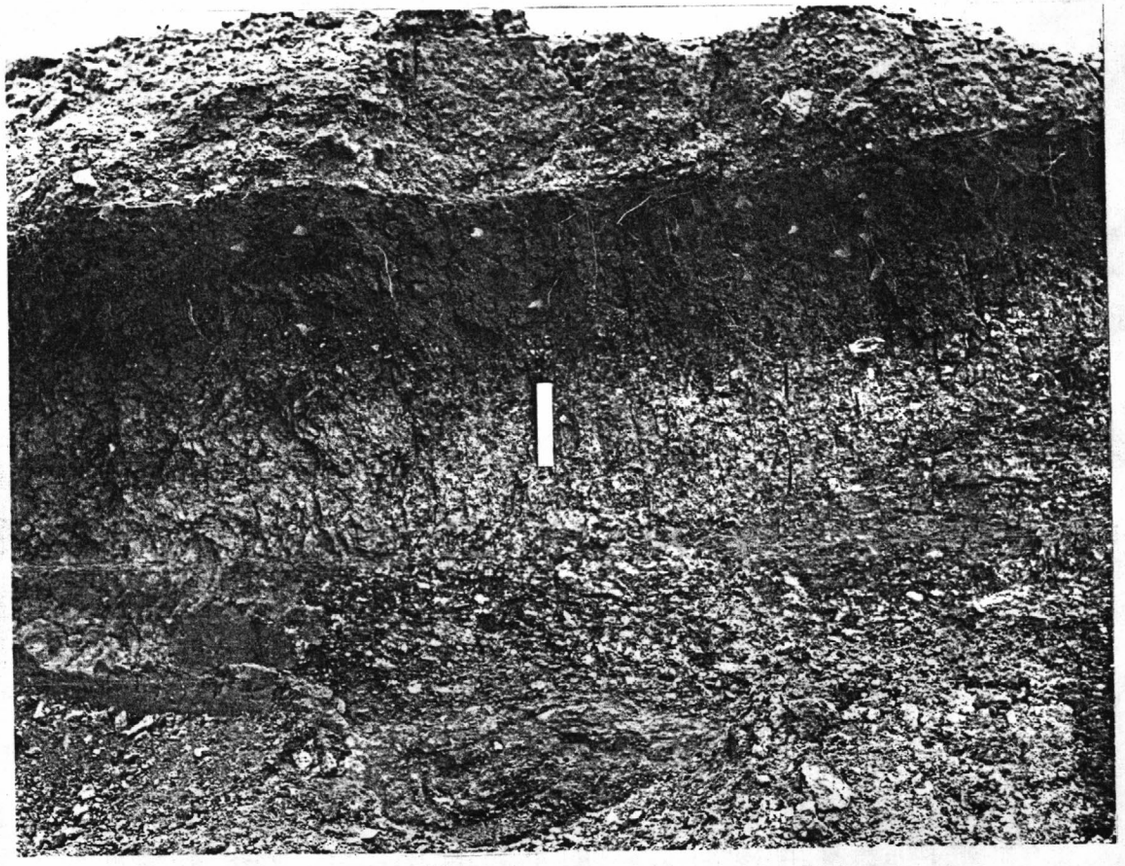
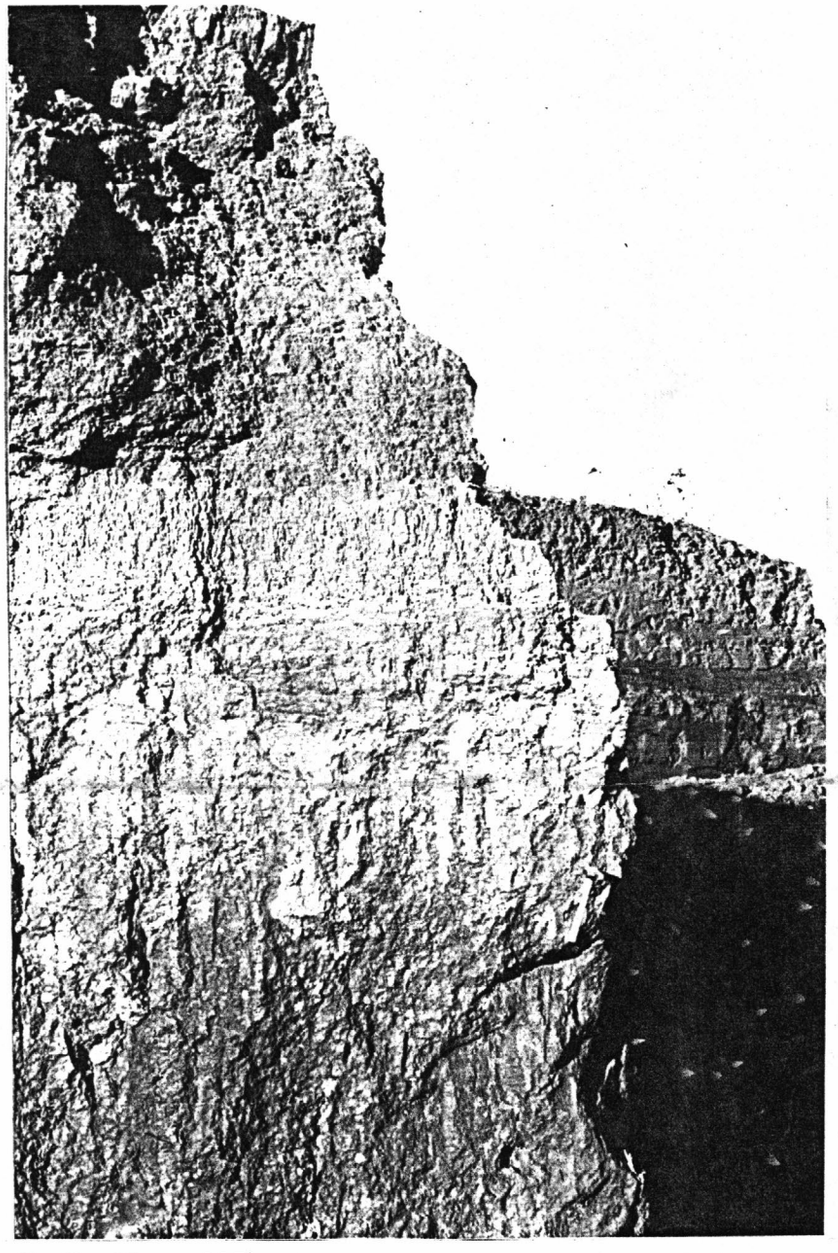
(WILLIAMS, J. R. 8)
North bank of Yukon River about 35 miles upstream from Fort Yukon, showing well developed Subarctic Brown forest soil in silt. Yukon Flats district, Yukon region, Alaska. July 17, 1949.



(CRANDELL, D. R. 6)
Soil profile developed on alluvium of probable Yarmouth age athe Stroup gravel pit. Top of 6-inch ruler is at base of leached horizon. Light-colored material above leached horizon is spoil. South Dakota. ca. 1950.



(DORR, J. V. N. II 317)
Laterization profile, the uppermost zone is chemical canga, followed by highly aluminous and ferruginous hard canga; 1-3 m thick commercial bauxite (hammer). Mutuca bauxite mine. Minas Geras, Brazil. ca. 1956.
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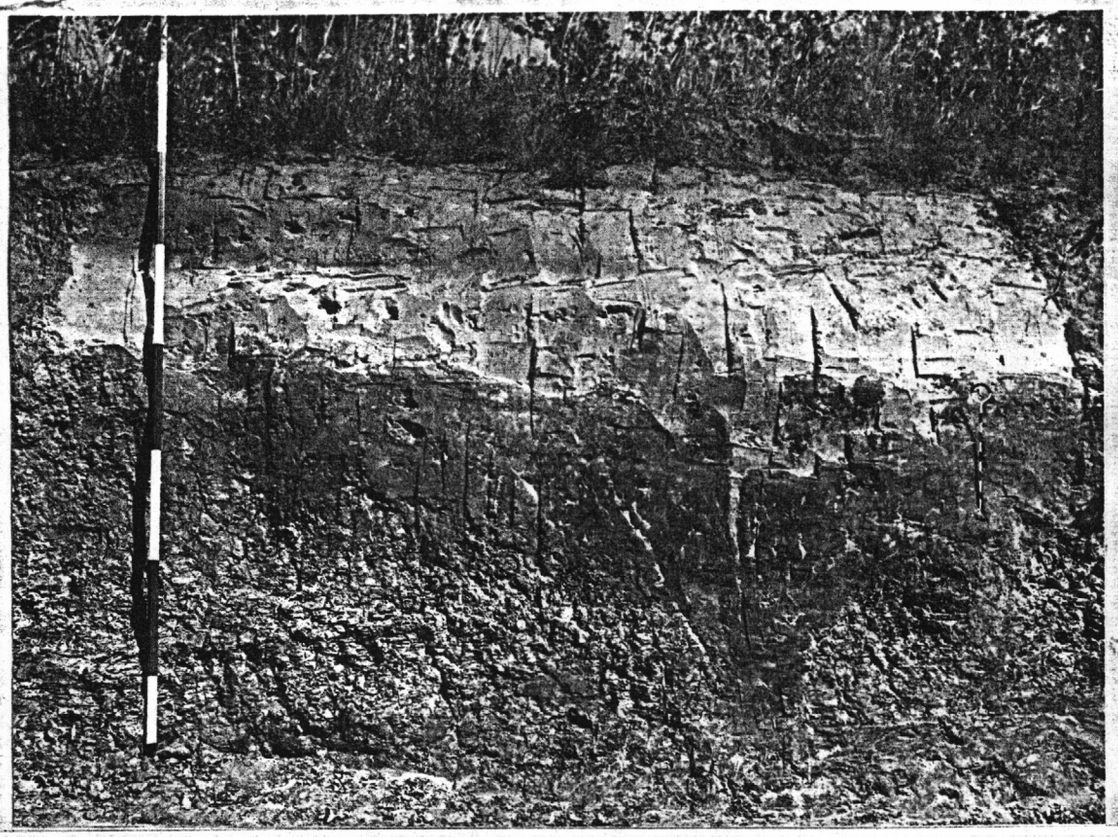
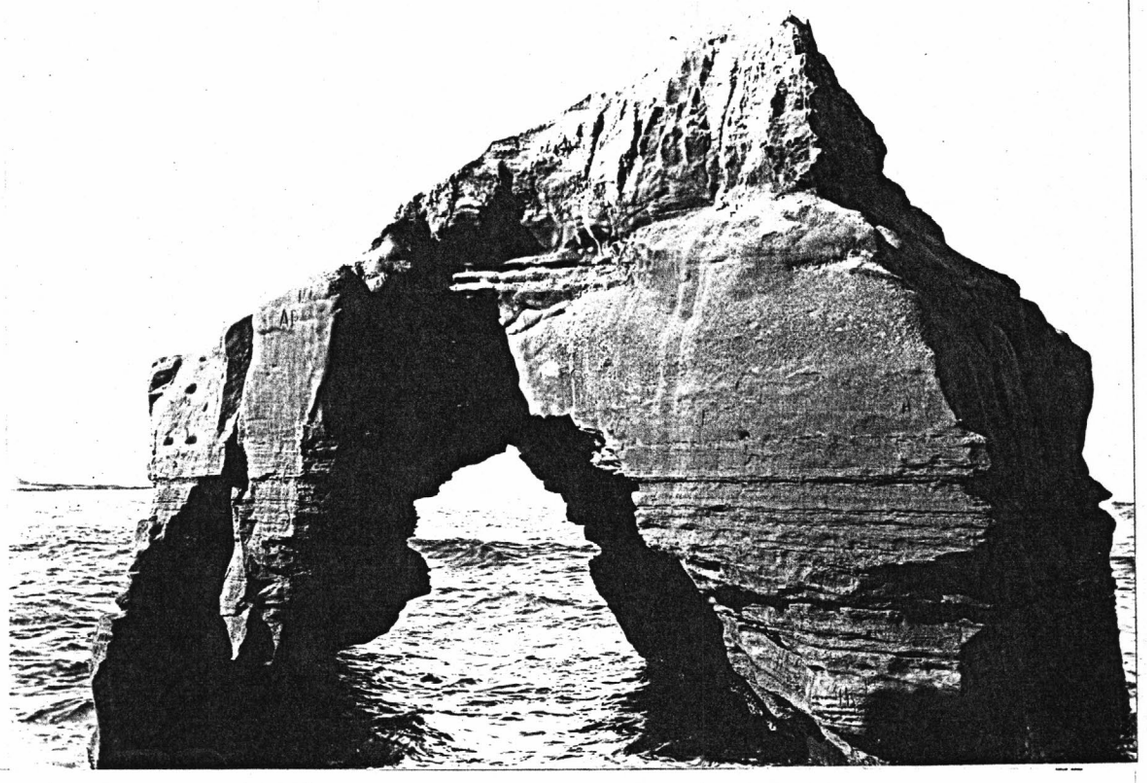


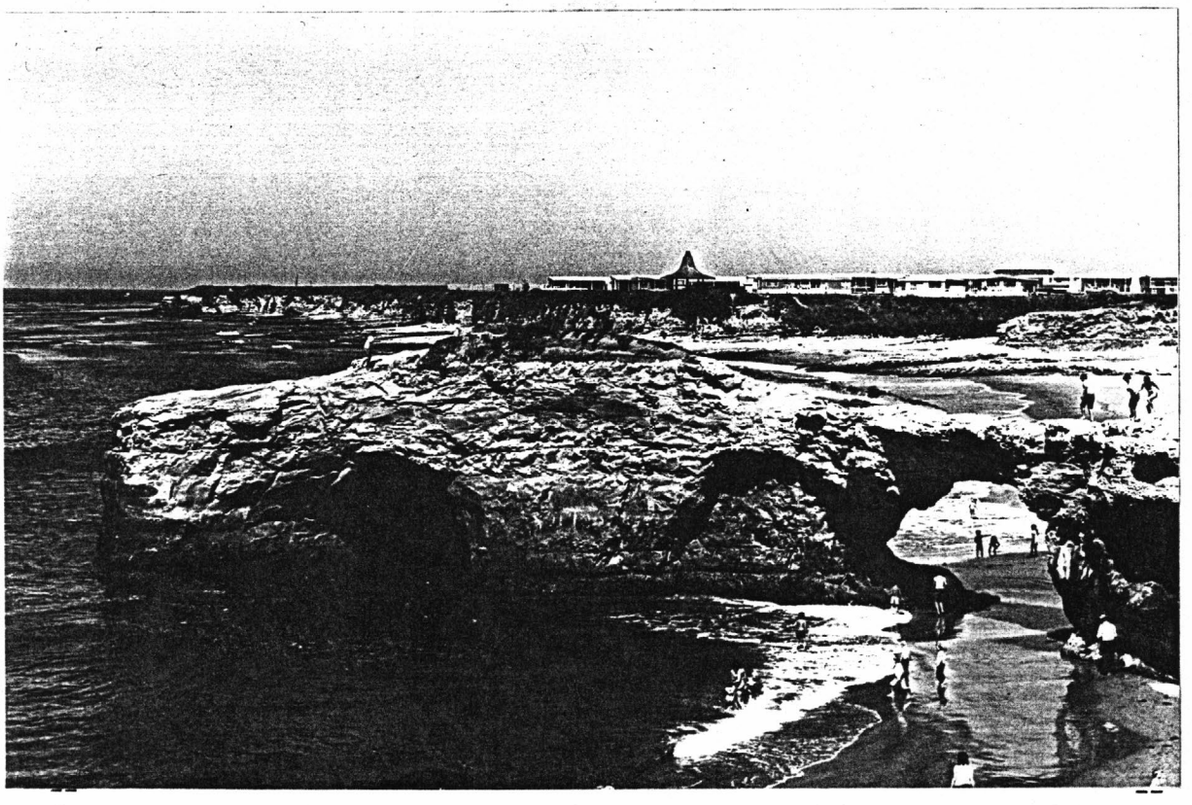
(MALDE, H. E. 14)
Soil profile at northwest corner of pit at station 101. Ladson quadrangle. South Carolina. April 18, 1953.



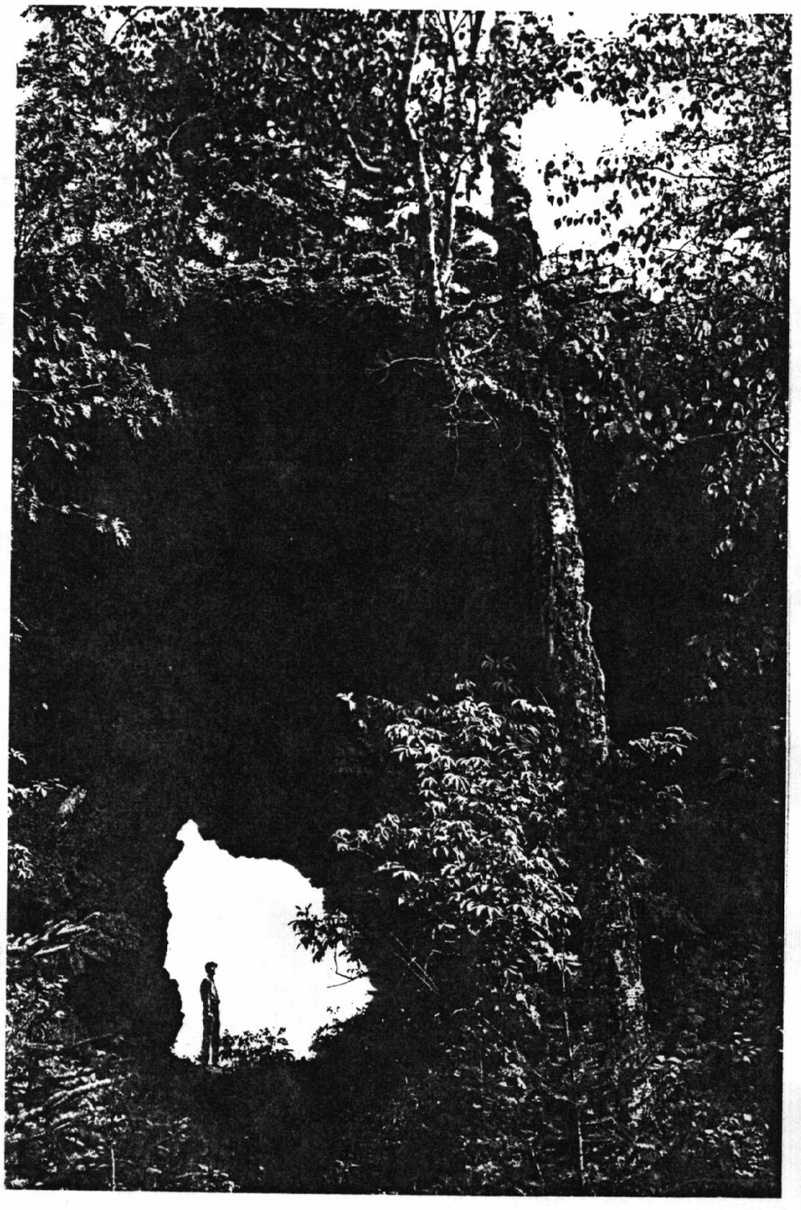
(VAUGHN, T. W. 824)
Spit north end of Loggerhead Key; horns recurved toward east by swell from north 60° west. Florida. May 25, 1913.



(ARNOLD, R. 218)
Cathdral Rock, Eocene sandstone. La Jolla. San Diego County, California.
September 24, 1905.

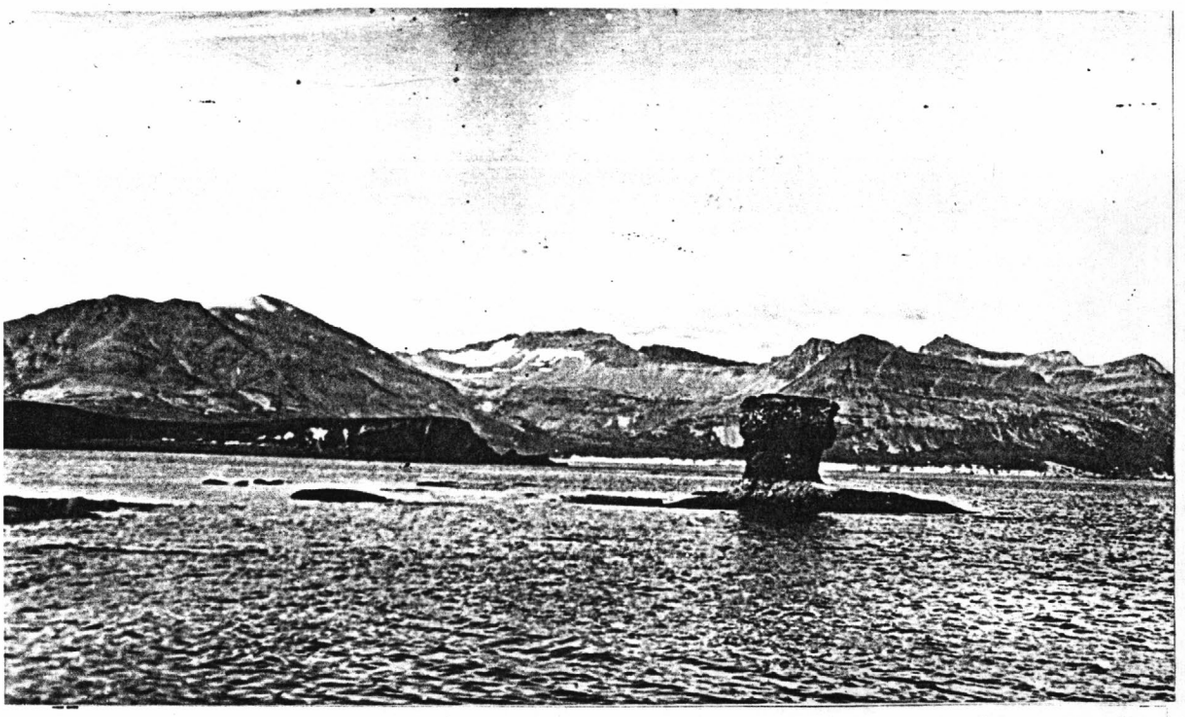


(CLARK, J. C. 11)
Santa Cruz Mudstone capped by marine terrace sand at Natural Bridges Beach State Park near Santa Cruz. View west toward lowest emergent marine terrace.
Santa Cruz County, California. ca. 1963.

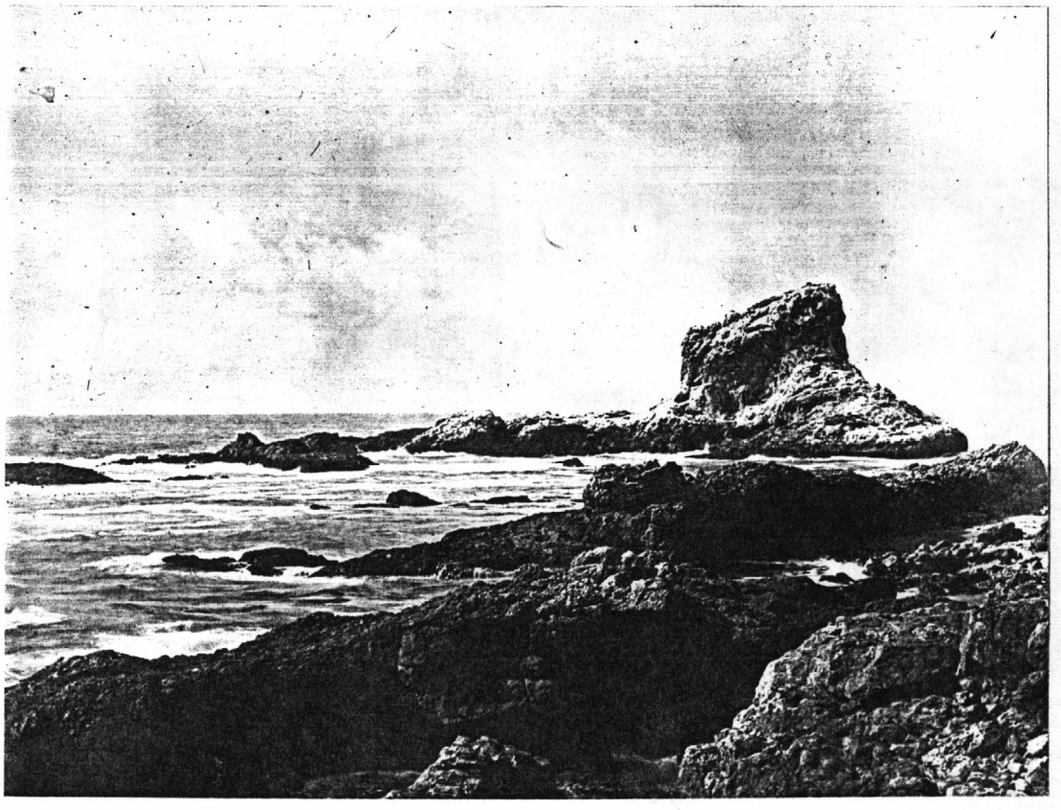


(HUBER, N. K. 8)
Wave-cut arch on Amygdaloid Island. Isle Royale National Park. Keweenaw County, Michigan. ca. 1971.

(STEARNS, H. T. 301)
Double bridge Kalapana Coast. Hawaii. 1924.



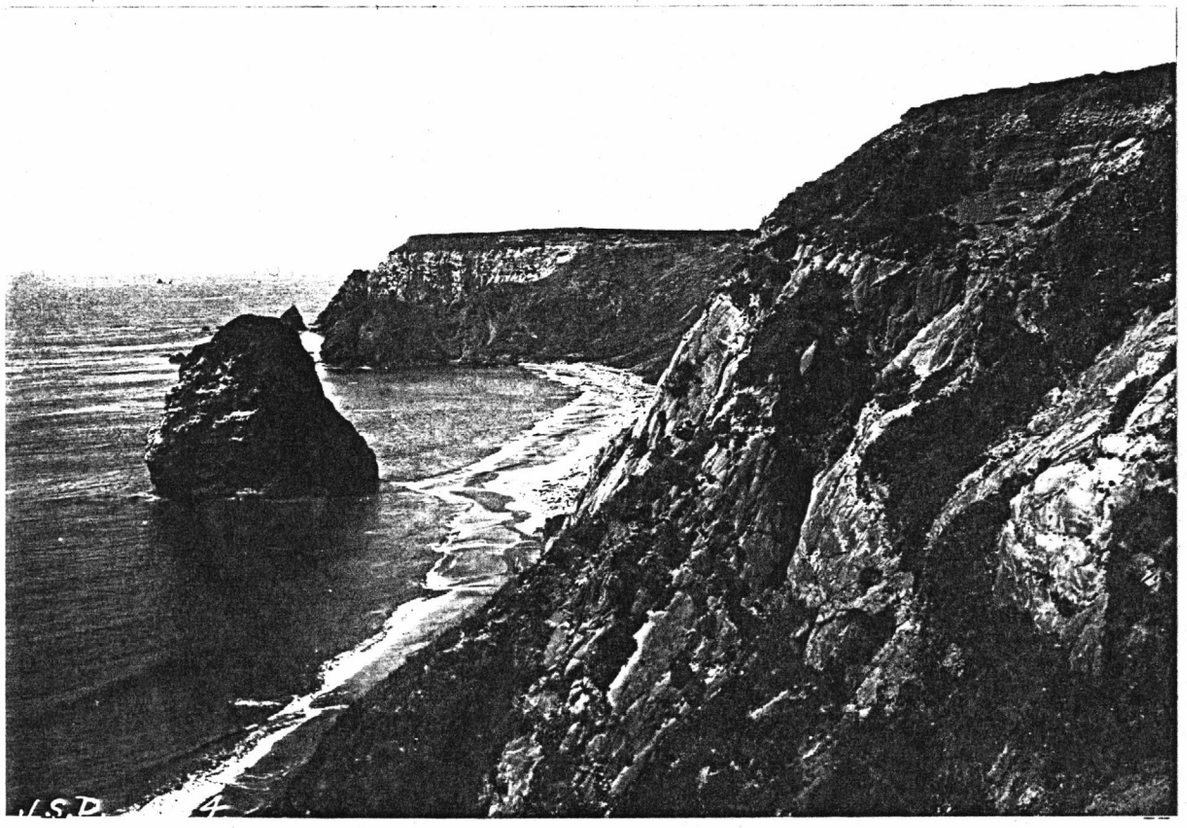
(KELLUM, L. B. 177)
Stack with Coal Point to left and Cape Igvak to right. Kanatak district, Southwestern Alaska region, Alaska. August 20, 1945.



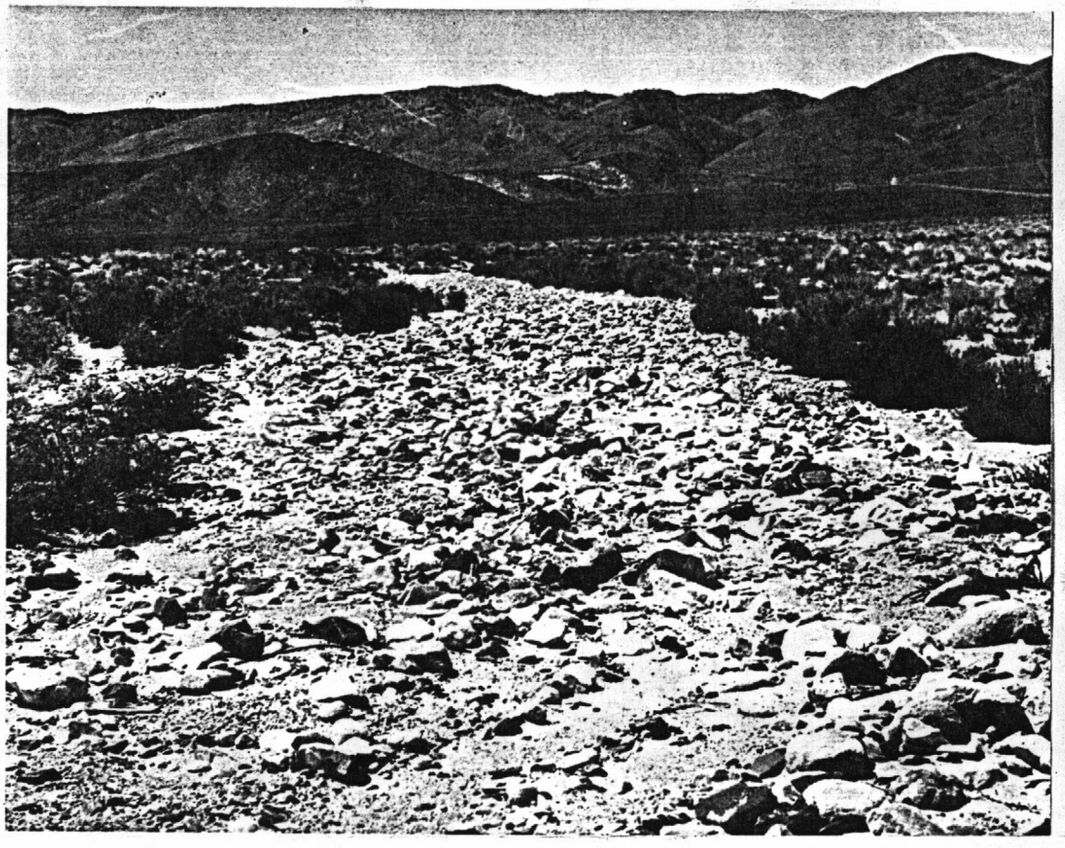
(WILLIS, B. 116)
Piedras Blancas, a Miocene outcrop. San Simeon. San Luis Obispo County, California. 1898.



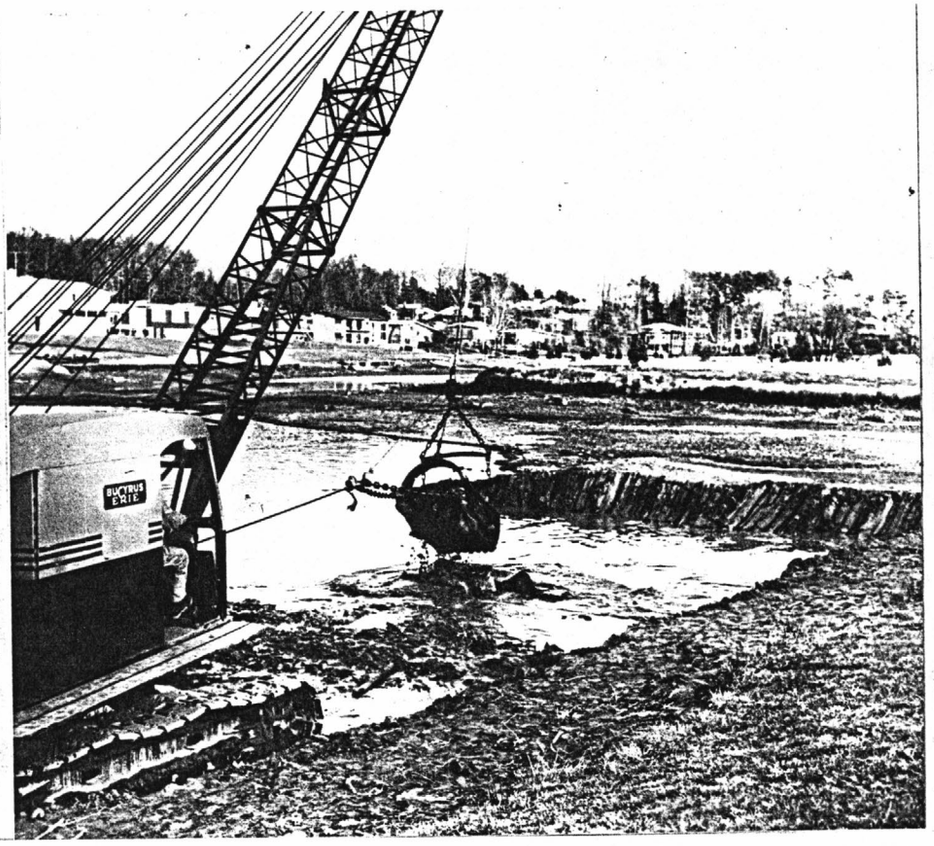
(CLOUD, P. E., JR. 34)
Emerged sea stacks of massive Mariana limestone on 20- to 40 foot bench north of Talofofo beach. Solution notch near 40-foot level. Saipan, Mariana Islands. n.d.



(DILLER, J. S. 434)
Fin Rock and Cape Blanco. Curry County, Oregon. n.d.



(LUSTIG, L. K. 39)
Bankfull deposition near station 318 in the Antelope Springs Channel. This fresh deposit is slightly above the general surface level. It represents sedimentation at the lower limits of the fan that tends to build outward into the valley proper. Inyo County, California. ca. 1961.



(RICKERT, D. A. 4)
Sediment removal is expensive; at Lake Barcroft, over one-third of a million dollars was spent in just 10 years. Drag-line at work. Fairfax County, Virginia. n.d.



(RICKERT, D. A. 2)
Sediment accumulation, the most common proble of real-estate lakes, can turn lakes into mudflats. United States. n.d.
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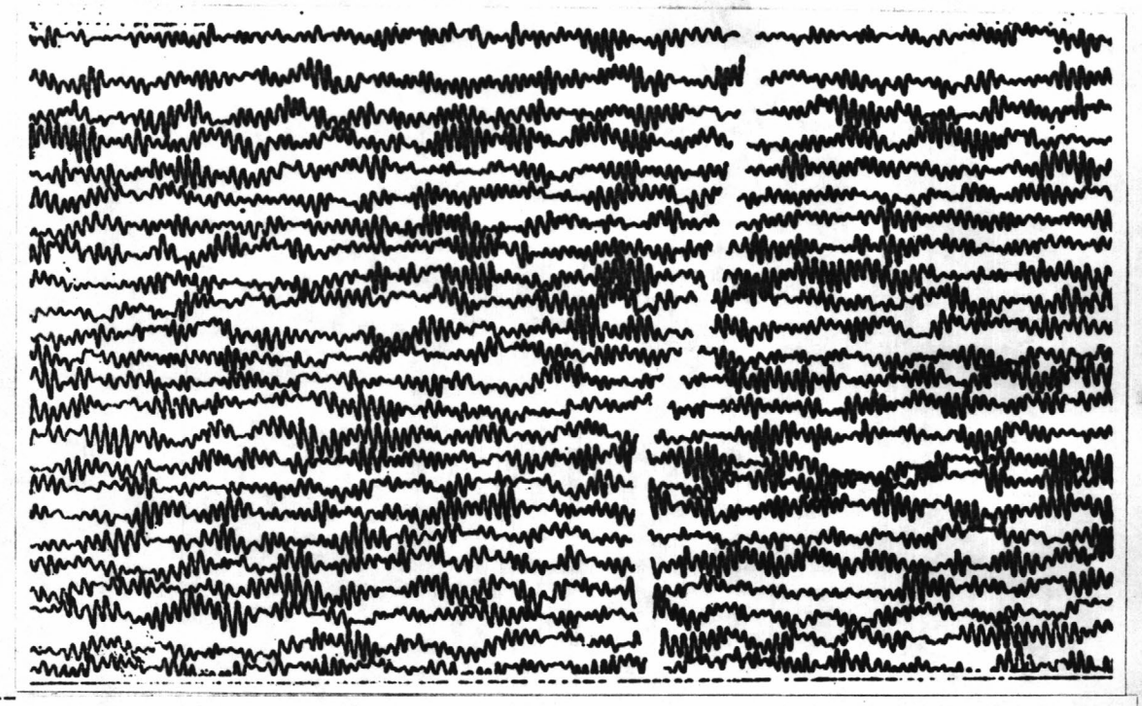
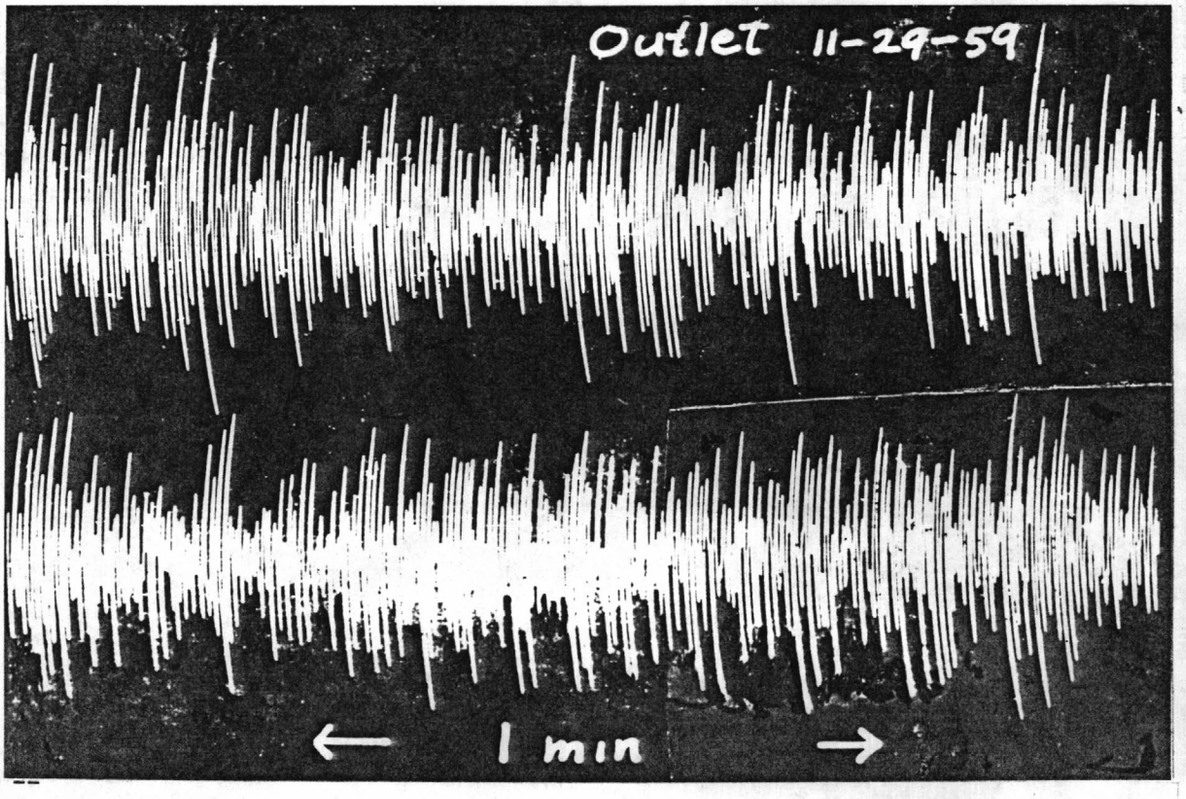
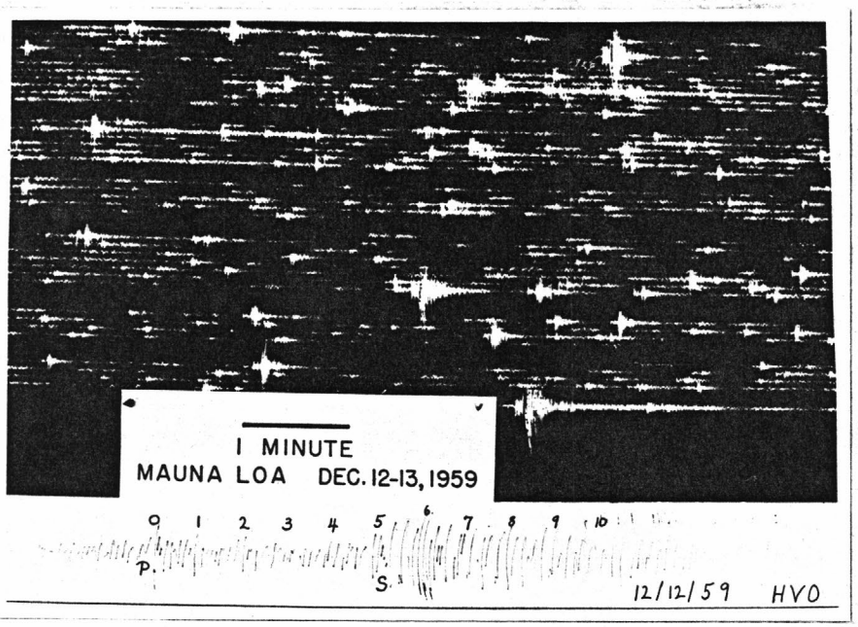


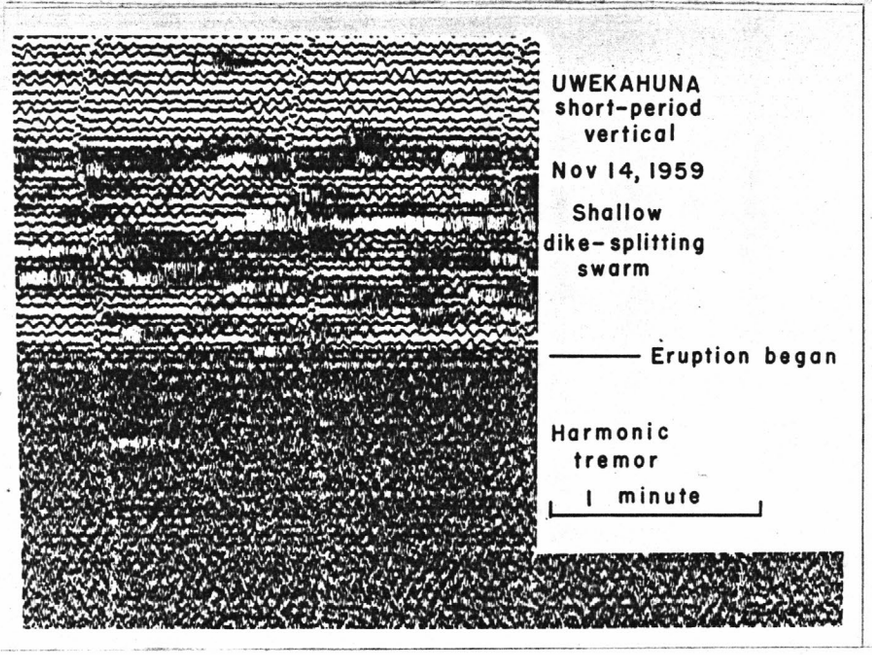
(MACDONALD, G. A. 62)
Volcanic tremor, recorded on the Bosch-Omori seismograph at the Whitney laboratory of seismology. The distance between successive minute marks on the original record is 60 millimeters. Magnified 145X. Hawaii County, Hawaii. July 25, 1952.



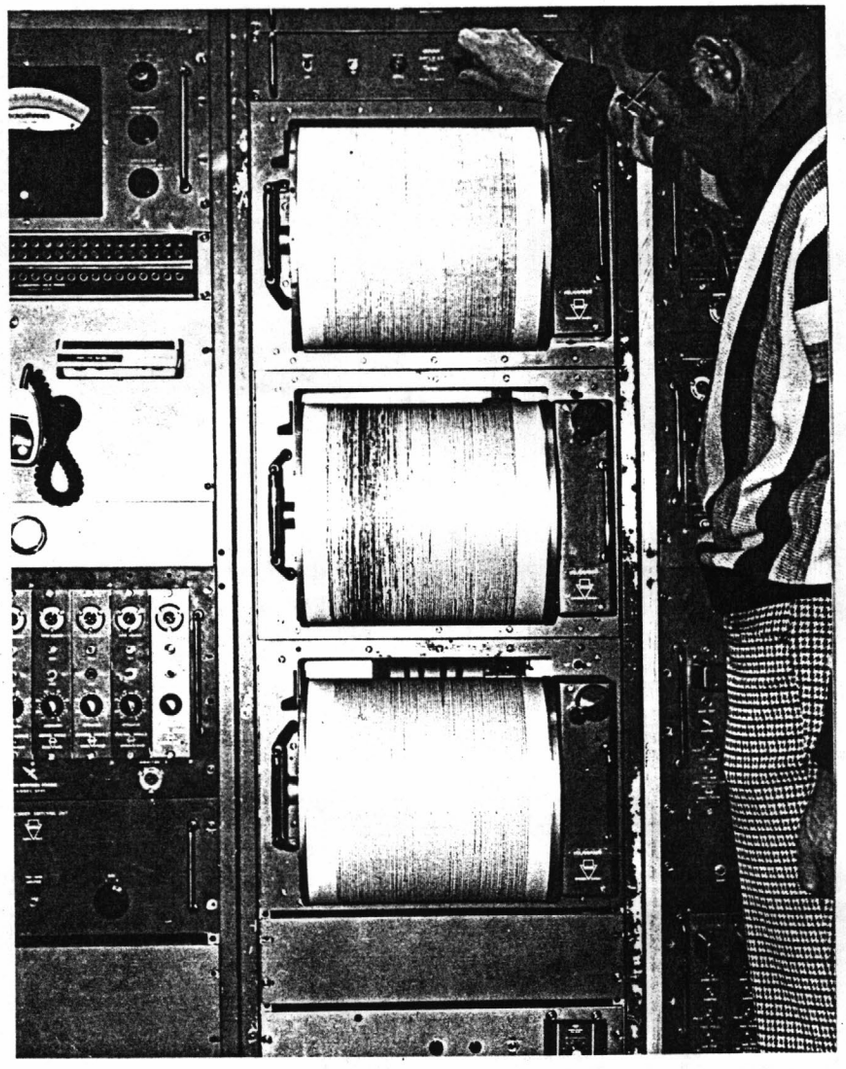
(U. S. GEOLOGICAL SURVEY/HVO 147)
Strong harmonic tremor recorded on Outlet seismograph during third phase of the 1959 eruption. Hawaii Volcanoes National Park. Hawaii County, Hawaii. November 29, 1959.



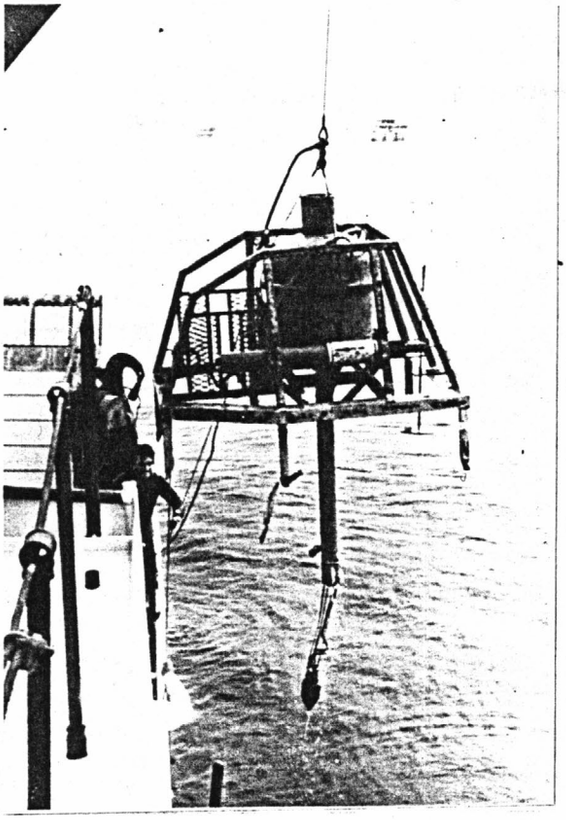
(U. S. GEOLOGICAL SURVEY/HAWAII VOLCANO OBSERVATORY [HVO] 142)
Sample of Mauna Loa seismogram of swarm of deep earthquakes beneath summit of Kilauea. Scale at bottom shows in seconds the arrivals of the P-wave and S-wave. Hawaii Volcanoes National Park. Hawaii County, Hawaii. December 11-12, 1959.



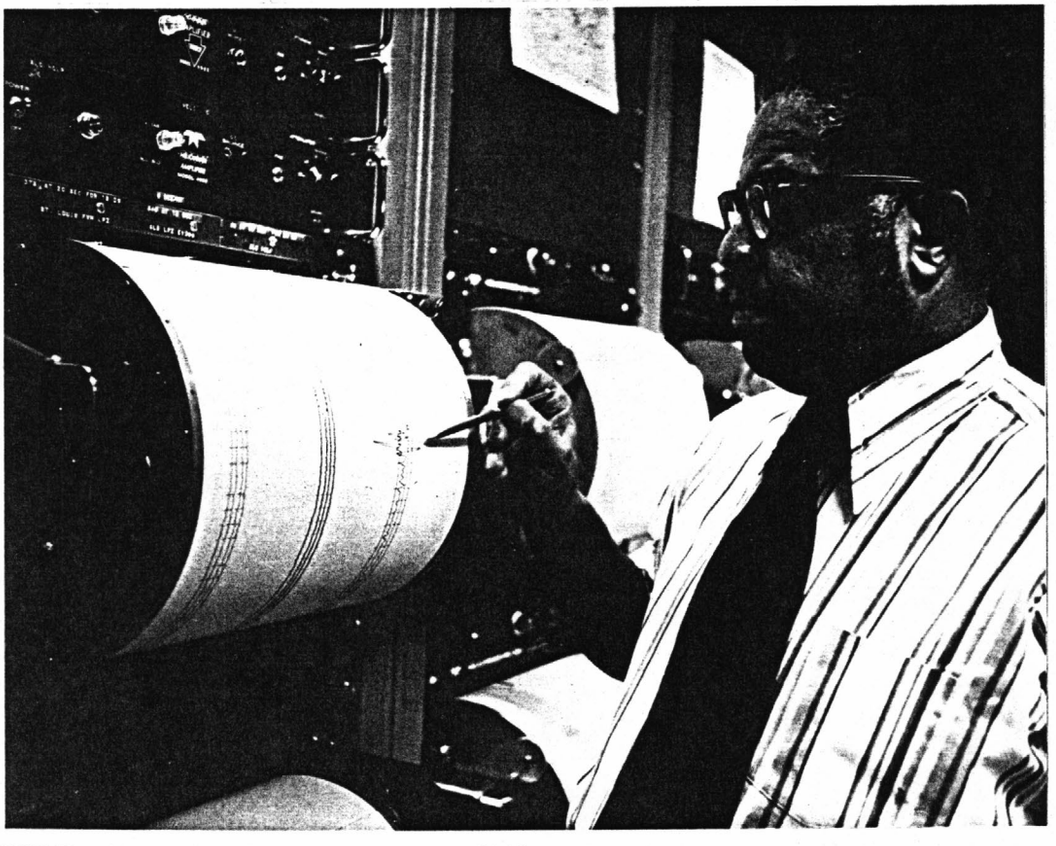
(U. S. GEOLOGICAL SURVEY/HVO 144)
Uwekahuna (short-period) seismogram illustrating (upper part) 5-hour long swarm of earthquakes that preceded the 1959 outbreak. The swarm gave way to strong harmonic tremor when fountaining began. Hawaii Volcanoes National Park. Hawaii County, Hawaii.



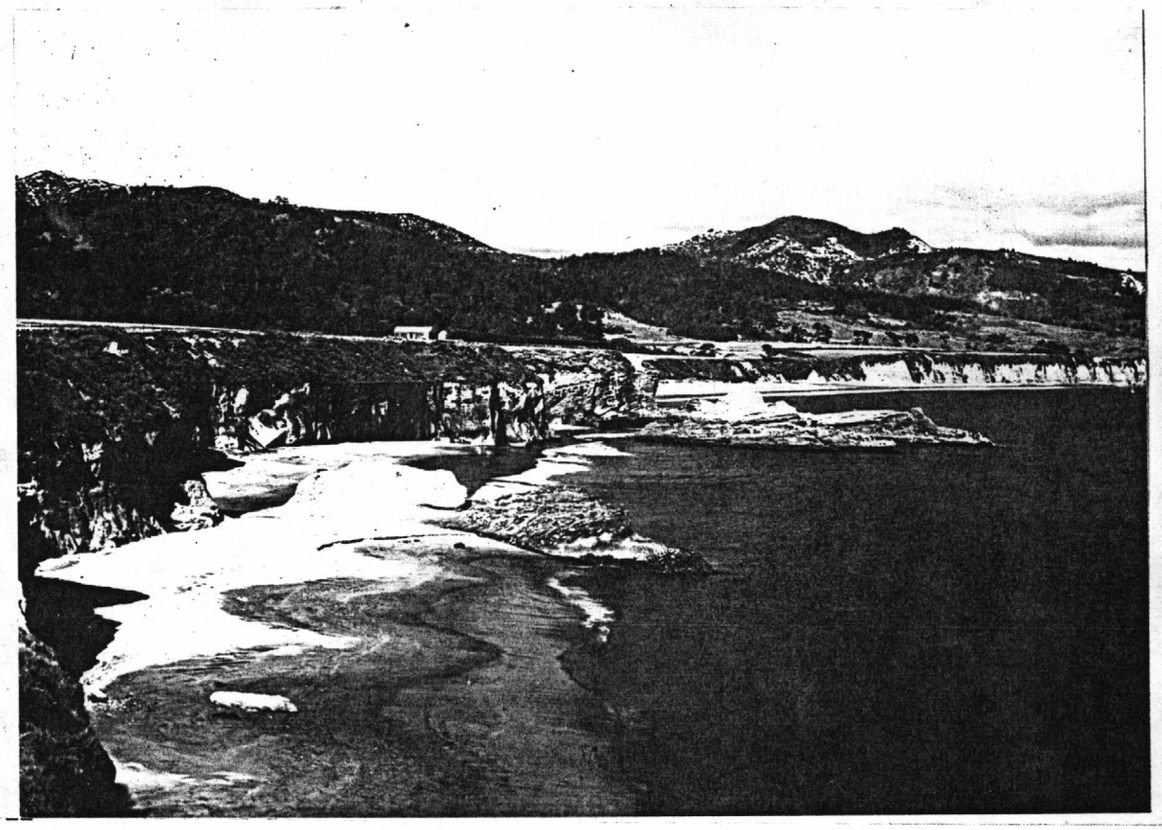
(EARTHQUAKE INFORMATION BULLETIN 184)
Seismometers and seismographs at the National Earthquake Information Service. Golden, Jefferson County, Colorado. n.d.



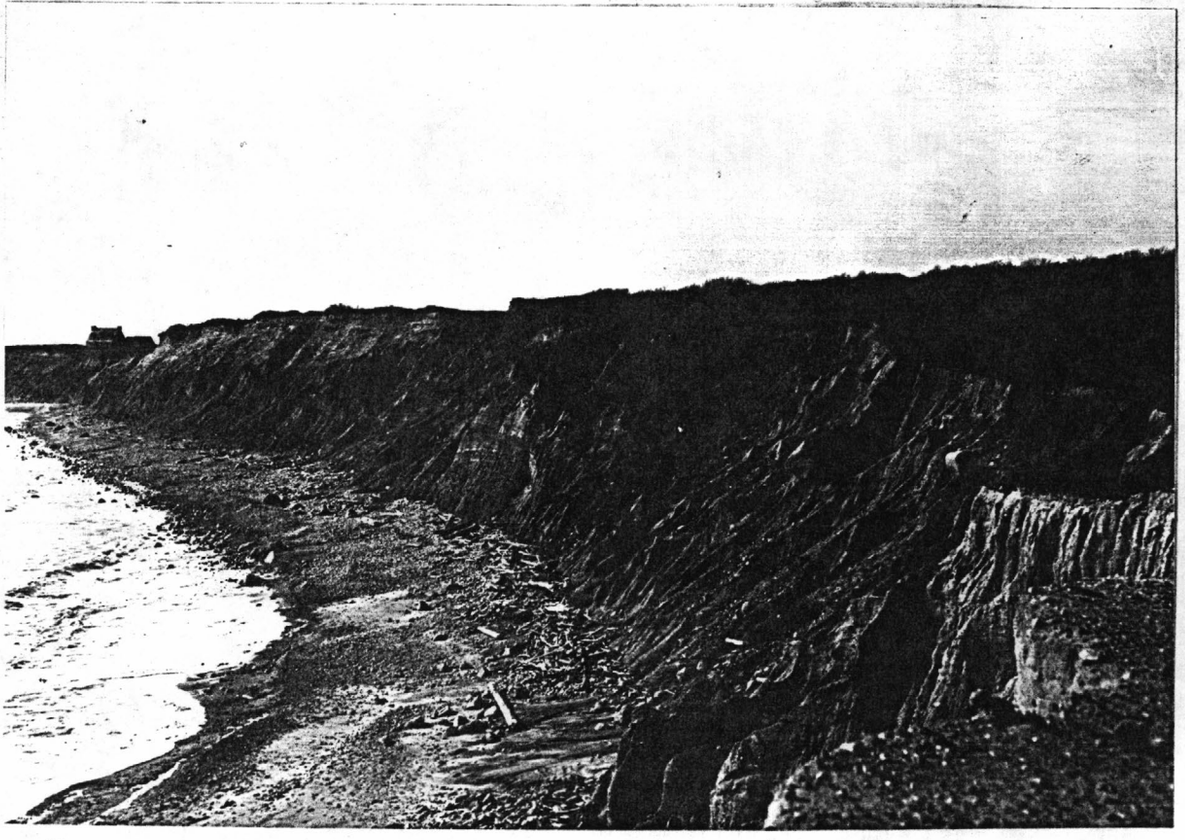
(EARTHQUAKE INFORMATION BULLETIN 547)
The Sea Floor Earthquake Measuring System - deploying the underwater package from a ship. The package consists of a pressure vessel containing a microprocessor, a power supply and probe containing the accelerometer package. United States. n.d.



(EARTHQUAKE INFORMATION BULLETIN 181)
A geophysicist points to the trace of an earthquake which triggered an alert at the National Earthquake Information Service. Golden, Jefferson County, Colorado.



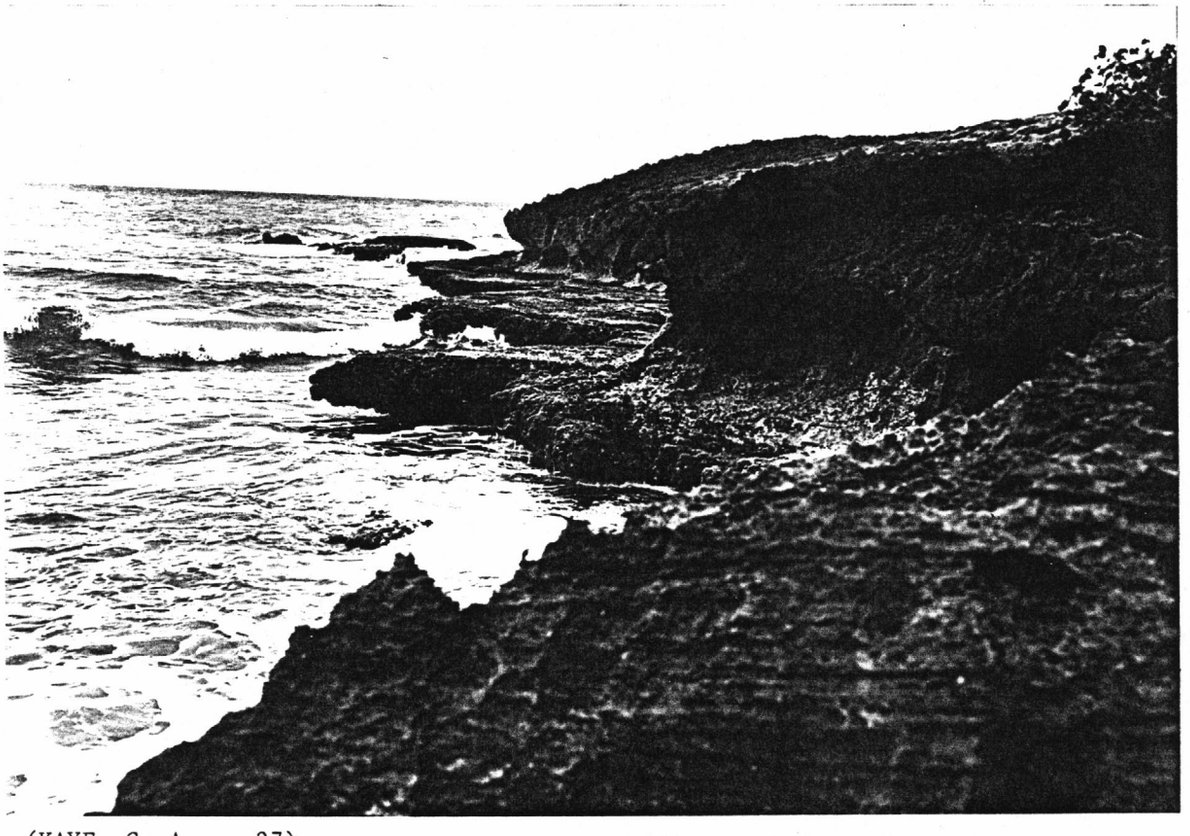
(ARNOLD, R. 117)
Vertical bluff on the left shows truncated beds of Pursisima Formation overlain by Quaternary deposits, the top of which forms the surface of the terrace. Merced Formation in the white bluffs. San Mateo County, California. 1905.



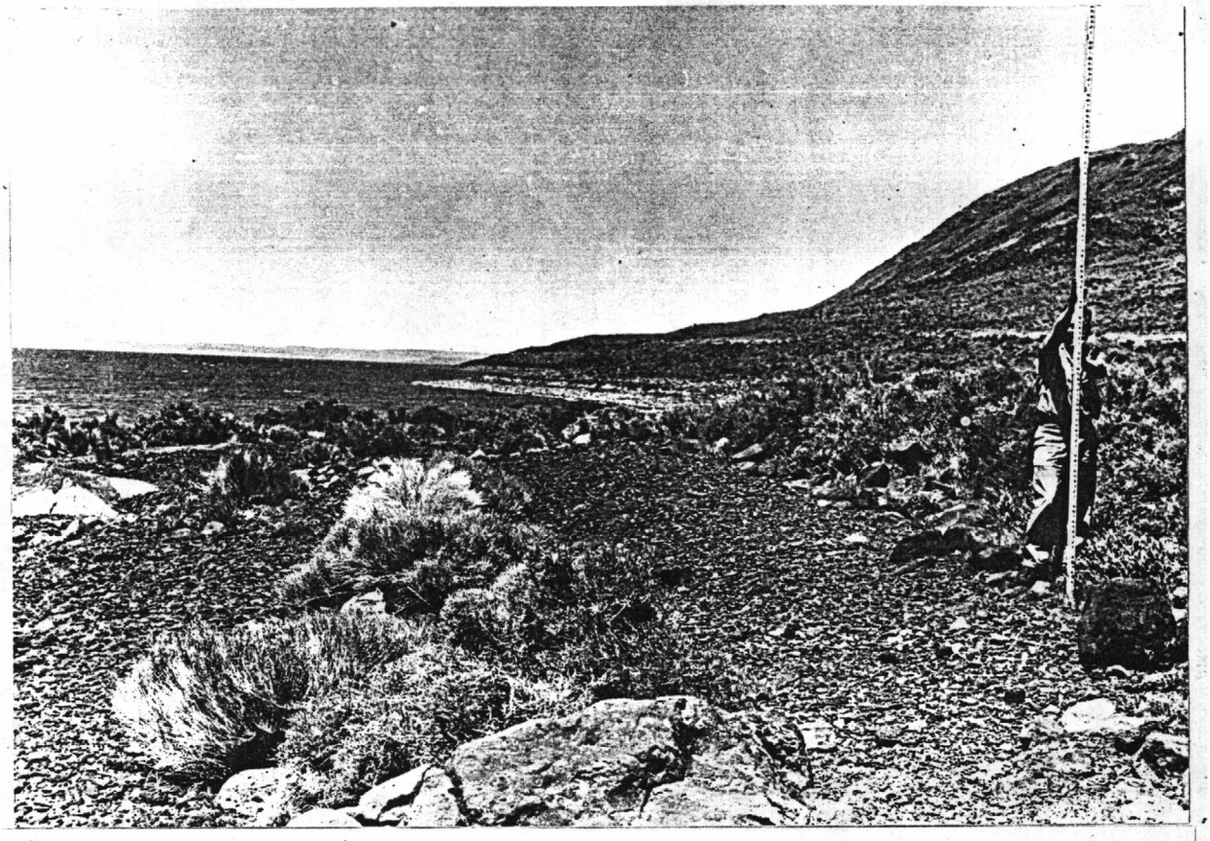
(PERLMUTTER, N. M. 3)
Outcrop showing stratified drift above till, south side of Montauk Air Force Station. Long Island, Suffolk County, New York. ca. 1960.



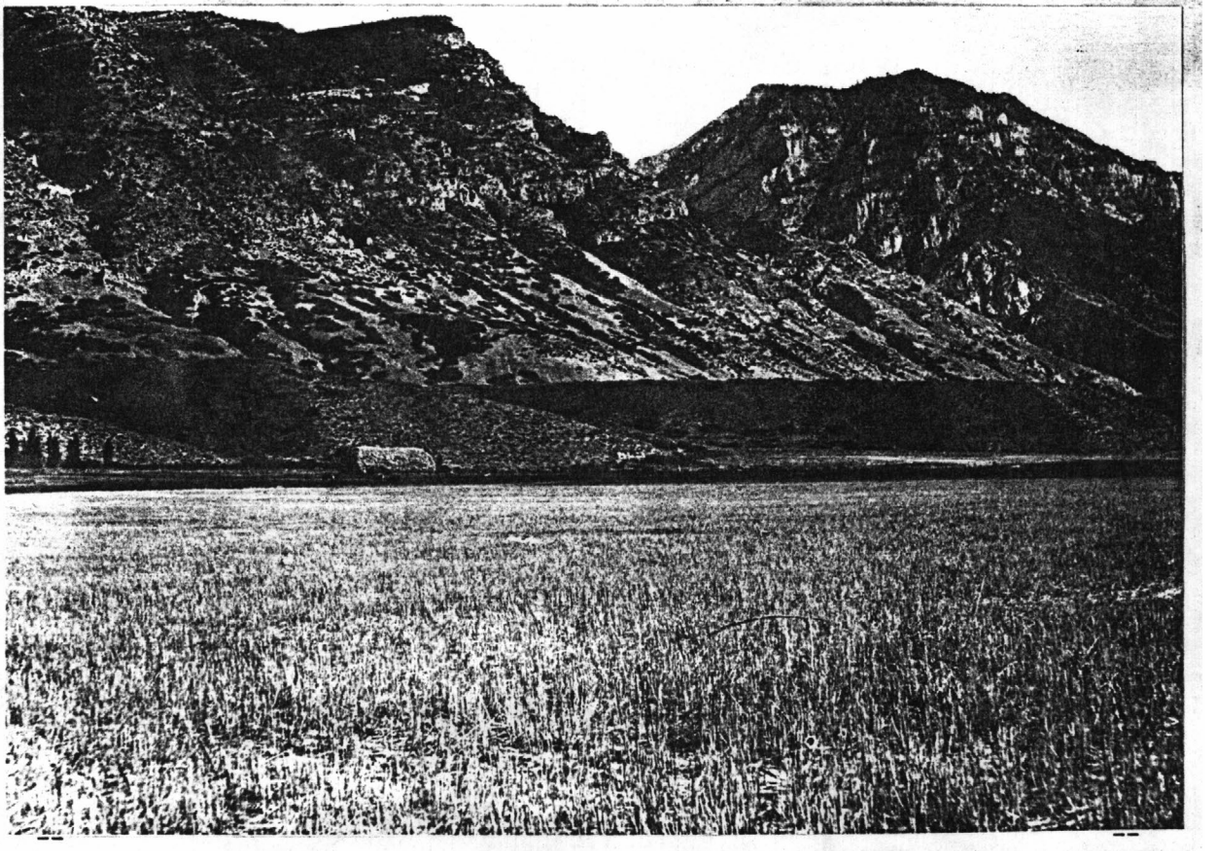
(MONROE, W. H. 485)
Beachrock formed in a calcareous beach east of the mouth of Rio Cibuco, Vega Alta, Puerto Rico. May 17, 1960.



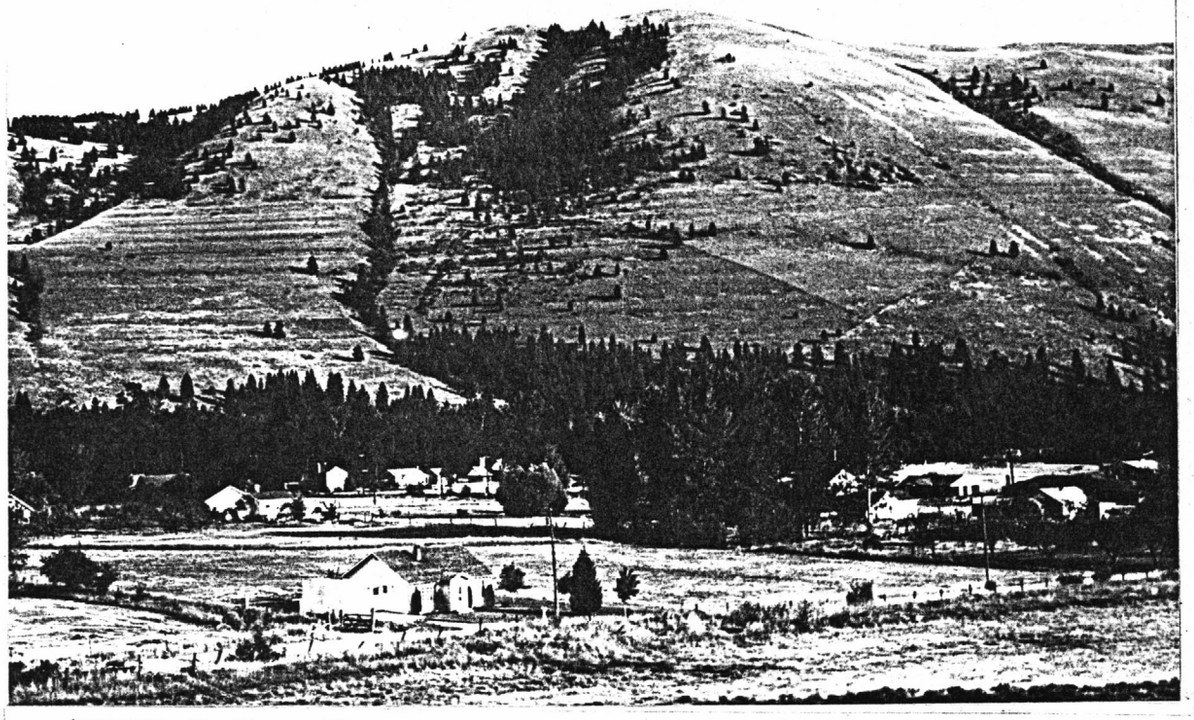
(KAYE, C. A. 27)
Tidal terrace on ocean side of eolianite ridge at low tide showing heavy algal mat on outer rim and the nip both above and below the terrace. As is usual for the ocean side, the upper lip shows up poorly because the fragile visor has been broken off by storm waves. Puerto Rico. ca. 1950.



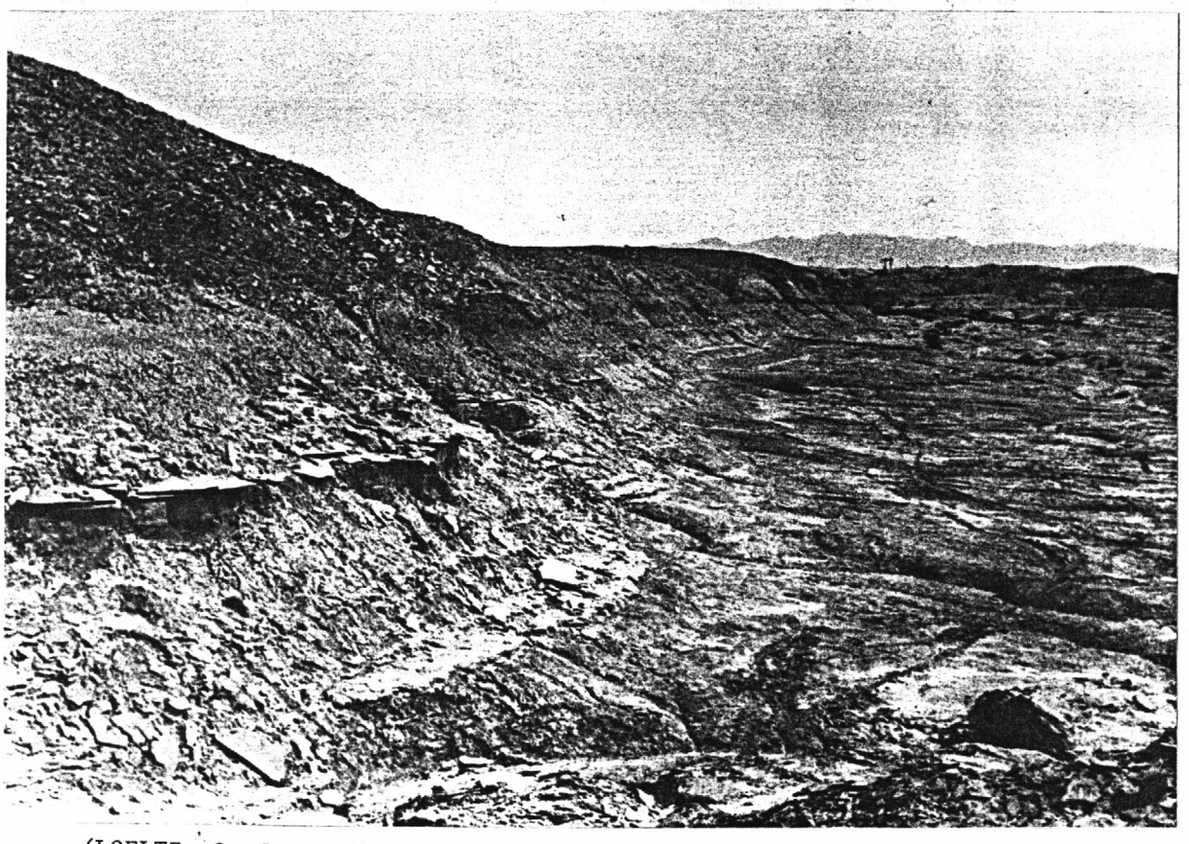
(PHILLIPS, K. N. 20)
Northward view from east shore of Lake Albert near site of lake gage. Rod is held at edge of the well-defined beach line (Altitude 4,269.7 ft), formed sometime prior to 1895. Lake County, Oregon. 1963.



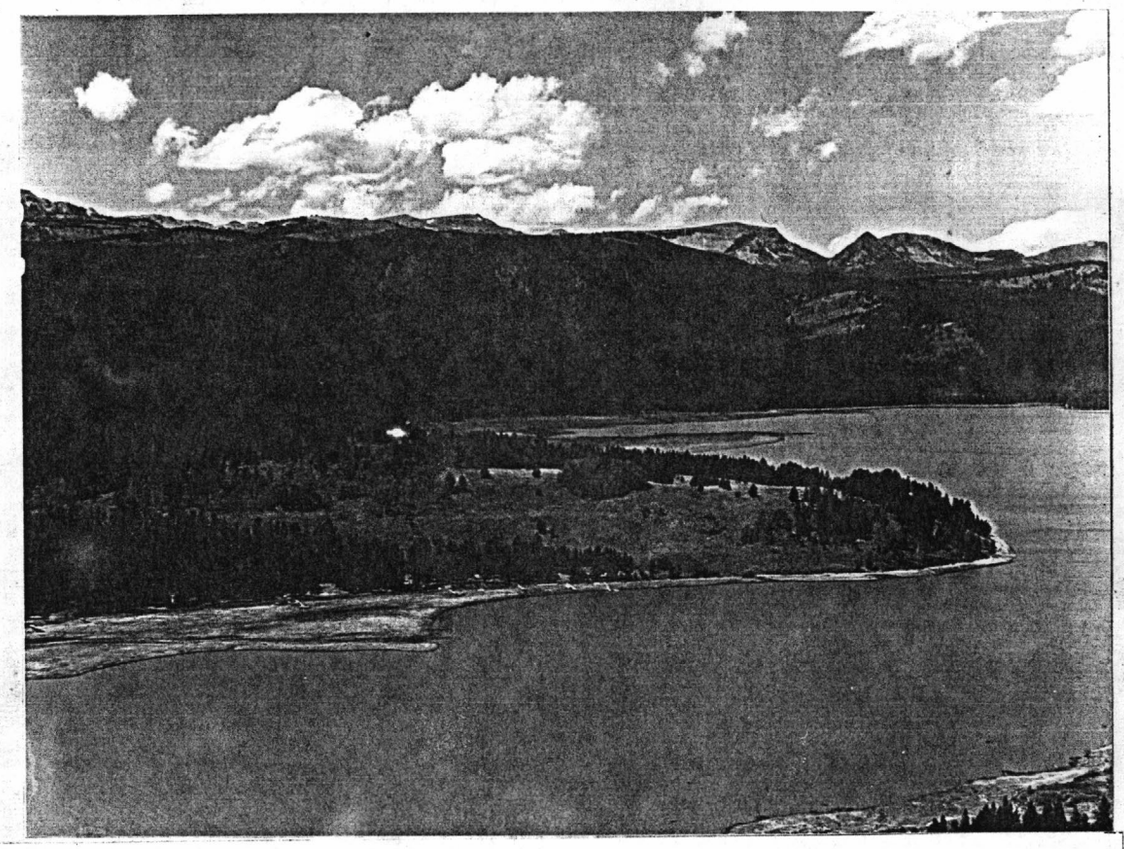
(RICHARDSON, G. B. 110)
Bonneville terrace south of Provo River. Wasatch County, Utah. n.d.



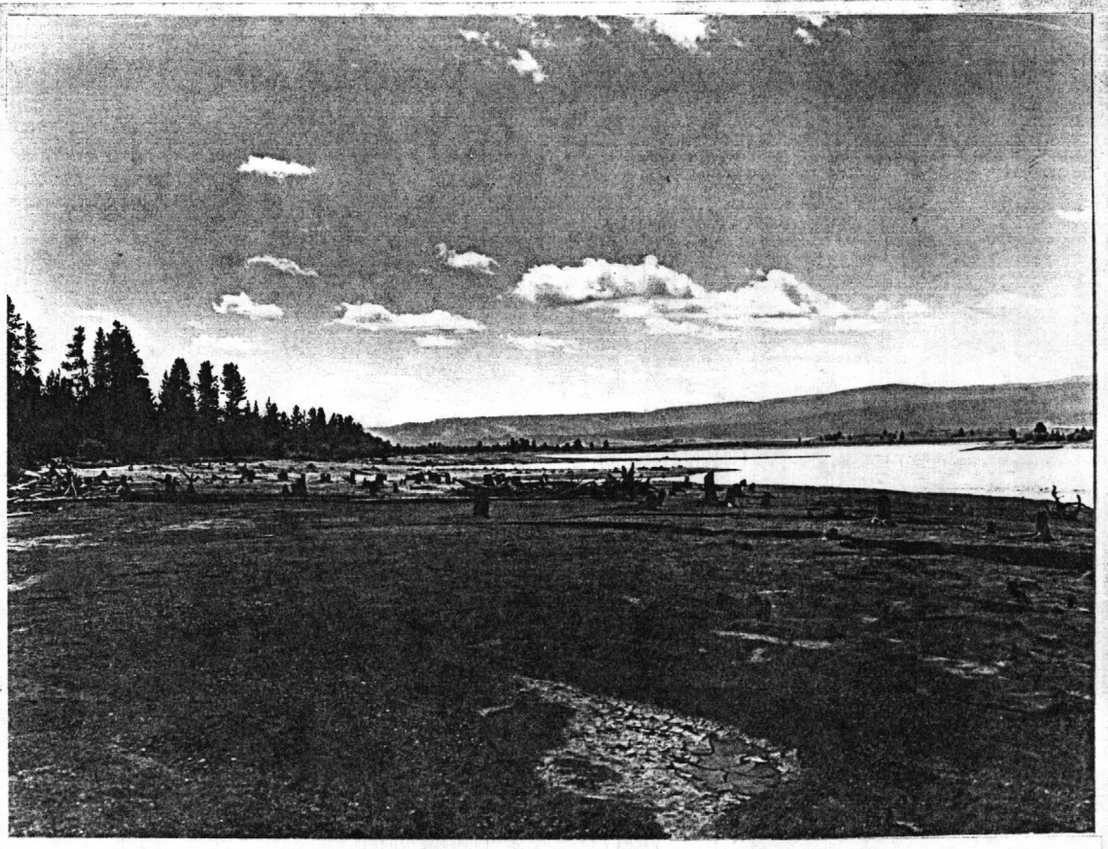
(NELSON, W. H. 3)
Shorelines of glacial lake Missoula. View is eastward across Rattlesnake Creek valley to Jumbo Mountain. Missoula County, Montana. n.d.



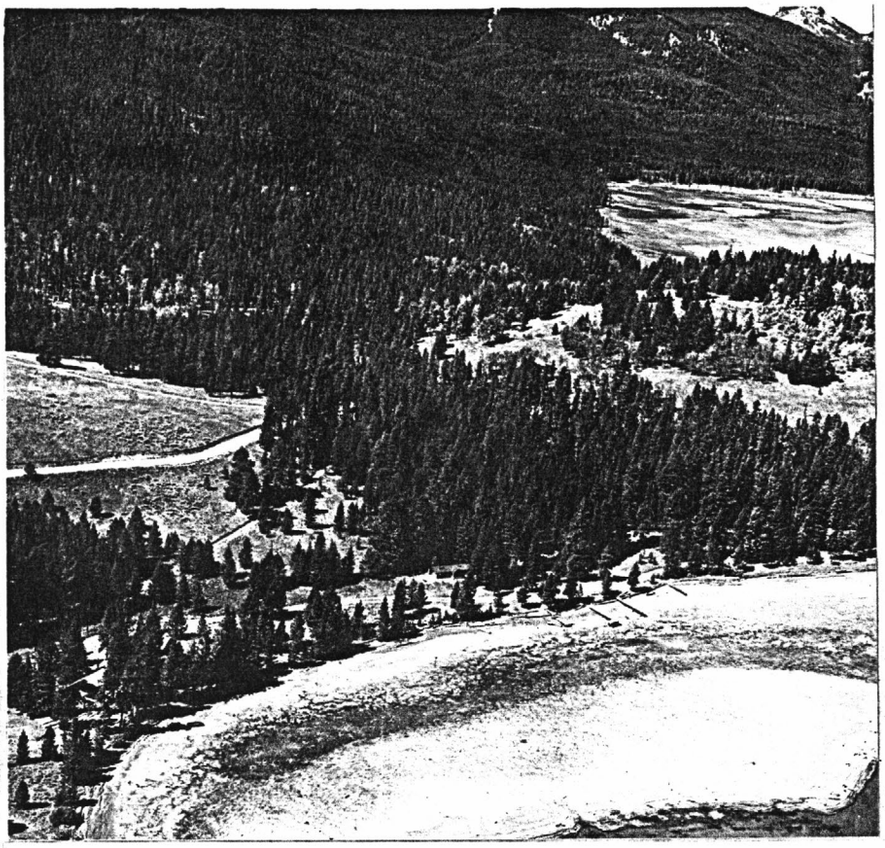
(LOELTZ, O. J. 4)
Upper shoreline, extending from left foreground to right background and cutting into the Brawley Formation of Dibblee. Located north of Niland. Imperial Valley. Imperial County, California. 1960.



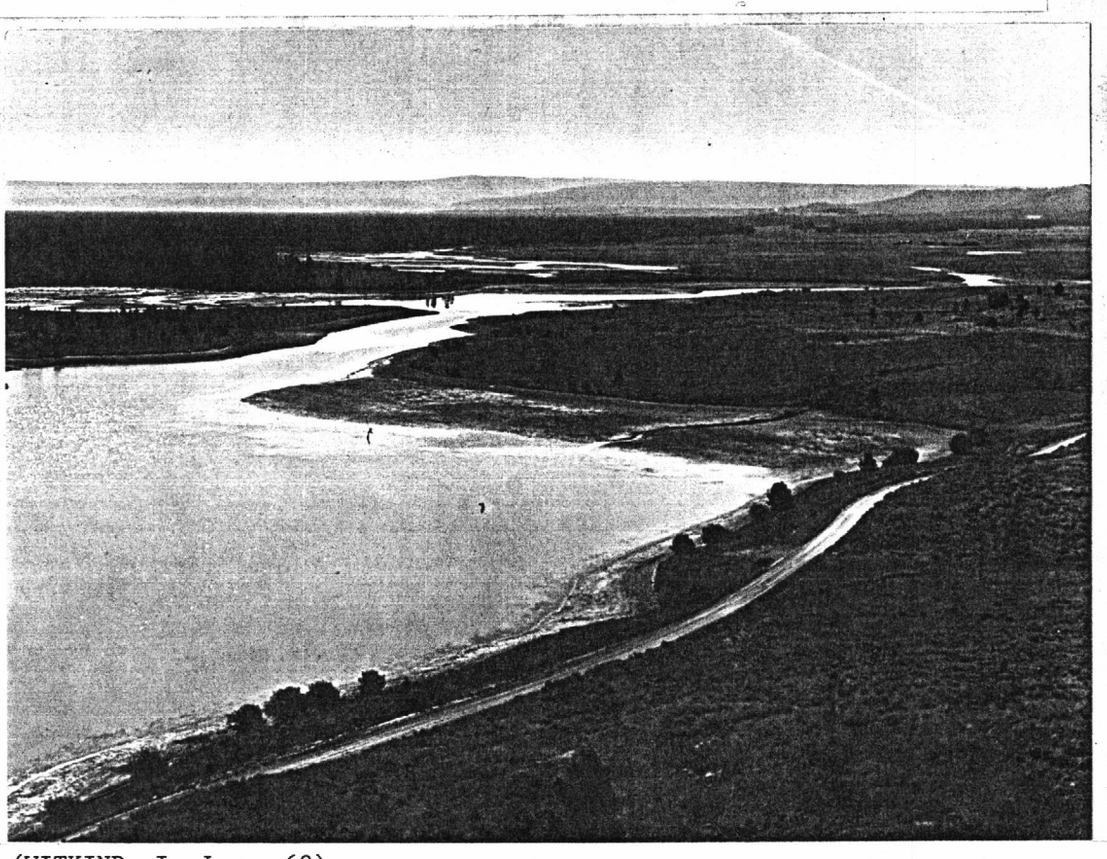
(WITKIND, I. J. 66)
Emergent shore line around the south end of Hebgen Lake. Note the stranded docks and broad mud flats exposed when the lake shifted northward. Hebgen Lake earthquake. Gallatin County, Montana. August 20, 1959.



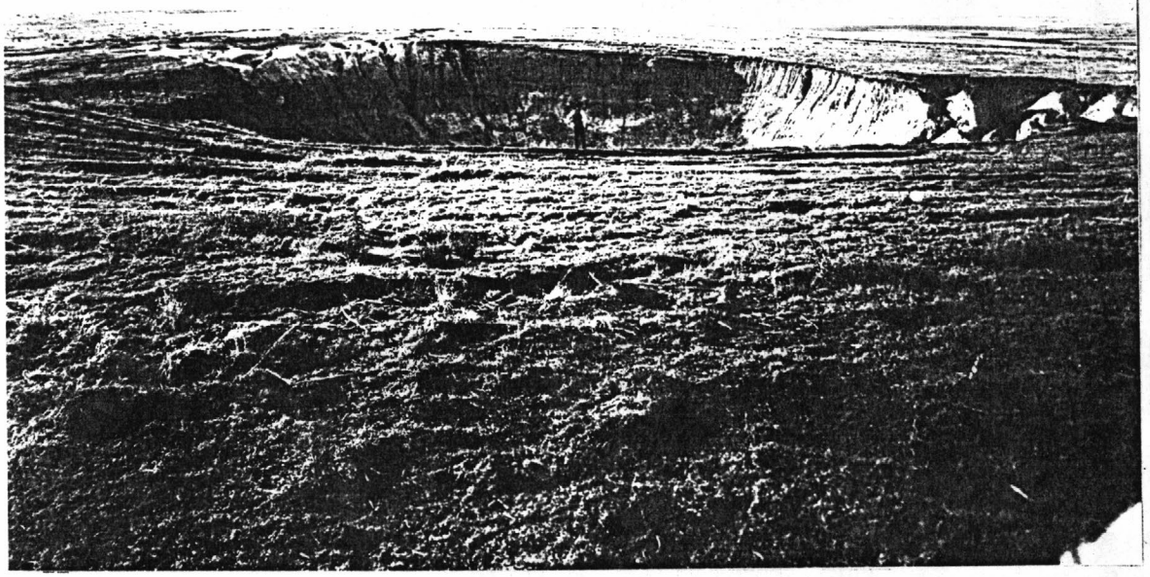
(WITKIND, I. J. 73)
Exposed mud flats along the south shore of Hebgen Lake. Gallatin County, Montana. August 1959.



(STACY, J.R. 259)
Looking west-northwest to emergent shore line at Lonesomehurst resort area, Hebgen Lake. Gallatin County, Montana. August 1959.



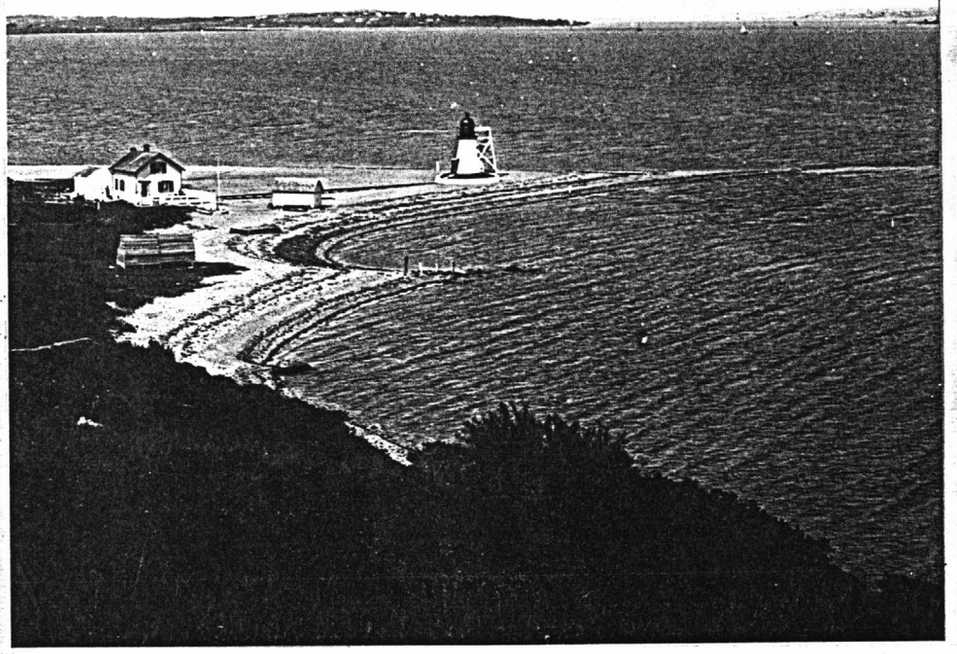
(WITKIND, I. J. 68)
View from lookout point looking south at the South Fork of the Madison River. Note the broad mud flats exposed when Hebgen Lake shifted northward. Gallatin County, Montana. August 1959.



(JOHNSON, W. D. 136)
The "Meade Salt Well", a sinkhole 1½ miles southeast of Meade. The sinking occurred in March 1879. Meade County, Kansas. 1897.



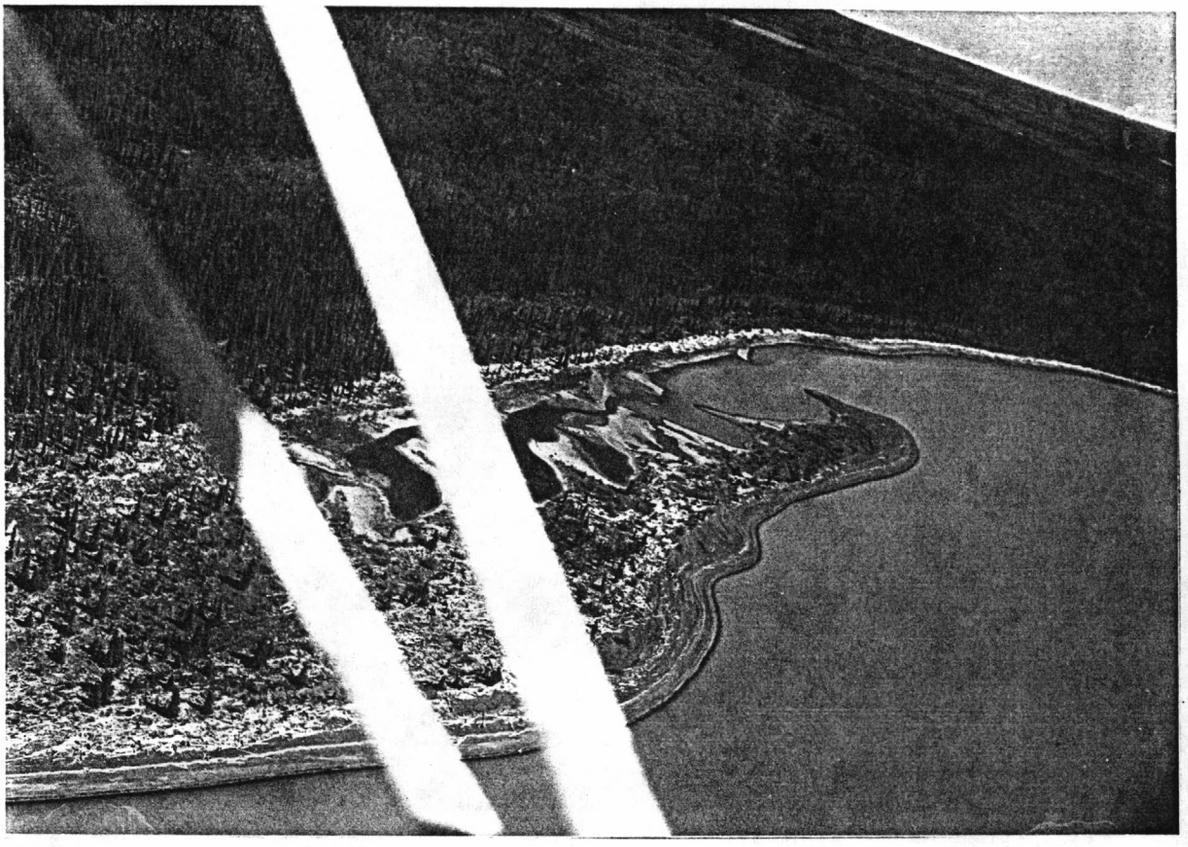
(U. S. GEOLOGICAL SURVEY 139)
Home lost in land collapse. Sinkhole that formed was 520 feet long, 125 feet wide, and 60 feet deep. Bartow, Polk County, Florida. May 22, 1967.



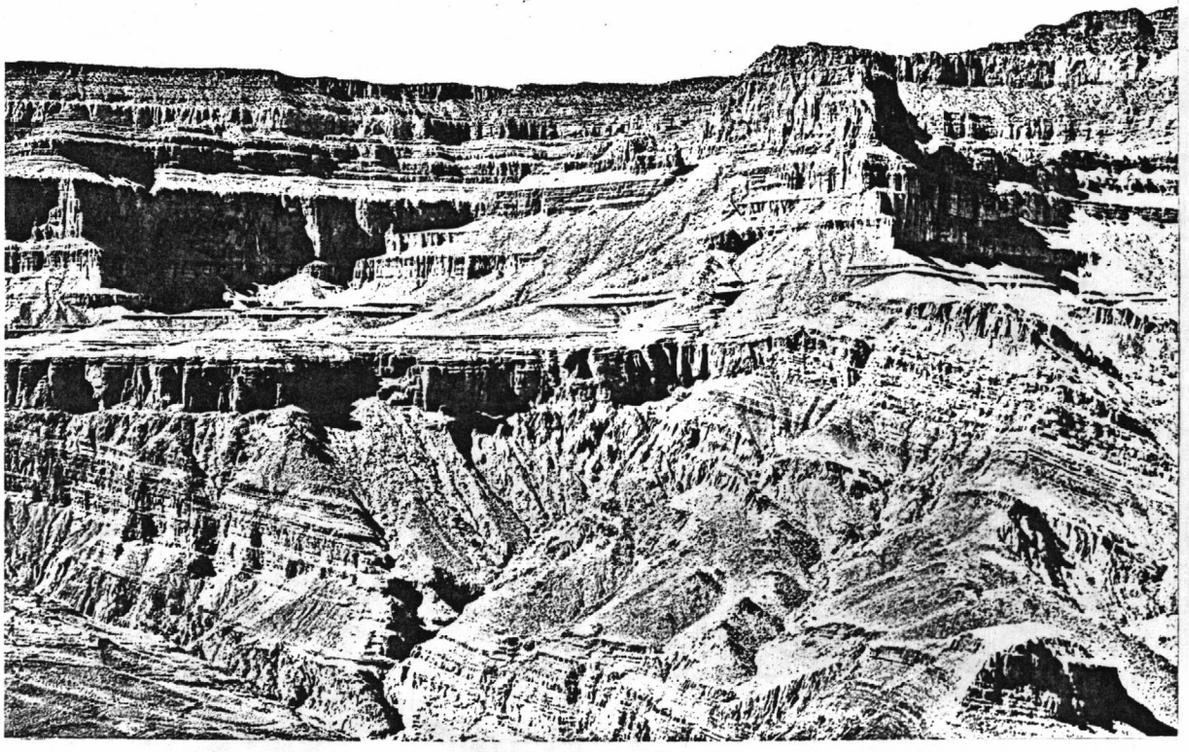
(WOODWORTH, J. B. 138)
Sand Point, Prudence Island light. View from knoll of slate looking northeast at spit on which the lighthouse stands. Newport County, Rhode Island. 1895.



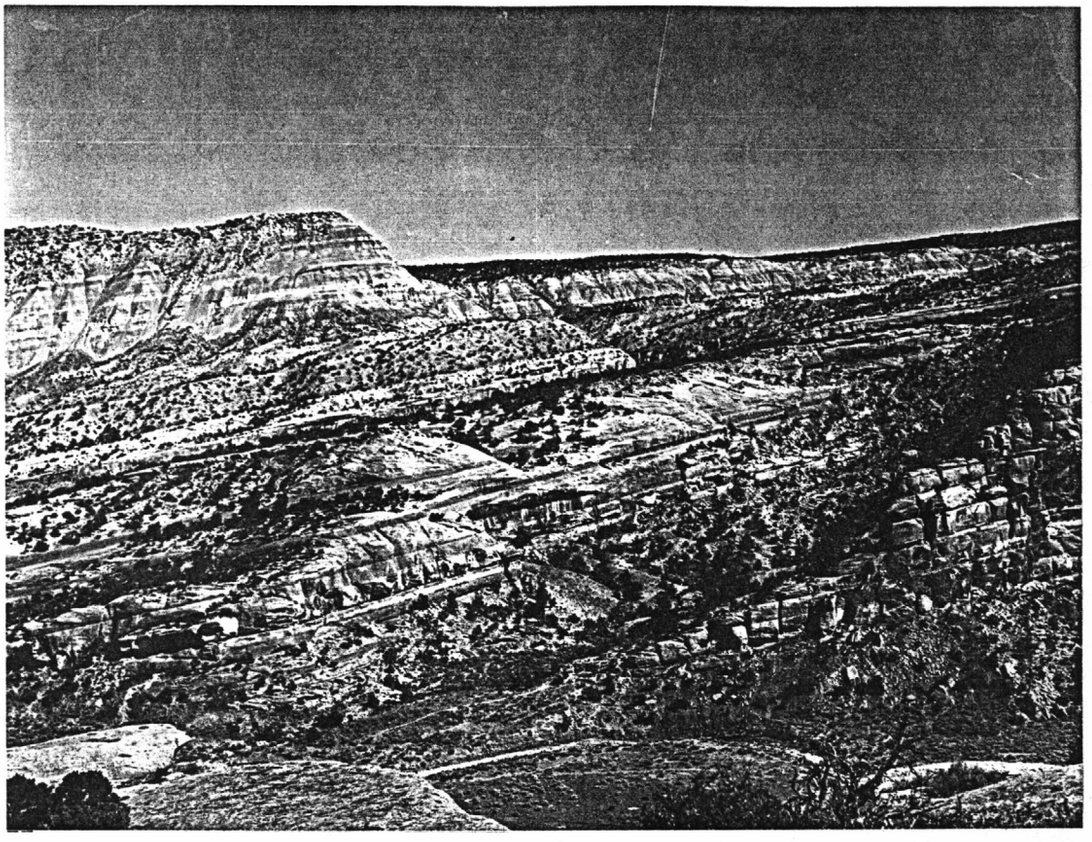
(ALDEN, W. C. 945)
Hooked spit at west end of East Beach 1½ miles northeast of Port Jefferson. Between this shore and foreground shore is one of the outlets of Mount Sanai Harbor. A strong current flows out to the left to Long Island Sound. Long Island. Suffolk County, New York. October 17, 1917.



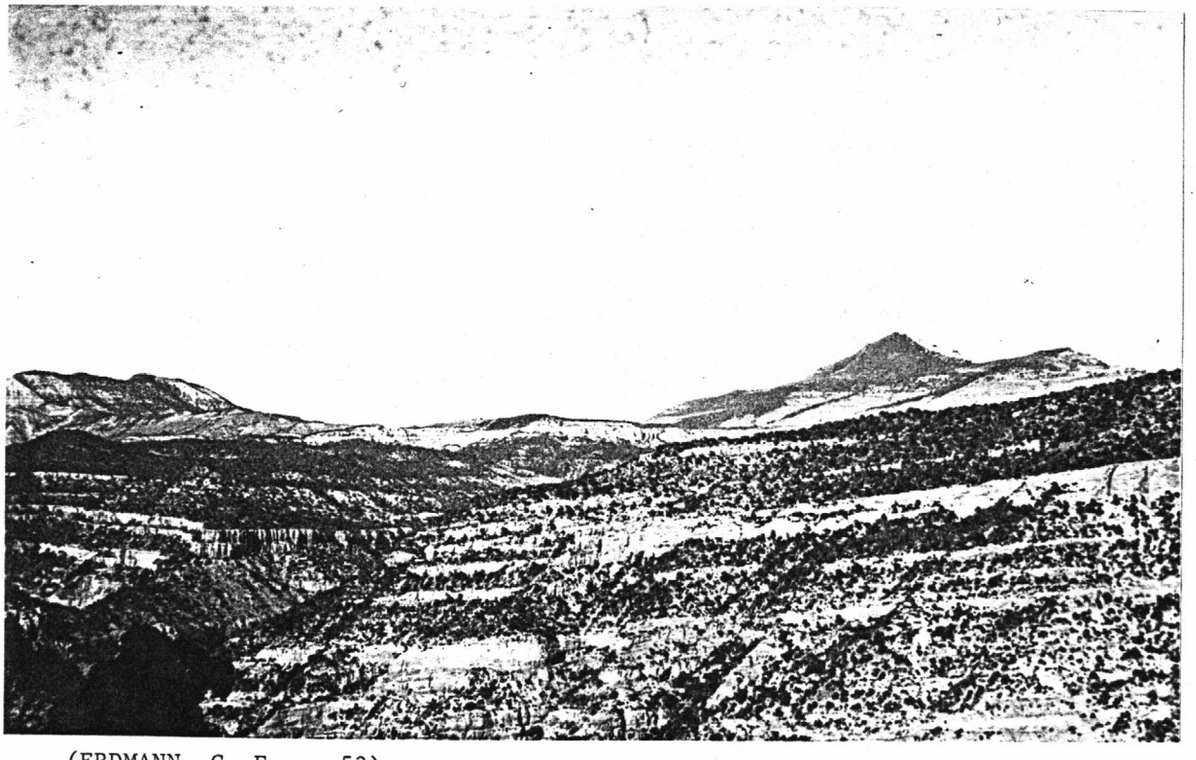
(WILLIAMS, J. R. 1311)
Gravel spit formed by longshore currents induced by wind waves, north slope of Tazlina Lake between Mendeltna Creek and outlet. Klutina district, Copper River region, Alaska. June 1957.



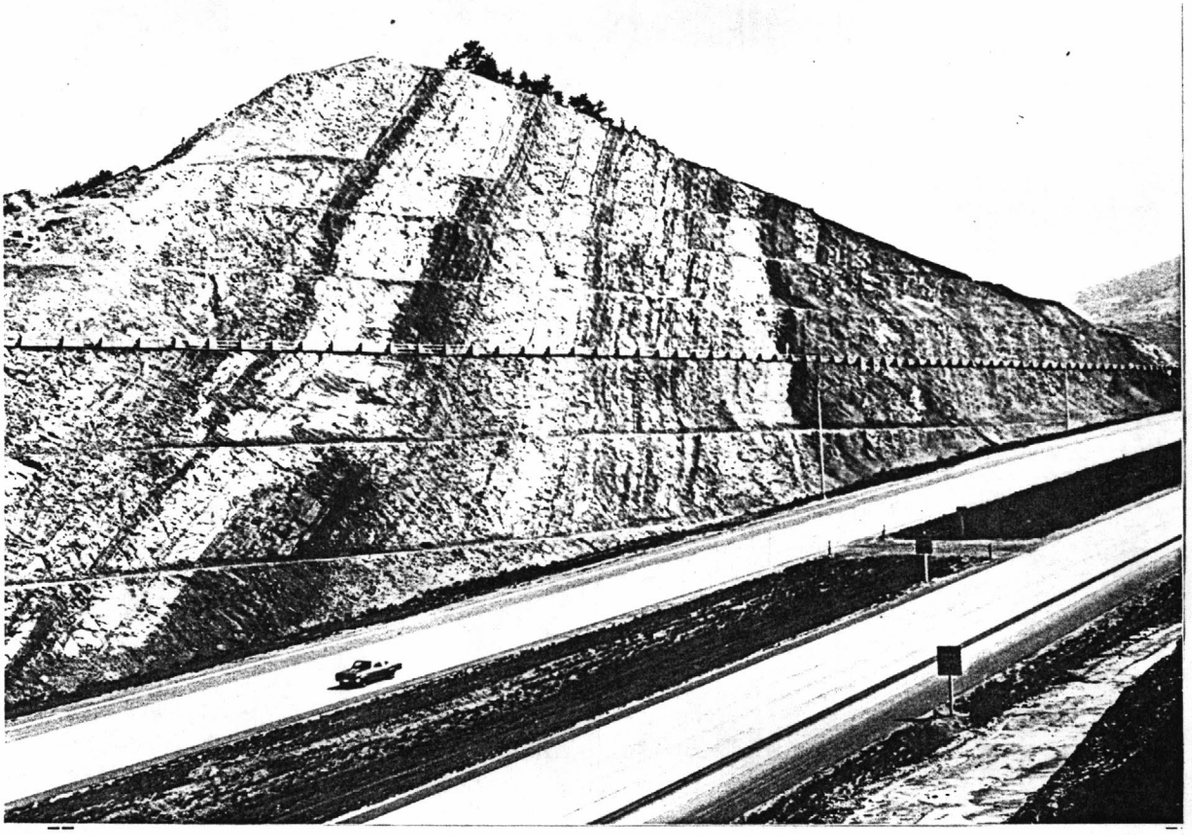
(CARKHUFF, N. W. 40)
Strata of the Grand Canyon, the great unconformity at lower left. Grand Canyon National Park. Arizona. 1901.



(LOHMAN, S. W. 41)
No Thoroughfare Canyon. Strata range upward from Triassic Chinle formation at lower right to Cretaceous Burro Canyon Formation atop hill at upper left. Mesa County, Colorado. ca. 1950.



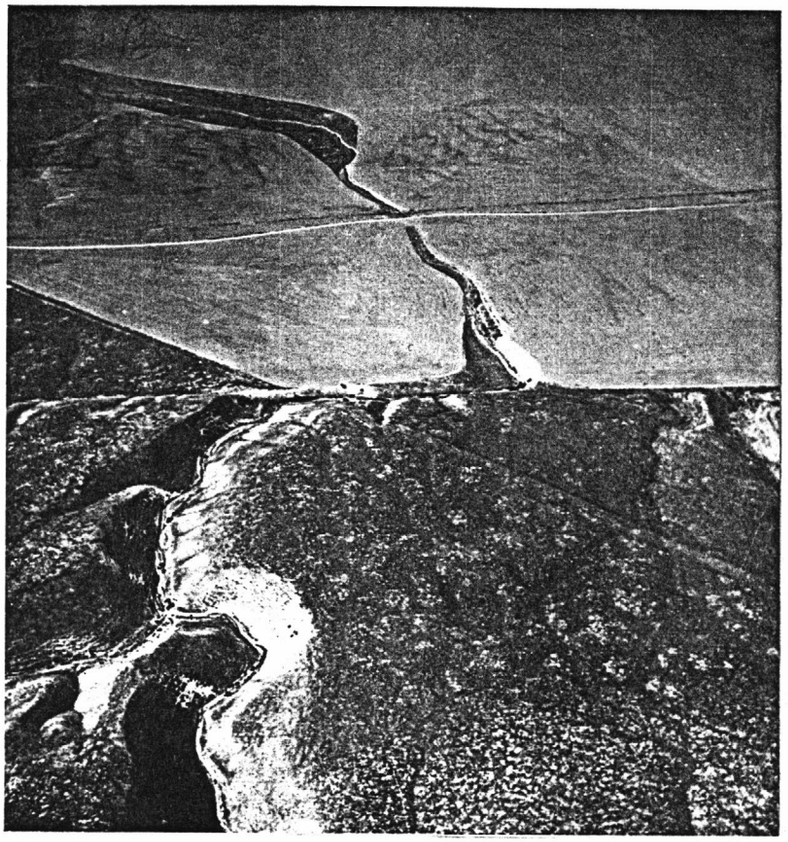
(ERDMANN, C. E. 53)
The Tgr-Tw contact is clearly visible. The strata in the foreground are undifferentiated Mesaverde, exposed on the east wall of Hunter Canyon. T. 8 and 9 S., R. 99 and 100 W. Mesa County, Colorado. July 1926.



(HANSEN, W. R. 187)
Sequence of tilted Dakota group strata. From left to right: South Platte Formation; Kassler Sandstone Member, Skull Creek Member, Plainview Sandstone Member: Lytle Formation, Morrison Formation and Ralston Creek Formation. Jefferson County, Colorado. July 1972.



(WALLACE, R. E. 215)
Stream offsets in Carrizo Plains. San Andreas fault. San Luis Obispo County, California. 1965.



(WALLACE, R. E. 193)
Stream offset in Carrizo Plains. Stream has been offset one-fourth mile. San Andreas fault. San Luis Obispo County, California. 1965.
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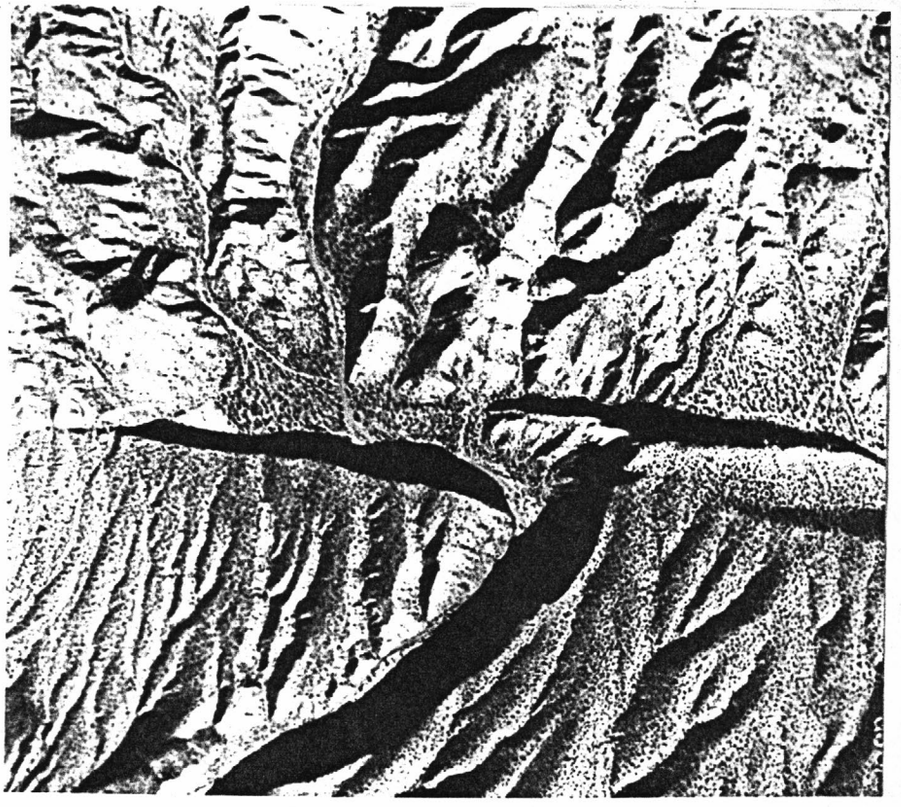

(EARTHQUAKE INFORMATION BULLETIN 36)
Garlock fault in the El Paso Mountains, west of searles Valley. The fault is the linear feature running from left to right. San Bernardino County, California. ca. 1978.
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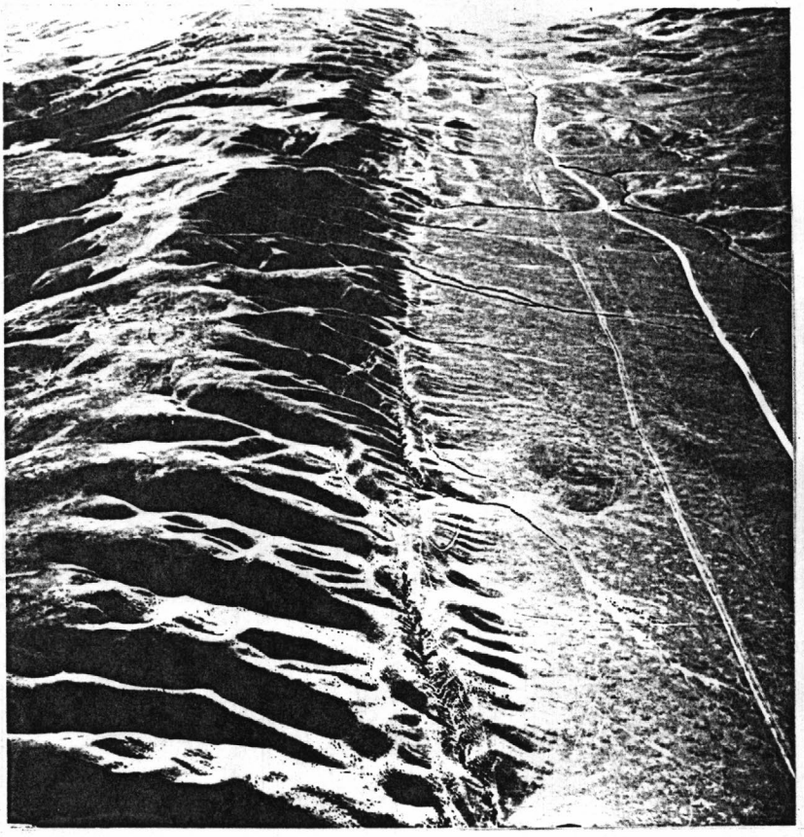
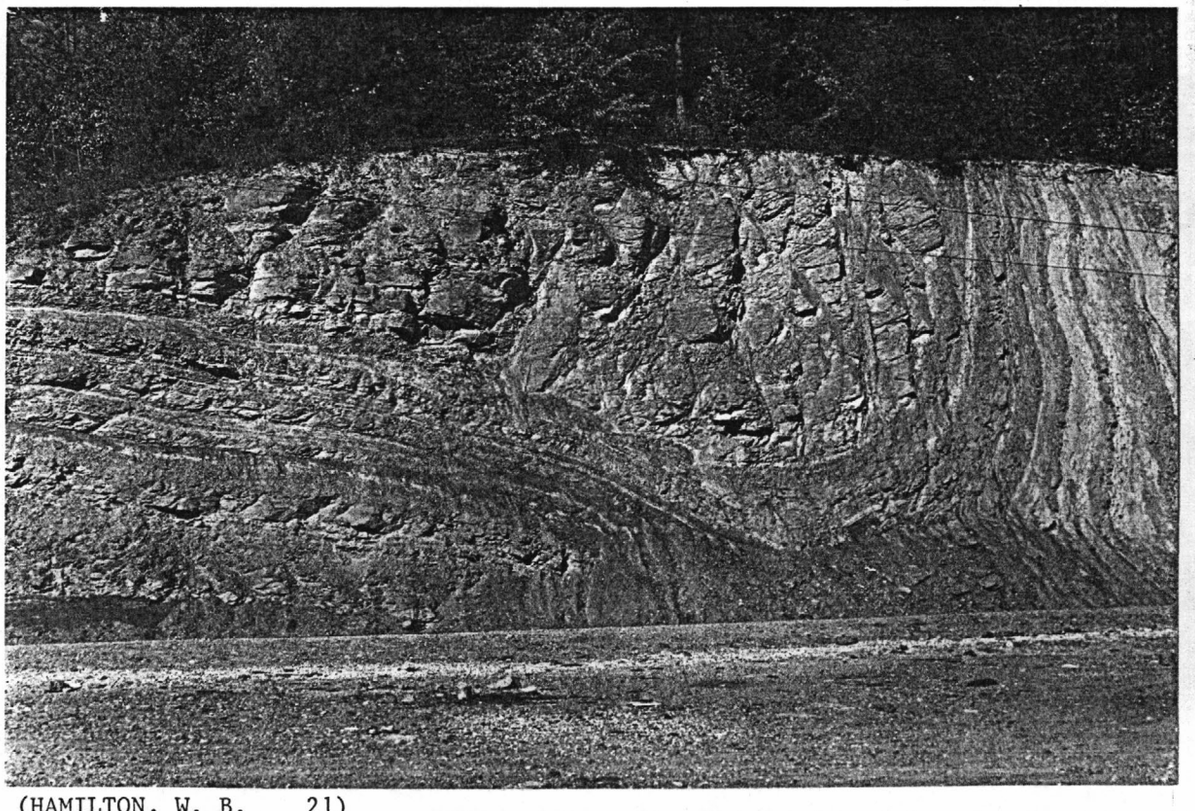
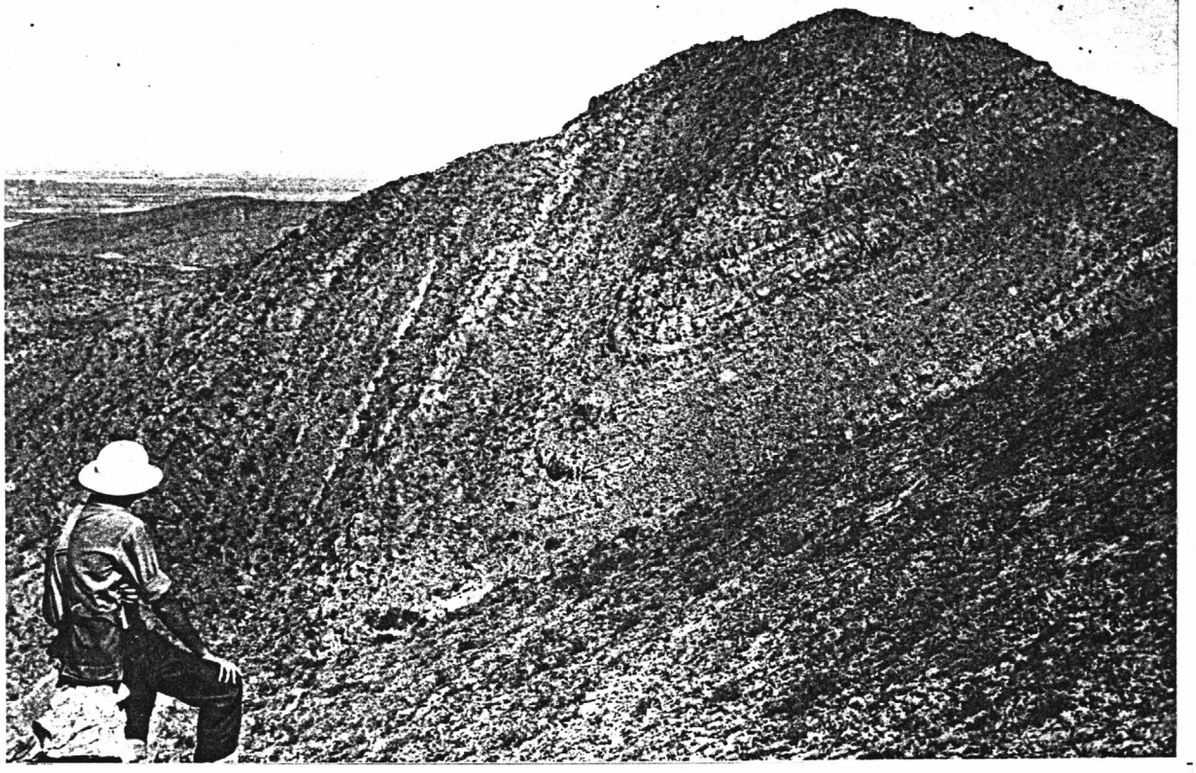


(WALLACE, R. E. 304)
Trace of the San Andreas fault in Choice Valley. Notice the streams that have been offset by the strike slip on the fault. San Luis Obispo County, California. 1974.



(HAMILTON, W. B. 21)
Syncline in weathered shale, Rome formation (Lower Cambrian). Left limb dips gently right, right limb is vertical. Highway 67, half mile south of (new) Butler. Johnson County, Tennessee. September 29, 1953.



(ALBRITTON, C. C., JR. 18)
Limestone beds of Torcer Formation in syncline along northeast front of Malone Mountains, south of Torcer station. Hudspeth County, Texas. ca. 1949.
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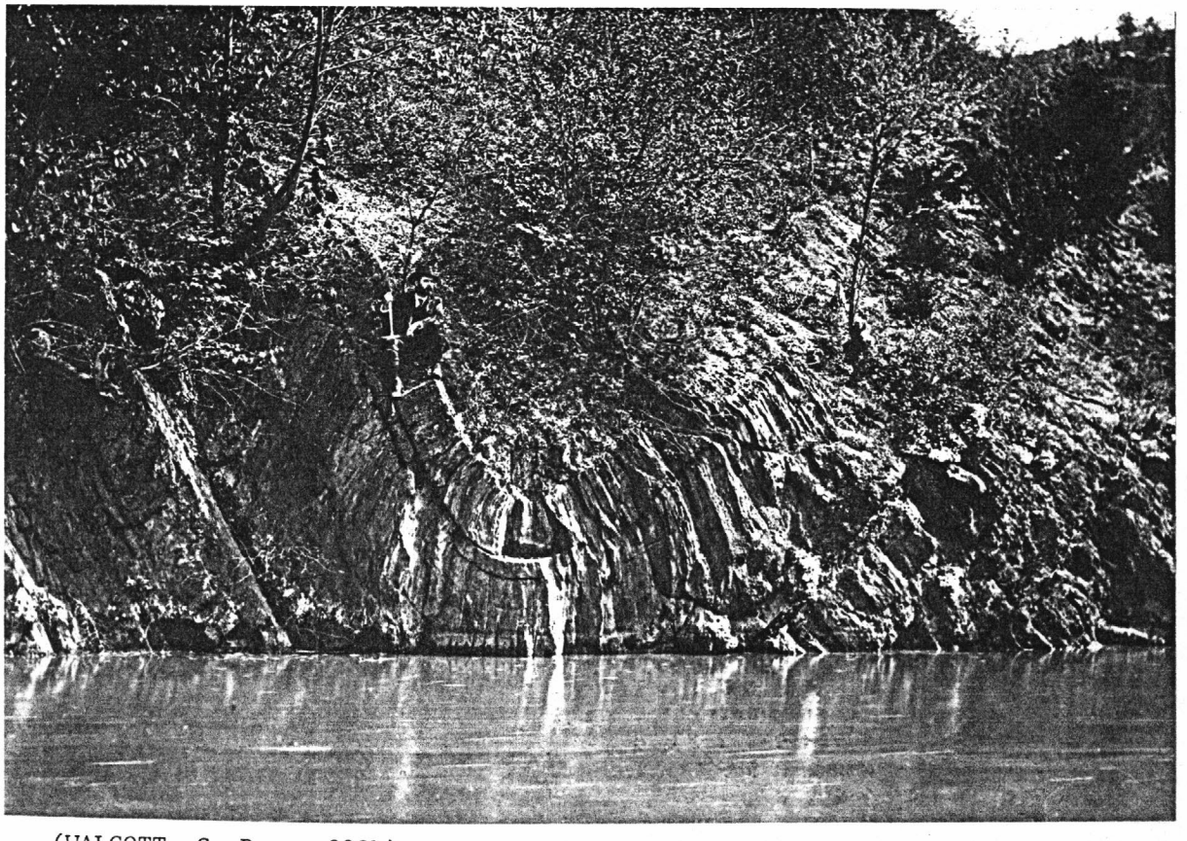

(WALCOTT, C. D. 330b)
Section of synclinal fold in sandstones and shales, near base of upper Silurian, 3 miles west of Hancock. Washington County, Maryland. May 1897.
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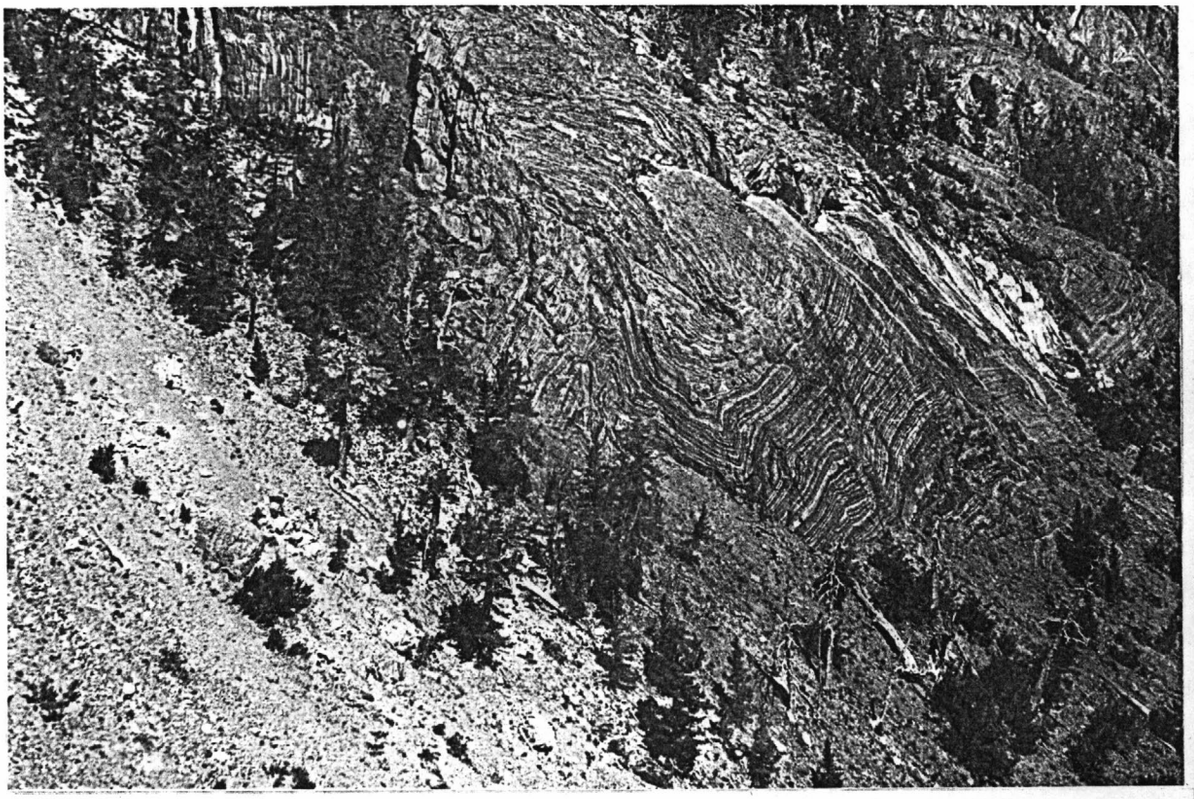
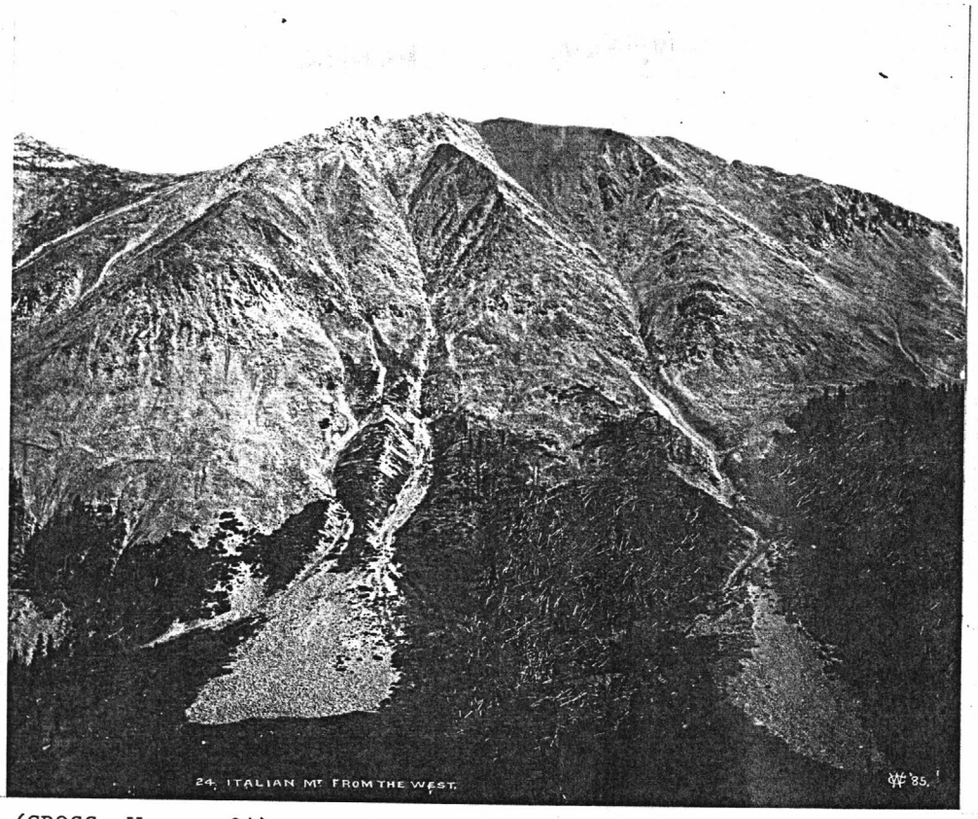


(RINEHART, C. D. 27)
Gently plunging syncline in Bright Dot formation northeast of Mildred Lake. Sierra Nevada. Mono County, California. ca. 1954.



(CROSS, W. 24)
Talus slopes on the west side of Italian Mountain. Gunnison County, Colorado. 1885.



(STERRETT, D. B. 115)
Heavy talus slopes and glacial moraines at foot in valley. Rough dark mountains composed of gabbro or allied rock. Chaffee County, Colorado. n.d.
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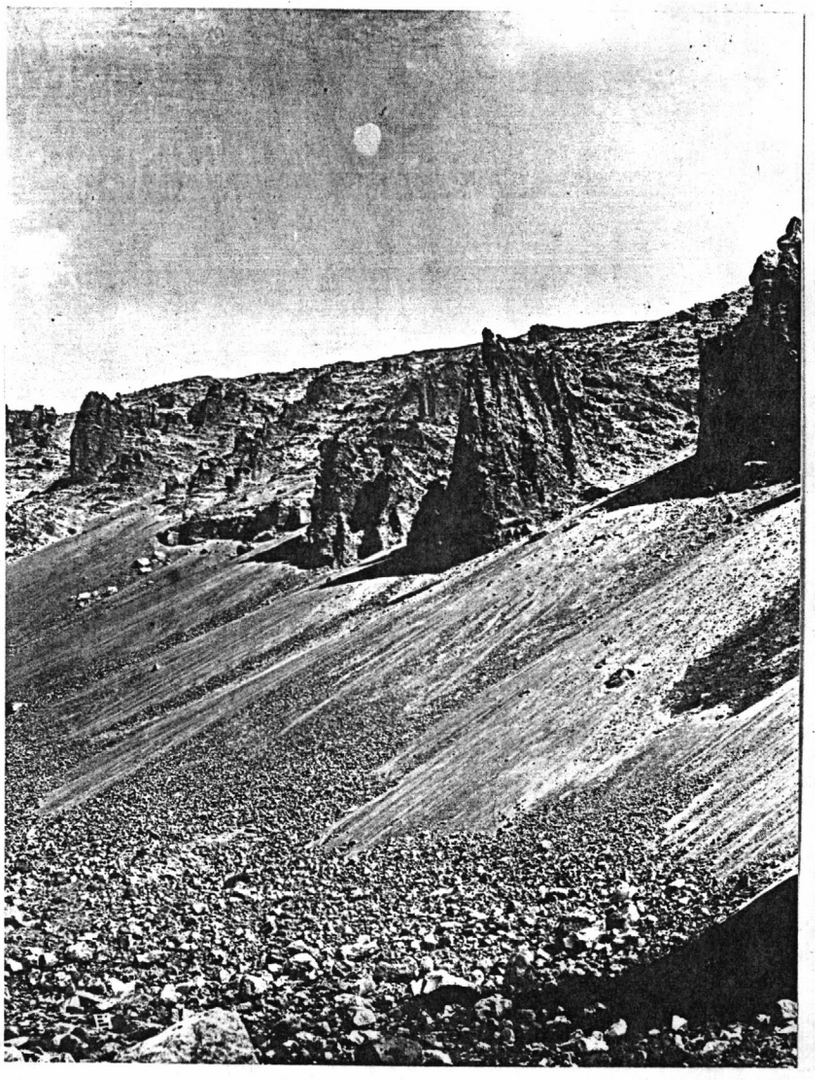
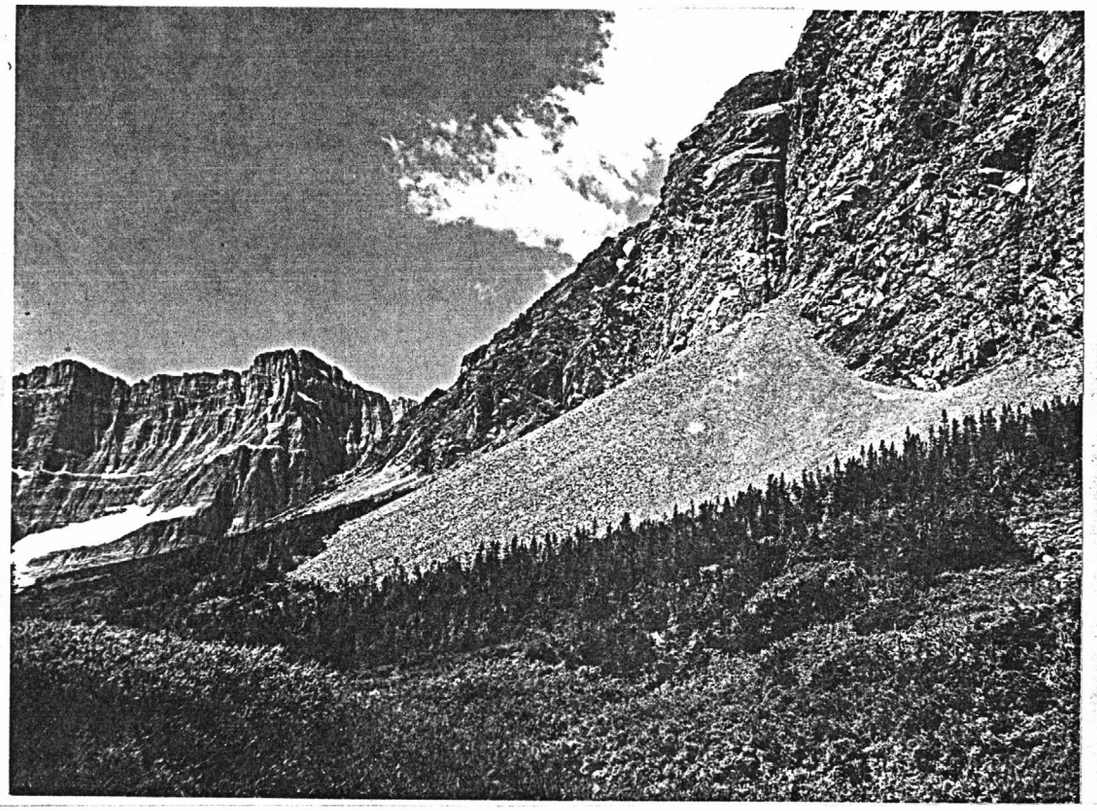
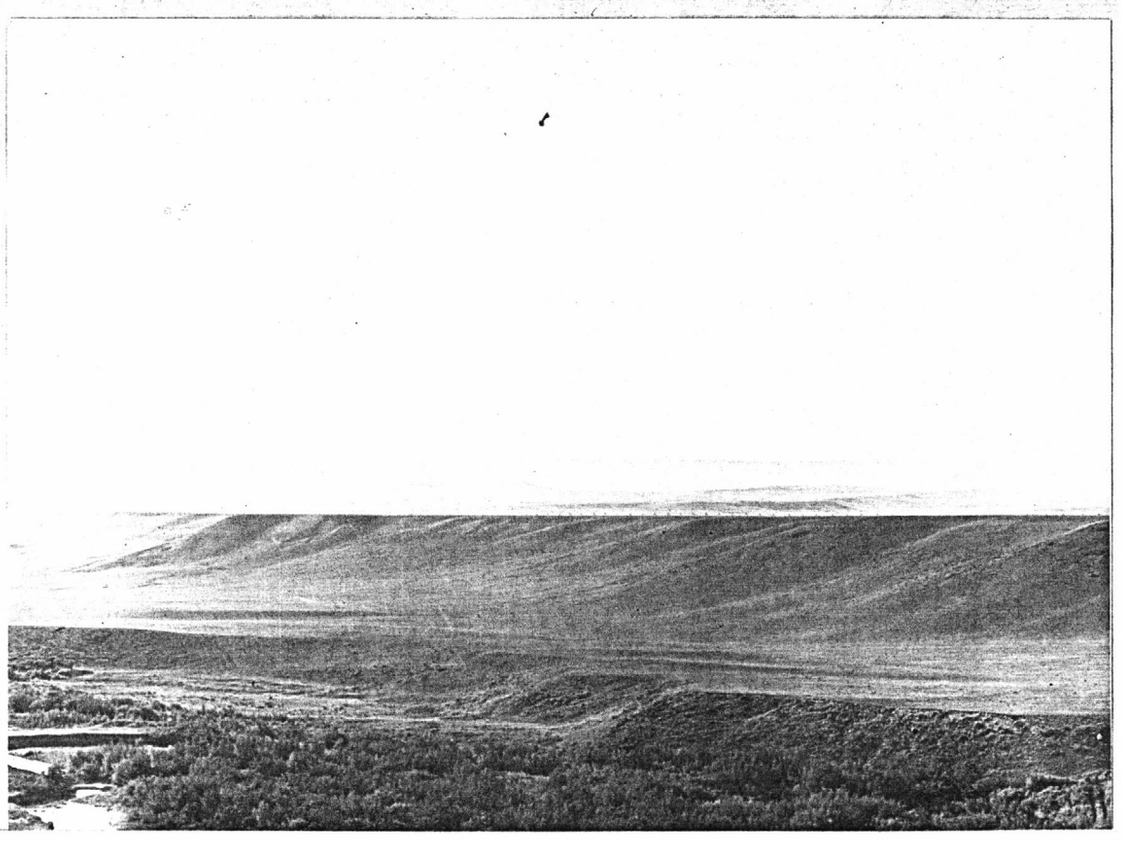


(DILLER, J. S. 81)
Fragmental rocks (talus) on the north side of the canyon of Mud Creek above timber line. Siskiyou County, California. n.d.



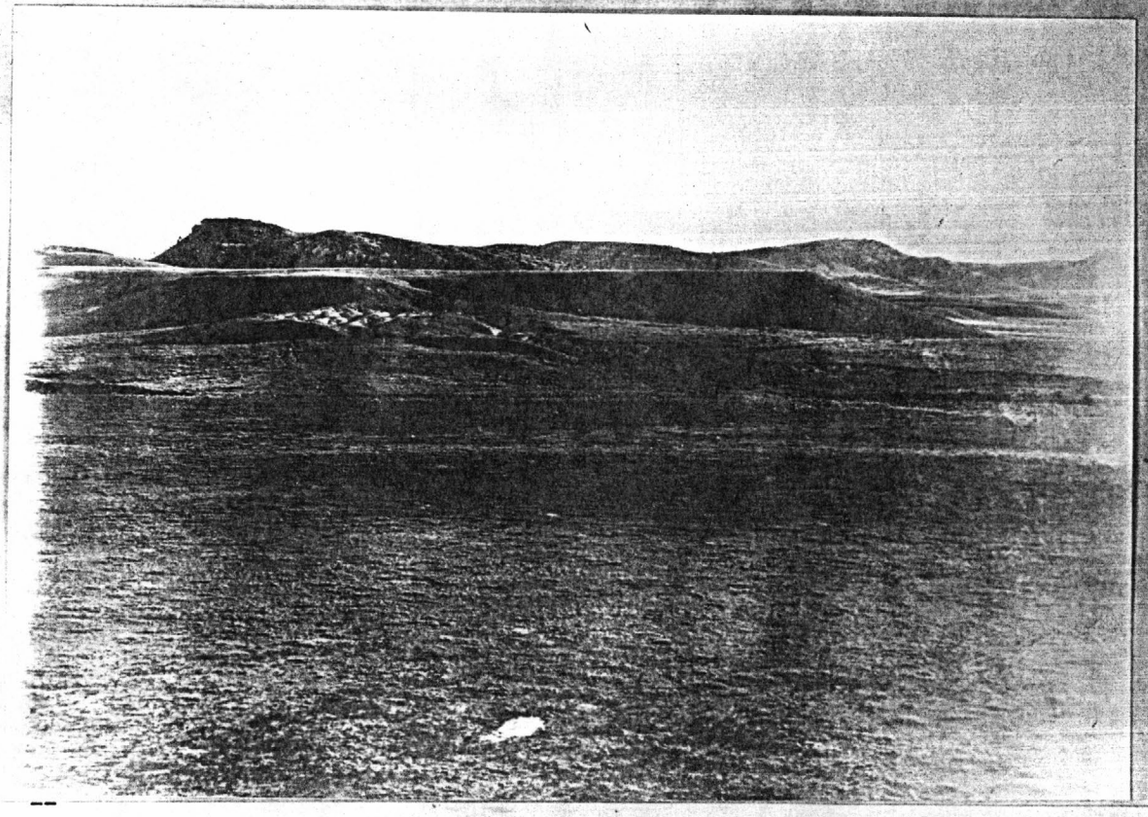
(MALDE, H. E. 48)
Talus cone on west wall of Canyon Creek Valley, about half-way up valley length. Glacier National Park. Glacier County, Montana. July 28, 1954.



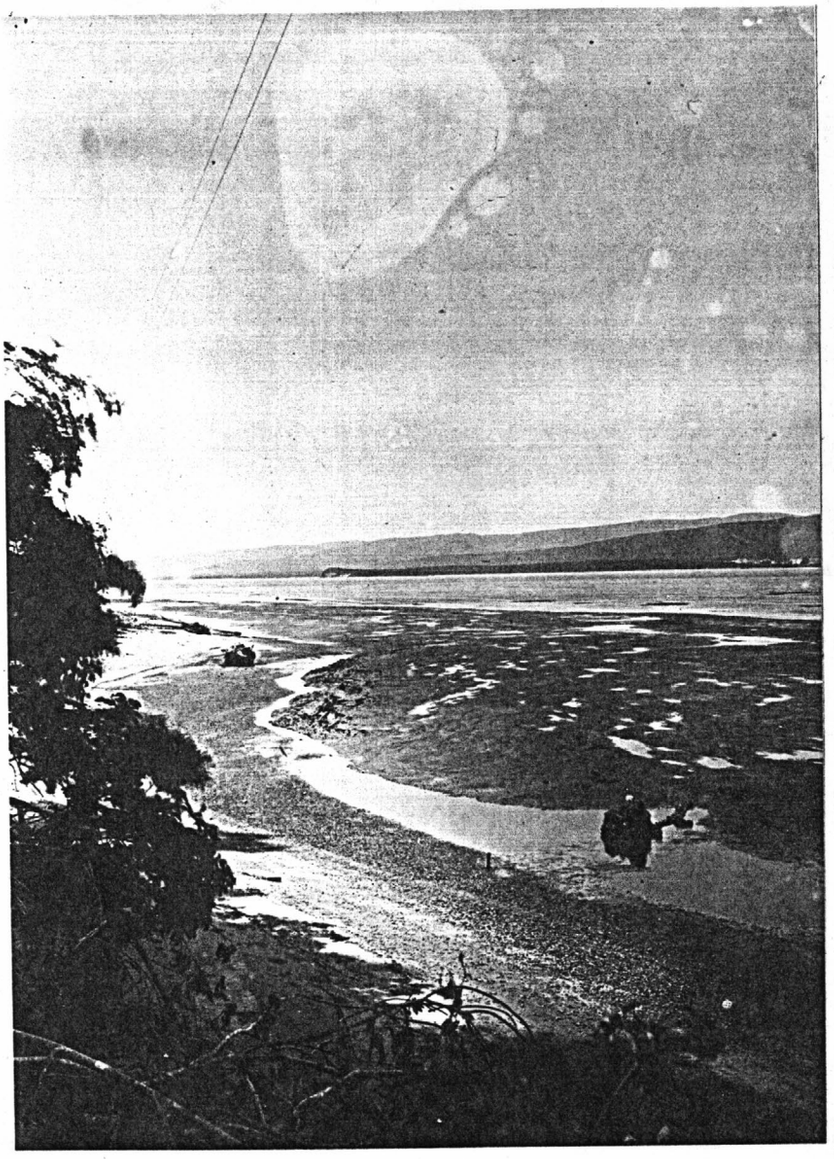
(WALCOTT, C. D. 662a)
Terraces on Deep Creek, about 8 miles from base of mountains. First terrace 30 ft; second 100 ft; third strongly marked terrace about 250 ft above creek. Teton County, Montana. 1900.



(WALCOTT, C. D. 705)
Lake Bonneville terrace, west side of Uquirr Mountain, 5 miles north of Tooele.
Tooele County, Utah. 1903.



(DARTON, N. H. 785)
Valley terrace on north side of North Platte River, north of Cassa station.
Platte County, Wyoming. ca. 1901.



(GILBERT, G. K. 2863)
Tidal flat west side of Tomales Bay, looking north. This part of the flat was ridged by the earthquake but has been smoothed by tides. The mud was also heaped up against the firmer ground of the shore as seen at left. Marin County, California. 1906.



(GILBERT, G. K. 2861)
Ridges and tidal flat near head of Tomales Bay, looking east at low tide. Before the earthquake the surface is said to have been smooth. Marin County, California. April 28, 1906.
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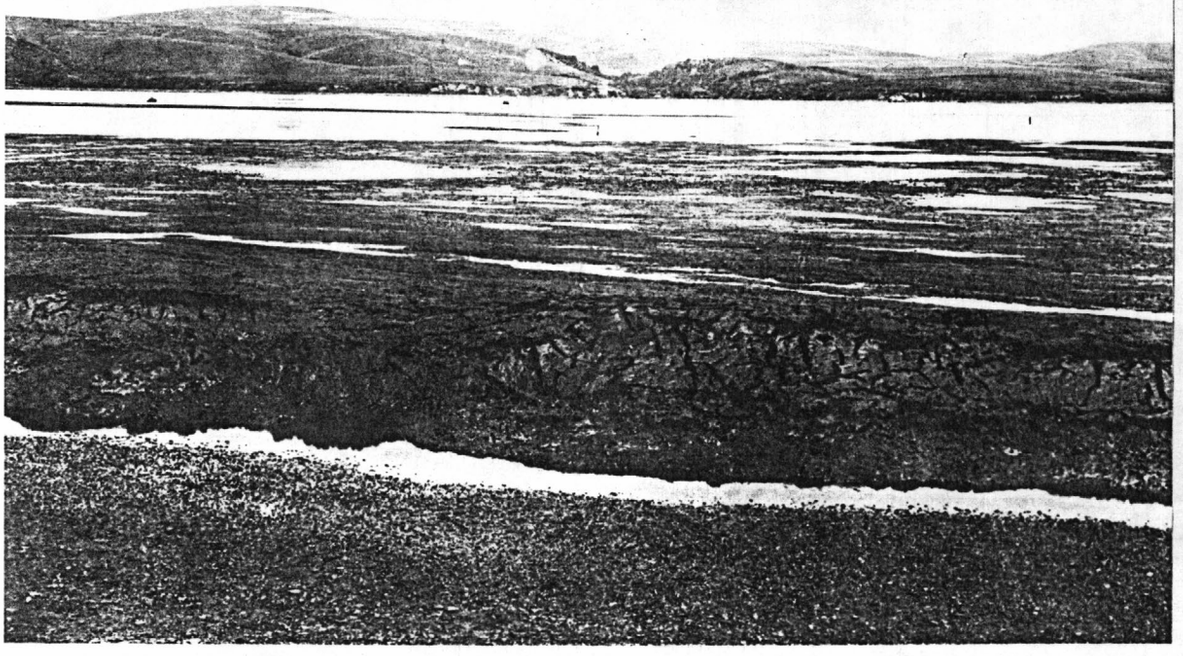

(GILBERT, G. K. 2864)
Portion of tidal flat, Tomales Bay, looking northeast after the earthquake of 1906. Marin County, California.
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ALDEN, W. C. 97)
Clayey matrix exposed in road cut through long, narrow drumlin, showing cleavage of material due to the over-riding glacier. SE¼ Sec. 21, T. 9 N., R. 14 E. Dodge County, Wisconsin. August 1904.



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(GILBERT, G. K. 1752)
Glacial till shore of Lake Ontario, Fort Niagara. Niagara County, New York. ca. 1889.

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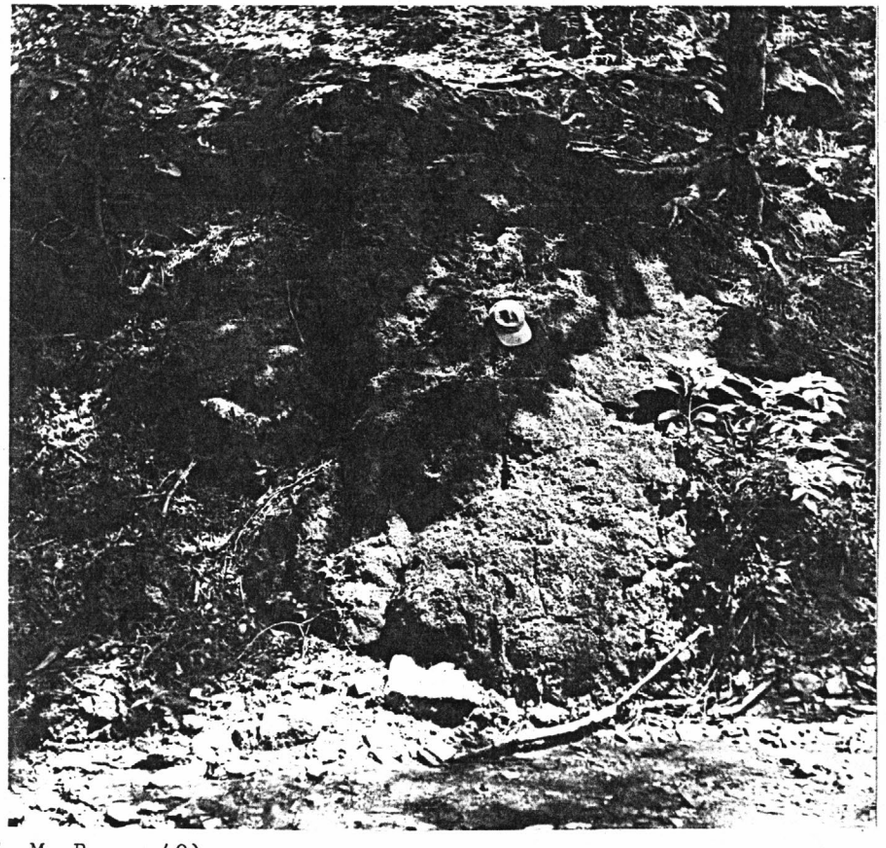
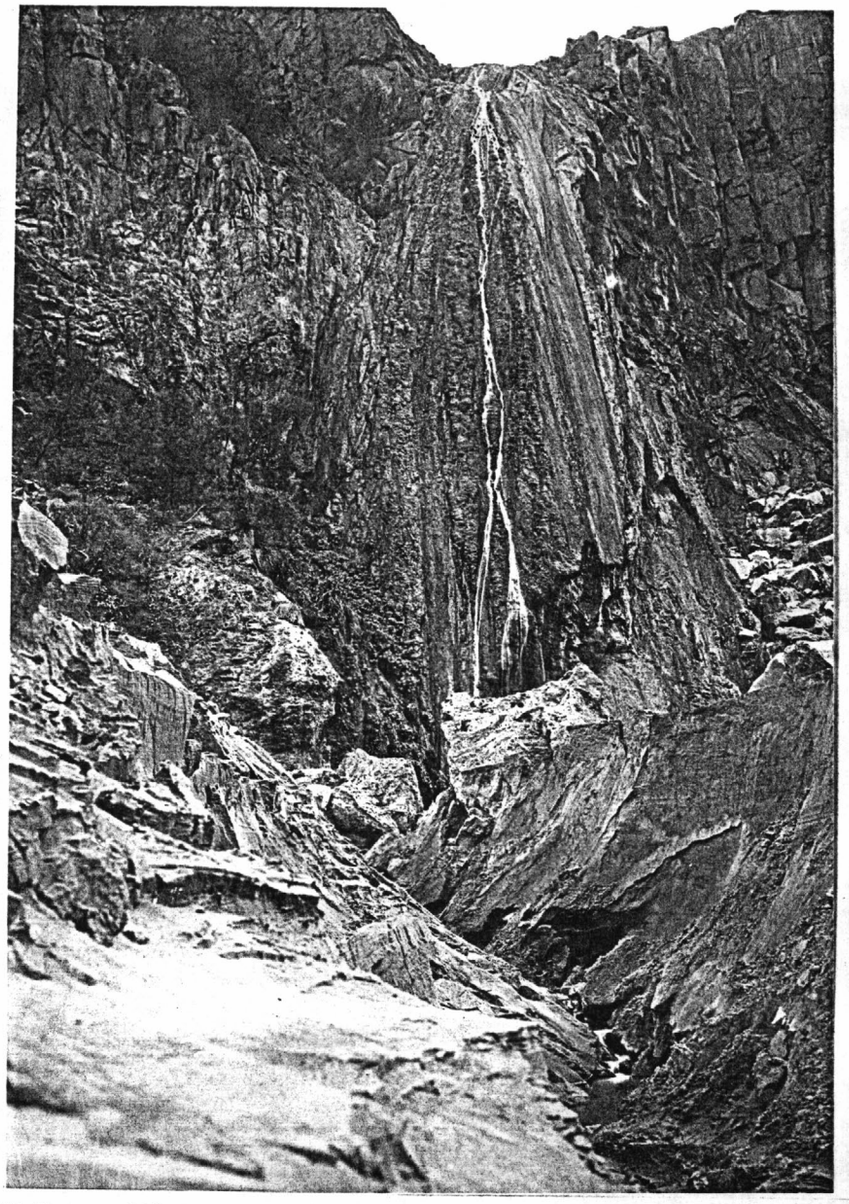
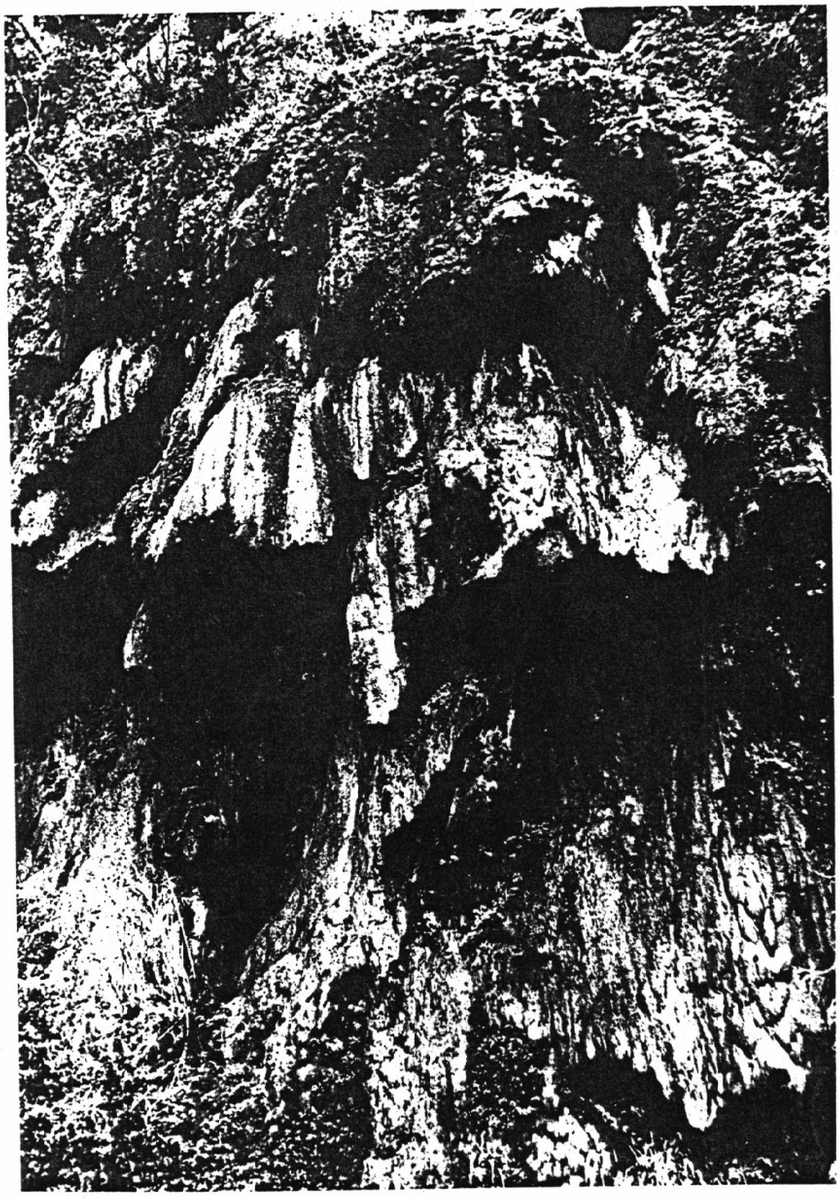
(WILLIAMS, J. R. 930)
Section of till and outwash overlying shale of the Matanuska formation in borrow pit, Caribou Creek area, Upper Matanuska valley. Alaska. September 1953.



(MUDGE, M. R. 49)
Travertine deposit formed from spring emitting from the base of the Neva limestone member of the Grenola limestone in SW¼SE¼ sec. 11, T. 12 S., R. 10 E. Wabaunsee County, Kansas. n.d.



(TOPOGRAPHY D 83)
Travertine Falls, 5 miles below Diamond Creek. Grand Canyon National Park. Mohave County, Arizona. 1923.



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(SEGERSTROM, K. 662)
Travertine deposits on wall of canyon of the Rio Extorax, about 5 km west of Las Medias. Queretaro, Mexico. ca. 1956.

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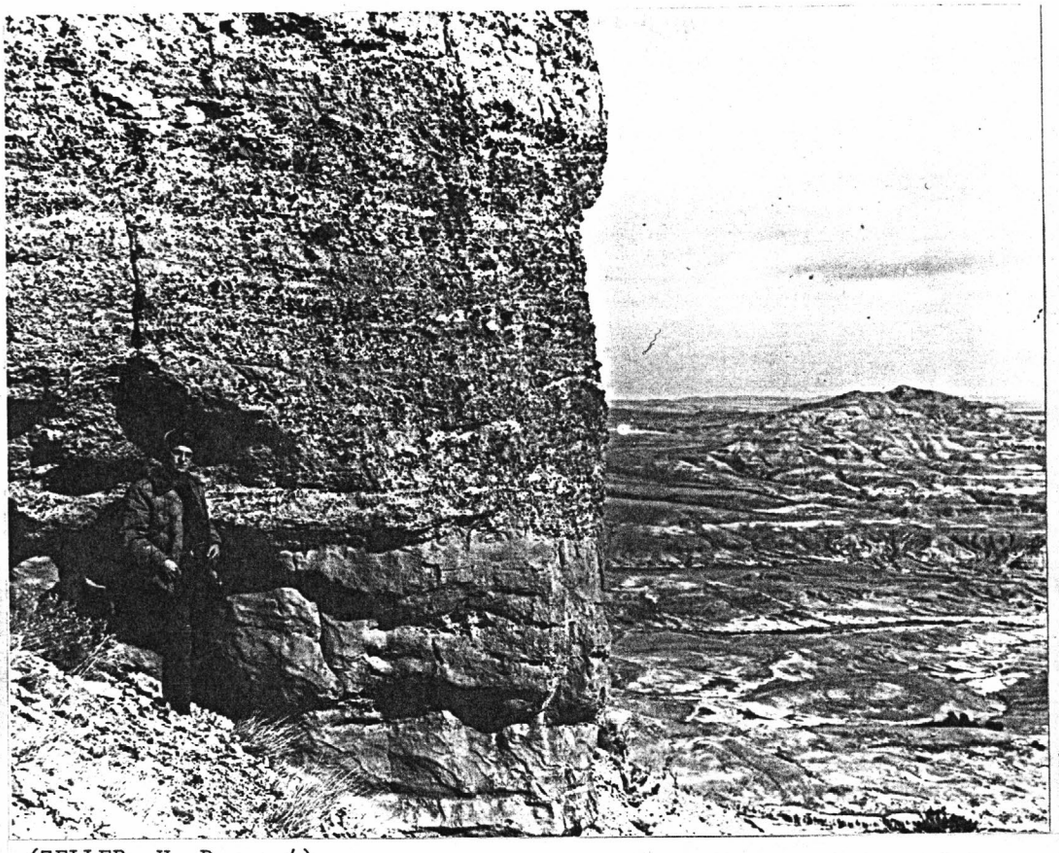
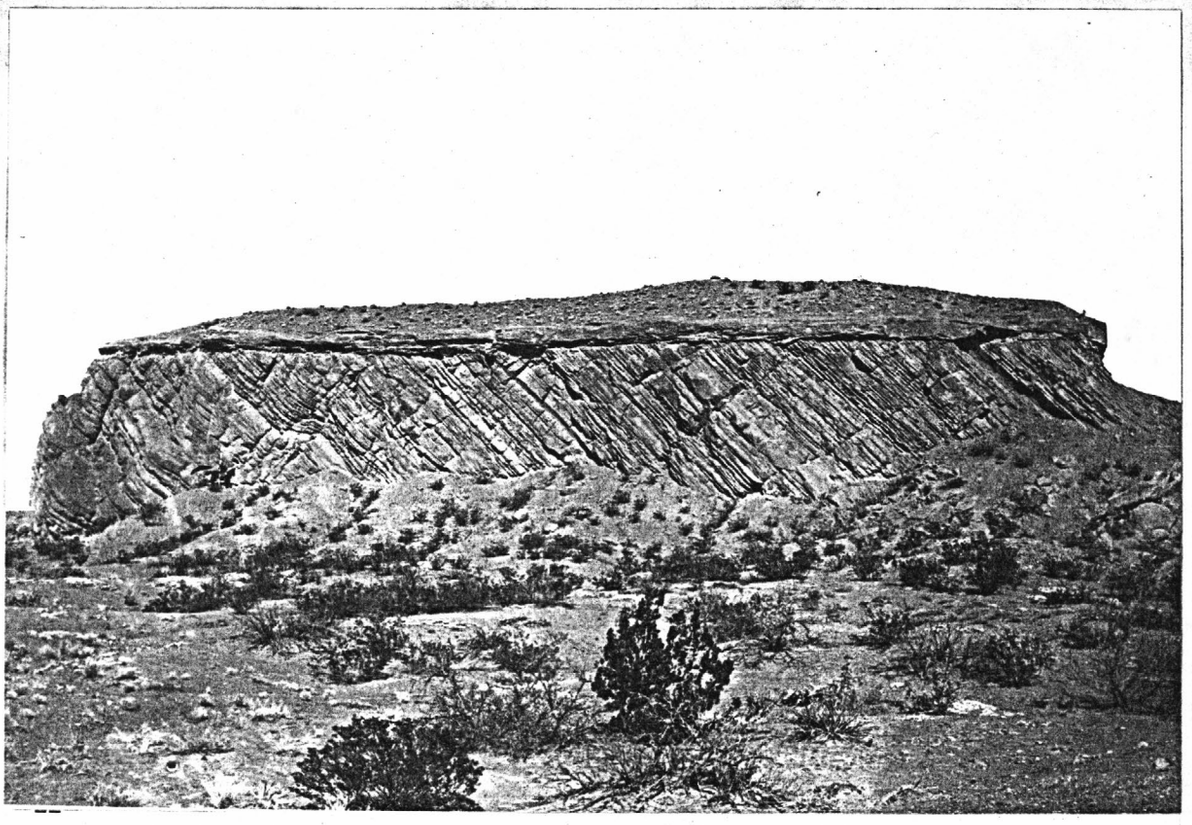
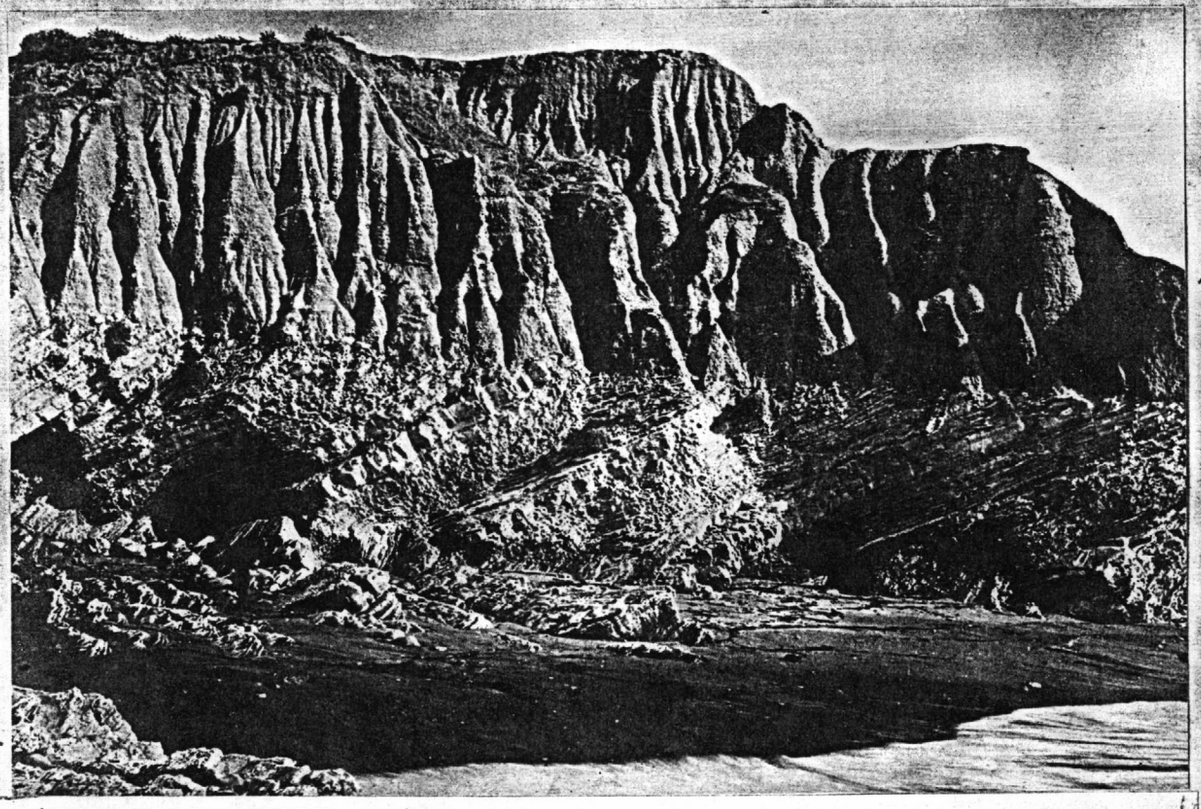
(HUNT, C. B. 953)
Travertine mound (white) at Nevares Spring, issuing along a fault at the foot of the Funeral Mountains. Cambrian Bonanza King Formation in background. Death Valley National Monument. Inyo County, California. ca. 1960.



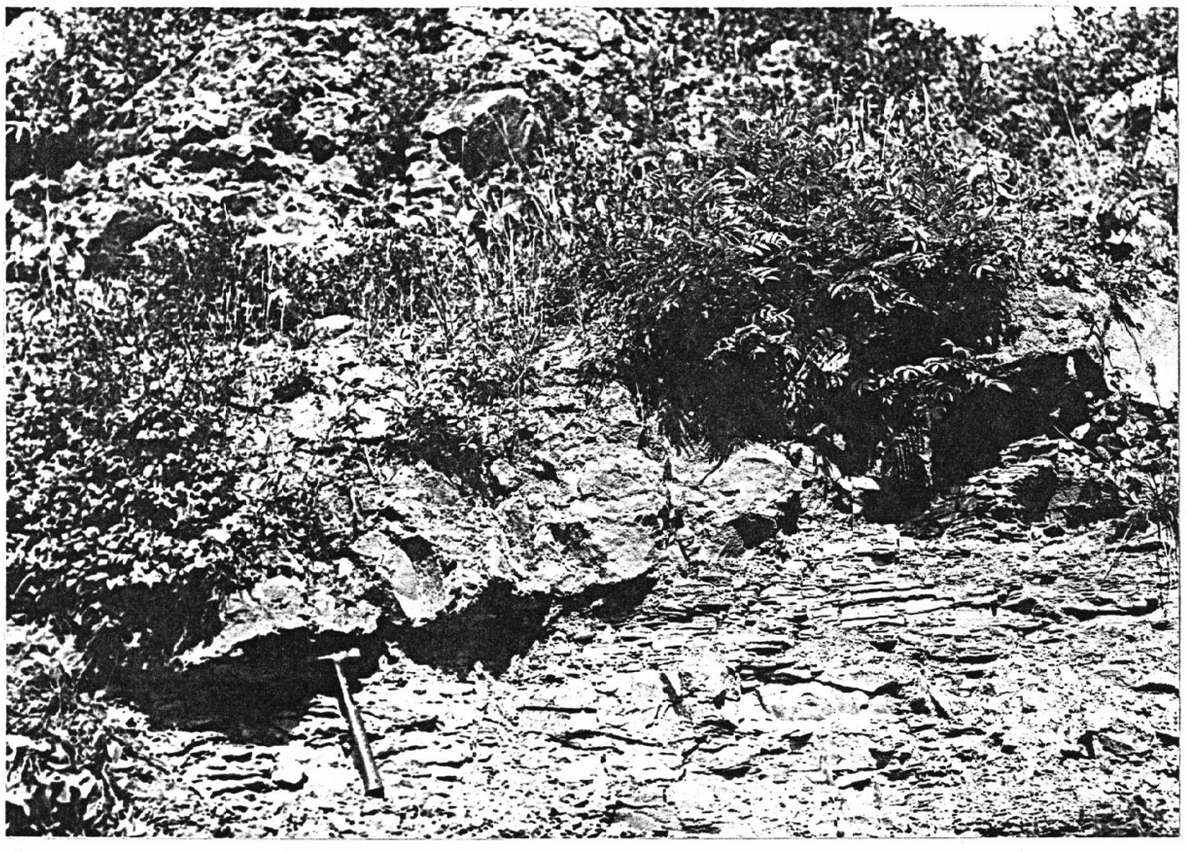
(ZELLER, H. D. 4)
Basal conglomerate of the Arikee Formation, resting unconformably on the Bridger Formation at Oregon Buttes. Continental Peak is in the background. Sweetwater County, Wyoming. ca. 1962.



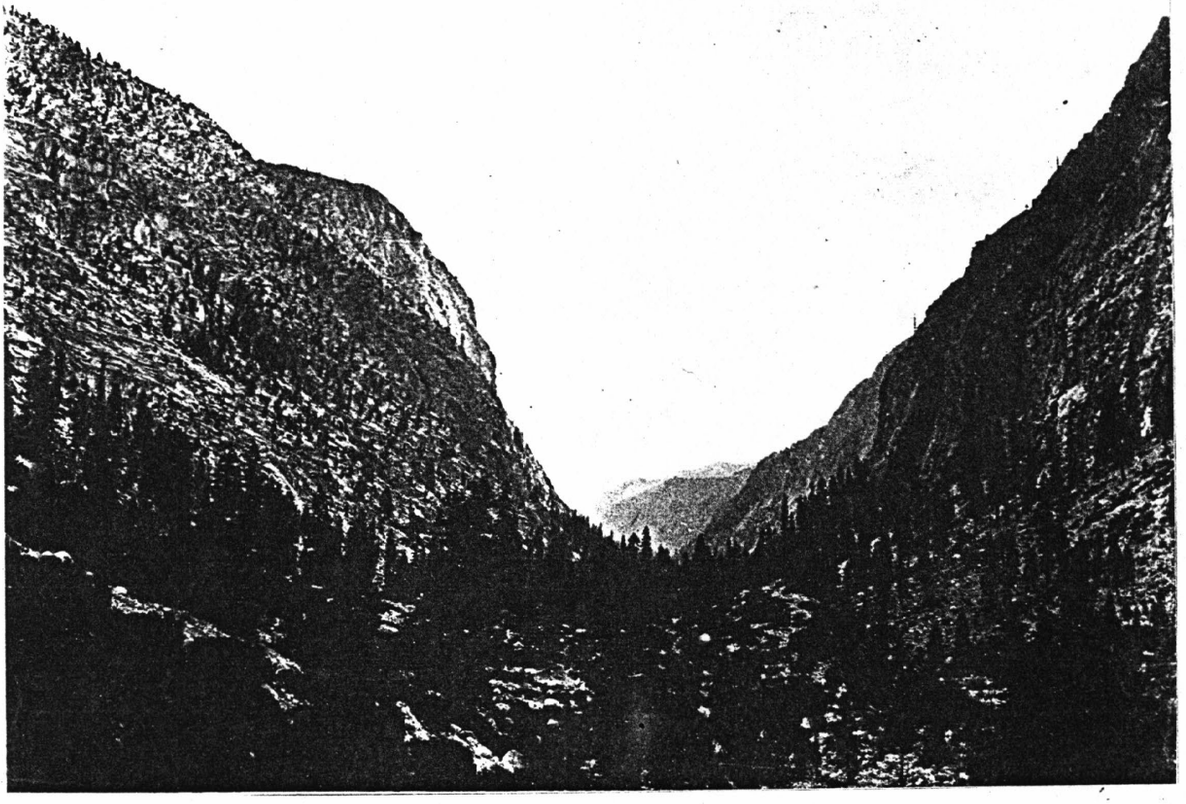
(CHAPMAN, R. H. 204)
Unconfromity, small mesa near San Lorenzo arroyo. Socorro County, New Mexico. 1905.



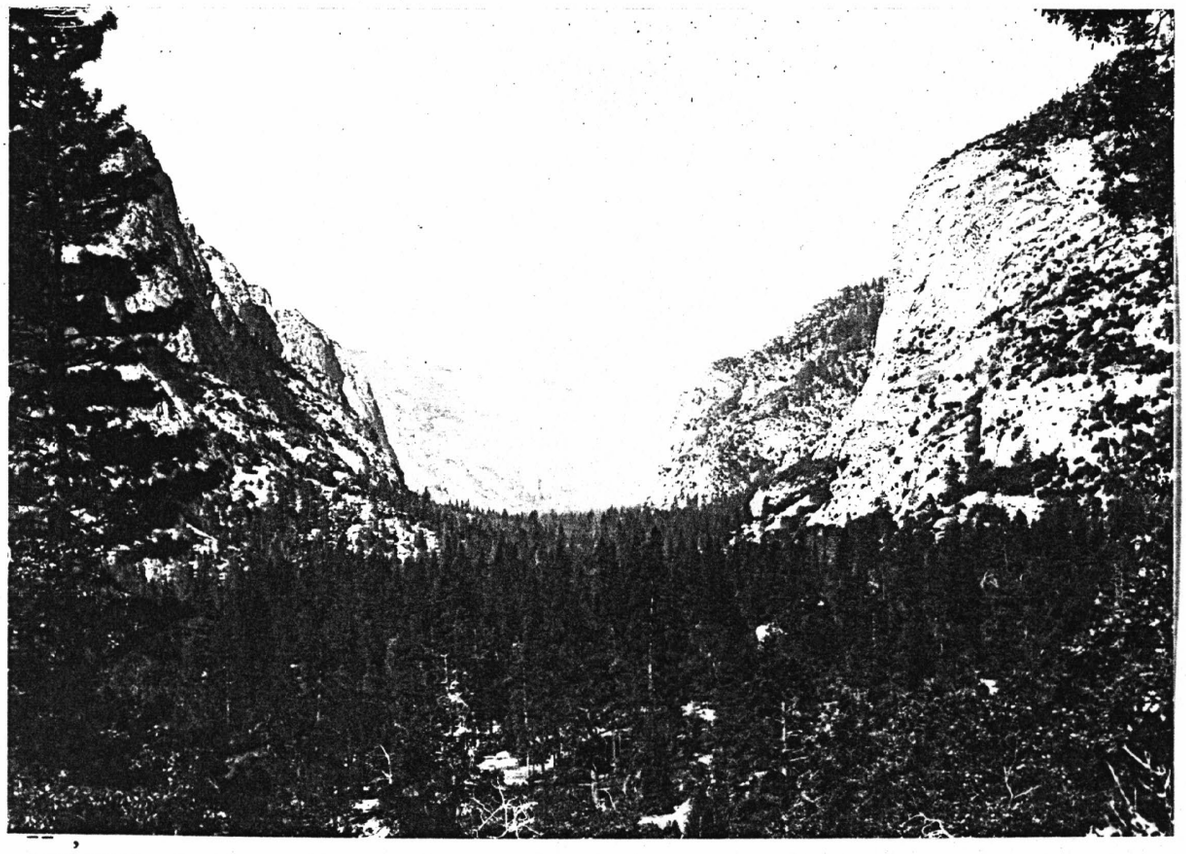
(STOSE, G. W. 771)
Quarternary terrace deposits resting unconformably on eroded edges of Monterey shale, on the coast between Pismo and Port Harford. The contact is a wave-cut plain. Note rain sculpture in terrace gravels. San Luis Obispo County, California. ca. 1900.



(LOVE, J. D. 152)
Unconformity between Hominy Peak and Darby Formations 275 m northeast of the Grand Targhee Resort. Strike is about north-south on both formations; Hominy Peak dips 20° W.; Darby dips 70° W. Teton County, Wyoming. September 17, 1971.



(GANNETT, H. 214)
Kern Canyon, a u-shaped valley. Tulare County, California. n.d.



(GILBERT, G. K. 2493)
Looking down Kings River Canyon, Sierra Nevada, from Summit Meadow trail. Kings Canyon National Park. Fresno County, California. 1904.



(MATTHES, F. E. 690)
Looking down Deadman Canyon showing its perfect u-shape. Tulare County, California. 1925.
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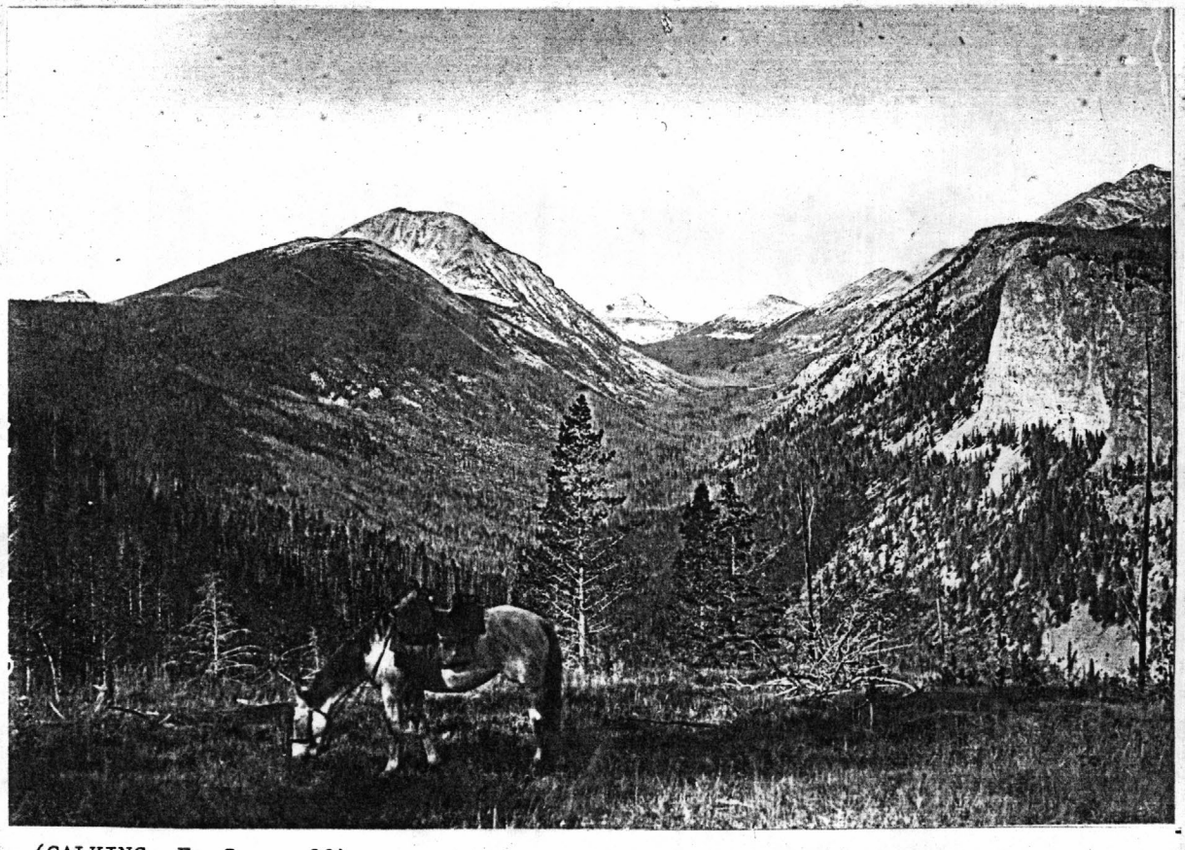

(CALKINS, F. C. 88)
Canyon of Mill Creek. Shows characteristic u-shaped cross section and remains of old topography on the sides. Deer Lodge County, Montana. n.d.
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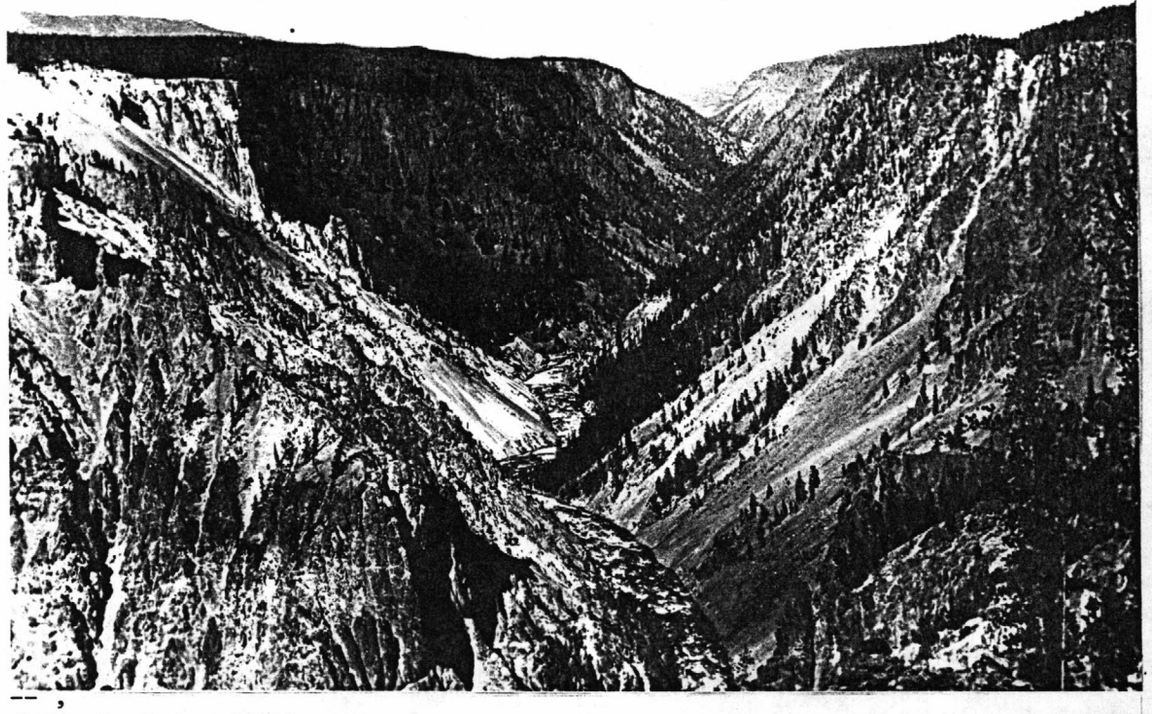
(PARKER, F. S. 100)
Grand Canyon of the Yellowstone, from platform near lodge. Yellowstone National Park. Wyoming. 1931.



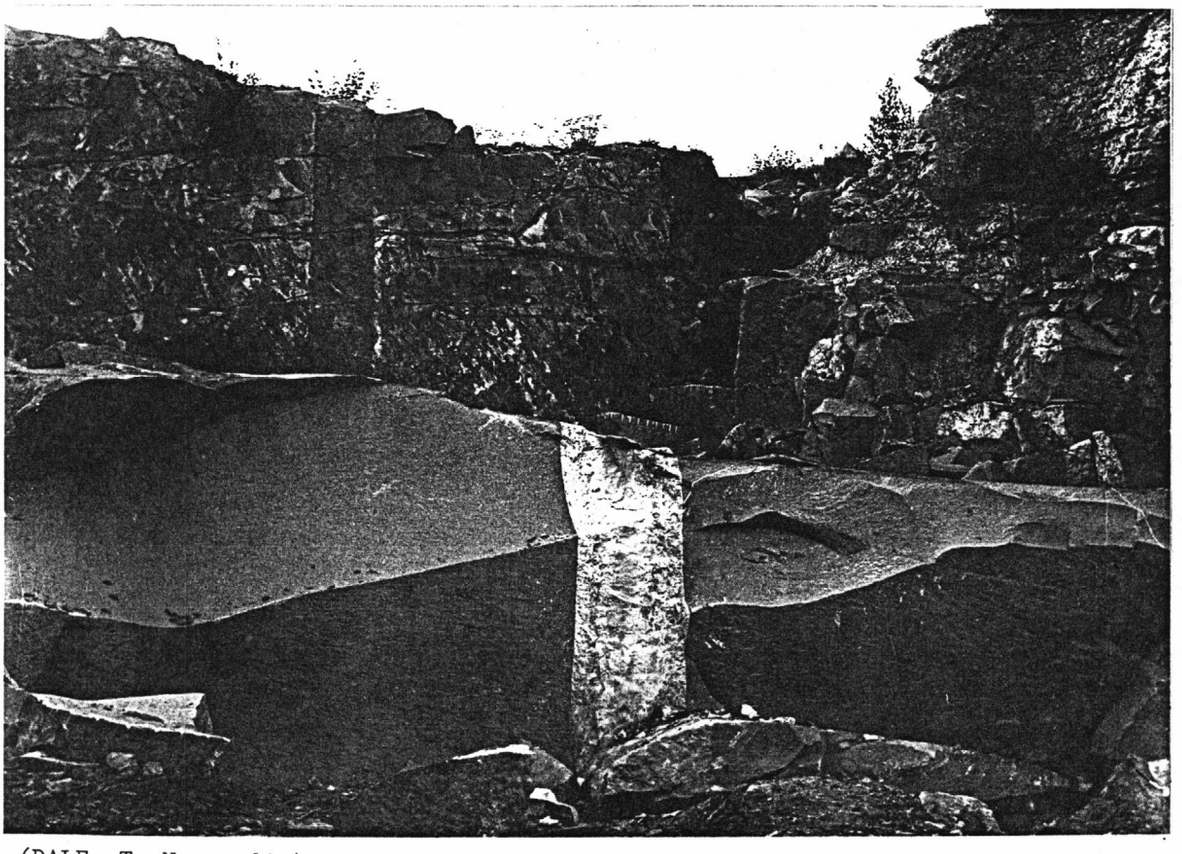
(LEE, W. T. 2119)
Grand Canyon of the Yellowstone. Yellowstone National Park. Wyoming. 1921.



(GREGORY, H. E. 208)
Valley cut into porphyry lavas on Mount Taylor. The skyline at head of valley is on the rim of the crater. Note rounded valley sides. Sec. 31, T. 12 N., R. 7 W. Valencia County, New Mexico. n.d.



(MENDENHALL, W. C. 302)
V-shaped valley above mouth of Rock Creek, looking south 3° east. Copper River region, Alaska. n.d.



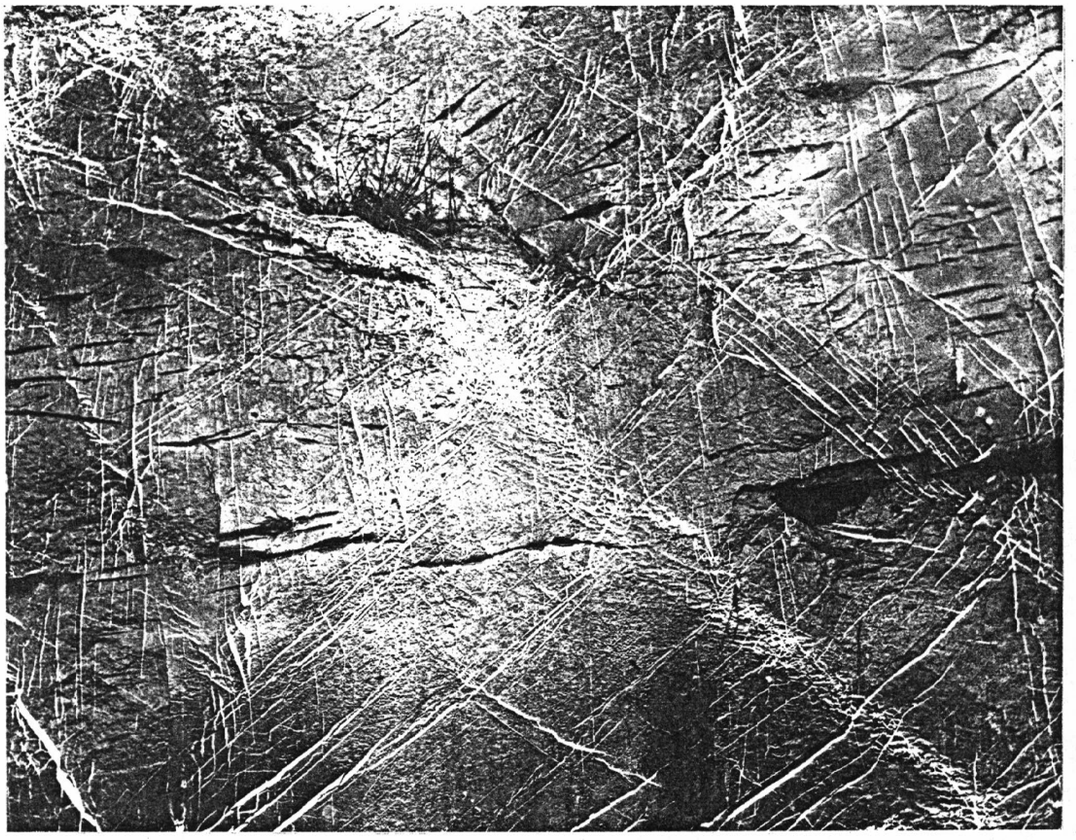
(DALE, T. N. 200)
Pegmatite vein in diorite. Lincoln County, Maine. n.d.



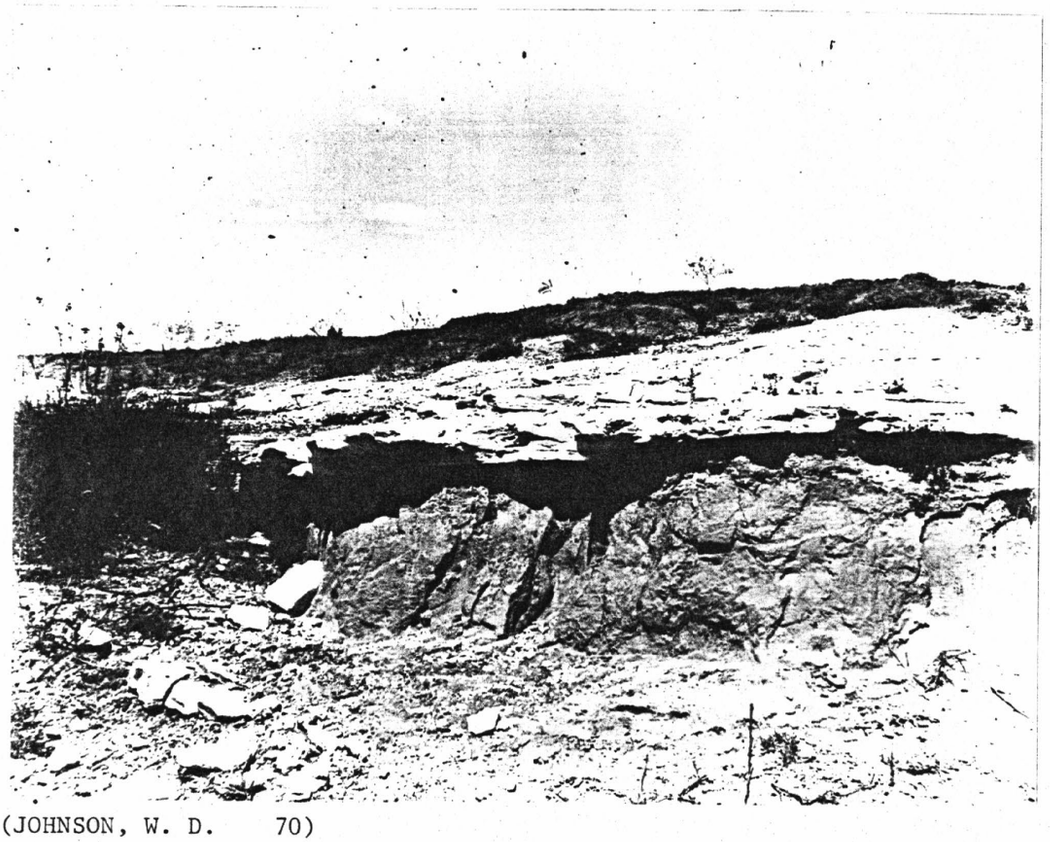
(HOWE, E. 57)
Pegmatitic vein cutting schist and small vein of granite. South of Sullivan Creek, Las Animas canyon. San Juan County, Colorado. October 2, 1900.



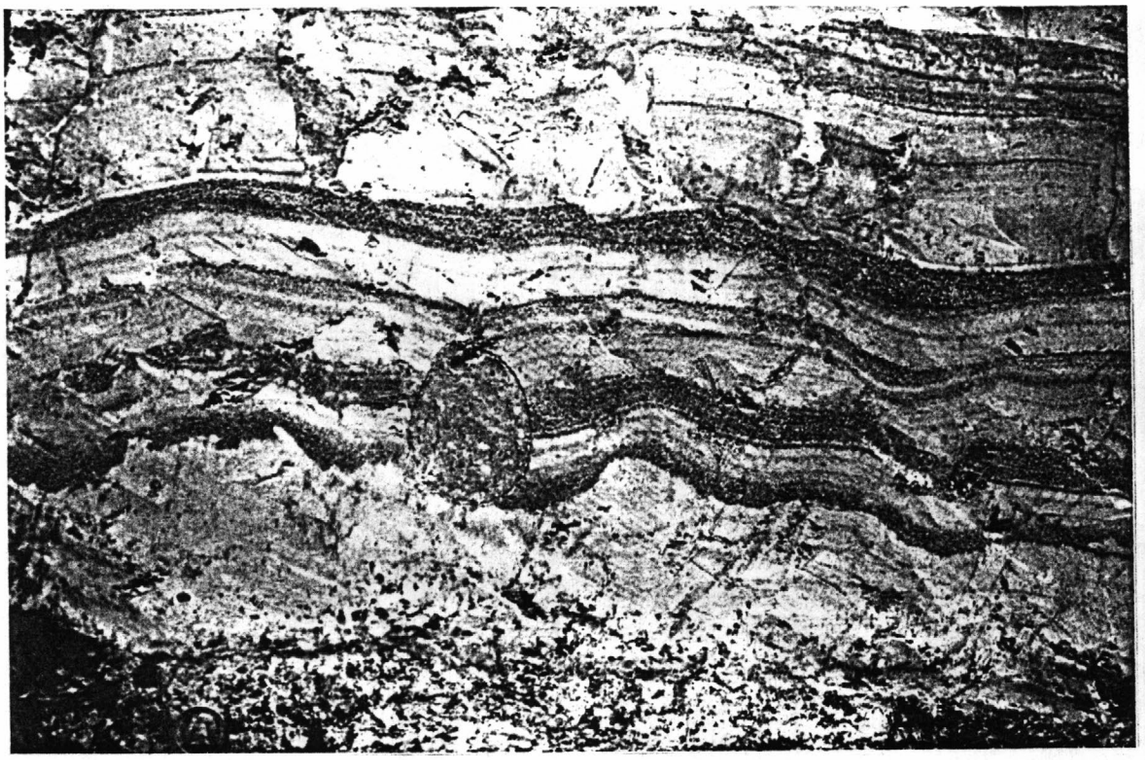
(RAY, R. G. 54)
Independence vein cut off by normal fault on 1100-foot level, Independence mine. Willow Creek mining district. Cook Inlet region, Alaska. 1949.



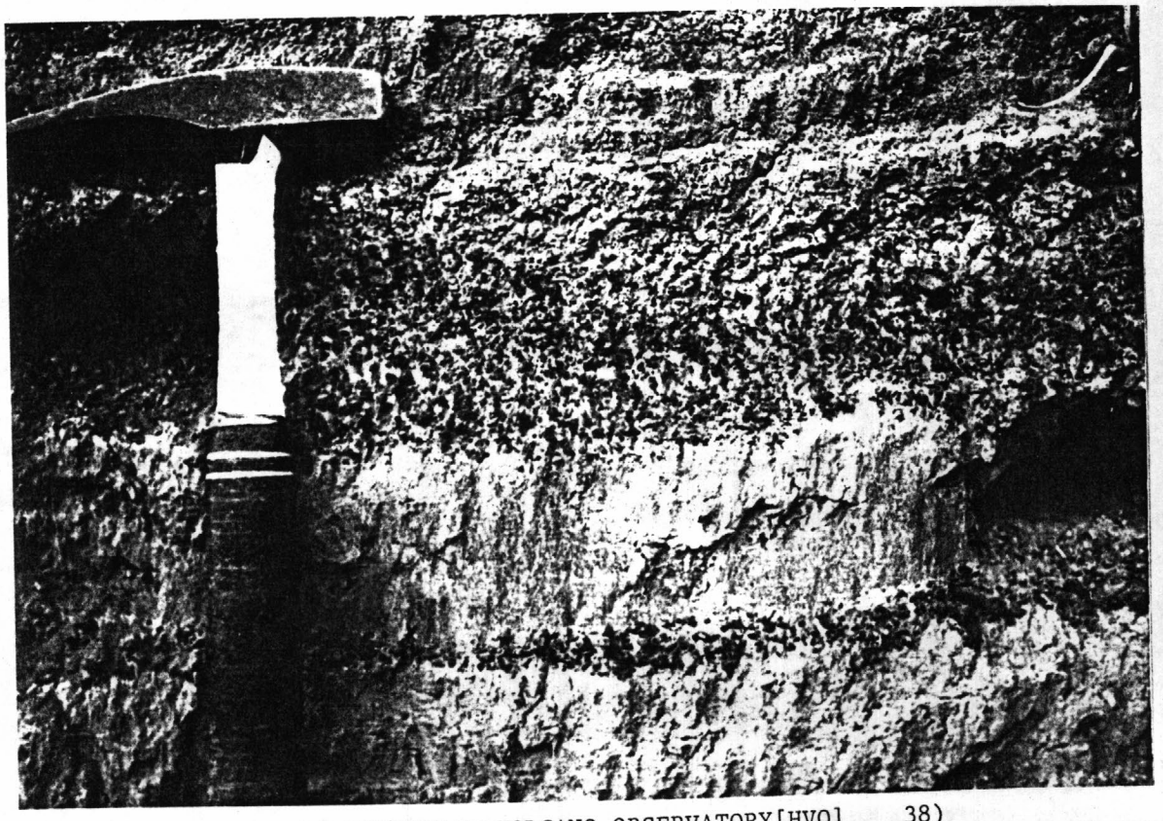
(WALCOTT, C. D. 39)
Seams in limestone filled with calcspar. Calciferous formation, near Limekiln Point, Highgate Springs. Franklin County, Vermont. 1889.



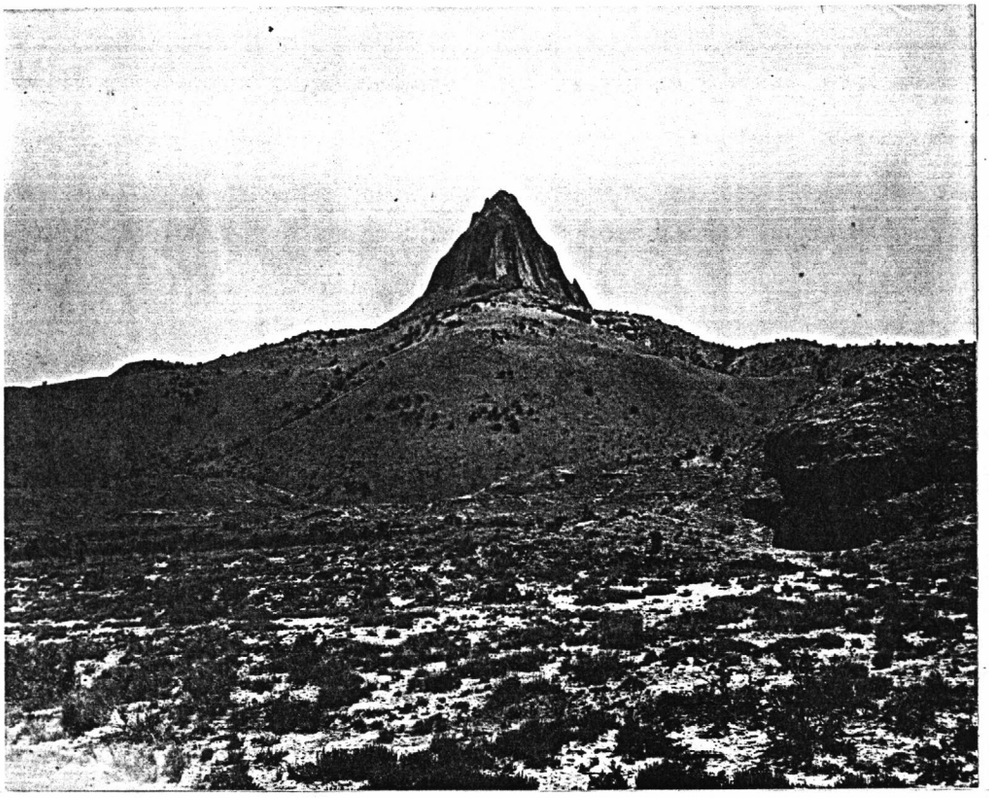
(JOHNSON, W. D. 70)
Volcanic ash deposit resting directly on the Red Beds. Woodward County, Oklahoma. n.d.



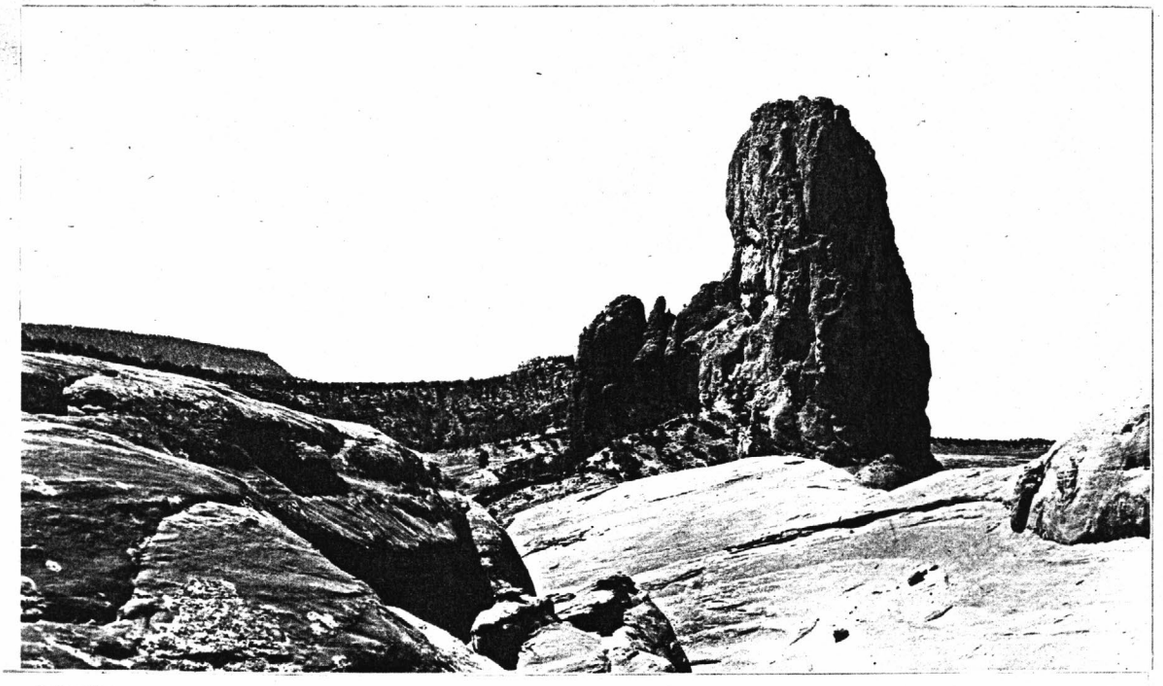
(MALDE, H. E. 1145)
Lower part of the Hueyatlaco ash showing graded laminar beddding resulting from deposition in water under relatively tranquil conditions. The coin at at lower left is 24 mm in diameter. The egg-shaped area is an animal burrow. Hueyatlaco archaelogical site, Valsequillo. Puebla, Mexico. ca. 1973.



(U. S. GEOLOGICAL SURVEY/HAWAII VOLCANO OBSERVATORY[HVO] 38)
Close-up view of lower beds of Pohaka Ash Member, Keana Bihopa, showing typical bedding and lithology. Hawaii County, Hawaii. n.d.



(DUTTON, C. E. 13)
Alesna, a volcanic in the northwest side and near base of the Mount Taylor mesa. McKinley County, New Mexico. ca. 1885.



(GREGORY, H. E. 166)
The Beast a volcanic neck, Red Lake volcanic field, Black Creek valley. McKinley County, New Mexico. July 1913.
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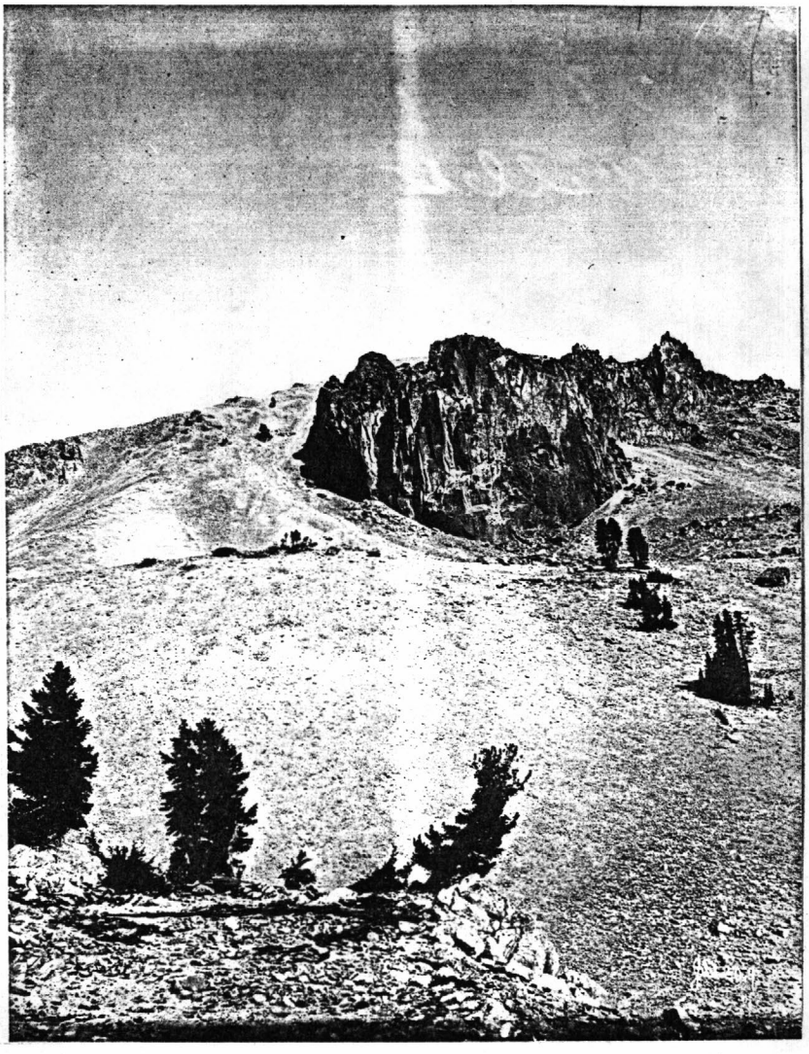

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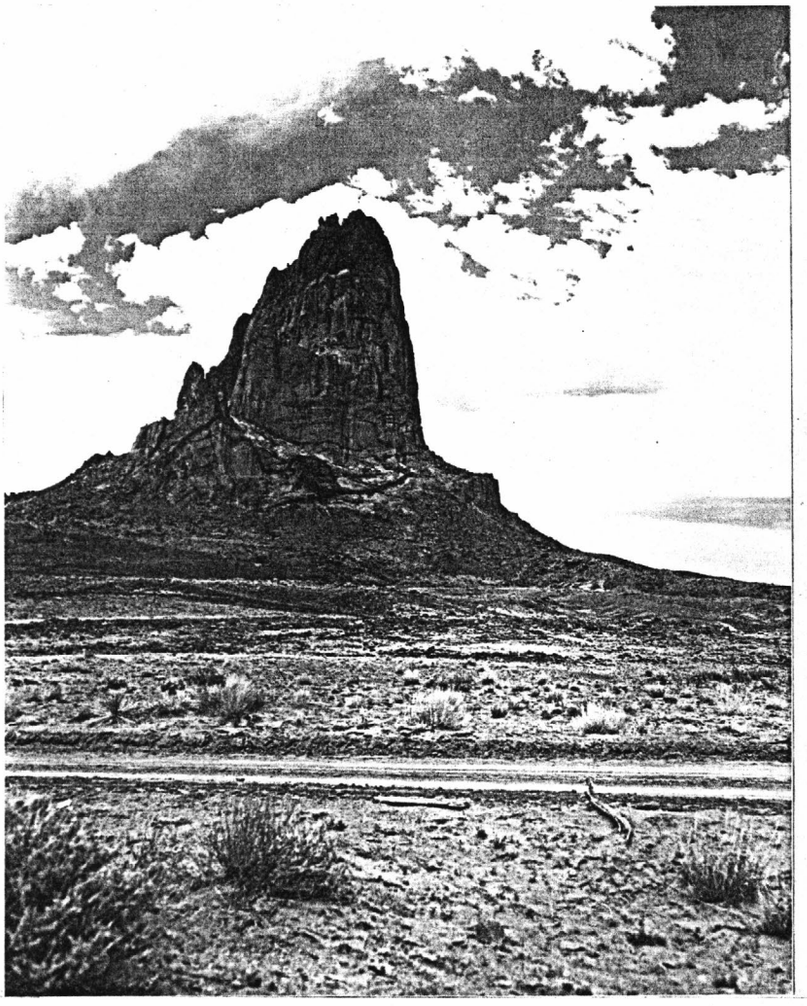
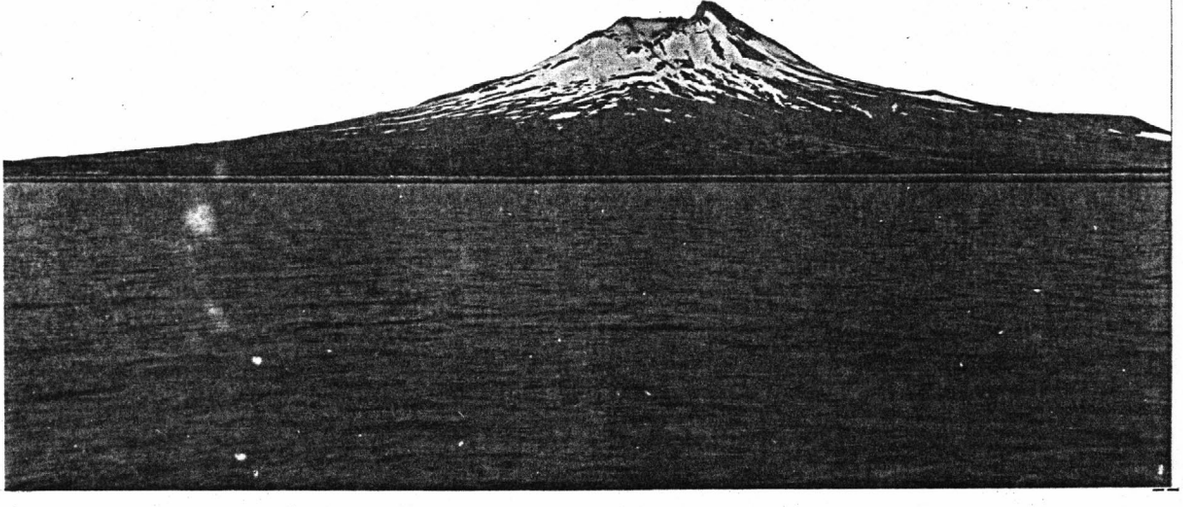
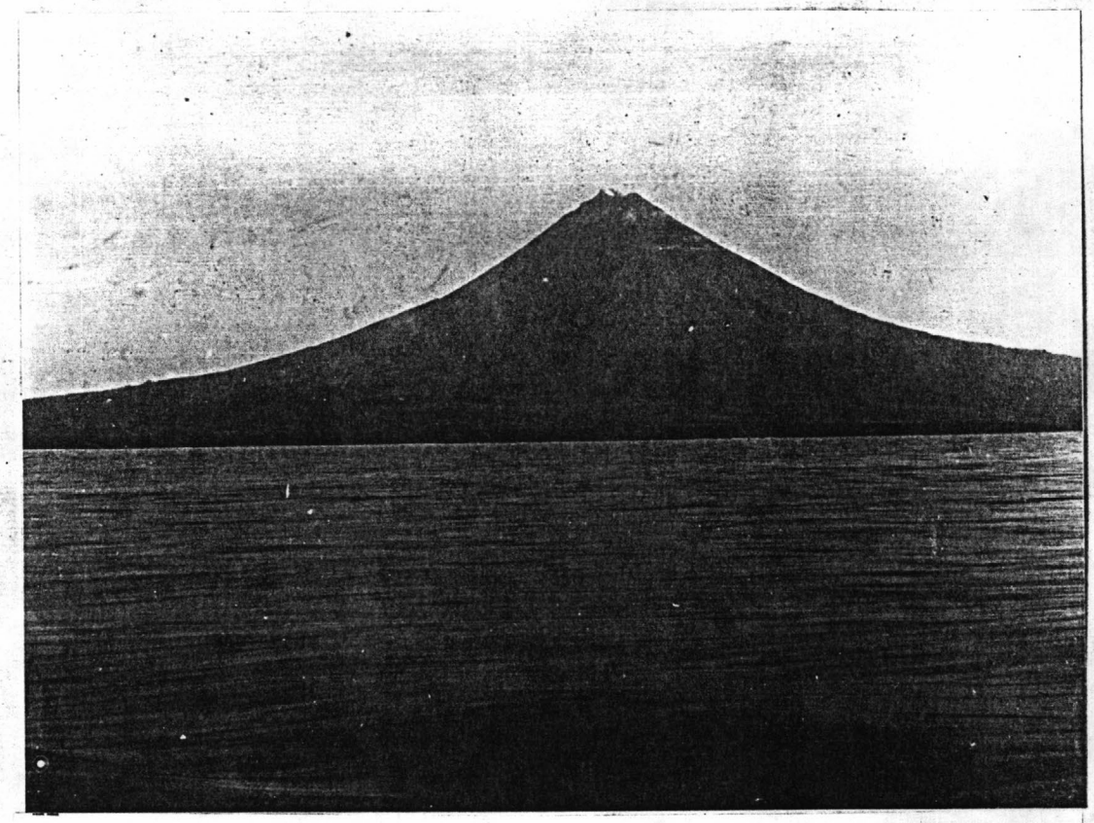
(DILLER, J. S. 209)
The volcanic neck of Lassen Peak as seen from the southwestern slope of the peak. Shasta County, California. n.d.



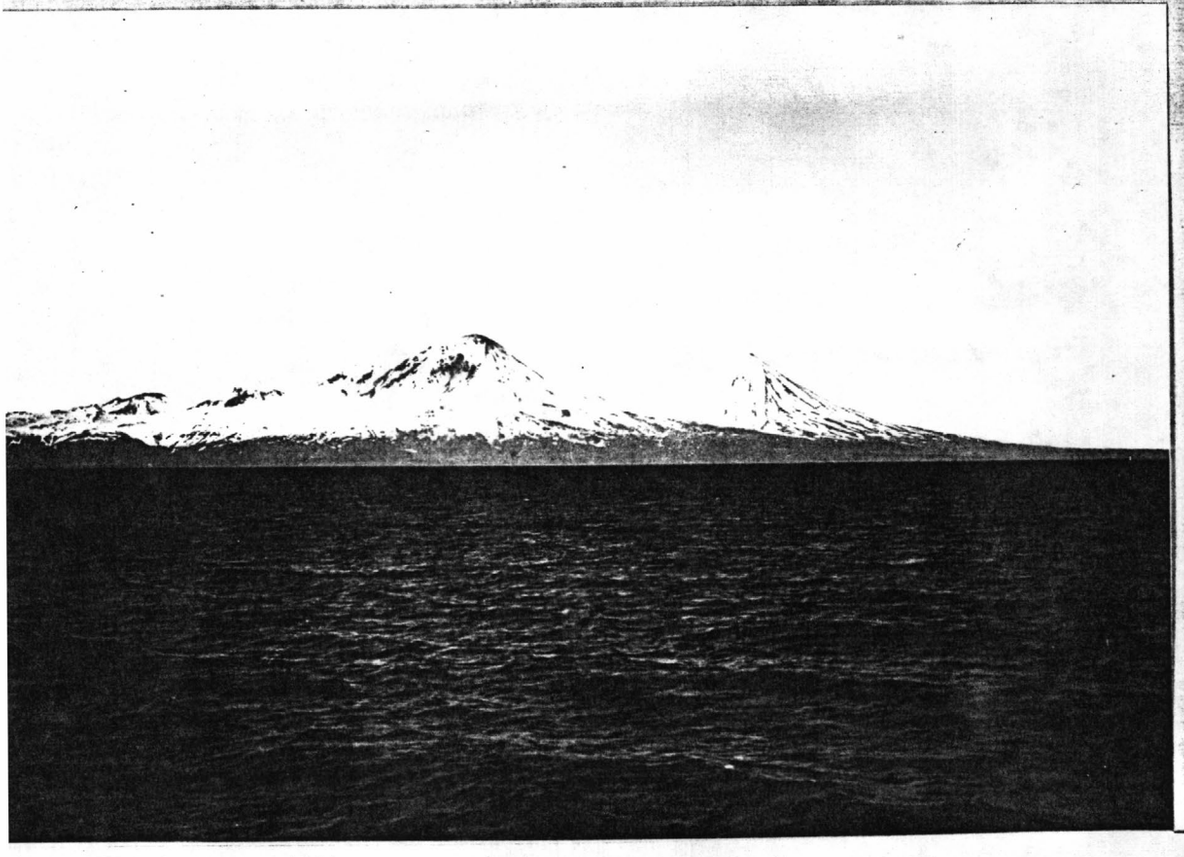
(WITKIND, I. J. 133)
Looking east at Agathla volcanic, from Navajo Indian Reservation Route 1. Note the crude bedding in the main mass of the volcanic neck. Monument Valley. Navajo County, Arizona. ca. 1952.



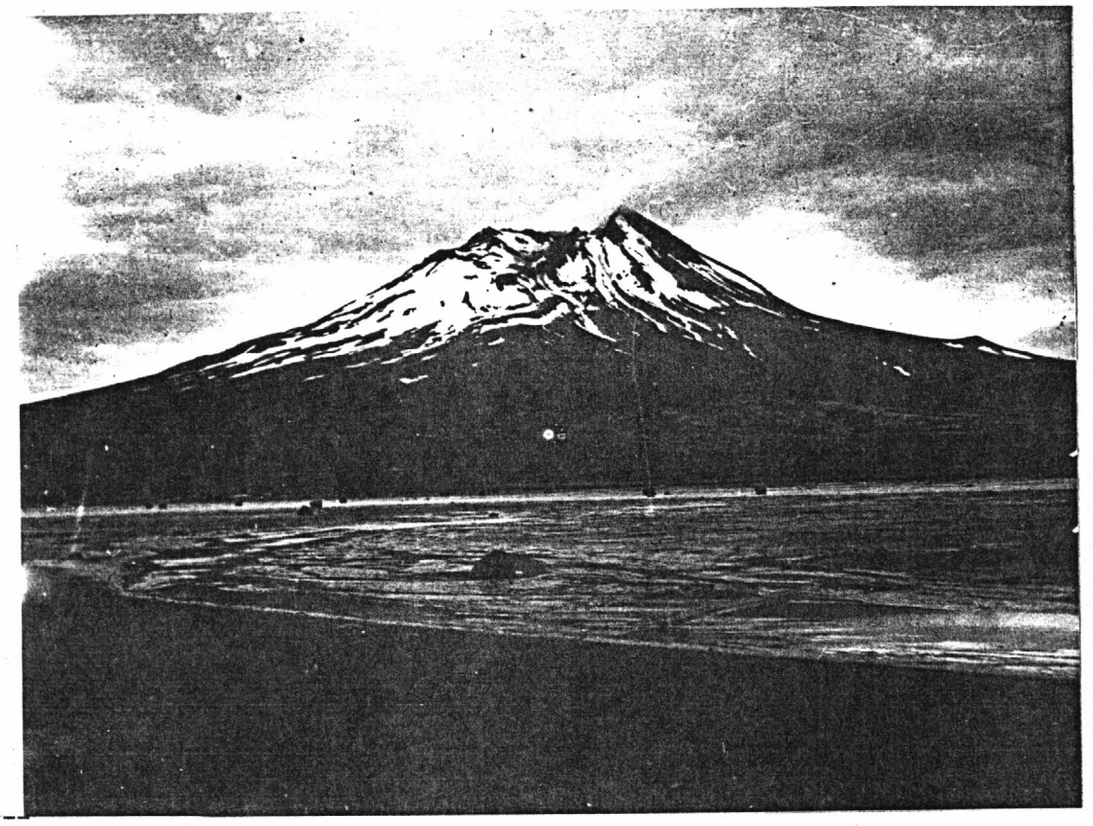
(PURINGTON, C. W. 50)
Mount St. Augustine as viewed from the southwest. Kamishak district, Cook Inlet region, Alaska. 1895.



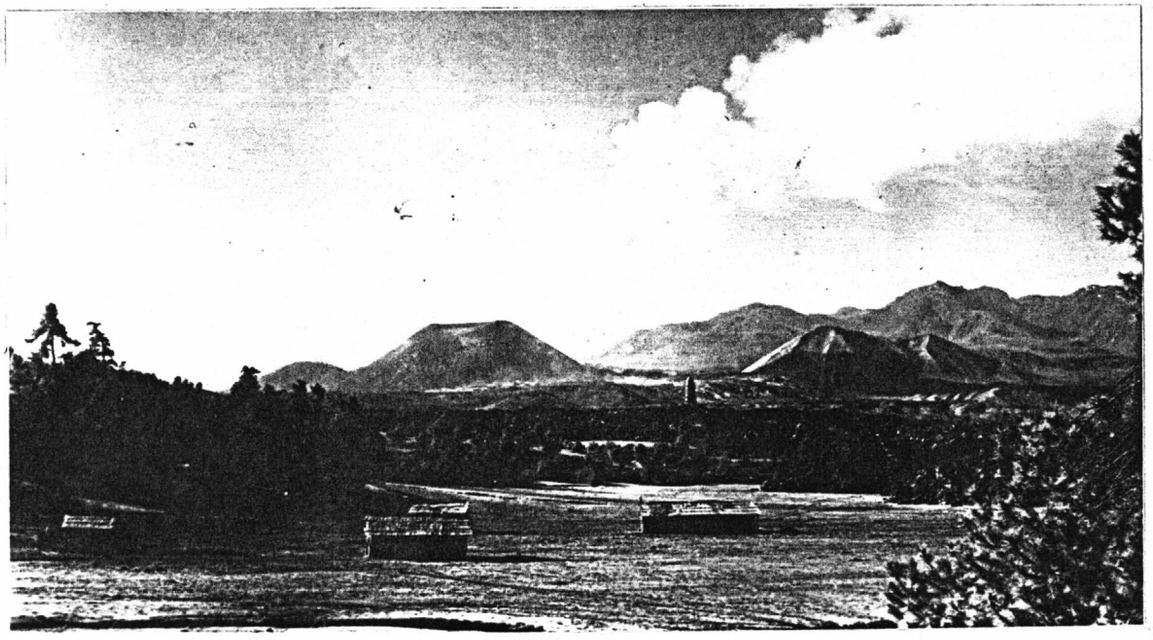
(GANNETT, H. 134)
Mount Mayon, Albay Province, Philippines. n.d.



(GILBERT, G. K. 410)
Pavlof volcano. The name is given to the broader mass at left. Pavlof district, Southwestern Alaska region, Alaska. July 1899.



(STANTON, T. W. 186)
Chernoburi volcano, Augustine Island. Kamishak district, Cook Inlet region, Alaska. n.d.



(SEGERSTROM, K. 182)
Paricutin in eruption as viewed from Cuzeno, showing the flat aspect of the top of the volcano. Michocan, Mexico. December 1946.
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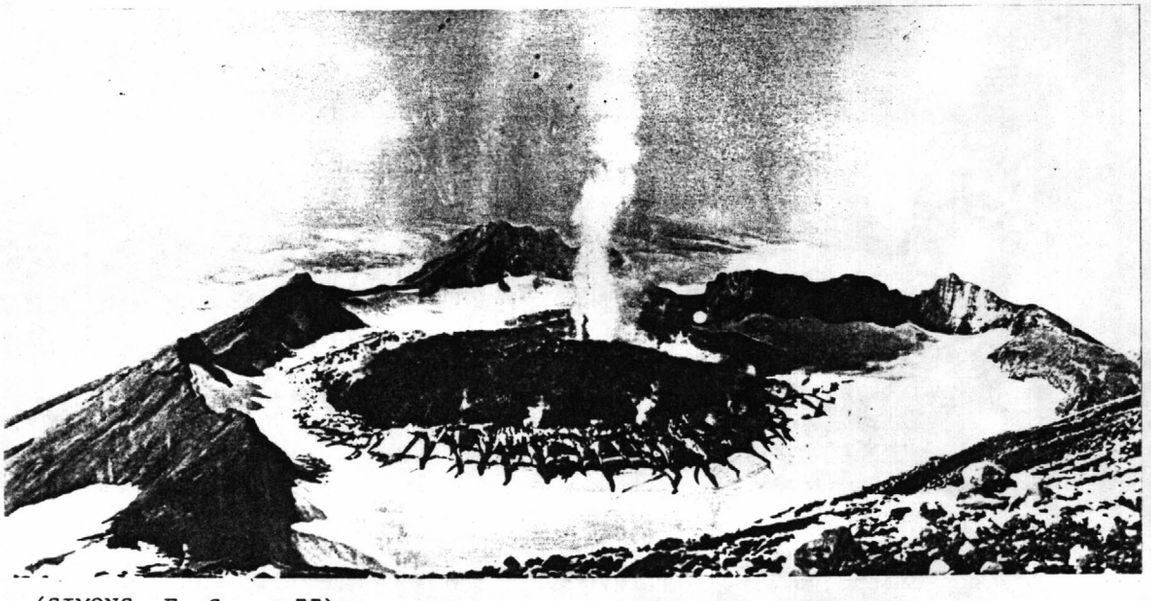
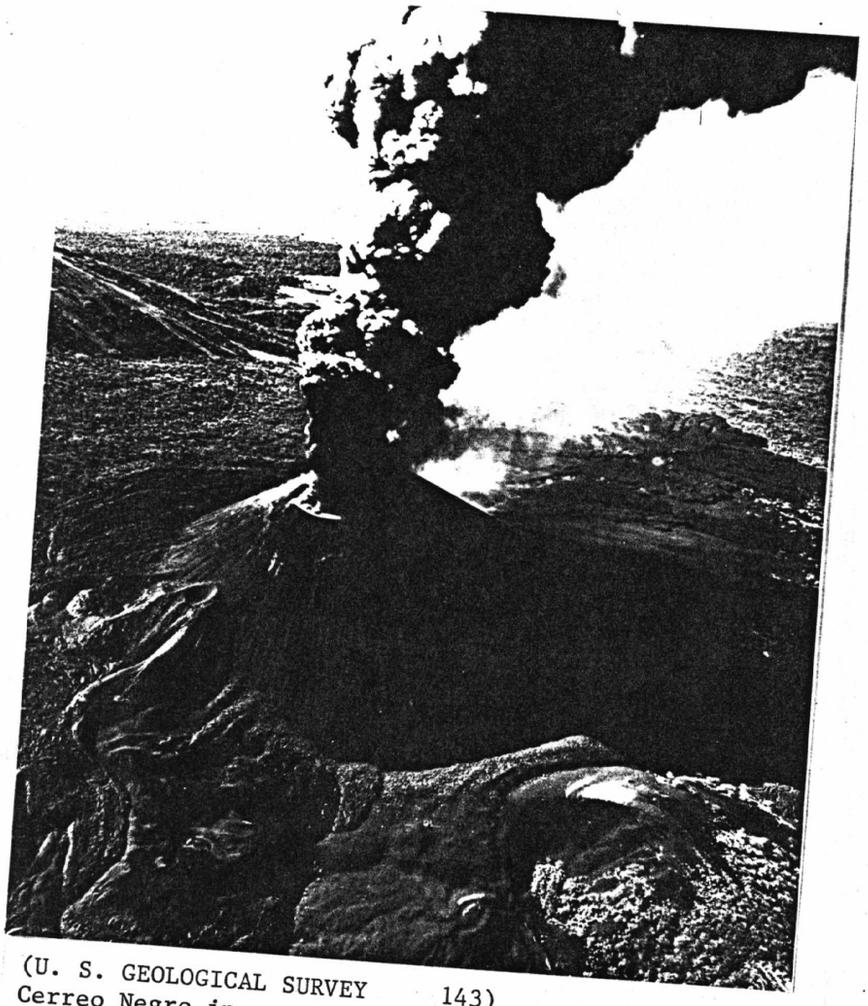
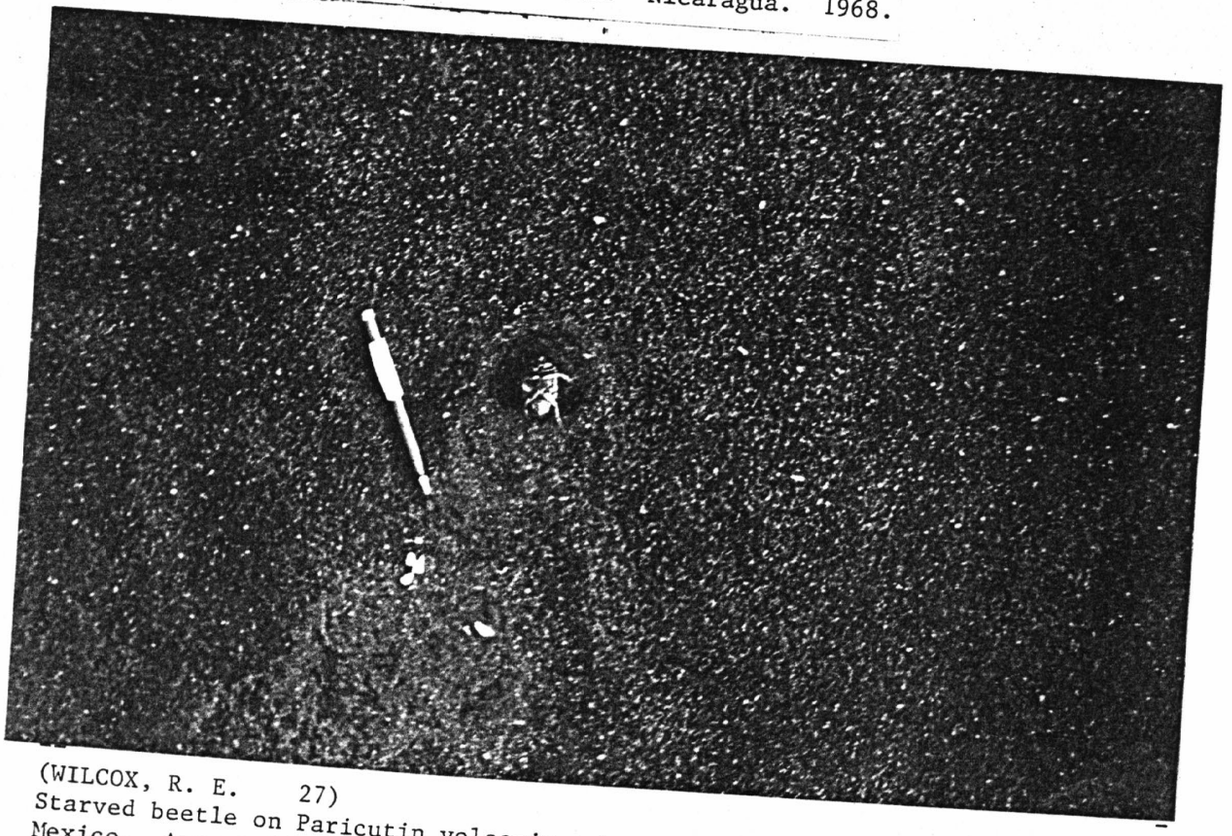
(MENDENHALL, W. C. 252)
Mount Wrangell in eruption as seen from Government trail south of Tonsina Bridge. Copper River region, Alaska. 1902.



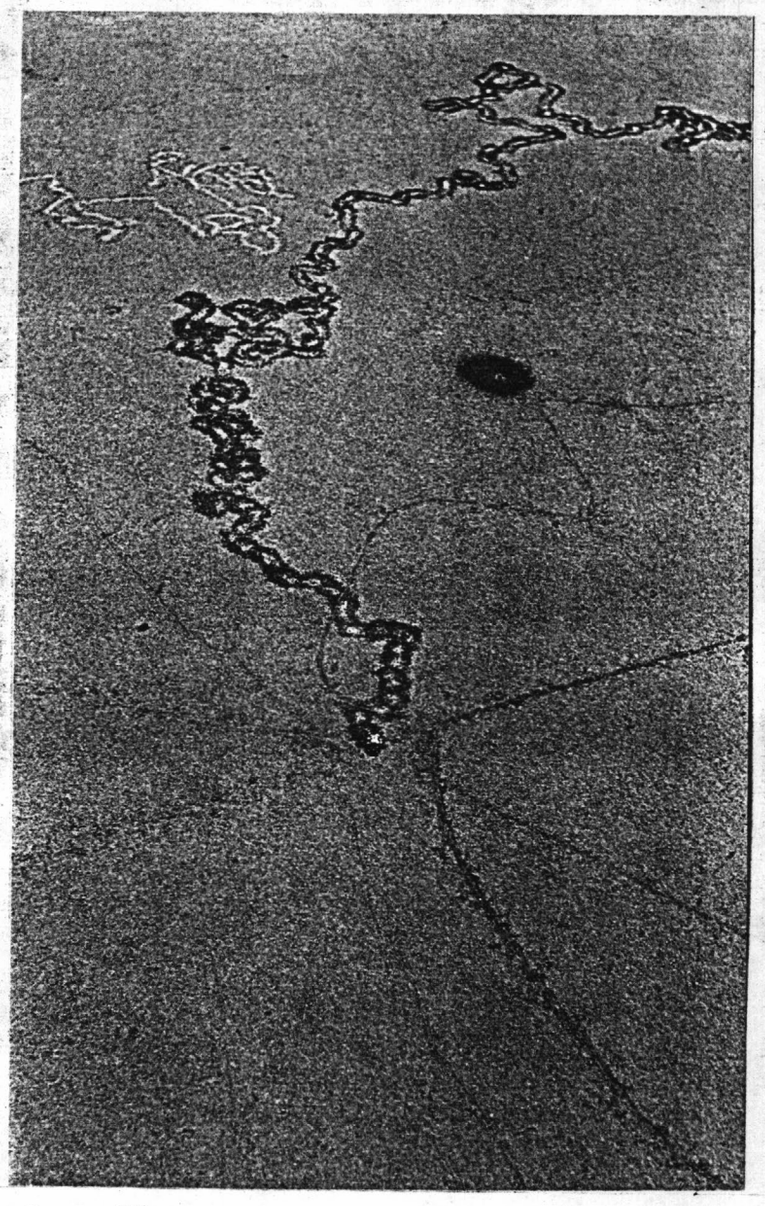
(SIMONS, F. S. 77)
Crater and 1945 crater dome of Great Sitkin volcano. Great Sitkin Island. Aleutian Islands, Aleutian region, Alaska. 1946.



(U. S. GEOLOGICAL SURVEY 143)
Cerreo Negro in eruption, near Leon. Nicaragua. 1968.



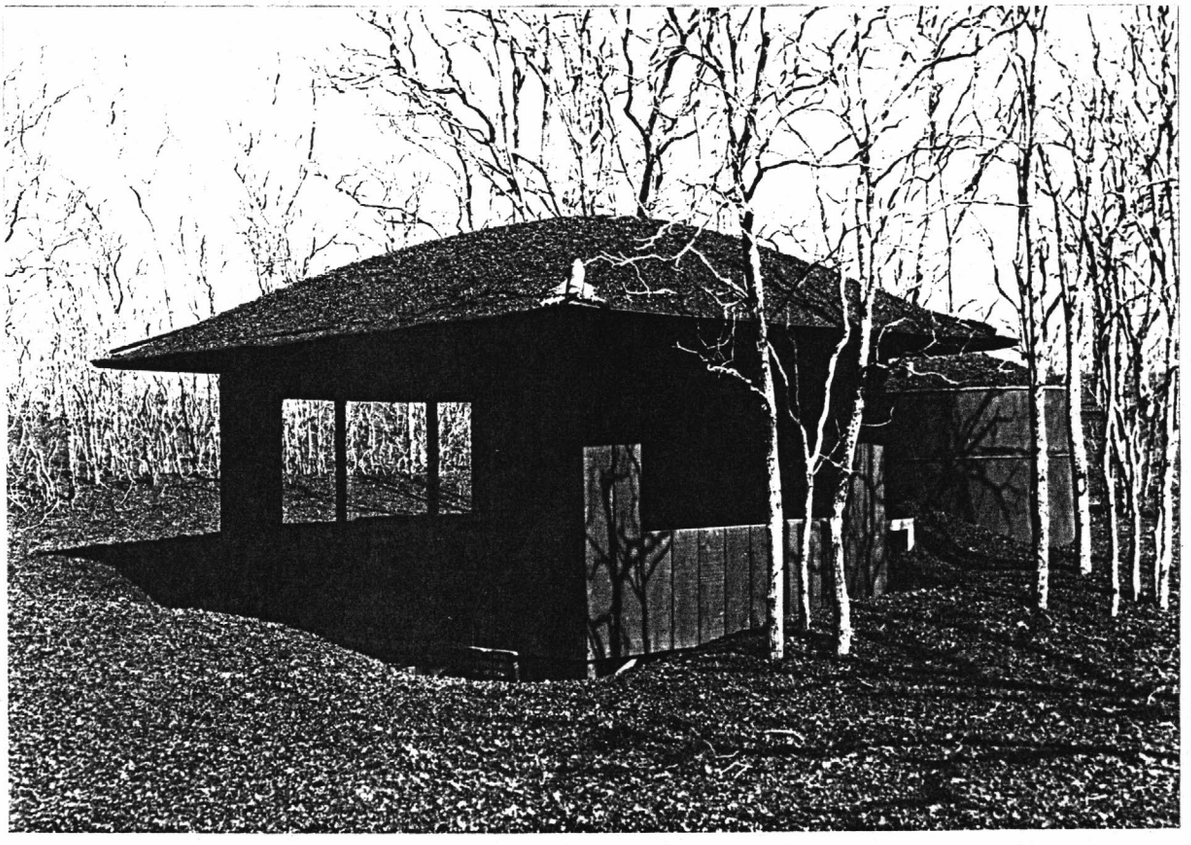
(WILCOX, R. E. 27)
Starved beetle on Paricutin volcanic ash; pencil for scale. Michoacan, Mexico. August 31, 1948.



(WILCOX, R. E. 19)
Dead beetle on Cerro Negro volcanic ash - insect's trail across ash is visible in the background. Nicaragua. July 26, 1947.



(MSH-DION, N. P. 1)
Mount St. Helens, Spirit Lake and St. Helens Lake after the eruption of May 18. Skamania County, Washington. July 7, 1980.



(RICHTER, D. H. 54)
Forty inches of pumice covers ground by small shelter in the Summer Camp area. Hawaii Volcanoes National Park. Hawaii County, Hawaii. November 30, 1959.



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(EARTHQUAKE INFORMATION BULLETIN 381)
Aerial view of timber blown down by the horizontal blast of Mount St. Helens on May 18, 1980. Skamania County, Washington. April 17, 1981.

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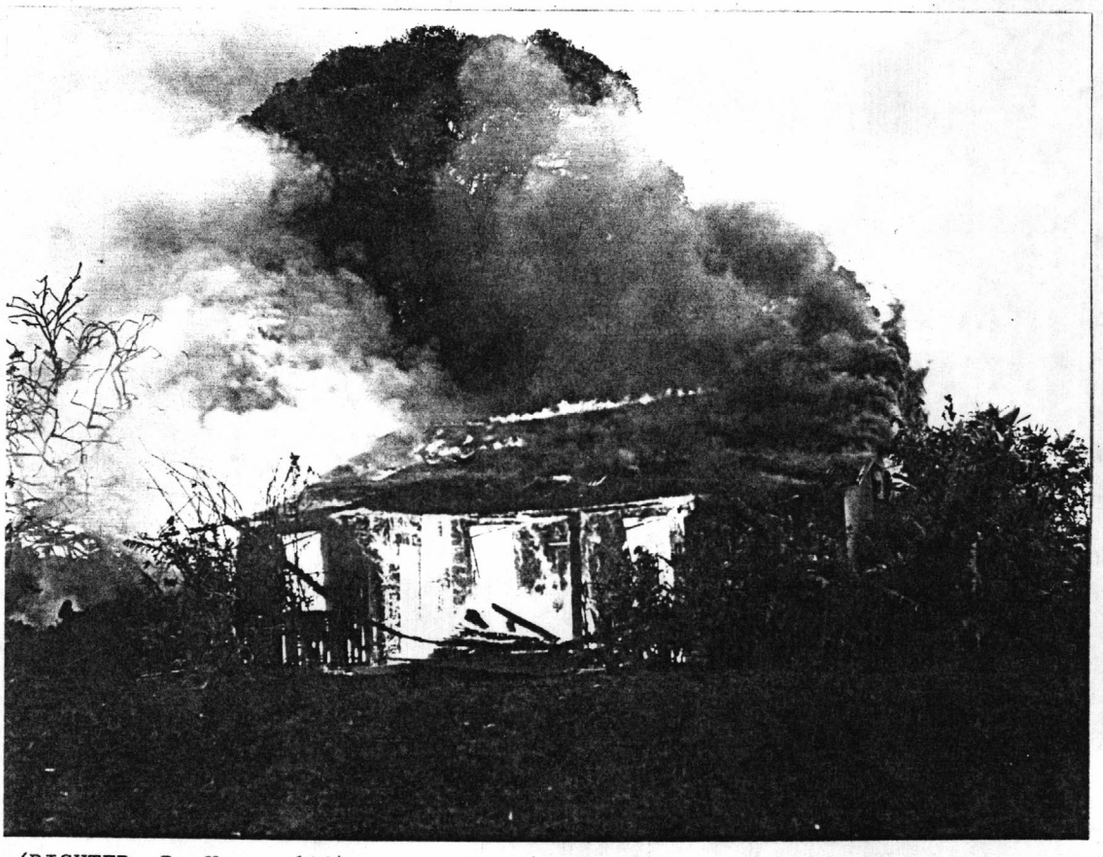
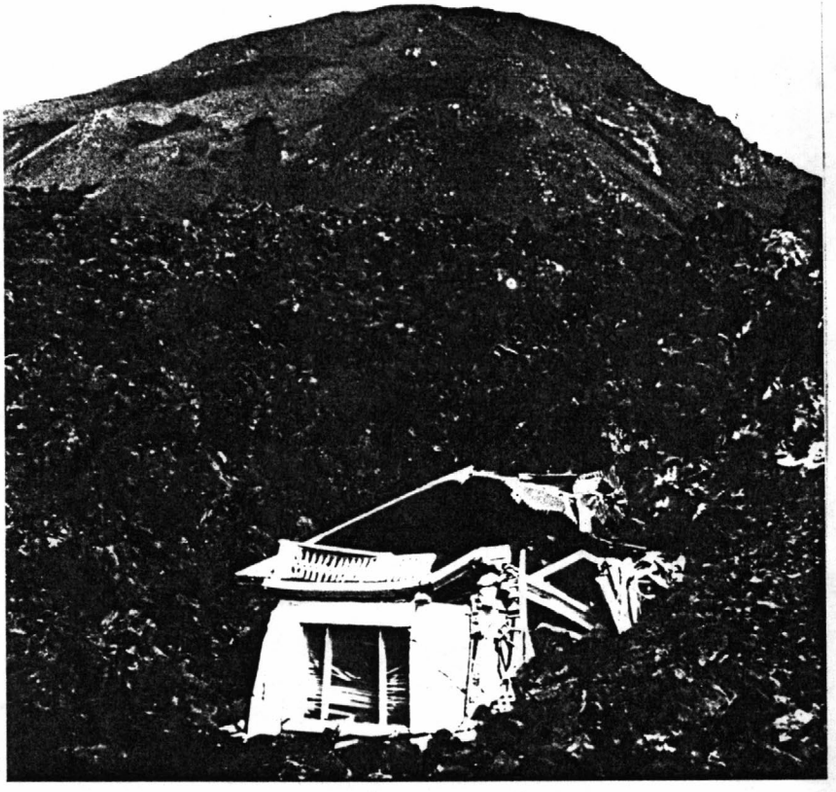


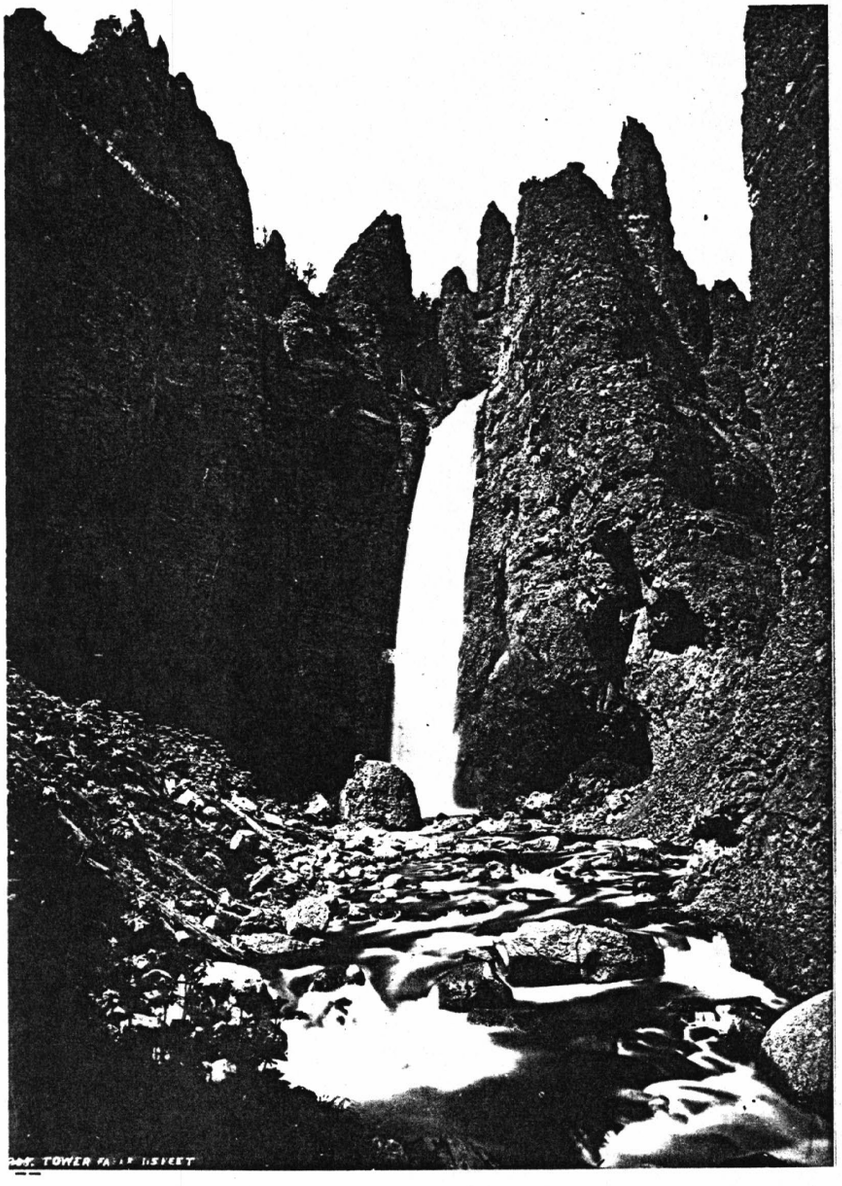
(RICHTER, D. H. 102)
Lava flow consuming a house in the Koae village area. Kilauea Volcano. Hawaii Volcanoes National Park. Hawaii County, Hawaii. January 23, 1960.



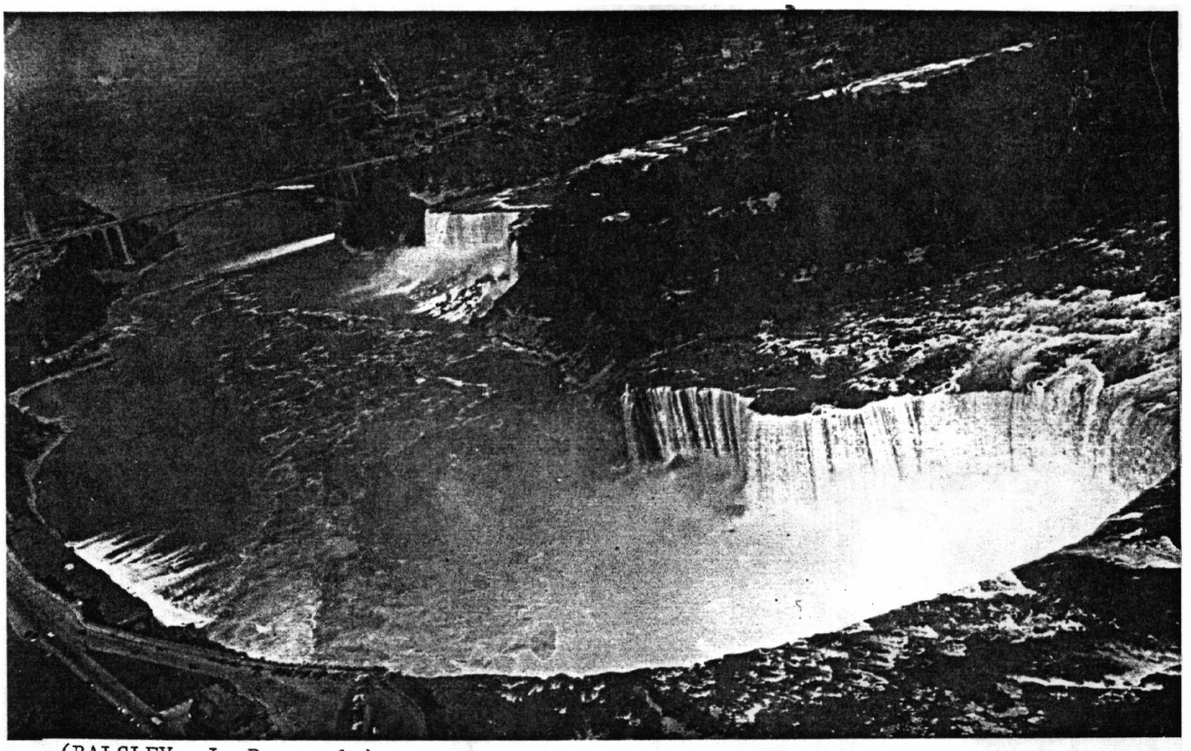
(EARTHQUAKE INFORMATION BULLETIN 465)
Bent reinforcement rods show the force as well as the direction of the pyroclastic flow that destroyed a village 3 miles south of El Chicho Volcano. Mexico. April 1982.



(U. S. GEOLOGICAL SURVEY 396)
View north toward a house engulfed by the March lava flow on the eastern part of Vestmannaeyjar. Heimaey, Island. July 23, 1973.



(JACKSON, W. H. 78)
Tower Falls. Yellowstone National Park. Wyoming. 1871.



(BALSLEY, J. R. 1a)
Oblique aerial view of Niagara Falls. Niagara County, New York. July 1949.
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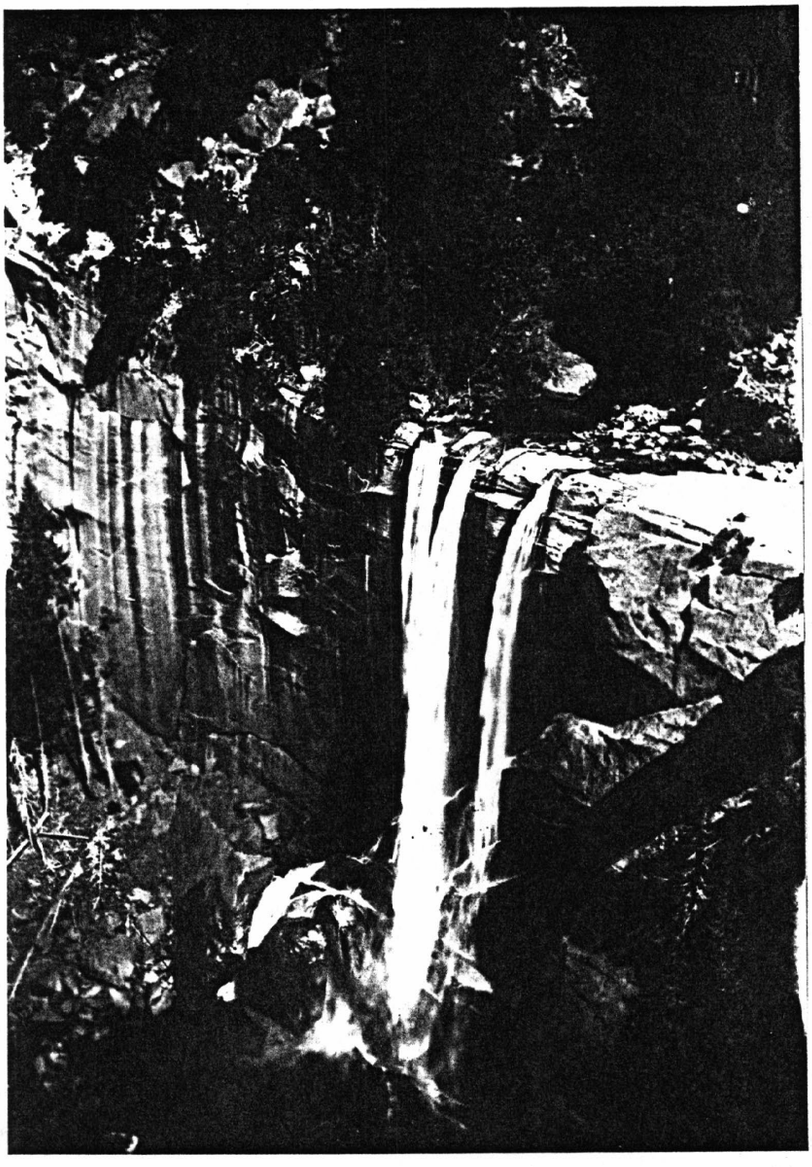
(GILBERT, G. K. 2152)
Nevada Fall at head of Yosemite Valley. Yosemite National Park. California.
1903.



(WALCOTT, C. D. 368)
Vernal Falls. Yosemite National Park. Mariposa County, California. September 1897.



(STOSE, G. W. 1627)
Susquehanna River Gap in North Mountain ridges above Harrisburg, Cox Island in foreground. Fort Hunter railroad bridge in distance. Blue Mountain left and extreme right; gap in Second Mountain; Petus Mountain on skyline. Cumberland County, Pennsylvania. n.d.



(LOHMAN, S. W. 45)
Susquehanna River valley, looking northwest from a hilltop near Halifax. Half Falls Mountain at left, water gap in Berrys Mountain, Mahantango Mountain in background. Note accordance of summits. Dauphin County, Pennsylvania. 1931.
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(Lohman, S. W. 46)
Susquehanna River Valley, looking northwest toward Shickshinny from Council Cup near Wapwallopen. Valley is filled with glacial outwash. Luzerne County, Pennsylvania. September 18, 1931.
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(KAYE, C. A. 29)
Tidal terrace originating as the base level of pitting. Note relict eolianite pinnacles. Puerto Rico. ca. 1950.
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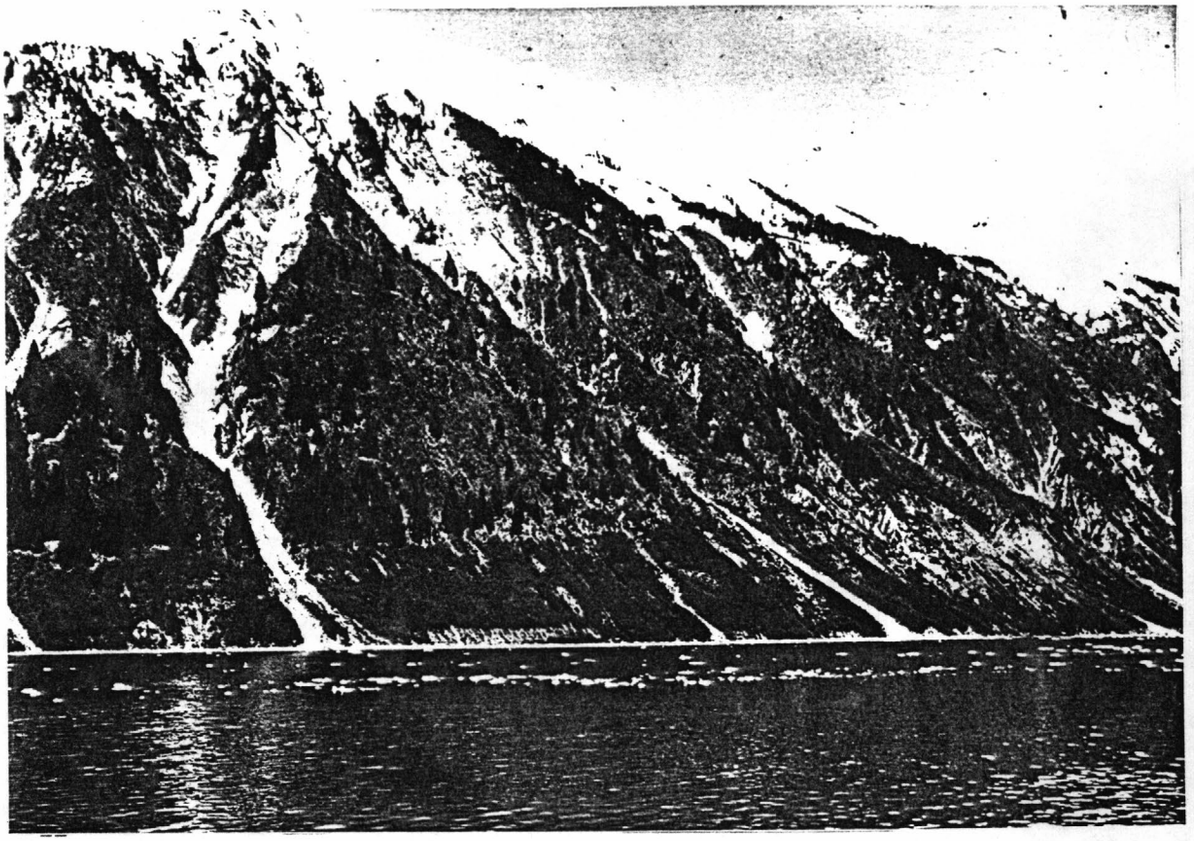

(MILLER, D. J. 1027)
Trees mark trimline of 1936 (giant) wave, Crillon Inlet. Lituya district, Alaska Gulf region, Alaska. June 10, 1952.
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(ALASKA EARTHQUAKE 212)
Rocky surf-cut platform, one-quarter mile wide, at Cape Cleare, Montague Island exposed by 26 feet of tectonic uplift. The white band on the upper part of the platform consists mainly of barnacles and calcareous worm tubes. Photo taken at about zero tide stage. Latouche district, Alaska Gulf region, Alaska. 1964.
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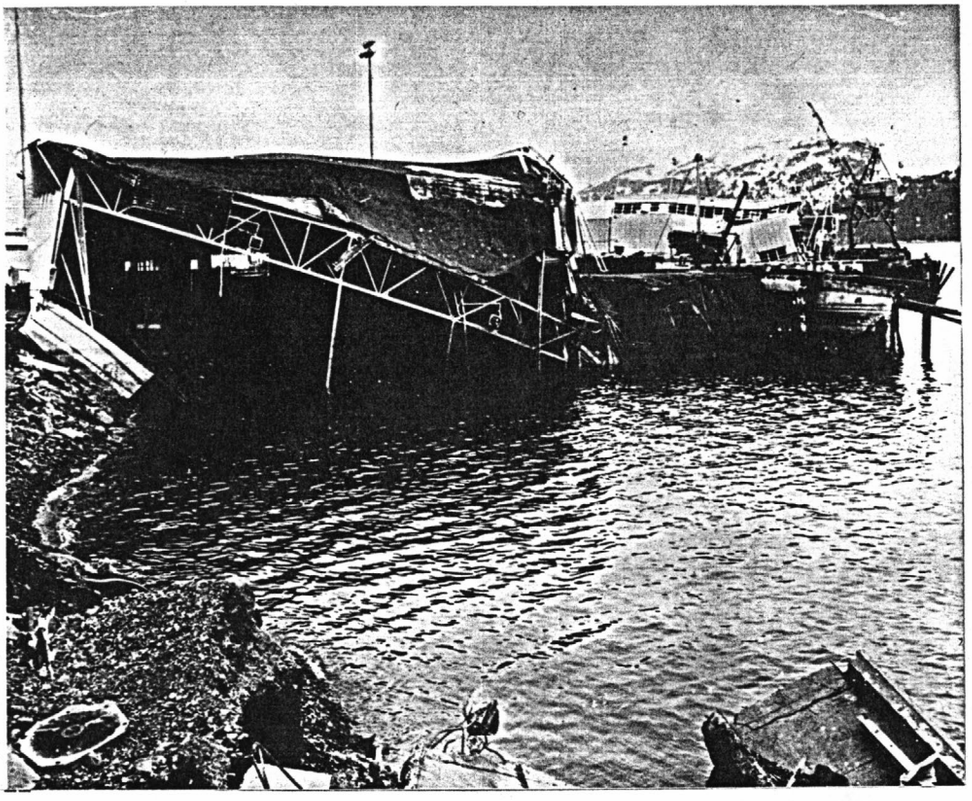

(ALASKA EARTHQUAKE 49)
Damage caused by earthquake induced water waves, to old Alaska Railroad dock and facilities. Alaska Earthquake of March 27, 1964. Seward district, Alaska Gulf region, Alaska.
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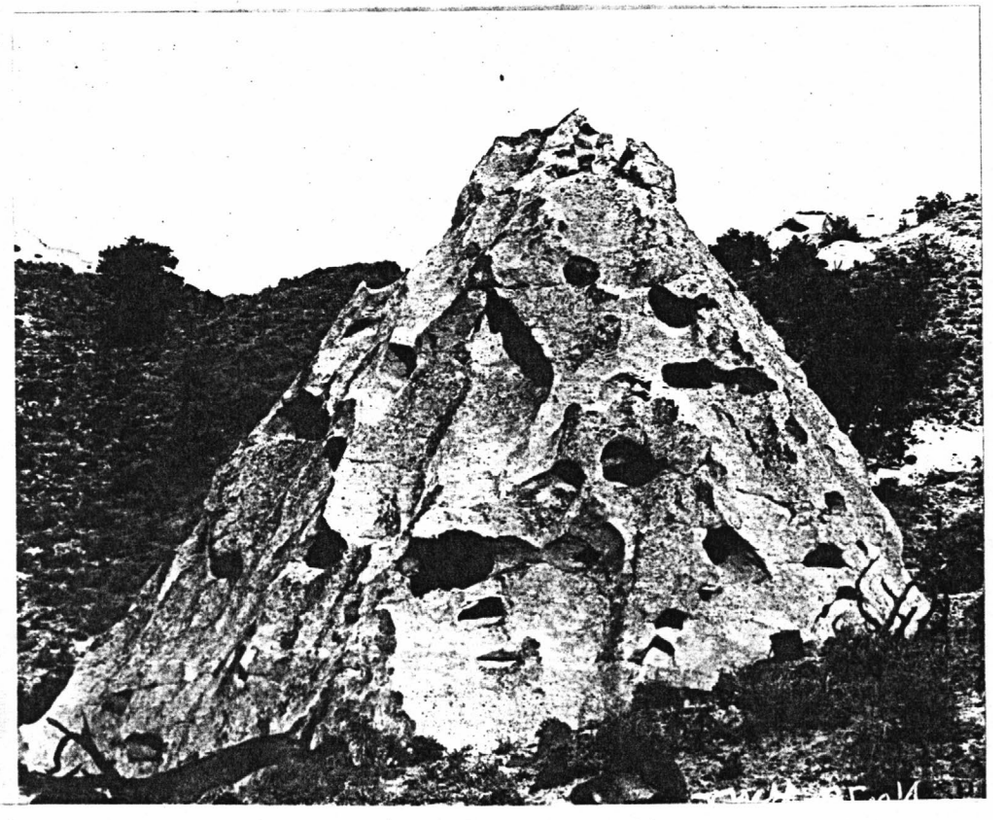

(TURNER, H. W. 77)
A single cone of weathered rhyolite tuff in the foothills of the Palmetto Mountains. Esmeralda County, Nevada. 1899.
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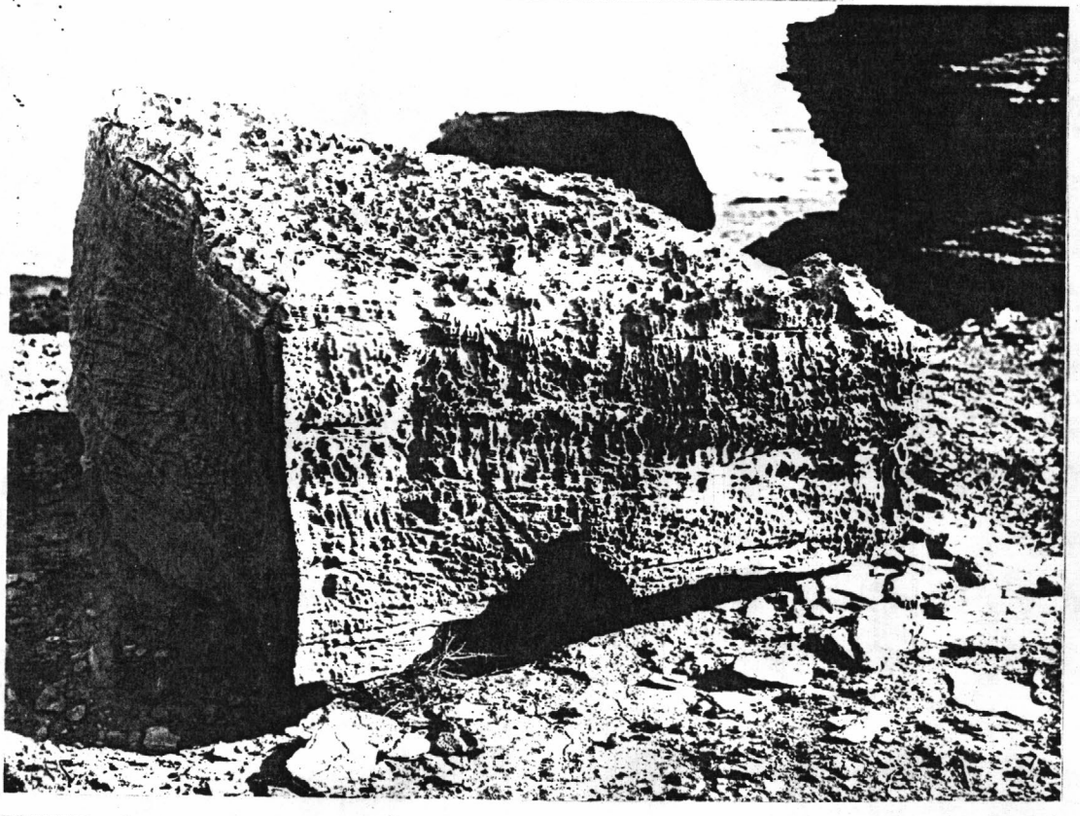
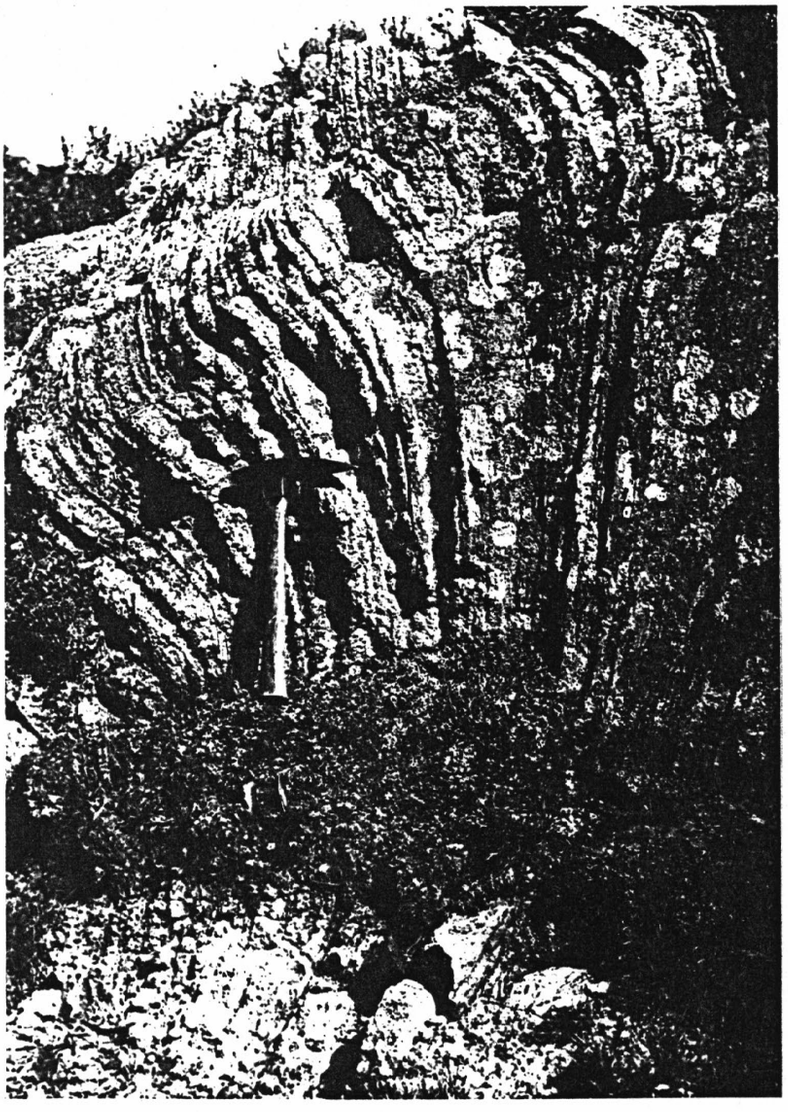
(SEGERSTROM, K. 555)
Exfoliation block of granite that has been hollowed out by the abrasive action of windblown sand, Llano de Caldera. Atacama Province, Chile. n.d.



(GILBERT, G. K. 795)
A weathered block of calcareous sandstone. Besides the fretting of the exterior of the block there has been an excavation of the interior, so that the block is sort of a box without a bottom. Coconino County, Arizona. 1891.



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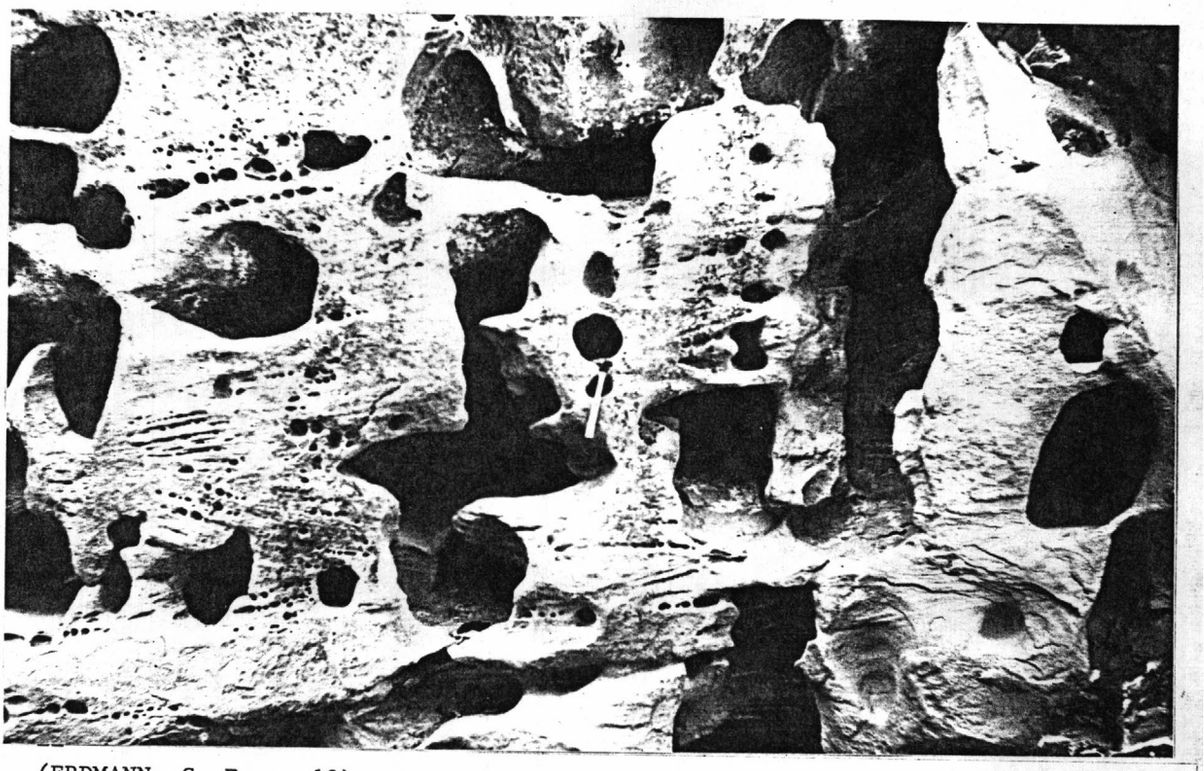
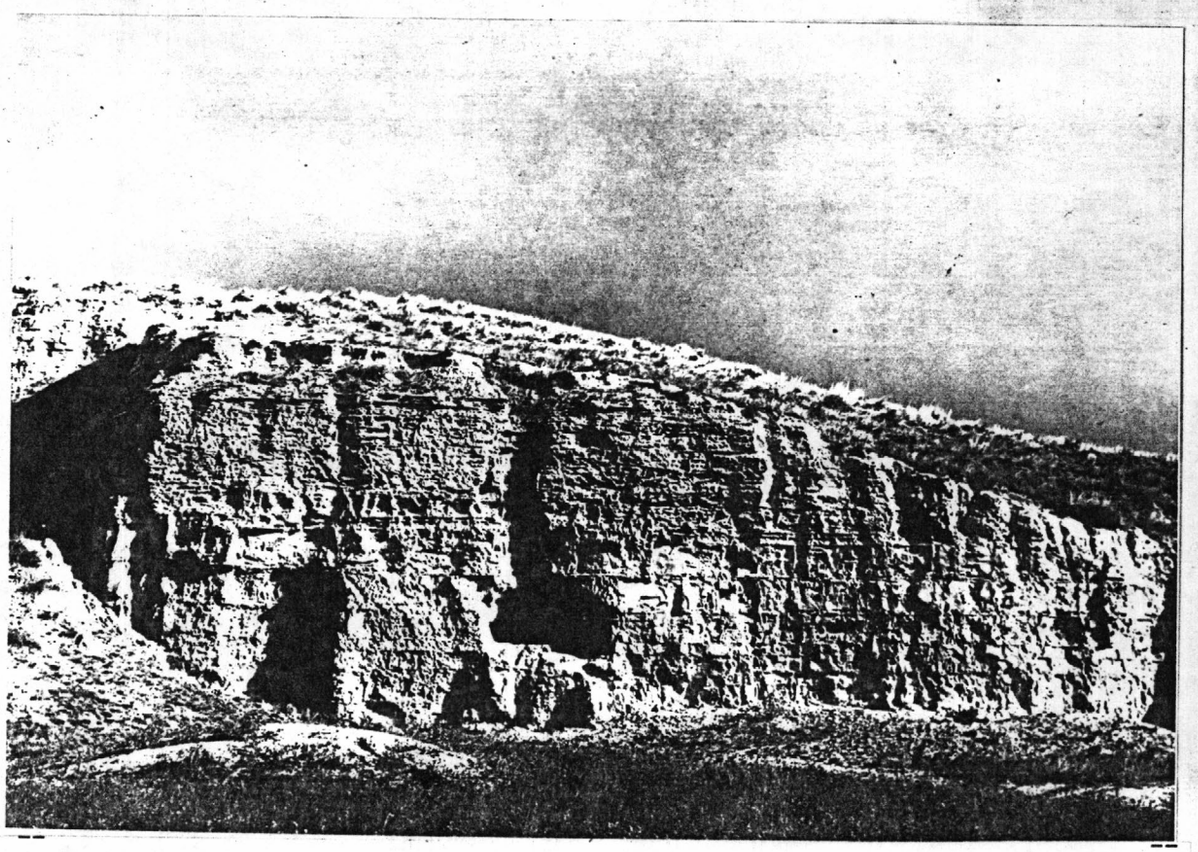
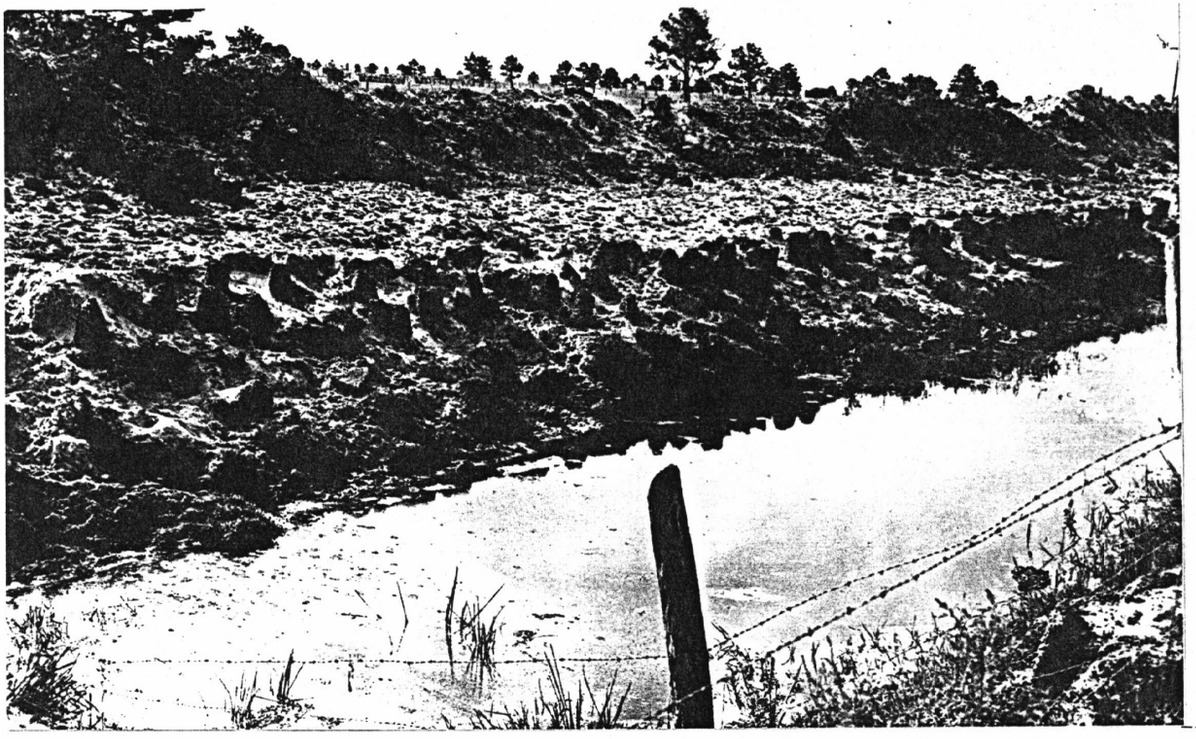
(SEGERSTROM, K. 695)
Flow structure, accentuated by weathering, in a small rhyolite plug near San Bartolo. Hidalgo, Mexico. n.d.



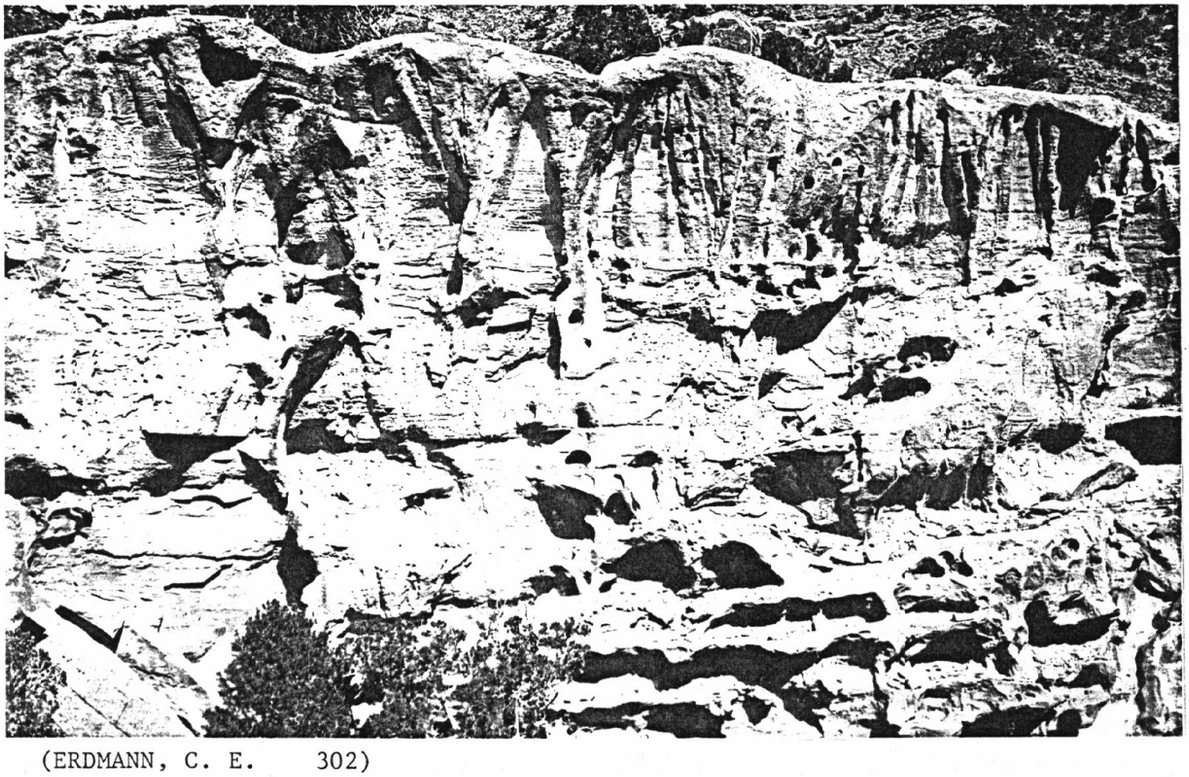
(ERDMANN, C. E. 18)
Solution weathering of medium-grained, torrential, cross-bedded sandstone (undifferentiated MesaVerde). In Hunter Canyon. Mesa County, Colorado. July 9, 1926.



(SIMPSON, H. E. 2)
Weathering of Smoky Hill chalk member, Niobrara formation. Note thickness of bedding, solution pits and joints, face is about 80 feet high. NE cor. sec. 17, T. 93 N., R. 56 W. Yankton County, South Dakota. ca. 1949.



(PARKER, G. G. 8)
Rock pinnacles resulting from solution of the Miami oolite. Florida. ca. 1945.



(ERDMANN, C. E. 302)
Lower member of the Sego Sandstone, This is characteristic of many sandstones in the overlying beds. The erosional effects are due to solution. Sec. 30, T. 7 R., R.102 W. Garfield County, Colorado. October 1927.
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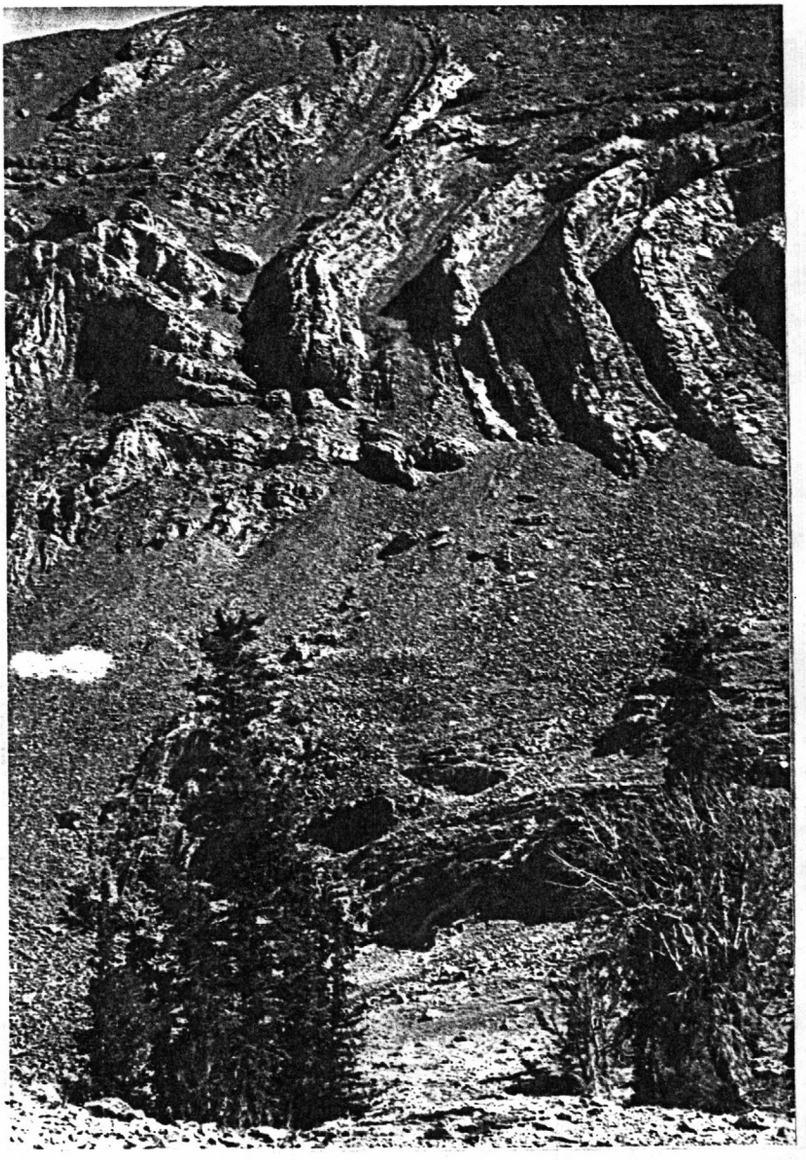

(ROSS, C. P. 1337)
Minor folds in Brazer limestone, emphasized by differential erosion, near Swanger Lakes. Custer County, Idaho. August 1936.
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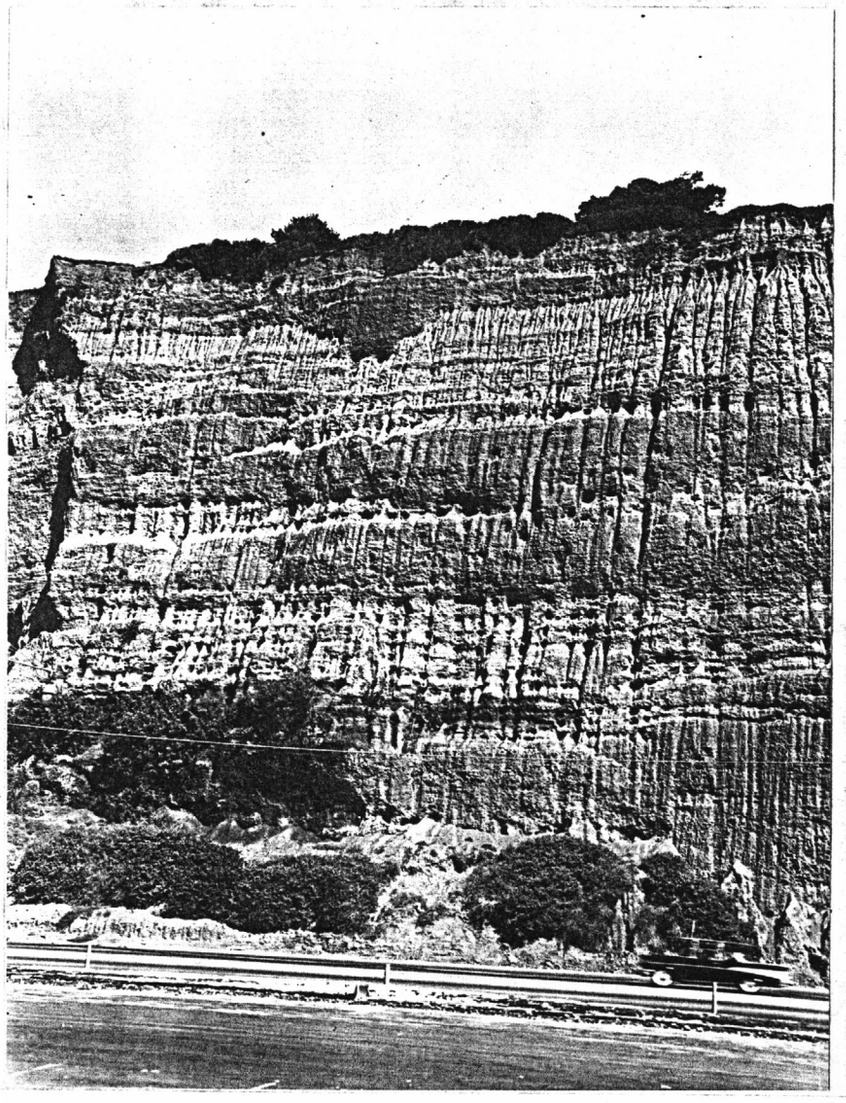
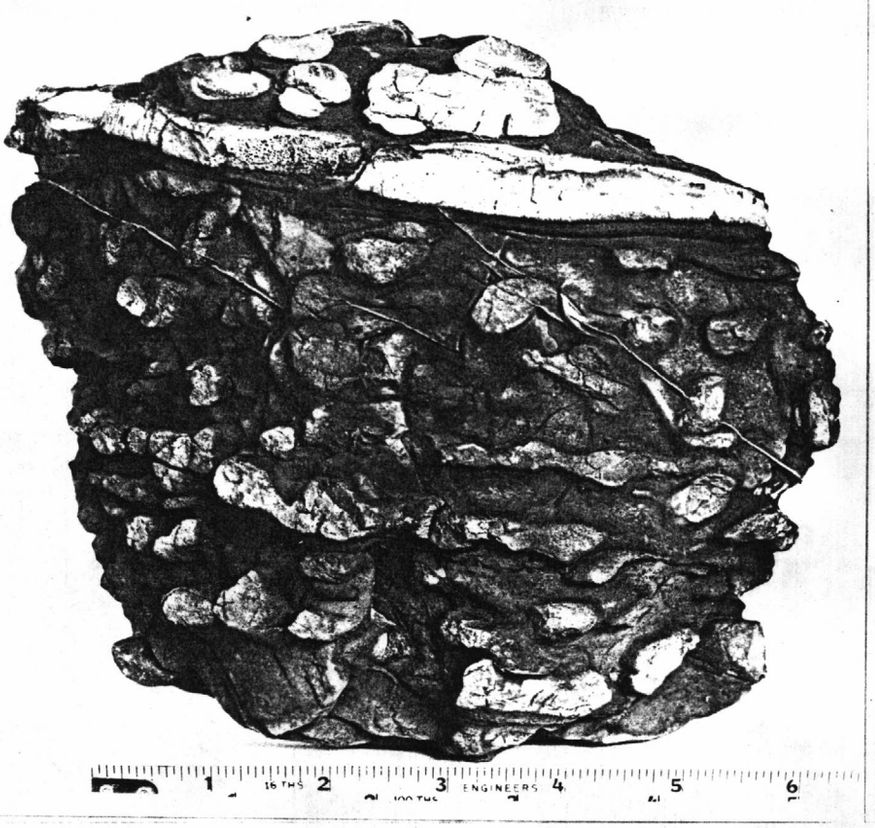


(MCGILL, J. T. 103)
Differential weathering and erosion of Upper Pleistocene alluvial terrace deposits. Cross-bedded gravel in scour-and-fill channel deposits. Huntington Palisades, Pacific Coast Highway in foreground. Los Angeles County, California. 1958.



(HOBBS, S. W. 7)
Differential weathering in rock from the lower part of the Wallace Formation. Coeur d'Alene district. Shoshone County, Idaho. n.d.
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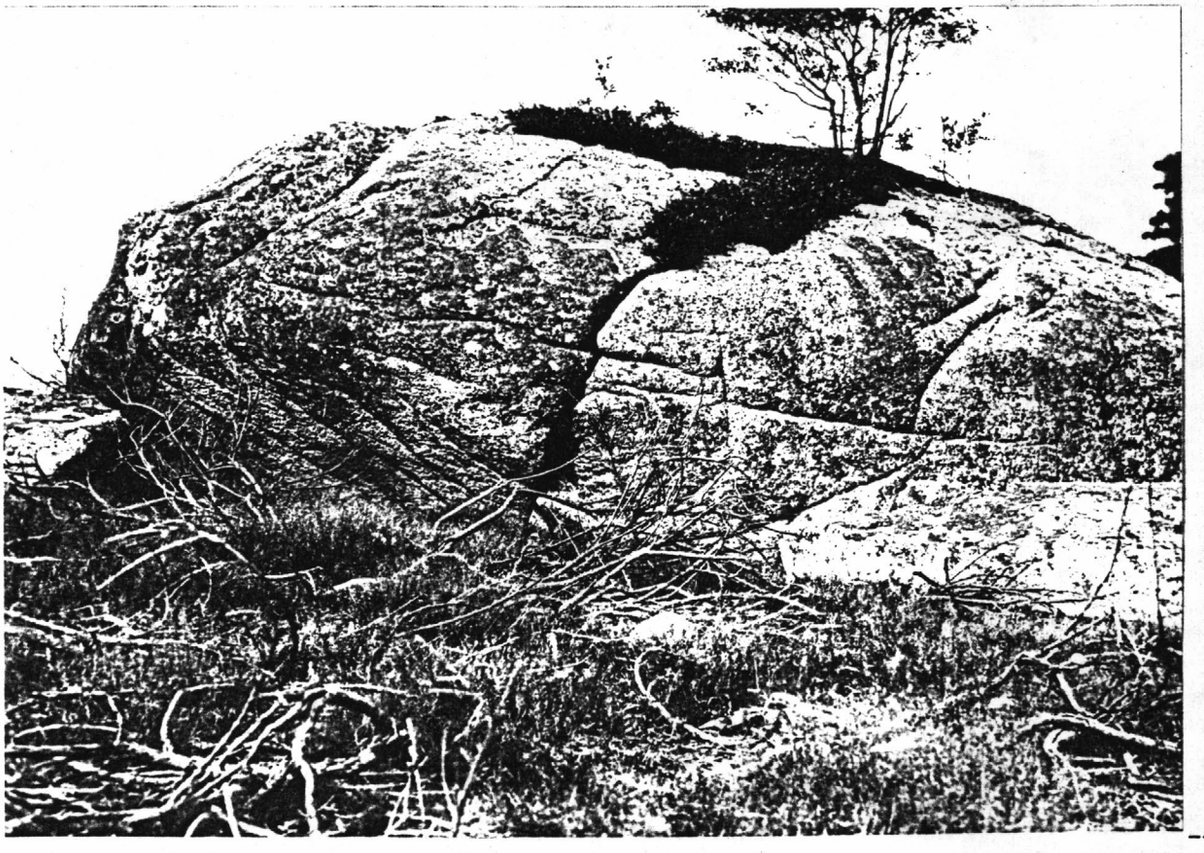
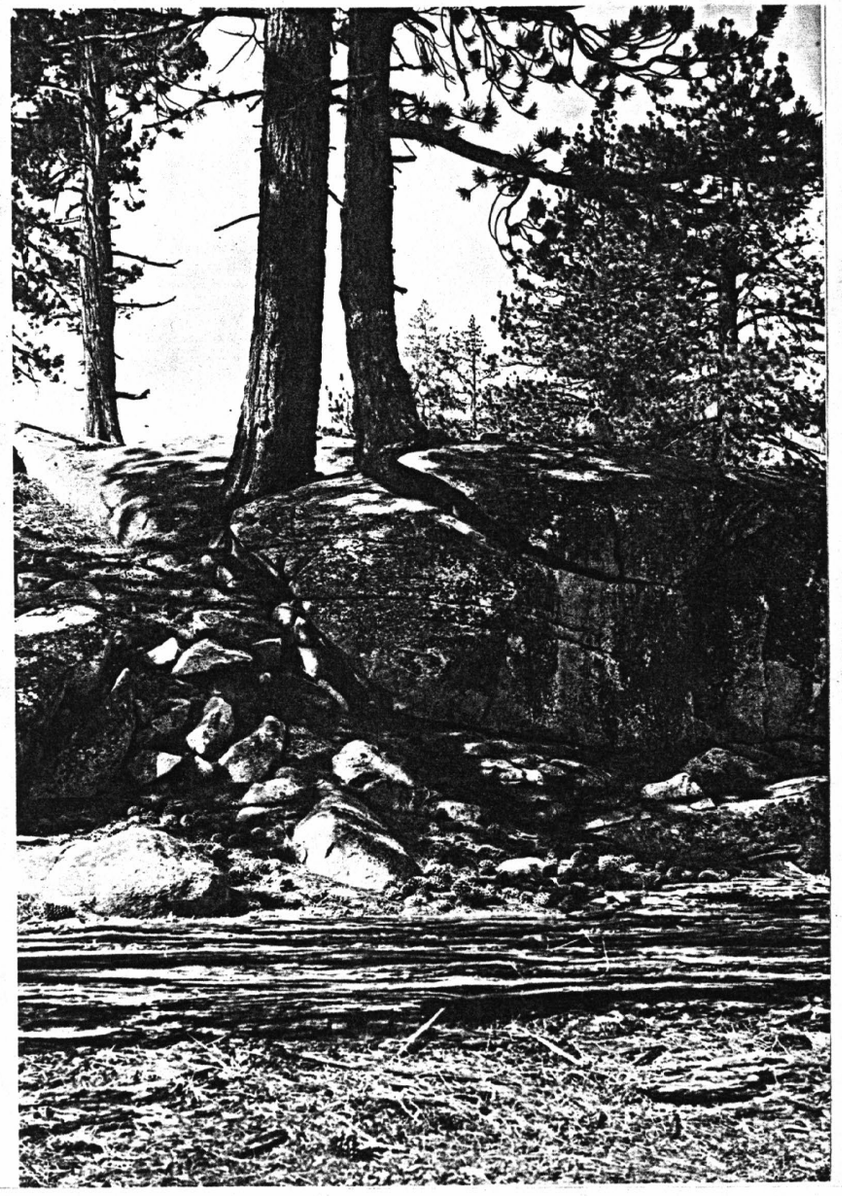
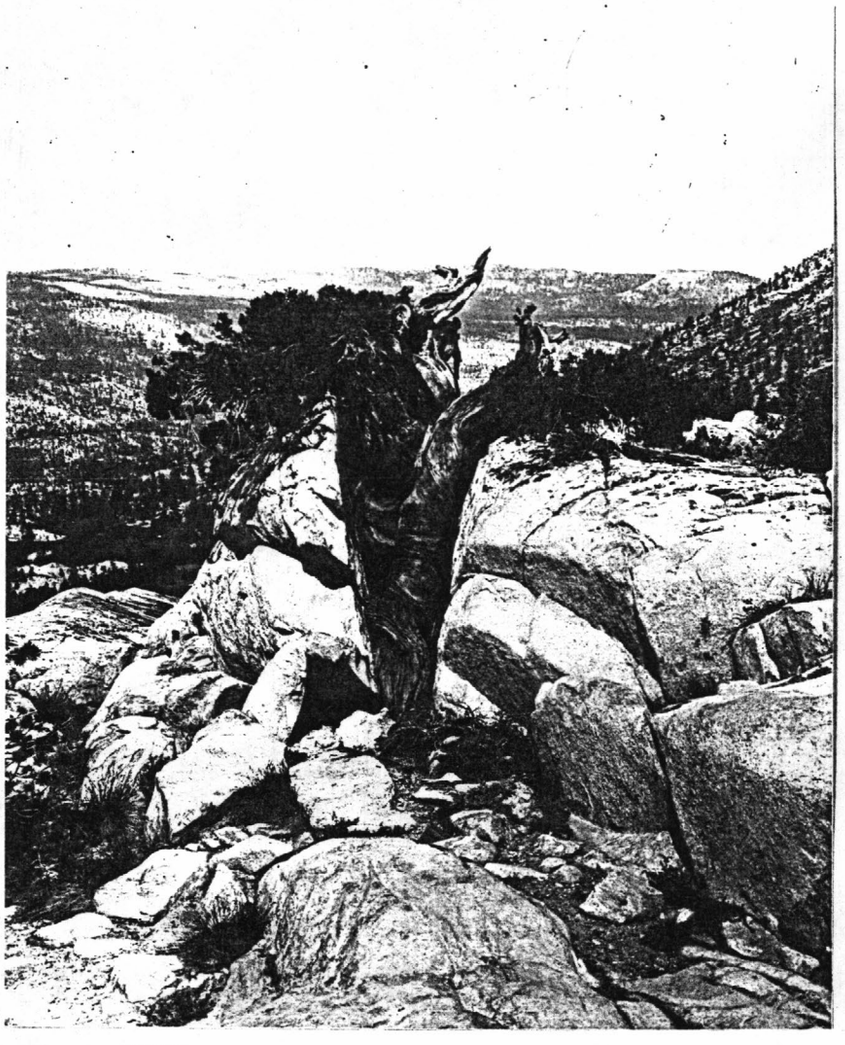


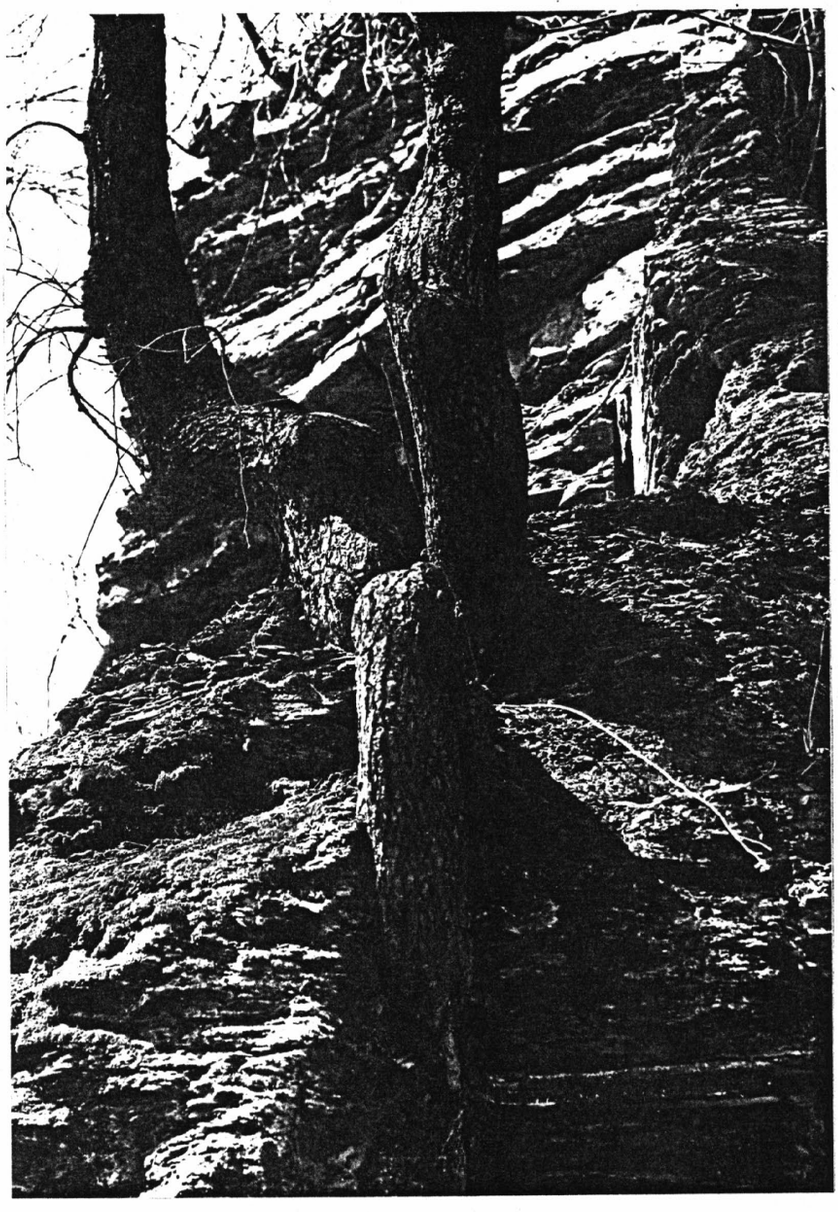
(WOODWORTH, J. B. 231)
Vegetation growing in crack on the "Governor", granite boulder on crest of Naushon Island. Elizabeth Islands, Massachusetts.



(GILBERT, G. K. 3382)
Mechanical weathering and uplift of rock by tree root growth. Sierra Nevada. California. n.d.



(GILBERT, G. K. 2271)
Joint in granite widened by growth of root of an upland juniper. Sierra Nevada. Fresno County, California. 1904.



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(TUTTLE, C. R. 49)
Mechanical weathering of Devonian shale by tree roots. Ithaca. Thompkins County, New York. 1942.

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