Course material from Geology 130 - Physiography of the US - 4. 1929-1954

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES

Final examination Jan. 27, 1954

Write on any 10 and please mark on cover which you left out. Kindly leave postcard for grade.

(1) Explain briefly two reasons for the prominence of limestone solution land forms in Interior Low Plateau (name a world-famous cavern).

(2) Compare briefly two alternative explanations of the uplands on the "soft rocks" of the Driftless Area.

(3) Explain significance of the course of the major streams in Osage Section.

(4) Give briefly supporting evidence of following statements in respect to Superior Upland: it (a) was once a mountain region, (b) was worn to low relief, (c) was completely buried by marine sediments after this erosion, (d) was eroded by continental glacier, (e) was altered by deposition by continental ice.

(5) What kinds of glacial drift occur in the Driftless Area? In Driftless Section?

(6) Locate as definitely as possible in the Coastal Plain good examples of (a) drowned valley, (b) barrier beach, (c) submerged cuesta, (d) coral reef, (e) salt dome hill

(7) Account for the rectangular steep-sided valleys of Adirondacks.

(8) Explain relation of the upland surface of Piedmont Plateau to (a) Blue Ridge, (b) surface of hard rocks below Coastal Plain. (Diagram--no long explanation).

(9) Compare two distinct explanations offered for the terraces of Glacial drift along Connecticut River.

(10) Give two alternative explanations of the skyline of Adirondacks.

(11) Explain why, although the drainage texture (define "drainage texture") of Blue Ridge is coarse, soil erosion forms many small gullies.

(12) Why has the course of Tennessee River below Chattenooga caused so much speculation and explain four possible hypotheses to explain it.

(13) Explain briefly why the Catskill Mountains are so high and why their drainage is still undergoing modification. (cite evidence of the latter).

(14) Give two alternative hypotheses which can be offered to explain the even skyline of hard rock ridges in Ridge and Valley province.

PHYSIOGRAPHY OF EASTERN UNITED STATES

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Twelve weeks examination Dec. 14, 1953

Write on 4 questions including the first and please indicate on cover which they are.

(1) Required of all. Separate sheet.

(2) With regard to the Finger Lake Region of New York state: (a, b, c) the three different types of topography which occur, (d, e) two possible hypotheses which could explain the origin of the topographic type which has been in controversy.

(3) What effect has glaciation had upon stream courses in unglaciated part of Allegheny Plateau(omit origin of Finger Lakes of glaciated part).

(4) Where and what is origin of (be brief): (a) Katerskill Creek, (b) Crab Orchard Mts., (c) Chestnut Ridge, Pa., (d) Mohawk Valley, (e) Tughill Plateau, (f) Cumberland Mts., (g) Narrows of Narrows Creek, (h) Indian River , (i) Natural Bridge, Va., (j) New River.

(5) Compare merits of two possible origins of even ridge crests of Ridge and Valley Province.

(6) Explain briefly : (a) why the Blue Ridge escarpment of the Carolinas presents a problem, (b, c) two possible hypotheses to explain it, (d, e) major points for and against each of the foregoing.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Midsemester examination Nov. 18, 1953

write on 4

WRite on any 4 questions and please indicate on cover which they are.

(1) Tell briefly (a) where evidence was seen, (b) nature of evidence, and (c) relative time in history that Baraboo Quartzite was eroded by stream work (not waves)

(2) Tell as definitely as practical where you saw on field trip (no discussion): (a) Sand dunes, (b) outwash from glacier, (c) sink hole, (d) Dresbach sandstone, (e) supposed ancient sea cliff, (f) ancient beach deposit, (g) terminal moraine, (h) bed of lake enclosed by glacier, (i) old terace gravel, (j) water gap.

(3) Complete following statements giving best single proof of each with no discuss ion beyond a single sentence:
(a) No satisfactory hypothesis of origin of terraces of Coastal Plain is possible until---
(b) Crowleys Ridge indicates that once the rivers flowed on---
(c) The "Carolina Bays" suggest impact of a shower of meteorites because----
(d) The surface of the High Piedmont is not the same as the top of similar rocks beneath the Coastal Plain because---
(e) The observed difference in form of the east and west coasts of Florida may be accounted for by ----------alone.

(4) State briefly (a) three possible ages of the surface on top of Happy Hill and (b) two possible modes of origin of that surface (no extended discussion)

(5) List IN PROPER ORDER of occurence the events which took place during the history of Wedimans Falls and the evidence of which each is based.

(6) Give (a) location, (b) origin or signifiance of (a) Chesapeake Bay, (b) Reelfoot Lake, (c) Door Peninsula, Wis. (d) Kettle Moraine, (e) Stone Mountain

(1) Explain briefly (a) reason for setting apart which determine boundaries, (c) major features of nature of rocks (geology) of underlying materials, and (d) general nature of topography of EITHER (1) Driftless Section of Central Lowland OR (2) East Gulf Plain. of Coastal Plain

Explain briefly (a) reason for setting apart (definition) (b) features

Kettle Moraine

Stone Mountain

Carbuet 2

GEOLOGY 13 0
PHYSIOGRAPHY OF EASTERN UNITED STATES

"Six weeks " Examination Oct. 21, 1953

Write on any 4 questions and please indicate which they are on cover of book

(1) L ocate as definitely as possible in area t hus far studied a good example of each: (a) sand dunes, (b) Niagara cuesta, (c) quartzite monadnock, (d) interlobate moraine, (e) drumlins, (f) lakes in pitted outwash, (g) glacial drift so thin it does not affect topography, (h) terminal moraine with very low slopes, (i) drift plain or till plain, (j) plain in bed of extinct glacial lake.

(2) (a) In crossing boundary from Central Lowland to Superior Upland what topography would indicate the change? (b) on same boundary what change in bed rock topography should be found? (c) on same boundary what change in soil could be observed? (d) In crossing boundary from Driftless Area to Driftless section outside how could line be discovered? (e) In crossing line between Driftless Section and Western Young Drift how could border be discovered? MAKE ANSWERS BRIEF WITH NO EXTENDED DISCUSSION°

(3) Complete following statements giving proof of each (no more counted):
(a) The Superior Upland was a low plain before the coming of the Upper Cambrian sea because---
(b) The water in the Great Lakes once stood higher than it now does because---
(c) The water in some of the Great Lakes once stood much lower than it now does because---
(d) The Superior Upland was once covered by the rocks now confined to the Central Lowland because--
(e) The basin of Lake Superior is lower than the adjacent highlands because-

(4) Compare the Till Plains with the Dissected Till Plains in respect to (a) amount of postglacial erosion, (b) depth of postglacial weat hering, (c) age of glacial drifts, (d) amount of windblow silt cover (where this is thickest), (e) state approximate line of division.

(5) Locate examples of lakes in areas thus far studied due to:
(a) glacial erosion, (b) s olution of bed rock, (c) changes in river courses, (d) drift blocking of old valleys, (e) ice blocks of drift.

(6) Describe the three general kinds of bed rocks of Superior Upland and (a) give the characteristic topography on each and (b) tell whay this topography cannot be observed at all localities.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

exam file I

Final examination — January 27, 1953

Write on 10 questions only. Please indicate on cover which they are. Leave card for grade.

(1) Compare merits of at least three explanations which have been given for the even skyline of coastal New England (New England Upland).

(2) Discuss not less than two explanations for the observed rarity of marginal moraines in eastern United States. (New York and New England).

(3) Tell where you saw and describe nature and topography developed on (a) three bed rock formations and (b) two unconsolidated deposits which were seen on the field trip.

(4) Account for not less than two distinct types of falls which occur in the mature topography of the Driftless Area.

(5) Classify the bed rocks of Superior Upland into three types which affect the topography, describe resulting land forms, and locate examples of each.

(6) Locate an example in Coastal Plain of land forms due to: (a) rise of sea level, (b) earthquake, (c) salt intrusion, (d) solution, (e) coral growth, (f) layer of quartzite, (g) wave work, (h) wind work, (i) stream deposition, (j) igneous intrusion.

(7) Compare topography of two major divisions of Piedmont Plateau which are based on difference in bed rock.

(8) Compare merits of at least four hypotheses to account for drainage system and drainage pattern of Ridge and Valley Province.

(9) Describe and compare two different interpretations of the summit levels of the Adirondacks. (diagrams)

(10) Describe the major sections of Interior Low Plateau illustrating them by a geological cross section or sections.

(11) Explain why the streams of the Blue Ridge escarpment are out of harmony with both those to northwest and to southeast (not less than three possible explanations).

(12) What is physiographic significance or origin of the following:
(a) Gogebic Range (Mich-Wis.) (b) level plain at Arena, Wis.,
(c) Wichita Mountains, Oklahoma, (d) valley of Black River, N.Y.,
(e) Manitou Falls, a short distance south of Superior, Wis.

(13) The coast of Maine is often referred to as submerged (or drowned) whereas that of the east side of Florida is classed as emerged (or rising). Explain reasons for the difference other than that given above.

(14) Complete following sentences giving adequate proof of each statement:
(a) The soils of New England are in many places so bouldery because—
(b) The principal evidence of the New England peneplain is—
(c) The southern Blue Ridge mountains have dendritic drainage because—
(d) The east border of the Driftless Area is so well-defined because—
(e) West Blue Mound, Wis., has been uplifted at least——feet because—

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination December 17, 1952

Write on four questions and no more, please indicating on cover which they are.

(1) Explain (a) why a special explanation is required for the location of the Blue Ridge escarpment in the Carolinas, (b, c) two possible and plausible hypotheses of above, (d, e) major points for and against each.

(2) With regard to the Finger Lake Region of New York state: (a, b, c) the three different types of topography in the region and (d, e) two different processes which operated to produce the one whose origin has been the subject of controversy.

(3) In respect to the Ridge and Valley Province explain briefly: (a) why valleys are more abundant than in the Plateau to the northwest, (b) the evidence commonly used to discriminate traces of ancient erosion levels, (c) why such evidence is more positive than that found in the Plateau, (d, e) two rival explanations of divide levels.

(4) Where (be as specific as possible) are and what is origin of: (a) Mohawk Valley, (b) Delaware Water Gap, (c) Pine Mountain, Georgia, (d) Pine Mt., Ky., (e) Tughill Plateau, (f) Allegheny Mts., (g) Allegheny River, (h) Chesapeake Bay, (i) Natural Bridge, Va., (j) New River.

(5) With respect to Catskill Mts. state briefly: (a) why they are so high, (b, c) two possible explanations for the small number of streams, (d, e) two possible explanations of the two major levels.

(6) (a) What origin of water gaps did we see illustrated on the field trip? (b) where? (c, d) give two other plausible origins for such gaps elsewhere, (e) if the cause found in Wisconsin is applied to Ridge and Valley province what episode of geologic history must be assumed?

GEOLOGY 130 PHYSIOGRAPHY OF EASTERN UNITED STATES

Midsemester examination Nov. 19, 1952

Write on four questions only and please indicate on cover which they are.

(1) List, describe briefly, tell where observed on trip, explain how difference in age is found, three different types of topography on Baraboo quartzite.

(2) Tell where on the field trip you saw: (a) evidence of former mountains, (b) blowout dune, (c) sink hole, (d) conglomerate on Cambrian beach, (e) bed of glacial lake, (f) bed of lake once enclosed by glacial outwash, (g) Franconia formation, (h) Yazoo type of stream junction, (i) evidence of more than one period of filling of valleys of Driftless Area, (j) kettle in outwash plain.

(3) Complete each sentence stating its proof: (a) The Baraboo quartzite bluffs were once completely buried by horizontal rocks because--- (b) Terminal moraines of central Illinois are smoother than those of eastern Wisconsin because---
(c) Chalk caps a cuesta in Texas and forms a lowland in Alabama because--
(d) Crowleys Ridge is a former floodplain of the rivers because--
(e) The floodplain and delta of Mississippi River are post-Wisconsin in age because--

(4) Locate as definitely as possible in areas thus far considered good examples of (a) hills due to salt dome, (b) barrier beach, (c) lake due to earthquake, (d) quartzite monadnock of Piedmont, (e) "bays", (f) atoll, (g) ungleciated karst topography, (h) elevated barrier beach, (i) submerged cuesta, (j) escarpment along fault.

(5) In respect to the Pleistocne terraces of Coastal Plain state two types of topographic evidence of former sea levels, how relative age of different levels is found, and two hypotheses of cause of the changes of water level.

(6) In respect to the Piedmont Plateau state (a) reason for the name, (b) evidence of former mountains, (c) difference between High and Low Piedmont, (d) evidence of former plain extending across the high ridges of Low Piedmont, (e) relation of upland surface of High Piedmont to top of hard rocks below Coastal Plain.

GEOLOGY 130

PHYSIOGRAPHY OF EASTERN UNITED STATES

"Six weeks" examination Oct. 22, 1952

Write on 4 questions and no more indicating on cover which they are.

(1) List and locate good examples each of 5 distinct topographic forms due directly or indirectly to glaciation which occur in Central Lowland and/or Superior Upland.

(2) Define briefly without details: (a) Driftless Area, (b) Driftless Section, (c) peneplain, (d) pediplain, (e) outlier.

(3) (a) Explain why the Dissected Till Plains are separated from the Till Plains Section
(b) Why a change was made in western boundary of Superior Upland.

(4) Complete sentences giving proof of each (no more counted): (a) The mountains of the Superior Upland were worn down to a low level prior to Cambrian submergence.———
(b) Lake level at the head of Lake Superior has risen since glaciation because——
(c) Inclined lava flows form hogback ridges because——
(d) The Western Young Drift Section is separated from the Great Lakes Section because——
(e) The major topographic features of the Great Lakes Section are controlled by bedrock because——

(5) Locate in areas thus far taken up a good example each of (a) "peneplain" formed during Pennsylvanian time, (b) glaciated karst, (c) interlobate moraine, (d) glacial outwash in Driftless Area, (e) falls in Driftless Area, (f) valley of superimposed stream, (g) bed of glacial lake, (h) cuesta due to dolomite cap, (i) lakes in pitted outwash, (j) folded sedimentary rocks in Central Lowland.

(6) Discuss and compare importance of three possible processes in formation of the basins of the Great Lakes including Lake Superior.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Final examination January 28, 1952

Write on 10 questions and no more. Please indicate on cover of bluebook which you took. Your final and exam grades will be mailed if you leave a postcard (remember the extra cent) or stamped envelope. Please avoid office or telephone calls. Grades must be in by noon, Wednesday.

(1) Explain the significance to physiographic history of Crowleys Ridge and adjacent stream courses.

(2) Describe the evidence commonly used to demonstrate the occurrence of several cycles of erosion in both Ridge and Valley and Appalachian Plateau provinces and compare their reliability.

(3) Explain why the location of the eastern boundary of the Blue Ridge in the Carolinas presents a problem and give 5 different hypotheses for it.

(4) Account for the relation of the Nashville Basin, Highland Rim and Cumberland plateau giving three alternative hypotheses. Draw section showing geology.

(5) List in proper order the <u>facts</u> observed on field trip and the <u>conclusions</u> drawn from them which demonstrate the physiographic history of the vicinity of Rock Springs, Wisconsin.

(6) Locate and describe some of the evidence which demonstrates former local or mountain glaciation in eastern United States. Give its general distribution.

(7) Give two hypotheses each for (a) rectangular system of narrow valleys in Adirondacks, and (b) skyline of Adirondacks as seen from south.

(8) Compare importance of processes which led to formation of basins of Great Lakes including Lake Superior.

(9) Defend the proposed change in boundary between Superior Upland and Western Central Lowland.

(10) Explain and compare merits of four different processes which may have contributed to formation of the valleys containing Finger Lakes of New York.

(11) Account for the presence in the Driftless Area of falls and rapids and for similar phenomena in unglaciated Allegheny Plateau.

(12) What in brief is physiographic significance of (a) Arbuckle Mountains, (b) terrace of chert-sandstone gravel north of Plain, Wisconsin, (c) presence of ridge of sand and gravel nearly across outlet of valley of Blue Mound Creek, Wisconsin, (d) Rib Mountain, Wisconsin (e) Valley of Black River, N. Y.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Dec. 19, 1951

Write on any 4 questions and no more. Please indicate on cover of bluebook which you answered.

(1) On separate sheet. Place in bluebook with all answers on it.

(2) Complete following sentences giving best proof of each statement in a single sentence of reasonable length:
(a) The northwest border of the Triassic Lowland of New Jersey is along a fault because--
(b) The major evidence commonly used to demonstrate former peneplaination of the Ridge and Valley province is--
(c) The limestones of the Coastal Plain have been thought to be important in working out the physiographic history of the Ridge and Valley Province because---
(d) The majority of the stream valleys of the Ridge and Valley Province are subsequents because--
(e) It is generally concluded that the last rise of sea level with respect to the lands is due to melting of continental glaciers because.

(3) Discuss four different theories of the origin of water gaps through ridges of resistant rock including examples seen on field trip.

(4) Two hypotheses have been advanced for the wide spacing of streams in the Catskills. Compare merits, including as evidence the same phenomenon as found in other regions.

(5) Locate as definitely as practicable and tell origin or (physiographic) significance of:
(a) Tughill Plateau, (b) Chestnut Ridge, (c) New River, (d) Indian River, (e) Southern Pine Hills, (f) Parker Strath, (g) Harrisburg "peneplain", (h) Cumberland Mountain, (i) Cumberland Plateau, (j) Lookout Mountain.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Midsemester examination Nov. 26, 1951

Write on 4 questions and no more. Please indicate on cover of bluebook which they are. Try not to change order.

(1) Complete following sentences giving best proof of each statement (no more than a single sentence of reasonable length counted);
(a) The upland of the High Piedmont is interpreted as a younger surface than that of the "hard rocks" below the Coastal Plain because----
(b) Happy Hill is more readily explained by wave action than by peneplanation because-----
(c) Stone Mountain, Georgia, is so perfectly rounded because----
(d) The sediments of the Coastal Plain must once have exteneded farther inland than they now do because---
(e) The coast near Cape Hatteras is a barrier beach because---

(2) In respect to the terraces of the Coastal Plain : (a, b) state two distinct criteria by which former levels of the ocean may be found, (c) state how marine and stream terraces are discriminated, (d, e) give two possible explanations of the change in relation of land and sea which led to the terraces.

(3) Locate as definitely as practicable by province, section, state, etc. and give origin or physiographic significance of: (a) Five Islands, (b) Crowleys Ridge, (c) Delaware Bay, (d) Georges Bank, (e) Watchung Mountains, (f) Key West, (g) Dry Tortugas, (h) Parrs Ridge, (i) Apostle Islands, (j) Black Belt. Please BE BRIEF.

(4) Compare (a) shape, and (b) [illegible] causing east coast of Florida and shoreline of Louisiana.

(5) List and locate as definitely as possible an example of each of 5 different types of lakes (in respect to origin) which occur in Coastal Plain (bodies of brackish water may be included).

(6) List and give as closely as possible an example each of 5 different types of topography due to continental glaciation with associated water which occur in provinces thus far studied.
Give locations by province, section, state, etc.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

"Six weeks" examination Oct. 31, 1951

Write on any 4 questions and no more. Try to keep questions in order.

(1) Where (be as specific as praticable) in provinces thus far studied can you find a good example of: (a) eroded till plain, (b) uneroded portion of pre-Cambrian peneplain, (c) cuesta due to resistance of gypsum, (d) lava hogbacks, (e) limestone hogbacks, (f) lakes in terminal or endmoraine, (g) interlobate moraine, (h) drumlins in Central Lowland, (i) outlet of glacial lake not now used by a stream (j) monadnock due to quartzite.

(2) (a) Define Driftless Area, (b) Define Driftless Section, (c) Account for the Driftless Area, (d) Account for sharp eastern boundary of Driftless Area, (e) Name two kinds of drift within Driftless Area.

(3) Describe and account for topography developed on three different types of bed rocks found in Superior Upland

(4) Describe five different kinds of topography found in Till Plains Section.

(5) Complete following sentences, keeping to a reasonable length, and giving proof of each statement:
(a) The Baraboo quartzite bluffs were once entirely buried by "soft rocks" because--
(b) The Baraboo quartzite once formed mountains because---
(c) The mountains of Baraboo quartzite were almost eroded away before Cambrian time because---
(d) The gorge below Weidman Falls did not exist in pre-Cambrian time because--
(e) Weidman Falls is no longer in its original position because--

(6) Where (be as specific as possible) on the field trip did we see:
(a) Franconia sandstone, (b) old terrace gravel, (c) Military Ridge, (d) Maquoketa shale, (e) Wisconsin terminal moraine, (f) outwash in mouth of tributary of Wisconsin River, (g) bed of lake once enclosed by Wisconsin glacier, (h) erosional outwash terrace, (i) basin enclosed by depostion of sand dunes, (j) basin eroded by wind action.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Final Examination Jan. 20, 1951

Write on any 10 questions and no more. BE BRIEF and to the point. Your grade will be mailed to you early next week if you leave an addressed postcard or a stamped envelope. PLEASE avoid office or telephone calls and all complaints.

(1) Locate as definitely as possible and tell origin of: (a) Rib Mt., (b) level valley bottom near Plain, Wis., (c) Arbuckle Mts., (d) Black Prairie.

(2) Account for the relation of the drainage pattern of Ridge and Valley Province to geologic structure presenting more than one hypothesis.

(3) Explain the very bouldery soils of New England and tell where else in eastern United States similar soils occur.

(4) List in parallel columns and in proper order the facts observed and the conclusions drawn from them which demonstrate the history of the topography at Weidman Falls.

(5) Compare the reliability of the evidences used to demonstate records of several erosion cycles in the Ridge and Valley and Appalachian Plateau provinces.

(6) Compare at least two explainations of the observed scarcity of marginal moraines in eastern United States.

(7) What facts in physiographic history are demonstrated by Crowley Ridge and adjacent flood plain? Explain.

(8) Account for the observed fact that certain parts of eastern United States are coarse texture drainage whereas other portions have a fine texture. Name examples of each. Does same explaination hold in all?

(9) Locate as definitely as possible in Eastern United States a good example each (a) topography due to large-scale glacial erosion, (b) change in drainage outside glaciated area due to adjacent glaciation, (c) uplifted barrier beach (d) extensive area of drumlins, (e) extensive lake district in pitted outwash.

(10) Show by means of a cross section the relation between the prominent cuestas of the Driftless Area and the Superior Upland. Indicate on your section at least one old erosion surface, in part concealed.

(11) Explain two factors which could explain abundance of entrenced meanders in Interior Low Plateau.

(12) Justify the inclusion by Fenneman of some glaciated terriotry in his Driftless Section and tell where more might have been included.

(13) Show by one or more cross sections two views of the summit levels of the Adirondacks.

(14) Give at least two views of the cause of rapids and falls along the southern Blue Ridge.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Dec. 11, 1950

Write on four (4) questions and no more. Please indicate on cover of bluebook which you wrote on.

(1) Separate sheet. Please write your name on it first and answer all questions on it. Fold cross ways and place in your book.

(2) Discuss merits and weaknesses of at least three suggested explainations of the course of Tennessee River near Chatta nooga, Tenn.

(3) Explain not less than three methods of formation of the "Finger Lake type" of valleys in Glaciated Allegheny Plateau.

(4) Explain (a) why a special explaination is needed for the Blue Ridge escarpment in the Carolinas and (b) at least three suggested hypotheses.

(5) What evidence has been used to support the hypothesis of past peneplaination in both Ridge and Valley and Appalachian Plateau provinces and why older reports speak of a "Cretaceous Peneplain" and a "Tertiary Peneplain."

(6) Where (province, section, state or other definite means of location) are and what in brief is origin of the following:
(a) Mohawk Valley, (b) Crab Orchard Mts., (c) Laurel Ridge,
(d) Asnville peneplain, (e) Pine Mt . Ga., (f) Catskill Mts.,
(g) Alleghony Plateau, (h) Reelfoot Lake, (i) Pine Mt., Ky.
(j) Delaware Water Gap.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Midsemester examination Nov. 15, 1950

Write on any 4 questions and no more. Please indicate on cover of bluebook which these are.

(1) Give briefly (a) location of, (b) origin, and (c) important significance, that is what is proved by, each of the following:
(a) Carolina Bays, (b) Stone Mountain, (c) Watchung Mountains,
(d) Trail Ridge, (e) Lake Okeechobee

(2) What facts must first be ascertained in order to reach a definite opinion on origin of the terraces of the Coastal Plain? Explain fully.

(3) The rolling uplands on the dolomite formations of western Wisconsin have been explained as uplifted and dissected peneplains. State the major theories on their number and origin including what evidences were actually observed on the field trip which bear on these ideas.

(4) State as specifically as possible where on the field trip each was seen: (a) chert-sandstone gravel, (b) St. Peter escarpment, (c) Yazoo type of stream junction, (d) Military Ridge, (e) supposed ancient sea cliff, (f) lake enclosed by terminal moraine, (g) lake basin formed by sand dunes, (h) water gap, (i) crags of St. Peter sandstone, (j) enclosed depression in sandstone.

(5) What two ages of valleys due to stream erosion of Baraboo quartzite occur? Where seen and how distinguished?

(6) Complete following sentences giving most important proof of each (no more than a single sentence of reasonable length counted):
(a) The upland of the High Piedmont Plateau is younger than the surface of the old rocks beneath the Coastal Plain because---
(b) Cuestas occur only in portions of the Coastal Plain because---
(c) Chalk forms a lowland in Alabama and an upland in Texas because----
(d) The east coast of Florida is so much smoother than the west coast because--
(e) The Driftless Area escaped glaciation primarily because----

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

"Six weeks" examination Oct. 18, 1950

Write on four questions only and please indicate on cover of your blue book which they are.

(1) Define briefly: (a) Dissected Till Plains, (b) Osage Section, (c) peneplain, (d) pediplain, (e) Niagara Cuesta OMIT ALL DETAILS, giving essentials.

(2) In areas thus far studied locate as definitely as possible a good example of each of the following: (a) pre-Cambrian peneplain passing beneath Upper Cambrian sedimentary rocks, (b) Cretaceous sedimentary rocks on peneplain of Superior Upland, (c) extensive drumlin area of Superior Upland, (d) glacial outwash outside glaciated area, (e) hogbacks on limestone formations, (f) extensive area of tilted lava flows, (g) quartzite monadnock, (h) peneplain or pediplain covered by Pennsylvanian rocks, (i) escarpment along fault, (j) glaciated sinkhole topography.

(3) Compare importance of three possible processes which operated to produce the basin of Lake Superior.

(4) What lines of evidence prove that (a) region of the Great Lakes has undergone postglacial earth movement, (b) that Superior Upland was once a mountain region?

(5) Complete following sentences giving proof of each statement (no more than a single sentence of reasonable length counted):
(a) The young sedimentary rocks of the Central Lowland once entirely buried the Superior Upland because---
(b) A change in western boundary of Superior Upland was suggested because---
(c) The parallelism of the main rivers of the Osage section indicates ------ because----
(d) Portions of the preglacial rock topography of the Superior Upland may be yet observed because---
(e) Flat floors of valleys of the Driftless Area which carried no glacial waters were caused by-----

(6) List and locate good examples of each of five topographic forms of Central Lowland and Superior Upland which were due directly or indirectly to continental glaciation.

(7) (a) Explain why Dissected Till Plains are separated from Till Plains Section.
(b) Explain why the boundary of the Driftless Area is not equally clear at all points.

GEOLOGY 130

PHYSIOGRAPHY OF EASTERN UNITED STATES

Final examination Jan. 21, 1950

Write on 10 questions and no more. Please indicate on cover of your bluebook which ones you answered. Your grade will be mailed to you on Monday or Tuesday if you will provide an addressed postcard or envelope. Please avoid office or telephone calls. Please BE BRIEF and avoid long discussion answers.

(1) What three different origins have been advanced for the upland surface of southern New England?

(2) Why and where are there extensive areas of sand dunes in eastern part of Central Lowla nd?

(3) Account for the occurence of falls and rapids within the Driftless Area, giving examples of each kind.

(4) Account for the southeastward courses of main streams of Osage Section of western Central Lowland.

(5) List five types of lakes each of different origin which occur in Coastal Plain.

(6) Using diagram cross sections show major steps in physiographic history of Superior Upland.

(7) Explain briefly why the major streams of Blue Ridge province are far apart (coarse textureed drainage) whereas ravins due to siol erosion in the same region are close together (fine texture).

(8) Why do the majority of stream valleys of Ridge and Valley province follow outcrops of weak bed rocks?

(9) Explain reasons for including Triassic Lowland of Virginia-New Jersey in Piedmont province instead of making a separate province.

(10) Explain two versions of origin of summit level of Adirondack Mountains but do not discuss relative merits of each.

(11) Account for preservation of the high portion of Appalachian Plateau.

(12) Explain with a cross section the three erosion levels of Nashville Basin, Higland Rim and Cumberland Plateau giving two interpretations of origin of this "stairway effect".

(13) Where in provinces of eastern United States could you find a good example each of: (a) uneroded peneplain, (b) ridge due to trap rock, (c) glacial cirque, (d) limestone hogback, (e) superimposed stream. Make each location as definite as possible.

(14) What is physiographic significance or origin of the following: (a) Gogebic Range (Mich-Wis). (b) level plain at Arena, Wis., (c) Wichita Mountains, Oklahoma, (d) valley of Black River, N. Y., (e) Manitou Falls, a short distance south of Superior, Wis.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Dec. 12, 1949

Write on four questions and no more. Please indicate on cover of book which they are.

(1) Explain briefly but definitely three hypotheses which bear on geologic age of the summit erosion level of Happy Hill and two of its manner of erosion.

(2) Account for and dsecribe three distinct types of rock topography which occur in Glaciated Allegheny Plateau.

(3) Compare the merits of four different hypotheses of origin of water gaps and state which one you have seen illustrated in the field.

(4) Where (province and section) is and what is origin of: (a) Lookout Mountain, (b) Crab Orchard Mountain, (c) Chesnut Ridge, (d) Grassy Cove, (e) Pine Mt., Ga., (f) Cumberland Mountains, (g) Dahlonega Plateau, (h) Tughill Plateau, (i) Loop Mountain, (j) Cumberland Gap.

(5) Compare merits of two possible explantions of the level skyline of Ridge and Valley Province.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Midsemester examination Nov. 16, 1949

Write on any four questions and please indicate on cover of bluebook which they are.

(1) Describe, using diagrams, and account for three different types of topography on the Baraboo quartzite of different ages.

(2) Compare merits of two different hypotheses of origin of the terraces in lower part of Atlantic Coastal Plain.

(3) Locate in areas thus far studied and as definitely as possible a good example each of: (a) ancient Yazoo type of stream junction now eroded, (b) unerloded remnant of a "peneplain" formed in pre-Cambrian time, (c) cuesta caused by resistance of chalk, (d) escarpment along a fault, outside of Superior Upland, (e) entrenched meanders, (f) atoll in part of Atlantic Ocean, (g) granite monadnock, (h) terminal moraine on crest of a cuesta, (i) extensive barrier beach. (j) level-crested mountain caused by trap rock.

(4) Where (state as definitely as possible) on recent field trip did you see: (a) outwash terrace, (b) blowout dune, (c) sink hole, (d) terrace underlain by non-glacial gravels now deeply weathered, (e) upland underlain by Maquoketa shale, (f) escarpment which divides two extensive uplands, (g) outcrop of Dresbach sandstone, (h) upland underlain by Galena dolomite, (i) watergap, (j) proof of former complete burial of Baraboo quartzite by younger horizontal rocks.

(5) List in proper order of occurence (a) observations made at Weidman Falls and (b) immediately following each the conclusions drawn from each fact so as to demonstrate a complete history of the development of present topography at that place.

(6) Give the origin and significance of: (a) Chesapeake Bay, (b) Indian River, Fla., (c) Passes of Mississippi River, (d) Reelfoot Lake, (e) cliff on side of Tower Hill.

file

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

"Six weeks" examination Oct. 19, 1949

Write on any four questions and no more.

(1) Define briefly: (a) Driftless Area, (b) Driftless Section, (c) Till Plains, (d) Great Lakes Section, (e) Superior Upland

(2) Locate one good example of each by province, state, section: (confine to areas thus far taken up) (a) uneroded remnant of pre-Cambrian "peneplain", (b) cuesta capped by gypsum, (c) quartzite monadnock, (d) glacial outwash in Driftless Area, (e) hogbacks due to tilted lava flows, (f) valley of superimposed stream, (g) uneroded till plain, (h) lake district in pitted outwash, (i) drumlins, (j) remnant of young soft rocks near middle of Superior Upland. 2½

(3) Discuss and compare merits of three possible origins of basins which contain the Great Lakes.

(4) Describe bed rock topography found on three different general types of bed rocks found in Superior Upland.

(5) Describe and account for five different types of topography which occur in south-central Illinois.

(6) Complete following sentences giving proof of statements (no more than a single sentence of reasonable length counted):
(a) The Superior Upland was once buried under the rocks which are now present in the Central Lowland because---
(b) The mountains of the Lake Superior region were almost destroyed prior to ----- because----
(c) The topography of all areas of the "young" (Wisconsin) drift differs from that of all areas of older drift because---
(d) The Niagara cuesta dominates the topography of much of the Great Lakes section because--
(e) The gorge of Niagara River varies in width in different places because----

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Final examination Jan. 29, 1949

Write on 10 questions only and please indicate on cover of your bluebook which ones they were. Please leave a postcard for grade and avoid telephone or office calls.

(1) Explain processes which caused the basins of the Great Lakes and the evidence which shows their relative importance.

(2) List in parallel columns the observations and the conclusions drawn from each (in proper order) which serve to demonstrate the history of the vicinity of Weidman Falls.

(3) Moraines formed at margin of the continental ice are scarce in Appalachian Plateau and New England; explain possible reasons for this fact.

(4) Rapids and falls occur in some of the streams of the Driftless Area; explain why such features of youth occur in a region of otherwise mature surface.

(5) Explain the problem of number and origin of terraces in lower Coastal Plain.

(6) Draw a cross section showing general nature of geology and topography along a line crossing Highland Rim, Nashville Basin, Cumberland Plateau, Ridge and Valley, Blue Ridge, Piedmont, Coastal Plain. Explain all major features shown by legend or otherwise.

(7) Explain with diagrams two interpretaions which have been given for the upland or summit level of the Adirondacks.

(8) Locate as definitely as possible in New England a good example each of: (a) local or alpine glaciation, (b) trap ridge, (c) drift terraces, (d) eskers, (e) valley due to limestone.

(9) The coast of Maine is often referred to as submerged or drowned whereas that of the east side of Florida is classed as emerged or rising. Explain reasons for the difference other than given above.

(10) Account for the fact that in Ridge and Valley and northern Blue Ridge many of the larger streams leave broad valleys and cross ridges in narrow gaps. Give major hypotheses which have been advanced.

(11) Describe the evidences which show (a) former outlets of the Great Lakes during glacial recession and (b) that there has been earth movement in the same region in relatively recent time.

(12) Locate in Central Lowland as definitely as possible a good example each: (a) drumlins, (b) hogbacks, (c) glaciated karst, (d) erosional surface which cuts across folded rocks, (e) cuesta due to sandstone.

(13) Complete following sentences giving adequate proof of each statement:
(a) The soils of New England are in many places so bouldery because-
(b) The principal evidence of the New England peneplain is--
(c) The southern Blue Ridge mountains have dendritic drainage because-
(d) The east border of the Driftless Area is so well-defined because-
(e) West Blue Mound has been uplifted at least ---feet because.-

(14) Account for (a) Trail Ridge, (b) Sequatchie Valley, (c) shoreline of Louisiana, (d) lakes of northernmost Wisconsin, (e) Mohawk Valley, N. Y.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Dec. 15, 1948

Write on first question and any three others. Please mark on cover of your book which you answered. Grades may not be ready until after vacation.

(1) On separate sheet. Required of all. Please put all answers on the sheet, fold crossways, and place in your book.

(2) Compare merits of 5 different hypotheses which have been advanced to account for the Blue Ridge escarpment next the Piedmont Plateau.

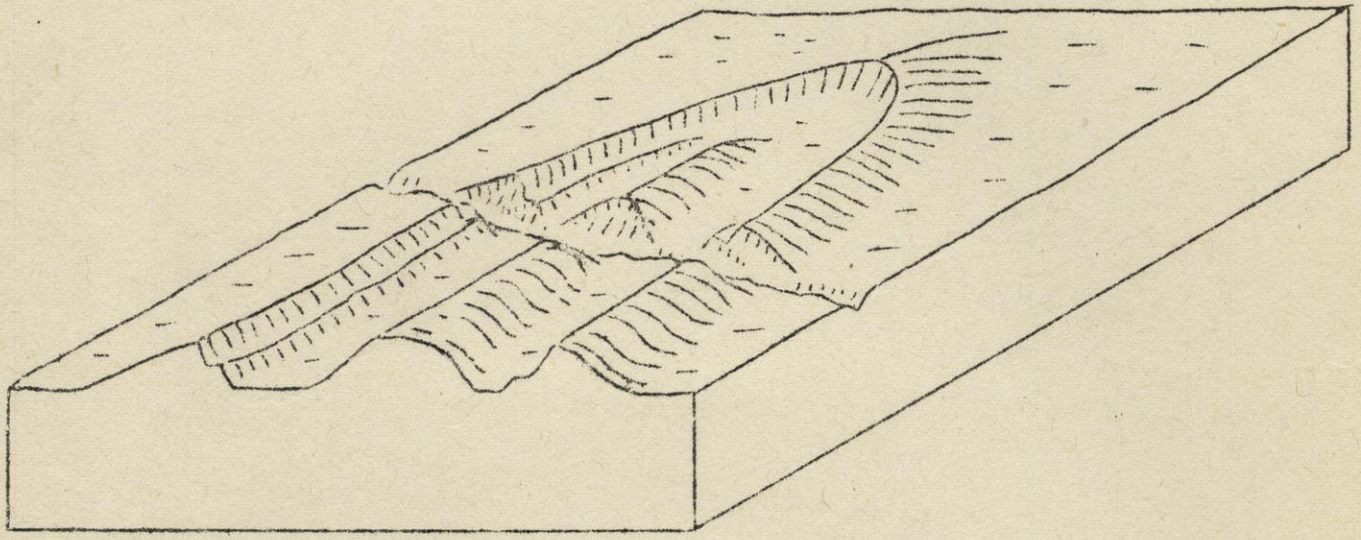
(3) Explain the effects of continental glaciation on drainage of Appalachian Plateau BOTH within and without the border of the ice.

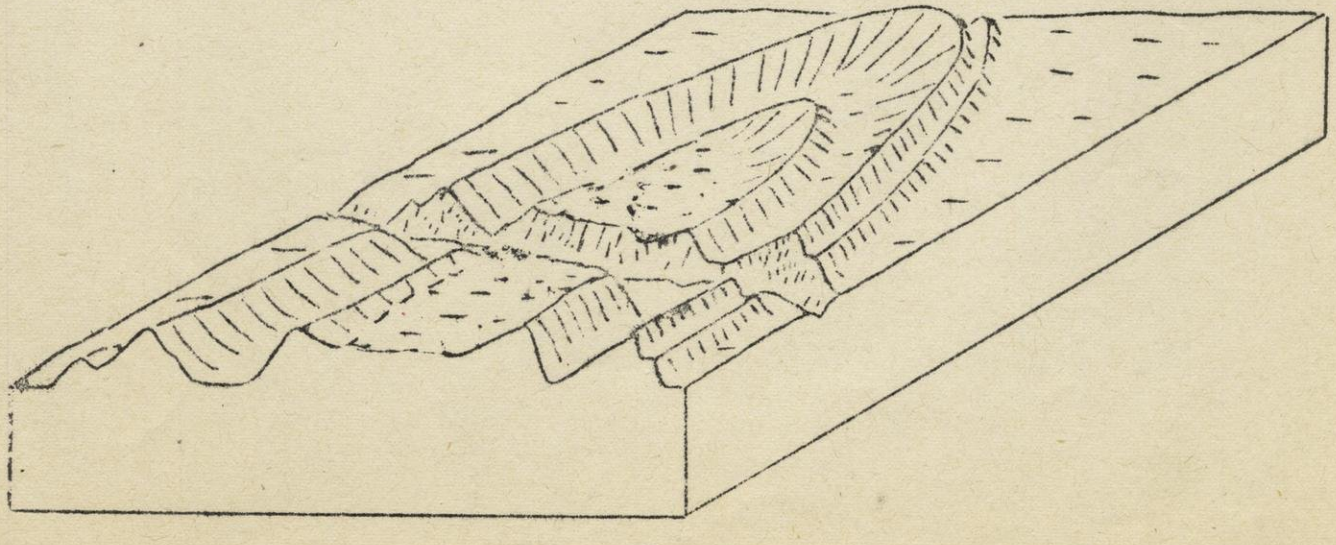
(4) Compare causes of wide spacing of streams (coarse-textured drainage) in Coastal Plain and Catskill Mountains.

(5) Complete following sentences giving proof of each statement (no more than a single sentence of reasonable length considered):
(a) The high elevation of the Catskills is due to--
(b) The problem of the course of Tennessee River in the Appalachian Plateau has attracted so much attention because--
(c) The sandstones of the Ridge and Valley Province are more resistant than the limestones because----
(d) In the Ridge and Valley Province anticlinal mountains are less abundant than synclinal because---
(e) The major evidence of past peneplaination of the Ridge and Valley Province is------

(6) Where and what is physiographic significance of (locate as definitely as possible): (a) Snickers Gap; (b) Kaaterskill Creek; (c) Reelfoot Lake; (d) Stone Mt.; (e) Parker Strath; (f) Zig-Zag mountains (in general); (g) Natural Bridge, Va.; (h) Chesapeake Bay; (i) Allegheny Mts.; (j) Cumberland Plateau..

(;) Required of all PLEASE WRITE YOUR NAME FIRST.
Kindly fold across before placing in bluebook.
show NEATLY on ends of blocks and sides where needed the STRUCTURE which gave rise to the topography shown. Also indicate what the resistant layers probably are and where you would find examples of these features.





GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Midsemester examination Nov. 17, 1948

Write on four questions only. Graduates and majors in geology or geography must include not less than one of first three questions. PLEASE indicate on cover of your bluebook the numbers of questions you wrote on. Time at 2:20

(1) List and tell where you saw on the field trip evidence which demonstrates that portions of the present surface on the Baraboo quartzite were made at different times.

(2) Compare two alternative explanations of the even skyline and rounded divides of the Piedmont Plateau.

(3) Complete following sentences giving best proof of each statement (no more than a single sentence of reasonable length considered.
(a) The upland surface formed by joining the summits of divides on the Piedmont Plateau is younger that the surface of the hard rocks beneath the Coastal Plain because---
(b) Although surrounded by hills the Black Belt may justly be termed a penenplain because---
(c) Chalk forms lowlands in Alabama and uplands in Texas because---
(d) We know that the Baraboo quartzite was once completely buried by younger rocks because---
(e) Cuestas occur only in certains portions of the Coastal Plain because---

(4) Compare the shape of, and forces which caused the difference between, (a) Florida east coast and (b) delta of the Mississippi River.

(5) How and where does nature of bed rock control present topography of the Superior Upland and describe several different types of such topography.

(6) Locate as definitely as possible and tell physiographic origin of: (a) Key West, (b) Dry Tortugas, (c) Tallulah Falls, (d) Parrs Ridge, (e) Chester Valley, (f) Rib Mountain, (g) Eastern Cross Timbers, (h) 5 (i) Crowleys Ridge, (j) Red Hills, (h) Apostle Islands.)

(7) Tell as definitely as possible where you saw on field trip:
(a) inactive sand dunes, (b) lake basin caused by dunes, (c) Franconia formation, (d) pre-Wisconsin gravel, (e) underground drainage, (f) upland underlain by Prairie du Chien dolomite, (g) hill of Maquoketa shale, (h) valley which narrows downstream, (i) St. Peter edcarpment, (j) remanant of "Dodgeville peneplain".

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

"Six weeks" examination Oct. 20, 1948

Write on FOUR questions only and please indicate on cover of your bluebook which ones you answered. Majors and graduates in geography or geology must include at least one of first two questions.

(1) List and explain evidence which demonstrates each of the major steps in history of the topography of Superior Upland. (must be in order).

(2) (a) Account for the Driftless Area.
(b) Explain difference between Driftless Area and Driftless Section as defined by Fenneman.

(3) (a) Describe briefly 5 different topographic forms which occur in either Central Lowland or Superior Upland which are due directly or indirectly to continental glaciation.
(b) locate an example of each as definitely as possible.

(4) Complete the following sentences (no more than a single sentence of reasonable length counted) giving proof of each statement:
(a) The Wichita Mountains resemble the Baraboo Bluffs because--
(b) The western boundary of the Superior Upland was changed from the tentative location given by Fenneman because---
(c) Parallel drainage of the Osage Section indicates-----because---
(d) Portions of the preglacial rock topography of Superior Upland can still be observed because--
(e) The larger valleys of the Till Plains and Dissected Till Plains have flat floors because---

(5) Discuss original topography and reasons for separating Till Plains from Dissected till plains (include cause of original glacial surface)

(6) Locate as definitely as possible a good example in provinces thus far studied of each of the following: (a) uneroded peneplain, (b) dolomite upland, (c) escarpment along a fault, (d) basin due to underlying salt and gypsum-bearing rock, (e) hogback ridges, (f) submerged (drowned) shore line, (g) cuesta capped by gypsum, (h) monadnock, (i) glaciated karst (sink hole) topographym (j) bed of glacial lake in Driftless Area.

(7) Describe and locate the major topographic features of the Great Lakes Section which are due to bed rock control.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Final examination Jan. 28, 1948

Everyone is to write on 10 questions and no more. Majors in Geology or Geography must include not less than two of first three questions.
Please indicate which questions you answered.
Please leave a postcard for your grade and avoid telephone or office calls.

(1) Explain why a special explanation is needed for the Blue Ridge escarpment in the Carolinas and compare merits of five suggested hypotheses of it.

(2) List in parallel columns the observations and interpretations of history derived from them made at Weidman Falls (arranged in proper sequence of events).

(3) Explain the several suggestions which have been advanced to account for the scarcity of marginal ice deposits (moraines) in New England and Appalachian Plateau.

(4) Account for rapids and falls in the mature topography of Driftless Area.

(5) List the 3 general types of bed rocks of Superior Upland with topography caused by each type.

(6) Draw an ideal cross section to show relation of Shawnee Hills, Highland Rim, and Blue Grass basin. Show general nature of bed rock formations.

(7) Discuss briefly major events in glacial history of Adirondacks. (last ice).

(8) Where in New England are good examples of (a) cirques, (b) trap ridge, (c) mountains of schist, (d) monadnock, (e) eskers

(9) Explain the major effects of glaciation on topography of Appalachian Plateau both within and outside the border of the ice.

(10) Account for the drainage <u>pattern</u> of Ridge and Valley Province.

(11) Draw an ideal geol. cross section to show relation of Blue Ridge, Piedmont (including a Triassic Area), and Coastal Plain (include terraces).

(12) Where could you find good examples of (a) drumlins, (b) hogbacks, (c) sinkholes in glaciated region, (d) drowned valley, (e) cuesta-island

(13) Complete following statements (be brief): (a) The Driftless Section differs from the Driftless Area because -; (b) Even ridge tops of eastern Pensylvania are commonly accounted for by --; (c) The Blue Ridge of the south has northwest-flowing dendritic drainage because-; (d) The east border of the Driftless Area is so well-defined because-; (e) Blue Mound, Wis. has been uplifted at least --- feet because.

(14) Account for: (a) Trail Ridge, (b) Catskill Mts., (c) Shoreline of St. Louis Bay near Superior, (d) lake district of northernmost Wisconsin (e) Black River of northern New York.

GEOLOGY 13 0
PHYSIOGRAPHY OF EASTERN UNITED STATES

Advance examination Dec. 18, 1947

Write on four questions only; No. 1 is required of all. Majors in geology or geography must include not less than one of next two questions. Grades will not be ready until after vacation. Please indicate which questions you wrote.

(1) Required question on separate sheet

(2) Explain at least two distinct hypotheses to account for the drainage system of Ridge and Valley province.

(3) Account for three different types of topography which occur in the Finger Lake District of New York.

(4) Complete following sentences giving proof of each statement (no more than a single sentence of reasonable length considered):
(a) It has been concluded that the divide along Blue Ridge is shifting to the northwest because:----
(b) It is known that there was neither the Allegheny nor Ohio Rivers in preglacial time because---
(c) Emergence of the Coastal Plain in relatively recent time is proved by--
(d) The upland surface of the Piedmont Plateau is not the same age as the surface of the hard rocks beneath the Coastal Plain because---
(e) It has been ~~commonly~~ widely thought that there was a Schooley Peneplain because--

(5) Describe briefly the location, geology a nd topography of Catskill Mts.

(6) Show with diagrams: (a) syncline, (b) monocline, (c) anticline, (d) anticlinal mountain, (e) monoclinal mountain, (f) s ynclinal mountain, (g) pitching fold, (h) thrust fault, (i) entrenched meander, (j) cuesta

(7) Account for: (a) greater summit elevations of Appalachian Plateau compared to Ridge and Valley
(b) why shale is found on some of the highest summits.

(8) Where and what are: (a) Heckley scarp, (b) Walden Ridge (c) Fall Zone Peneplain, (d) Ashville basin, (e) Harrisburg Peneplain, (f) Western Cross Timbers, (g) Reelfoot Lake, (h) Yazoo B asin, (i) Everglades, (j) Sea Islands .

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Dec. 19, 1947

Write on four questions which must include the first. Majors in either geology or geography must include not less than one of next two questions. Please indicate which questions you answered. Grades will not be ready until after vacation.

(1) Required of all. On separate sheet. Plese fold crosswise and put in your bluebook.

(2) Compare points for and against four distinct hypotheses to account for the fact that many streams of Ridge and Valley Province leave wide valleys on soft rock to enter narrow gorges or gaps.

(3) Compare relative merits of the several processes which have been appealed to in oreer to explain the youthful glaciated valleys of Allegheny Platea u in New York.

(4) Complete following sentences giving best proof of each statment (no more than a single sentence of reasonable length considered):
(a) Recent stream capture along the east side of the Catskills is demonstrated by--
(b) It has often been assumed that limestones of the Coastal Plain demonstrate that the la nd was low at time of their formation because---
(c) Sinking of Coastal Plain in relatively recent time is shown by---
(d) The abrupt change in course of Tennessee River at Chattanooga has attracted so much attention because--
(e) Even ridge crests in northern Ridge and Valley Province have been generally taken to prove---

(5) Show with diagrams (a) anticline, (b) syncline, (c) pitching anticlinal mountain, (d) pitching synclinal mountain, (e) monocline, (f) monoclinal mountain, (g) zig-zag ridge of folded resistant formation with structure, (h) discordance of relation of streams to structure after eroding through plane of overthrust fault, (i) thrust fault, (j) change of position of ridges as erosion progresses downward through a series of upright folds of alternate soft and resistant formations.

(6) Give as definitely as possible an example each in area thus far studies: (a) stream system changed by glaciation, (b) consequent stream, (c) subsequent stream, (d) Triassic lowland bordered by fault, (e) salt dome hill, (f) stream capture, (g) quartzite mountains, (h) valley on limestone, (i) entrenched meander, (j) lake due to earthquake.

(7) Describe briefly the boundaries, geology and topography of either (a) Cumberland Plateau or (b) Mississippi floodplain and delta.

(8) Where is (be specific) and what is origin of: (a) Pine Mt. Ky., (b) Crowleys Ridge, (c) Chesnut Ridge, (d) Lookout Mt., (e) Crab Orchard Mt., (f) Tug Hill, (g) Cumberland Gap, (h) Parrs Ridge, (i) Mohawk Valley, (j) Catskill Mts.

GEOLOGY 130
P HYSIOGRAPHY OF EASTERN UNITED STATES

Special examination (midsemester) Dec. 1, 1947

Write on four questions only.

(1) List in proper sequence the OBSERVATIONS made at Weidman Falls and in opposite column state the CONCLUSIONS drawn from each. Sequence should be that in which events took place.

(2) Account for and give examples of each type of falls and/or rapids which occur in the Driftless Area.

(3) Discuss origin of Crowleys Ridge and its associated drainage changes.

(4) Complete following sentences giving best proof of each statement (no more than a single sentence of reasonable length counted):
(a) The mountains of the Piedmont were destroyed before Upper Cretaceous time because--
(b) (c) The Interlobate Moraine of eastern Wisconsin is such a prominent feature of the landscape because---(give two reasons).
(d) Some cuestas of the Coastal Plain of Texas are capped by chalk whereas a similar rock forms a lowland in Alabama because---
(e) The Driftless Area escaped glaciation primarily because---

(5) Tell as definitely as possible where on the Nov. 1 trip you saw a good example of each of the following: (a) Franconia sandstone, (b) topographic break between two separate uplands, (c) lake enclosed on one side by terminal moraine, (d) bed of former lake enclosed on one side by glacial outwash, (e) peneplain on quartzite, (f) water gap, (g) gravel of non-glacial origin (h) vertical strata, (i) clinkstone, (j) soil formed of material left by weathering of dolomite.

(6) Discuss the Piedmont Plateau in respect to definition, boundaries, geology, and topography (omit history).

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Midsemester examination Nov. 26, 1947

Wite on four questions and no more. Please indicate with you answered. Majors in either geography or geology must include not less than two of first three questions.

(1) What field observations were made on the Nov. 1 trip which bear upon the validity of the peneplain interpretations of the uplands? List, tell where seen and significance of each. This included both hard and soft rocks.

(2) Describe and give proof of age and tell where seen on trip:
(a) remnant of topography developed in pre-Cambrian time.
(b) valley of superimposed stream eroded into older topography.
(c) terrace of possible marine origin.

(3) Discuss the problems of number, position, and origin of the terraces of Coastal Plain.

(4) Complete following sentences giving proof of each statement (no more than a single sentence of reasonable length considered):
(a) It is harder to distinguish glacial erratics in Superior Upland than in Central Lowland because---
(b) One of the cuestas of West Gulf Plain is capped by chalk because---
(c) The topographic effects of the great New Madrid earthquake are more prominent on the Mississippi floodplain than in adjacent areas because ---
(d) Crowleys Ridge records a condition akin to that of the present Yazoo River because--
(e) The floodplain and delta of Mississippi River are of post-Wisconsin age because---

(5) Where on the recent field trip did you see : (a) basin of pond enclosed by sand dunes, (b) blowout, (c) terrace gravel, (d) sandstone crags, (e) Dresbach sandstone, (f) vertical quartzite. (g) Trempealeau formation, (h) basin enclosed by terminal moraine, (i) sink hole, (j) basin of extinct lake once enclosed by glacial outwash.

(6) Outline the physiographic history of Piedmont Plateau and adjacent Coastal Plain using diagrams for each major step.

(7) Where are (be as specific as possible) and what is origin of:
(a) Watchung Mts., (b) Lake Okeechobee, (c) Chesapeak Bay, (d) Cape Hatteras, (e) Black Belt, (f) Five Islands, (g) Stone Mt. (h) Rib Mt. (i) Southern Pine Hills, (j) Long Island.

file

GEOLOGY 1 30
PHYSIOGRAPHY OF EASTERN UNITED STATES

Six weeks examination Oct. 29, 1947

Write on four questions and no more. Pleas e indicate on cover of bluebook which you wrote. Majors and graduates in geology or geography must inclue not less than one of first two questions.

(1) Exp lain evidence on relative importance of different processes in origin of basins of the Great Lakes.

(2) Describe and account for five different types of topography found in Till Plains of southern Illinois

(3) (a) Compare origin of gorge below Niagara Falls with valley of a normal stream.
(b) Explain without going into too much detail why this gorge varies in width.

(4) Complete following sentences giving best proof of each statement (no more than a single sentence of reasonable length counted):
(a) The mountains of the Superior Upland were reduced to a low state before the coming of the sea in which the bed rocks of Central Lowland were laid down because--
(b) The level of Lake Superior has risen at Duluth and Superior in relatively recent time because--
(c) Hogback ridges occur in areas underlain by inclined lava flows because ---
(d) The Western Young Drift Section is separated from the Great Lakes Section because--
(e) The Dissected Till Plains differ from the Till Plains because---

(5) Discuss the evidence which causes us to conclude that:
(a) The Superior Upland was once mountainous
(b) The Superior Upland was once completely buried by rocks which are now confined to the Central Lowland.

(6) Explain fully how, why, and along what line the Great Lakes Section is separated from the Till Plains Section.

(7) Where in areas thus far studied (locate as definitely as possible) could you find a good example each of: (a) interlobate moraine, (b) drumlins, (c) uneroded till plain or drift plain, (d) bed of glacial lake in Driftless Area, (e) hogback ridge, (f) lake district in pitted outwash, (g) valley where bluffs come closer together downstream, (h) outlet of glacial lake no longer followed by a stream, (i) granite hills, (j) monadnock on peneplain with no dispute of classification.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Final examination Jan. 15, 1947

Write on 10 questions only. Majors in geology or geography must include not less than two of first three questions. Leave card for grade.

(1) Compare merits of at least two explanations which have been given for the even skyline of coastal New England (New England Upland).

(2) Compare merits of four processes which might explain the Finger Lake type of valleys of New York.

(3) Discuss not less than two explanations for the observed rarity of marginal moraines in eastern United States.(New York and New England).

(4) Tell where you saw and describe nature and topography developed on (a) three bed rock formations and (b) two unconsolidated deposits which were seen on the field trip.

(5) Account for not less than two distinct types of falls which occur in the Driftless Area.

(6) Classify the bed rocks of Superior Upland into three types which affect the topography , describe resulting land forms and locate examples of each.

(7) Locate an example in Coastal Plain of land forms due to: (a) rise of sea level, (b) earthquake, (c) salt intrusion, (d) solution, (e) coral growth, (f) layer of quartzite, (g) wave work, (h) wind work, (i) stream deposition, (j) igneous intrusion.

(8) Account for (a) direction and (b) texture and pattern of drainage in southern part of Blue Ridge Province.

(9) Compare topography of two major divisions of Piedmont Plateau which are based on difference in bed rock.

(10) Compare merits of at least four hypotheses to account for drainage system and drainage pattern of Ridge and Valley Province.

(11) Describe topography, drainage changes and drainage texture of Catskills.

(12) Describe and compare two interpretaions of the summit levels of the Adirondacks.

(13) Describe the major sections of Interior Low Plateau illustrating them by a geological cross section or sections.

(14) Discuss significance of entrenched meanders of two types stating where examples of each may be found in eastern United States.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Dec. 13, 1946

Write on 4 questions in all and no more. Please mark on cover of your bluebook which you wrote on.

(1) Required of all- questions on separate sheet.

Majors in geology and geography must include at least one of next two questions.

(2) Explain 5 possible phenomena which may have caused the present location of the southern Blue Ridge escarpment, comparing merits of each.

(3) Compare two different explanations of the level skyline of both Ridge and Valley and Appalachian Plateau.

(4) Discuss cause of present course of Allegheny and Ohio Rivers.

(5) Complete following statements giving best proof of each (no more than a single sentence of reasonable length counted):
(a) Streams which flow east from the Blue Ridge differ from those which flow west because---
(b) Shale is found on some of the highest parts of the Cumberland Plateau because---
(c) The nose of a pitching anticline is higher than the ridges along the sides because--
(d) The Finger Lakes extend below sea level because----
(e) The Coastal Plain sediments once extended farther inland because--

(6) Locate as definitely as possible an example of each of the following in areas thus far studied: (a) water gap, (b) subsequent stream, (c) antecedent stream, (d) anticlinal mountain or ridge, (e) valley along anticline, (f) zig-zag mountains, (g) recent stream capture, (h) natural bridge, (i) ridge along thrust fault, (j) uplifted barrier beach.

(7) Account for "coarse-textured drainage" giving two examples in areas thus far studied.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Midsemester examination, [illegible] Nov. 18, 1946

Everyone is to write on four questions and NO MORE. Graduates and majors in geology or geography must include at least two of first three questions. Please mark on cover of your bluebook which questions you wrote.

(1) Discuss and compare merits of three different explanations which have been offered to explain the topography of Happy Hill.

(2) Discuss and compare merits of two distinct hypotheses to account for the terraces of the Coastal Plain.

(3) List IN PROPER ORDER the facts observed at Weidman Falls; in parallel column give the interpretation of each fact as it bears on the physiographic history of the region.

(4) Complete following sentences giving proof of each statement (no more than a single sentence of reasonable length counted):
(a) The to pography of the Black Belt must have been made during the Pleistocene because----
(b) The Piedmont Upland is younger than the surface beneath the Coastal Plain sediments because---
(c) The trap ridges of New Jersey have such level summits because--
(d) The "Bays" of the Carolinas have been ascribed to impact of meteorites because--
(e) Yazoo River joins the Mississippi where it does because---

(5) State as definitely as possible where on field trip you saw:
(a) evidence which has been used to prove peneplaination of the nearly horizontal rocks
(b) Sink hole formed in postglacial time (c) original surface of outwash filling in Driftless Area, (d) Cliff due to Franconia sandstone,
(e) Escarpment on St. Peter sandstone, (f) Blowout, (g) Supposed beach of an ancient sea, (h) Water gap, (i) Trempealeau formation,
(j) Military Ridge.

(6) Compare East coast of Florida with shoreline of Louisiana and account for the differences.

(7) Describe not less than three distinct kinds of topography due to differences in the bed rock which are found in Superior Upland.

(8) Describe not less than five (5) different kinds of lakes (include brackish water lakes but not swamps) which occur in Coastal Plain giving as definitely as possible location of examples of each.

to file

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Six weeks exam Oct. 23, 1946

Everyone is to write on four questions and no more. Please mark on cover of bluebook which questions you answered. Majors in geology or geography must include not less than two of first three questions.

(1) List in proper order the major events in physiographic history of the Superior Upland which explain its present topography.

(2) With regard to the Driftless Area: (a) define and distinguish from Driftless Section, (b) comment on the name, (c) describe the major topographic features including their relation to geology, (d) what types of drift occur in the area, (e) explain its origin (non-glaciation).

(3) Discuss relative importance of three different processes which shaped the basins of the lower Great Lakes.

(4) Describe 5 different land forms due to continental glaciation including associated water, which occur in Superior Upland and Central Lowland and locate an example of each.

(5) Complete following sentences (no more counted) as briefly as possible:
(a) The mountains of the Arbuckles were almost wholly destroyed during the Pennsylvanian period because---
(b) The entire Osage Plains were once covered by horizontal sediments because--
(c) Caves are more abundant in western Illinois than in Driftless Area because---
(d) The northwest boundary of the Superior Upland was changed because---
(e) Some of the cuestas of Oklahoma have a gypsum cap because--

(6) Locate in Superior Upland or Central Lowland good examples of each: (a) valley due to recession of waterfall, (b) loess hills, (c) uneroded peneplain, (d) fault escarpment, (e) glacial lake outlet, (f) quartzite monadnock, (g) clay till moraine, (h) drift plain, (i) sand dunes, (j) gravel moraine

(7) What evidences demonstrate that the earth's crust has tilted in the Great Lakes Section since the last glaciation?

(8) With regard to the Till Plains Section describe briefly (limit two pages): (a) definition, (b) why separated from adjacent glaciated district, (c) major features of geology both bed rock and drift, (d) explain major topographic features.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Final Examination Jan. 17, 1946

Everyone is to write on 10 questions. Please mark on cover of your book which questions you answered. Please leave postcard for grade and do not interrupt work of grading by office or phone calls. Majors in geology or geography must include not less than two of first three questions.

(1) Discuss relative merits of at least two different explantions of course of Tennessee River from source to mouth.

(2) Compare relative merits of two distinct explantions of the drift terraces of Connecticut Valley.

(3) Compare at least two explantions of the rarity of recessional moraines in New England and adjacent regions.

(4) Describe the evidence which indicates former high levels of the Great Lakes and other similar lakes in NE U. S.
(5) Describe, account for origin and locate examples of not less than two distinct types of waterfalls and rapids in Driftless Area.
(6) Describe both erosional and depoisitional effects of continental glaciation on topography of Superior Upland including examples of each.
(7) What drainage patterns are found in Piedmont Plateau?; account for each type.
(8) Account for the difference in level of the headwaters of Blue Ridge and Piedmont Plateau streams (southern Blue Ridge area).
(9) Explain the even ridge crests of Ridge and Valley Province by at least two distinct theories.
(10) Explain and describe examples of changes brought about by continental glaciation in topography of Appalachian Plateau both within and outside of ice-covered area.
(11) Locate an example each (be as definite as possible) of (a) local or alpine glaciation, (b) drumlins, (c) ice-contact outwash terrace, (d) stream eroded outwash terrace, (e) trap rock ridge, (f) esker, (g) granite mountains, (h) monadnock, (i) bed of glacial lake, (j) valley caused by limestone.
(12) Draw a cross section east-west through Kentucky showing the geologic cause of the several sections of Interior Low Plateau which it crosses.
(13) (a) Justify a proposed change in west border of Superior Upland.
(b) Explain with cross section the boundary of Superior Upland on south side.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Dec. 17, 1945

Everyone is to write on four questions and no more. Majors in Geology or Geography must include not less than two of the first three questions. Please mark on cover of your bluebook which questions you answered.

(1) List in parallel columns IN PROPER ORDER the FACTS observed at Weidmans Falls and the CONCLUSIONS drawn from these observations which demonstrate steps in physiographic history of the region.

(2) Compare meritsof four distinct hypotheses to account for the water gaps of Ridge and Valley Province.

(3) Explain four distinct processes which have been appealed to in order to account for the Finger Lake type of valleys of Glaciated Allegheny Plateau.

(4) Complete following sentences (no more counted) giving proof of each statement:
(a) Recent stream capture along Blue Ridge Escarpment is shown by--
(b) That drainage has locally been reversed in the Unglaciated Allegheny Plateau is shown by---
(c) Releatively recent uplift of Coastal Plain is shown by--
(d) The upland surface of the Piedmont Plateau is younger than the peneplain which is buried under the Coastal Plain because--
(e) The commonly accepted evidence of complete peneplaination of Ridge and Valley Province is---

(5) Account for the great elevation of and for the drainage pattern of the Catskill Mountains.

(6) Show with diagrams: (a) anticline, (b) syncline, (c) pitching anticlinal mountain, (d) pitching synclinal mountain, (e) monocline, (f) monoclinal mountain, (g) structure which accounts for zig-zag ridge, (h) normal fault, (i) thrust or reverse fault, (j) change in position of ridges due to hard formations as erosion level is lowered.

(7) Locate an example each and explain origin of (a) antecedent river, (b) subsequent valley, (c) obsequent valley, (d) superimposed stream, (e) consequent stream. Confine examples to provinces thus far studied.

(8) Account for (a) greater elevation of the Appalachian Plateau compared to average elevation of Ridge and Valley province,
(b) preservation of areas of weak shale on some of the highest parts of the Plateau.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Midsemester examination Nov. 19, 1945

Everyone is to write on four (4) questions and no more. Majors in Geology and Geography must include at least two (2) of first three questions. Please mark on cover of your book which questions you answered.

(1) Discuss evidences seen on field trip which bear upon the problem of former peneplaination of the younger, nearly horizontal rocks of the Driftless Section.

(2) Describe and locate where examples were seen in field trip of four different kinds of topography due to erosion of Baraboo quartzite.

(3) Discuss alternative explanations of the terraces found in Coastal Plain.

(4) Where on the field trip did you see a good example each of: (a) lake enclosed by sand dunes, (b) sink hole, (c) cuesta capped by dolomite, (d) bed of glacial lake, (e) terrace eroded in outwash, (f) water gap in quartzite, (g) old terrace gravel, (h) terminal moraine, (i) Dresbach sandstone, (j) exposure which proved that a mountain-making earth movement once occured.

(5) Compare shoreline of Embayed Section of Coastal Plain with east coast of Florida considering processes involved.

(6) Comple following sentences (no more counted) giving proof of each statement:
(a) The Superior Upland was once buried under the rocks which now underlie the Central Lowland because---
(b) The terminal moraines of central Illinois are less conspicious than are those of eastern Wisconsin because---
(c) Cuestas are absent in the Carolinas because---
(d) Similarity of Narrows of Narrows Creek to the gorge below Weidman Falls proves---
(e) The Coastal Plain was once higher above sea level than it now is because---

(7) Where in provinces thus far studied could you find a good example each (locate as specifically as possible) of: (a) salt dome, (b) stream divered by natural levee of main river, (c) lake due to earthquake, (d) interlobate moraine, (e) monadnock, (f) "bays", (g) atoll, (h) chalk lowland, (i) lakes in sink hole, (j) escarpment along fault.

(8) Name, describe and locate an example each of five (5) different types of glacial depositional topography found in provinces thus far studied.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Six weeks exam Oct. 26, 1945

Everyone is to write on four questions and no more. Please mark on cover of bluebook the numbers of questions you wrote on. Majors and graduates in geology or geography must include not less than two of the first three questions.

(1) Using diagrams explain the physiographic history of basin of Lake Superior.

(2) Discuss: (a) geologic age of the upland of Arbuckle Mts.
(b) cause of the parallel southeast drainage of Osage Plains

(3) Name and describe five different topographic features found in Till Plains of southern Illinois.

(4) Explain why the gorge below Niagara Falls varies in width.

(5) Where (be as specific as possible) in provinces thus far studied could you find a good example of (a) superimposed stream, (b) loess hills, (c) outlet valley formed by flow from a glacial lake, (d) peneplain underlain by granite and not yet dissected, (e) karst topography, (f) monadnock, (g) escarpment along fault, (h) sand dunes along a lake shore, (i) cuesta due to resistant sandstone, (j) lake in basin surrounded by granite bed rock.

(6) Into what differenet classes (from standpoint of topography) can be bed rocks of Superior Upland be divided? List and tell what kind of topography each forms giving examples.

(7) Complete following sentences (no more counted) giving the proof of each statement:
(a) Portions of the topography controlled by erosion of bed rock survived glaciation of Superior Upland because---
(b) we know that the peneplain of the Superior Upland was once buried by flat-lying sedimentary rocks because---
(c) we know that the drift of southern Iowa is older than the drift of southern Illinois because---
(d) The name "Driftless Area" is a misnomer because---
(e) The large valleys of the Till Plains have flat floors because---

(8) Define, bound, describe geology and topography of <u>either</u> Osage Plains or Dissected Till Plains (no history, limit two pages)

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Final examination January 17, 1945

Write on 10 questions in all and no more; majors in geology and geography must include not less than 2 of the first three questions. Please list on cover of bluebook numbers of questions you wrote on.

Questions for majors, optional for others.

(1) Compare merits of four distinct explanations of water gaps in Ridge and Valley province giving example of any definite cases of each kind when known.

(2) Explain fully 5 distinct hypotheses of origin of Blue Ridge escarpment in the Carolinas.

(3) On separate sheet with instructions -- please fold crosswise and put in bluebook. Disregard part 1; required of all.

Questions for all.

(4) Explain significance of variations in width of the gorge below Niagara Falls.

(5) Account for the presence of rapids and falls in streams of the Driftless Area.

(6) List three distinct classifications of bed rocks in relation to their topographic expression in Superior Upland and state a locality where area is well illustrated.

(7) Locate examples of New England of (a) glacial cirque, (b) drumlin, (c) ice-contact terrace, (d) trap rock ridge, (e) superimposed stream, (f) esker (g) granite mountain, (h) monadnock, (i) valley on limestone, (j) glacial lake bed

(8) Complete following, giving a satisfactory proof of each (single sentence only counted):
   (a) Coarse textured drainage occurs in Catskills because
   (b) Scarcity of moraines in much of eastern U.S. may be explained by
   (c) The level skyline of the Allegheny Plateau may be explained by
   (d) The valleys in which the Finger Lakes lie are older than the last glaciation because
   (e) Some of the rocks of the Blue Ridge province are less resistant to weathering than are others because

(9) Discuss origin of trellis drainage pattern in (a) Ridge and Valley and (b) Adirondack provinces

(10) Discuss origin and significance of entrenched meanders giving at least three examples in eastern U.S. where they are well developed.

(11) Complete following sentences (no more counted) giving a satisfactory proof of each: (a) The former mountains of both Superior Upland and New England were once reduced to a peneplain because
   (b) The Schooley peneplain is indicated in the Ridge and Valley province by
   (c) The Highland Rim is interpreted as a dissected peneplain because
   (d) Glacial control of sea level has been inferred from data in Coastal Plain because
   (e) The Cumberland Plateau is not part of the same erosion surface which is present beneath the Coastal Plain because

(12) Account for Crowleys Ridge and nearby drainage changes.

(13) Discuss evidences which indicate former presence of local glaciers in eastern U.S. giving at least two localities where such is found.

(14) Explain with diagrams the topographic expression of hard layers in (a) plunging anticline, (b) plunging syncline, (c) anticlinal mountain, (d) monoclinal ridge, (e) synclinal mountain

(15) Amount for rivers of the Yazoo type giving at least one other example in eastern U.S.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Dec. 15, 1944

4 questions

All must write on first question. Majors in geology and geography must include at least one of next two questions. Please mark on cover of bluebook which questions you wrote.

(1) Required of all. Questions on separate sheet. Please put your name on it and fold cross wise before placing in bluebook.

(2) List and discuss various explanations of three types of topography found in Glaciated Allegh eny Plateau

(3) Discuss and compare merits of two explations of the even mountain crests of the Ridge and Valley Province.

(4) Complete following sentences giving best proof of each. No more than a single sentence considered.
(a) The Blue Ridge escarpment of the Carolinas demands a special explanation because---(do not give the several theories)
(b) The Alleghany Plateau is believed by most students to have been once eroded to a peneplain because---
(c) The high elevation of the Catskills is due to--
(d) A halt in uplift of the Ridge and Valley Province is concluded from--
(e) It is difficult to apply the hypothesis of stream capture to the course of Tennessee River through Waldon Ridge because--

(5) Locate as definitely as possible a good example each of the following taken from provinces thus far studied: (a) anticlinal mountain, (b) uplifted barrier beach, (c) escarpment due to limestone, (d) diversion of stream across a divide due to terminal moraine, (e) antecedent stream, (f) subsequent stream, (g) recent stream capture, (h) mountain due to thrust fault, (i) strath, (j) entrenched meanders

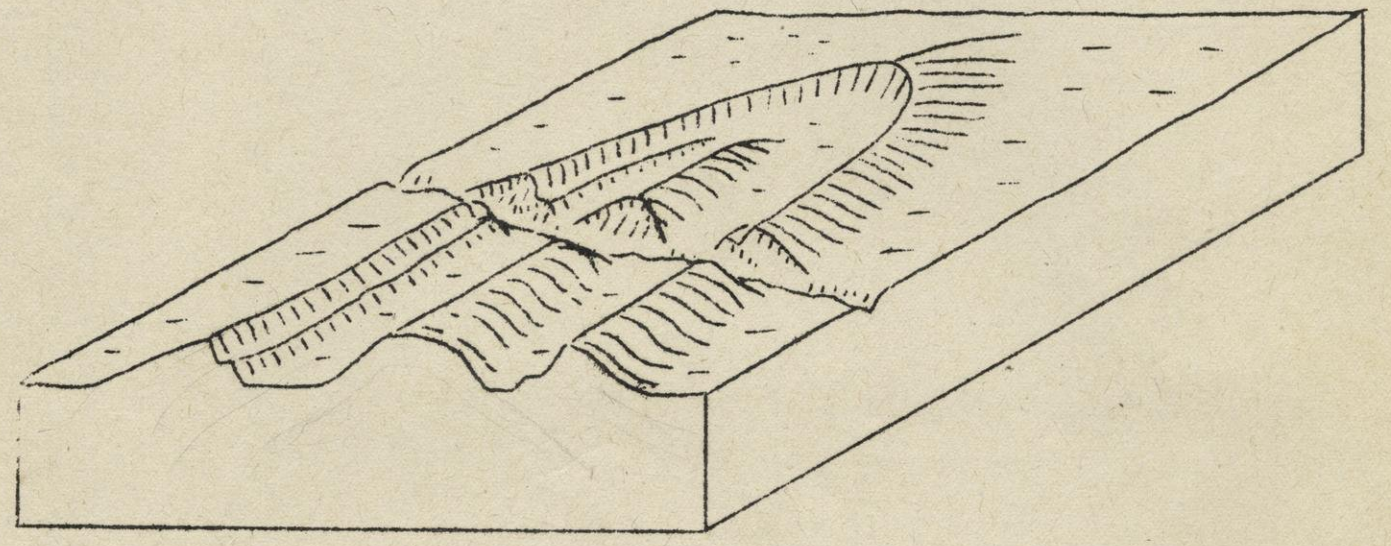
(6) Compare merits to two explantions of water gaps in Ridge and Valley Prov.

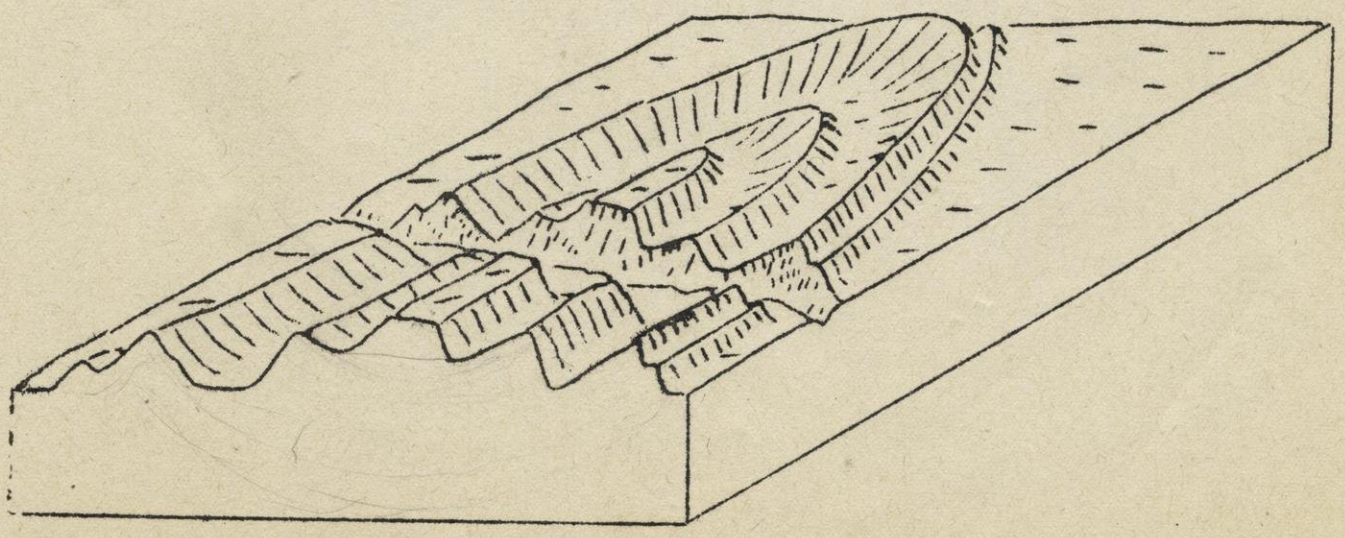
(7) What is texture of drainage and account for variation in it.

(8) Explain with diagram cross sections or sketches: (a) anticlinal ridge, (b) synclinal ridge, (c) monoclinal ridge, (d) zig-zag ridge, (e) two-story valley.

Dec 15, 44

(;) Required of all PLEASE WRITE YOUR NAME FIRST.
Kindly fold across before placing in bluebook.
show NEATLY on ends of blocks and sides where needed the STRUCTURE which gave rise to the topography shown. Also indicate what the resistant layers probably are and where you would find examples of these features.





GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Oct. 27, 1944

No one is to write on more than four questions. Majors in Geology or Geography are to include at least two of first three questions. Others may choose any four questions. Please mark on outside of book which questions you wrote on.

Questions for majors-optional with others.

(1) List in proper order the major events in history of Superior Upland including the basin of Lake Superior

(2) Explain two reasons for the difference in original form of glacial deposits of Great Lakes Section and Superior Upland compared with those of Till Plains section.

(3) Discuss three processes which caused the basins of the Lower Great Lakes including evidence for each and the relation of the basins to rock geology

Questions for others- optional to extent of two with majors

(4) List and describe briefly 5 different land forms due to glaciation which are found in Central Lowland or Superior Upland

(5) For the Driftless Section of Central Lowland (a) define, (b) state dominant land form, (c) name at least two different kinds of drift found in it, (d) distinguish from Driftless Area, (e) explain briefly why part was <u>not</u> glaciated.

(6) Complete following sentences giving best proof of each (no more than a single sentence will be counted):

(a) The mountains of the Superior Upland were eroded before Cambrian time because---

(b) It was decided to change the northwestern boundary of Superior Upland from Fenneman's tentative location because---

(c) The Central Lowland was glaciated at widely different times because ----(toppgraphic evidence only).

(d) Tilted lava flows form hogbacks because---

(e) The level of Lake Superior has risen near Superior and Duluth because---(evidence not explanation of cause)

(7) Where in either Central Lowland or Superior Upland could you find a good example (locate as definitely as possible) of: (a) hogback, (b) cuesta (c) uneroded peneplain (d) escarpment along a fault (e) eroded drift or till plain (f) interlobate moraine, (g) pitted outwash plain, (h) drumlin (i) glacial lake plain (j) monadnock

(8) (a) what kinds or rocks cap cusetas of Osage Section?
(b) Name one of the most prominent cuestas of that Section.
(c) Why are cuestas so prominent there?
(d) Explain what is included in term "Soft rocks", "Hard rocks".
(e) What is meant by term "peneplain."

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Exa mination Nov. 20, 1944.

Majors in geology or geography must include not less than two of first three questions which are optional with others. Everyone is to write on four questions in all. Please mark on cover of your bluebook which questions you wrote on.

(1) Describe and discuss not less than two theories of origin of the Carolina Bays

(2) Compare physiographic histories of Superior Upland and Piedmont Plateau using diagram sections to illustrate the second.

(3) Discuss two of the following: (a) age of erosion of topography of higher Coastal Plain, (b) relation of the peneplain beneath the Coastal Plain to surface of Piedmont, (c),(d) two theories of the cause of the terraces in Coastal Plain, (e) surface indications and underground make up of salt domes

(4) Complete following sentences giving proof of each statement (no more counted)
(a) The Piedmont Plateau wqs once a mountain region because--
(b) The Superior Upland was once wholly buried by flat-lying sedimentary rocks because--
(c) The trap ridges of the Low Piedmont have level crests because--
(d) Lakes abound in Florida because--
(e) Southern Iowa is more disssected than south-central Illinois because--

(5) List five different types of lakes (fresh-water) which may be found in any province thus far studied (natural lakes only). Explain origin of each type.

(6) Locate as definitely as possible a good example in provinces thus far studied of (a) loess hills (b) cuesta capped by gravel, (c) sand dunes (d) lowland on chalk, (e) glacial lake bed with no surviving lake, (f) non-pitted outwash plain, (g) monadnock in Piedmont, (h) wind gap, (i) terminal moraine, (j) earthquake lake

(7) Compare origin and form of (a) Florida East Coast with (b) shoreline of Louisiana

(8) (a) describe what part in detail of Coastal Plain was glaciated
(b) What was effect on topography compared to region to south.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Dec. 31, 1943

Write on four questions

(1) With regard to the Driftless Section explain:
- (a) term "Driftless Area"
- (b) major relief features in relation to geology
- (c) cause of failure of glaciers to reach all of the section
- (d) kinds of drift fround in the Section
- (e) evidence commonly used to demonstrate penplaination

(2) Complete following sentences giving proof of each statement:
- (a) The mountains of the Superior Upland were destroyed before Cambrian time because....
- (b) We suggested a change in location of northwest boundary of Superior Upland because....
- (c) The entire Superior Upland was once buried by sedimentary rocks because....
- (d) Rectangular (trellis) drainage of southeastern Adirondacks is explaind by....
- (e) karst topography is better developed in Kentucky than in Wisconsin because....

(3) Outline the physiographic history of the basin of Lake Superior

(4) Describe briefly the boundaries, geology and topography of EITHER Shawnee Hills or Highland Rim

(5) Describe five different topographic forms (land forms) due to glaciation which are important in both Superior Upland and Great Lakes Section

(6) Discuss reason for separating Great Lakes and Till Plains Sections contrasting their land forms as well as age of drift; account for the differences

Final from recent sheets
have no record

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Nov. 26, 1943

Write on four questions

(1) Complete following sentences giving proof of each statement:
(a) Valley glaciers once existed in New England because.....
(b) The soils of New England contain much stone because.....
(c) The highest ridges of the Ridge and Valley province are..... because
(d) Entrenched meanders are common just above water gaps because....
(e) Level ridge crests in Ridge and Valley province are commonly regarded as..

(2) Discuss theories which have been advanced to explain the Finger Lake valleys

(3) Discuss points for and against four theories of origin of water gaps in Ridge and Valley province

(4) Describe briefly the boundaries, geology and major topographic features of EITHER Cumberland Plateau OR Catskill Mountains

(5) Discuss effects of continental glaciation on drainage of unglaciated part of Appalachian Plateau

(6) Discuss two ideas of way in which continental glacier disappeared in Appalachian Plateau and New England

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Six weeks examination Oct. 25, 1943

Write on four questions only

(1) Answer each of following in a SINGLE SENTENCE giving proof:
(a) Streams flowing down east side of south part of Blue Ridge Province are capturing territory which formerly drained to northwest because----
(b) Distant level skyline is in many places a poor criterion of former peneplaination because---
(c) Cuestas occur in Coastal Plain from Texas to Georgia and not in region of the Carolinas because--
(d) The Pied mont upland surface is not of the same age as the surface of the same rocks which is buried by the Coastal Plain sediments
(e) The sediments of the Coastal Plain once extended farther inland than they do now because----

(2) Where and what are (tabulate and list origin where known; give locality as to Province and section
(a) Carolina Bays (b) Trenton Prong (c) Trail Ridge (d) Long Island
(e) Marquesas islands (f) Reelfoot Lake (g) Yazoo River (h) Fall Line
(i) Crowleys Ridge (j) Five Islands

(3) List and explain briefly the origin of five different types of lakes and/or swamps which are found in Coastal Plain

(4) Contrast form of shore line of Florida east coast and north Gulf coast and account for the difference

(5) Discuss points for and against five different hypotheses of origin of southeastern escarpment of the Blue Ridge

(6) Explain glacial control theory of coastal terraces.

file

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Final examination Jan. 18, 1943

No one is to write on more than or less than 10 questions Majors must include at least two of first three questions-optional with others. Please leave post card for grade and kindly avoid office calls in regard to grades. Please mark on cover of your blue book which questions you left out.

(1) Arrange in parallel columns the FACTS and their INTERPRETATIONS in proper order to show physiographic history as observed at Weidman Falls
(2) Discuss relative importance of three different processes which cooperated to make the basins of the Great Lakes
(3) List and discuss origin and age of four different types of topography found on Baraboo quartzite
(4) Compare four different explanations of water gaps in Ridge and Valley Province
(5) What is cause of rapids and falls in streams of the Driftless Section (others than Weidmans falls must be included)
(6) Account for land forms displayed in Interior Low Plateau which are caused by solution of limestone comparing with those due to streams
(7) List five land forms displayed in Appalachian Plateau which are due to stream erosion and weathering of bed rock
(8) List three major divisions of bed rocks of Superior Upland stating characteristic topography of each which is due to bed rock.
(9) Define and describe briefly geology and topography of EITHER Floridian Section OR Embayed Section of Coastal Plain
(10) Define and describe briefly geology and topography of EITHER Catskills OR Cumberland Plateau
(11) List five land forms displayed in New England which are due to glaciation

(12) Account for drainage pattern of southeastern ADIRONDACKS

(13) Account for course or location of (a) Black River, N. Y. (b) Yazoo River (c) Ohio River (d) Crowleys Ridge (e) West end of Lake Superior (not a duplication of (2) but location only)
(14) Account for the entrenched meanders of Interior Low Plateau giving their significance in physiographic history

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GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Dec. 11, 1942

Write on four questions only and please mark which you left out.

(1) List evidences which have been used to demonstrate that the Ridge and Valley and Appalachian Plateau provinces have been completely peneplained and comment on validity of each.

(2) Discuss the Finger Lake problem giving the several hypotheses proposed.

(3) Show with diagrams how topography may be used to determine structure of folded sedimentary rocks (anticlines and synclines).

(4) Describe briefly the boundaries, geology, and topography of EITHER Mohawk Valley or unglaciated Allegheny Plateau

EITHER

(5) Discuss formation of Allegheny River OR New River

(6) Complete following sentences (no more counted) giving proof of statement:
(a) The streams which flow down the southeast sdie of the Blue Ridge are encroaching on those which flow to northwest because---
(b) The entrenched meanders of this river end at the watergap because--
(c) The zig-zag ridge due to the resistant layer is highest at the bend because---
(d) Water gaps fail to show evidence of partial peneplaination of the Ridge and Valley province because---
(e) Stream capture alone could not explain the course of Tennessee River through Walden Ridge because---

to file

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Nov. 16, 1942

Write on four questions only and please mark on cover of book which you left out

(1) Complete each of following sentences giving best proof of statement (no more counted):
(a) The Piedmont was once a mountain range because---
(b) The Coastal Plain once extened farther from the Atlantic Ocean because---
(c) Cuesta occur in the Coastal Plain from Texas to Georgia and not in the Carolinas because----
(d) The present Piedmont upland is not the same as the buried surface of the "hard rocks" under the Coastal Plain because---
(e) The Coastal Plain once stood higher above sea level because----

(2) Explain origin and locate as definitely as possible one example each of five different types of lakes and/or swamps in Coastal Plain

(3) Discuss origin of the Carolina Bays

(4) Account for the differences in form of (a) east coast of Florida and (b) coast of Gulf of Mexico in United States

(5) Discuss two possible modes of origin of the terraces found in Coastal Plain and give ways of discriminating each.

(6) Locate as definitely as possible in Coastal Plain or Piedmont a good example of each:
(a) trap ridge
(b) terminal moraine
(c) bed of lake enclosed by continental glacier
(d) uplifted barrier beach
(e) distributary stream
(f) salt dome
(g) monadnock
(h) falls due to stream capture
(i) drowned inner lowland
(j) trellis drainage

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GEOLOGY 130

PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Oct. 23, 1942

Write on four questions only Time called at 2:25

(1) (a) Explain difference between constructional and destructional land forms
(b) Locate definitely a good example of each in either ~~Interior~~ Central Lowland or Superior Upland

(2) Complete following sentences (no more counted) giving proof of each statement:
(a) (b) The terminal moraines of the Till Plains are less conspicuous than thoseof the Great Lakes Section because---(two reasons)---
(c) The mountains of the Superior Upland were almost all destroyed before ----- time because----
(d) We changed the northwestern boundary of the Superior Upland because---
(e) The Superior Upland was once buried under the bed rocks now found in Central Lowland because---

(3) Locate as definitely as possible in either Central Lowland or Superior Upland a good example each of: (a) drift plain (b) lake district in pitted outwash (c) hogback (d) monadnock (e) bed of glacial lake

(4) With regard to the Driftless Section explain (a) difference from Driftless Area with better name for latter (b) major relief features (c) cause of Driftless Area (d) three types of drift within Driftless Section (e) presence of some pre-Cambrian bed rock in Driftless Section

(5) Outline events which led to formation of Lake Superior

(6) State evidences of postglacial earth movement in Great Lakes Section including its effect on present shorelines.

GEOLOGY 130

PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Dec. 19, 1941

Write on four questions only; graduates and majors must include one or more of questions 2 and 3; question 1 is required of all. Please mark ones left out.

(1) On separate sheet; required of all

(2) List points for and against four explnations of water gaps in Ridge and Valley

(3) List points for and against five theories of location and form of Blue Ridge escarpment on southeast

(4) Complete following sentences giving proof of each statement: (a) The great depth of the Finger Lakes may be explained by---because-- (b) Tughill Plateau is separated from the plateau to the south because--- (c) Portions of the Allegheny and Ohio valleys narrow downstream because---(d) We can be certain that the Ridge and Valley province was peneplained once because-- (e) The Blue Ridge province is higher than the Ridge and Valley because--

(5) In Blue Ridge, Ridge and Valley and Appalachian Plateau locate as definitely as possible good examples of (a) water gap (b) antecedent stream (c) recent stream capture (d) subsequent stream (e) quartzite ridge (f) anticlinal mountain (g) synclinal mountain (h) anticlinal valley (i) bed of glacial lake (j) wind gap

(6) Describe boundaries, geology and topography of EITHER (a) Cumberland Plateau of (b) Unglaciated Allegheny Plateau

(7) Give points for and against two explanations of the even ridge crests of Ridge and Valley province.

Geology 130 - Physiography of Eastern United States

Midsemester examination — Nov. 24, 1941

Write on four questions and no more. Please mark those written on. Majors and graduates must include at least one of the first two questions.

1. Discuss origin and age of basin of Lake Superior including more than one view.
2. Discuss the possible origins and ages of peneplain on Happy Hill.
3. List in parallel columns in proper order the FACTS and CONCLUSIONS derived from each which demonstrate physiographic history of vicinity of Lower Narrows School.
4. Complete the following sentences (no more counted) giving proof of each statement --
   (a) The Superior Upland was once mountainous because
   (b)-(c) The entire Superior Upland was buried under undisturbed sedimentary rocks because (Two reasons)
   (d) The tilted lava flows of the Superior Upland have 6 6 6 drainage because
   (e) Drainage controlled by rock structure has survived in parts of the Superior Upland because
5. Complete following table in blue book:

Name	Seen on field trip	Origin
(a) Sink hole	(c) Sand dune lake	(e) Beach of Cambrian sea
(b) Water gap	(d) Dresbach sandstone	

6. Locate definitely in Coastal Plain or Piedmont good example of each and explain origin: Complete as a table in book.

Name	Location	Origin
(a) Cuesta due to sandstone	(c) Monadnock	(e) Salt dome
(b) Karst topography	(d) Trap ridge	

7. Explain the fact that the valley between the bluffs of Wisconsin River narrows downstream.

GEOLOGY 130

PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Oct. 22, 1941

Everyone is to write on four questions and no more. Graduates and majors in geology and geography must include at least one of first two questions.

(1) With reference to the lower Great Lakes explain (a) relation to preglacial cuesta, (b) three processes which gave them the present form.

(2) Explain the significance of the form of the Niagara cuesta of eastern Wisconsin on physiographic history

(3) Complete following sentences giving evidence to prove each statement (no more than one sentence counted): (a) The flat bottom of the valley of Wisconsin River in the Driftless Area is due to---- (b) The Dissected Till Plains are separated from the Till Plains because----- (c) The west border of the Driftless Area is unlike the east border because-----(d) North-central Minnesota is more like northern Wisconsin than southern Minnesota because----- (e) The flat bottom of the Red River Valley of Minnesota-North Dakota is due to -----.

(4) Define (a) peneplain, (b) cuesta, (c) terminal (end) moraine, (d) till plain, (e) pitted outwash and GIVE a good example of each in Central Lowland locating each as definitely as possible

(5) Where in Central Lowland could you find a good example of (a) clay till moraine, (b) sand dunes, (c) gypsum cuesta, (d) loess-mantled erosion topography, (e) outlet of glacial lake

(6) Summarize in not over three pages the definition,borders, geology, and topography of EITHER Till Plains or Western Young Drift Section

(7) Account for variations in width of gorge below Niagara Falls.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Final examination January 26, 1942

Write on 10 questions only.

Majors must include at least one of first three questions.

Please leave post card for grades (no telephone or office calls, please).

-- --

1. Compare three possible explanations of the scarcity of marginal moraines in New England.

2. Compare three different interpretations of the Uplands on the soft rocks of the Driftless Area citing facts seen in the field.

3. Discuss two interpretations of drift terraces of Connecticut Valley.

4. (a) Explain why the ridges between stream valleys are so much wider on the Baraboo quartzite than on adjacent sandstone. (b) Locate another example of this phenomenon.

5. Account for the fact that despite a mature topography there are rapids and falls in the Driftless Area (more than one origin).

6. What evidences demonstrate extensive glacial erosion of bed rock in Great Lakes Section?

7. Classify bed rocks of Superior Upland into divisions, each of which has a characteristic drainage pattern and different type of topography.

8. What effect did glaciation have upon topography of Interior Low Plateau.

9. List, account for, and locate, if possible, example each in Coastal Plain of lakes due to five different processes.

10. Compare the problem of finding records of old erosion cycles in (a) Ridge and Valley, and (b) Appalachian Plateau.

11. Account for stony soils of New England and northern Wisconsin.

12. Discuss glacial history of Adirondacks, citing evidence.

13. Describe geology, topography, and history of either Blue Grass or Shawnee Hills.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Final examination Feb. 4, 1941

NO ONE is to write on more than TEN (10) questions
GRADUATES and MAJORS must include at least two (2) of first three (3) questions
Please leave postcard or stamped envelope for grades (no telephone or office calls, PLEASE) Blind students may omit diagrams and references to field trip.
Please mark on outside of book the questions you wrote

(1) (a) Describe, (b) account for, and (c) give location of one example seen on field trip of four (4) different types of topography found on Baraboo quartzite

(2) Explain three (3) hypotheses of origin of basins of Great Lakes giving points for and against each.

(3) Discuss briefly the problem of submarine canyons and river channels of Atlantic coast.

(4) (a) describe, (b) account for and (c) locate an example seen on field trip of two differnet kinds of drift found in Driftless Area.

(5) (a) give proofs of changes in levels of the Great Lakes since their formation (b) give evidence that change has not been same in amount at all points.

(6) (a) describe with diagram if possible, (b) account for and (c) locate an example of each of five (5) different land forms which occur in Great Lakes Section of Central Lowland (choose an example seen on field trip wherever possible)

(7) (a) What phenomena indicate relatively recent drainage changes along Blue Ridge escarpment?
(b) Where else in Eastern United States is same process going on?

(8) Discuss the significane of even ridge crests on physiograhic history of Ridge and Valley province.

(9) Explain (with diagrams if desired) the relations of the Appalachian Pleateau to bed rock character and structure (do not forget to include all sections).

(10) Contrast the shore line forms of (a) east coast of Florida and (b) delta of Mississippi River

(11) Locate in New England one good example each of (a) alpine glaciation, (b) ice-contract terrace, (c) trap rock ridge, (d) drumlin, (e) esker

(12) (a) Explain and compare two different hypotheses of the mode of ice retreat In New England
(b) What field evidence causes this problem?

(13) (a) Describe the topographic cylce in an area od pure limestone
(bO describe resulting topography and compare with that produced in other kinds of rock

(14) Account for the course of Yazoo River, Mississippi

GEOLOGY 130

PHYSIOGRAPHY OF EASTERN UNITED STATES

Makeup examination Jan. 25, 1941

Write on four questions including the first

(1) Block diagram

(2) Finish sentences:
(a) The great depth of the Finger Lakes may be accounted for by
(b) Positive proof of peneplaination of the Ridge and Valley Province is found
(c) A possible survivor of the original drainage in Ridge and Valley Province is River
(d) The high elevation of Chesnut Ridge, Pa. is due to
(e) The even skyline of the Appalachian Plateau may be due to

(3) Where is and what is origin of:
(a) Cumberland Gap (b) Teays Valley (c) Allegheny Front
(d) Mohawk Valley (e) Tughill Plateau

(4) State four hypotheseis of origin of water gaps in Ridge and Valley and discuss points for and against ONE of them

(5) Describe the ridges of Ridge and Valley including origin

GEOLOGY 130

PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Dec. 18, 1940

No one is to write on more than four questions in all. PLEASE mark on cover of bluebook which questions you wrote on.
Graduates and majors must include one or both of first two questions.

(1) Discuss the validity of evidence of regional peneplaination in Ridge and Valley and Appalachian Plateau provinces.

(2) Disucss the effects of glaciation in Appalachian Plateau including both area covered by ice and that outside.

(3) Complete following sentences in bluebook giving proof:
(a) The east-flowing streams of the Blue Ridge differ from the west-flowing streams (state how and why)
(b) The zig-zag ridge due to the resistant layer is highest at the bend because------
(c) Shale occurs in the middle of the Cumberland Plateau because------
(d) Entrenched meanders occur above the water gap because-----
(e) The resistant formations of the Ridge and Valley province are---- because-----

(4) Show with diagrams: (a) anticlinal ridge, (b) synclinal ridge, (c) monoclinal ridge, (d) relation of ridge tops in Ridge and Valley province to Fall Zone peneplain, (e) example of change in arrangement of formations with depth of erosion(change in structure)

(5) Describe briefly the boundaries, geology, and topography of EITHER (a) Catskill Mountains or (b) Allegheny Mountains

(6) Where is and what is origin of: (a) Pine Ridge, (b) Allegheny Front, (c) Natural Bridge, Va., (d) Lookout Mountain, (e) Sequatchie Valley

(7) Discuss the problem of the course of Tennessee River in Blue Ridge, Ridge and Valley, and Appalachian Plateau provinces.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Nov. 22, 1940

NO ONE is to write on more than four questions. Please mark on cover of your bluebook which questions you wrote on.
Graduates and majors must include one or both of first two questions.

(1) Discuss the Pleistocene Terrace Problem of Atlantic Coastal Plain

(2) Disucss evidence for and against existence of one or more dissected peneplains in Driftless Section

(3) Complete following sentences giving proofs:
(a) The Piedmont was once mountainous because-----
(b) Happy Hill was once overlain by dolomite because---
(c) The water level is rising in St. Louis Bay (Superior-Duluth) because-
(d) Blue Mound has been uplifted about --- feet because---
(e) Presence of rolling uplands right up to tops of escarpments along Lake Superior Basin shows-----

(4) Complete following table in bluebook:

	Name	Example	Origin
(a)	Cuesta overlain by gravel		
(b)	water gap in quartzite ridge		
(c)	lake in floodplain		
(d)	lake in sinkhole		
(e)	chalk lowland		

(5) List in two columnas IN PROPER ORDER the FACTS observed and the CONCLUSIONS derived from them which demonstrate physiographic history of Weidman Falls and vicinity.

(6) (a) What evidence shows that the Piedmont was a peneplain
(b) that peneplaination of present surface took place after formation of hard rock surface under Coastal Plain
(c) Compare with similar evidence in Superior Upland

(7) Describe and locate examples of five different land forms found in Superior Upland

(8) Tabulate in bluebook:

	Name	Location	Origin
(a)	Watchung Mountain		
(b)	Lake Ponchartrain		
(c)	Trail Ridge		
(d)	Parrs Ridge		
(e)	Keweenaw Point		

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Oct. 23, 1940

NO ONE IS TO WRITE ON MORE THAN FOUR QUESTIONS. Required questions for majors and graduates below. Please park all books and notes on desk (U. W. rule) Time will be called at 2:25 No overtime allowed.

(1) Define: (a) vale, (b) cuesta, (c) hogback, (d) superimposed stream, (e) drumlin and give as definitely as possible an example of each in Central Lowland

(2) With reference to the Great Lakes section (a) describe the boundaries, (b) explain what controls the major topographic features, and (c) account for its separation from adjacent(province)sections. of Central Lowland.

(3) Complete following sentences (no more counted) giving proofs:
(a) There are glacial lake clays in the Driftless Section because-----
(b) (c) The terminal moraines of the Western Young Drift section are more conspicious than those in the Till Plains section because---(give two reasons)----
(d) We changed the boundary between the Western Young Drift section and the adjacent province because-------
(e) The Dissected Drift Plains section is separated from the Western Young Drift section because-----

(4) Where in Central Lowland (be as specific as possible) could youn find a good example of (a) eroded till plain, (b) pitted outwash, (c) basin due to glacial excavation, (d) interlobate moraine, (e) glaciated karst topography.

(5) Explain causes of the Driftless section and the Driftless Area.

ONE OF THE FOLLOWING REQUIRED OF MAJORS AND GRADUATES; optional with others.

(6) Explain (a) causes of the cuestas of the Driftless section, (b) three hypotheses of origin of the uplands (do not dicuss merits).

(7) Describe, geology, topography, and physiographic history of Arbuckle Mountains (limit 3 pages).

REMEMBER NO OVERTIME CAN BE ALLOWED

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Final Examination January 29, 1940

Write on ten (10) questions only. Please mark on cover of blue book which you left out. Please leave a card for grades (no telephone requests, please). Graduates and majors must write on at least two of first three questions.

1. Discuss evidences for and against the presence of remnants of many partial peneplainations in Ridge and Valley and New England provinces.

2. Discuss four explanations of the youthful glaciated valleys of Appalachian Plateaus.

3. Explain theories of origin of limestone caverns including their topographic effects throughout the erosion cycle.

4. Account for nonglaction of part of Driftless Section; explain why some glaciated territory is included in this section.

5. Describe and account for rapids and falls in Driftless Section.

6. Outline with diagrams the physiographic history of Superior Upland.

7. List and account for five different types of lakes and swamps found in Coastal Plain.

8. In Appalachian Plateau, locate examples of topography due to (a) glacial deposition, (b) stream capture, (c) anticlinal fold, (d) anticlinal valley, (e) ridge due to thrust fault.

9. Account for the stony soil of New England citing other instances of same phenomenon.

10. What indicates the former presence of local glaciers in New England? Where else are the same phenomena found in eastern U. S.?

11. What significance may be attached to the absence of recessional moraines in New England? (two explanations).

12. Account for drainage pattern of southeastern Adirondacks.

13. Which did you see on field trip (a) sink hole, (b) sand dune lake, (c) terminal moraine, (d) dolomite upland, (e) peneplain on quartzite, (f) outwash plain, (g) water gap, (h) superimposed stream, (i) entrenched meander, (j) shore of Cambrian Sea? (Do not explain origin but locate as definitely as possible).

GEOLOGY 130

PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Dec. 13, 1939

No one is to write on more than four questions in all.
Question (1) is required of all.
Graduates and majors are to write on two or more of questions (2), (3), (4)
PLEASE MARK on cover of bluebook which questions you wrote

(1) On separate sheet

(2) List four possible explanations of water gaps in northern Ridge and Valley Province; illustrate each with diagram; list briefly points for and against each.

(3) List five possible explanations of location and form of Blue Ridge escarpment; illustrate each with diagram; list briefly points for and against each.

(4) List briefly four criteria commonly used to demonstrate former peneplaination of an area at more than one time. Discuss validity of each considering both regions of nearly horizontal rocks and regions of folded rocks.

(5) Explain effects of continental glaciation on drainage features of Appalachian Plateau both inside and outside the glaciated district.

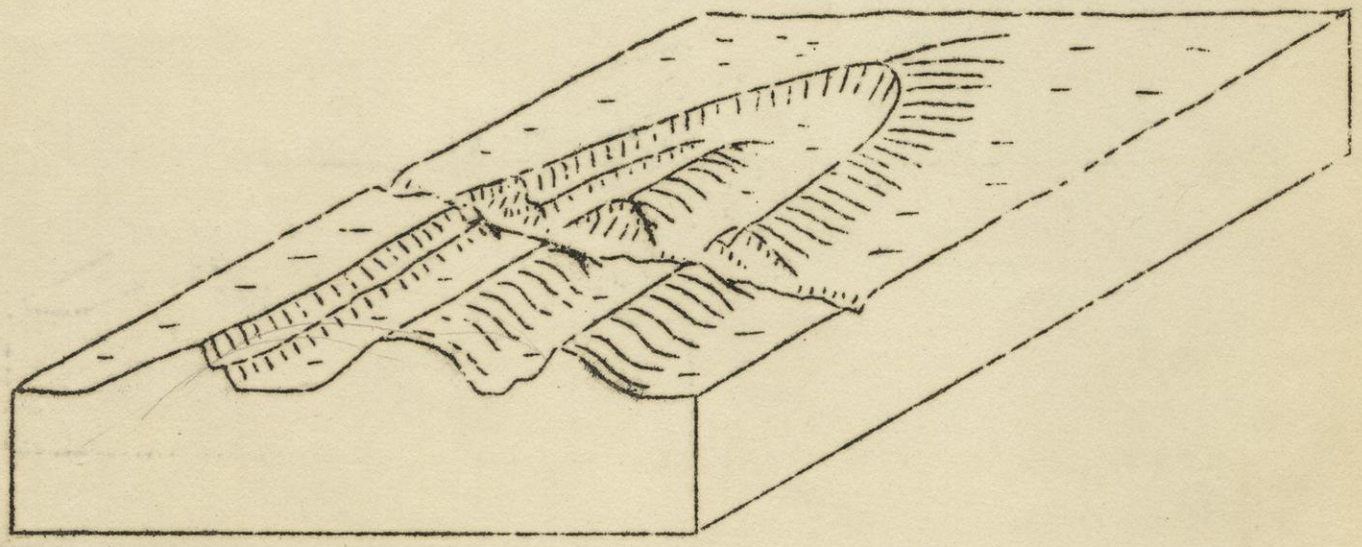
(6) Complete following sentences giving best proof:
(a) The average elevation of the Ridge and Valley Province is less than that of the Appalachian Plateau because....
(b) The great depth of the Finger Lakes may be accounted for by...
(c) The location of the Mohawk Valley was determined by.....
(d) Shale is preserved on top of the Cumberland Plateau because....
(e) Positive evidence of peneplaination of the Ridge and Valley Province is afforded by the fact that.....

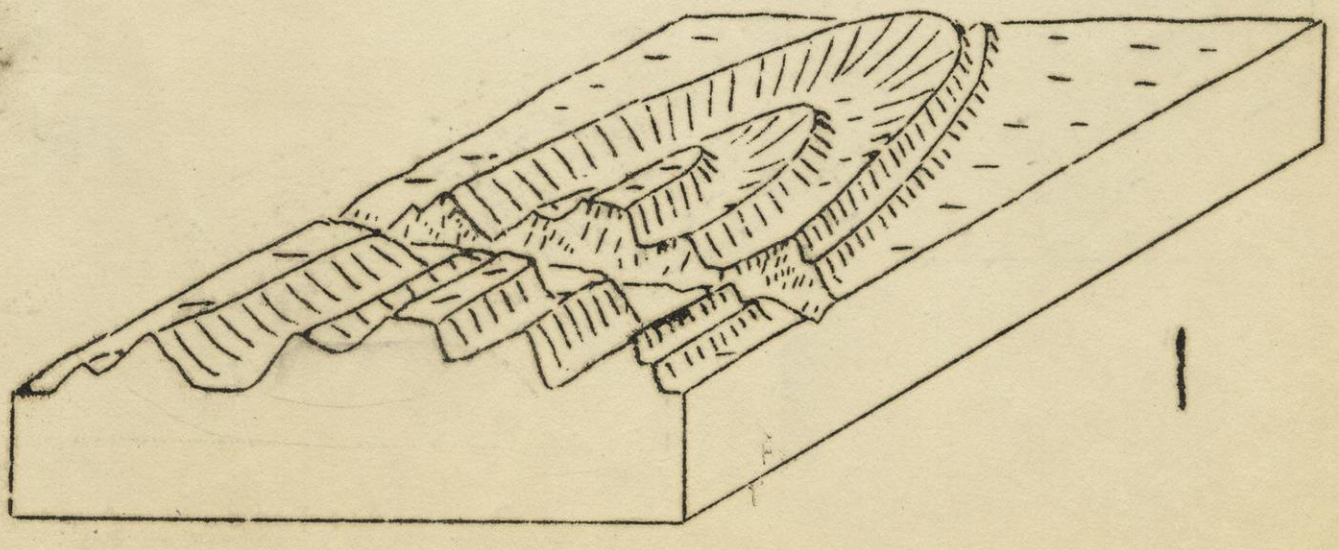
(7) Locate as definitely as possible in Blue Ridge, Ridge and Valley or Appalachian Plateau Provinces examples of: (a) water gap, (b) subsequent stream (c) antecedant stream (d) entrenched meanders, (e) anticlinal mountain.

(8) Contrast two basic ideas as to manner of retreat of the continental glacier in Hudson Valley.

A 11 B 7 C 6 D 3 E, F 3

(;) Required of all PLEASE WRITE YOUR NAME FIRST.
Kindly fold across before placing in bluebook.
show NEATLY on ends of blocks and sides where needed the STRUCTURE which gave rise to the topography shown. Also indicate what the resistant layers probably are and where you would find examples of these features.





GEOLOGY 130

PHYSIOGRAPHY OF EASTERN UNITED STZTES

Midsemester Examination Nov. 17, 1939

No one is to write on more than FOUR questions in all. PLEASE MARK on cover of your blue book which questions you wrote.

Graduates and majors in geology or geography must write on one of the first two questions or on both. These questions optional with others.

(1) Discuss at least two theories of the origin of the Carolina "Bays".

(2) Describe and account for four different types of topography on the Paraboo quartzite and tell as closely as possible where examples of each were seen in the field.

(3) List in two parallel columns in proper order the FACTS and the CONCLUSIONS from each as to the physiographic history of the region at Ableman.

(4) Complete following sentences(no more counted) giving proofs of statements:
(a) The Superior Upland was once mountainous because...
(b) The Piedmont was once a peneplain because....
(c) The Piedmont was peneplained after the deposition of the earlier sediments of the Coastal Plain because...
(d) The level of Lake Superior is rising at Duluth because...
(e) The ridges due to tilted layers of Triassic trap have level tops because.

(5) Compare and account for differences in shape of the coast line (a) on east coast of Florida and (b) Mississippi delta.

(6) Complete following table: (write in bluebook)

Name	Example	Origin
(a) Cuesta capped by dolomite		
(b) Water gap in trap ridge		
(c) Marine terrace		
(d) lake in hard rock basin		
(e) lake in sink hole		

(7) Describe and account for not less than FOUR different types of topography found in Superior Upland.

GEOLOGY 130

PHYSIOGRAPHY OF EASTERN UNITED STATES

Examination Oct. 18, 1939

NO ONE IS TO WRITE ON MORE THAN FOUR QUESTIONS IN ALL. Required questions for majors and graduates at end.

(1) (a) Distinguish between "constructional" and "destructional" land forms
(b) Give as definitely as possible one example of each in Central Lowland

(2) With reference to the "Driftless Section" (a) describe the boundaries, (b) account for three different kinds of drift within it, (c) explain what controls the major topographic features

(3) Complete following sentences (no more counted) giving evidence:
(a) There are more and larger sand dunes on the east shore of Lake Michigan than on the west shore because-----
(b) (c) The moraines of the Till Plains Section are less conspicious than those of the Great Lakes Section because---(two reasons)---
(d) We changed the northeastern boundary of the Western Young Drift Section from that given in the text because------
(e) The Dissected Till Plains Section is separated from the Till Plains Section because-----.

(4) Where in Central Lowland could you find(be as specific as possible) good examples (one each) of: (a) uneroded till plain, (b) loess hills, (c) bed of glacial lake now dry, (d) outlet of glacial lake not now followed by a stream, (e) gypsum acting as a resistant rock.

(5) With regard to the Osage Section explain connection between geologic structure and topography.

ONE OF THE FOLLOWING QUESTIONS IS REQUIRED OF MAJORS AND GRADUATES

(6) Explain (a) relation of the basins of the lower Great Lakes to bed rock geology, (b) three hypotheses of origin of the basins

(7) Describe structure and physiographic history of Wichita Mountains.

CAUTIONS: Please park all books and notes on the desk.
If you forgot a bluebook kindly go and buy one.
NO OVERTIME CAN BE ALLOWED.

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Final examination January 31, 1939

Write on ten (10) questions only. Please mark on cover of blue book which you left out. Please leave a card for grades (no telephone requests, please). Graduates and majors must write on (1) and (2).

(1) Required of graduates and majors - optional with others.
Discuss fully at least four explanations of why streams cross the Ridge and Valley Province from northwest to southeast.

(2) Required of graduates and majors - optional with others.
Discuss three possible explanations of the summit level of the Baraboo Range.

(3) Give two possible explanations of the fact that there are no recessional moraines in New England.

(4) Complete following sentences giving best single line of evidence: We know that

(a) the Superior Upland was once mountainous because
(b) the Superior Upland was reduced to a peneplain before _____ time because
(c) the Superior Upland was once buried by rocks of surrounding region because
(d) till soils of the Superior Upland are very bouldery because
(e) Lake Superior waters once stood much lower at Superior than now because

(5) Where in provinces studied this semester could you find good examples of

(a) drumlin (b) cirque (c) hanging valley (d) water gap (e) ice contact terrace (f) trap rock ridge (g) drowned cuesta (h) stony terminal moraine (i) esker (j) granite mountain.

(6) Where and what is (a) Fall Zone peneplain (b) Harrisburg peneplain (c) entrenched meanders (d) St. Francis (Francois) Mts (d) Novaculite (f) Shawnee Hills (g) Blue Ridge (h) Blue Grass Basin (I) Wichita Mts. (j) Apostle Islands.

(7) Name, Define, bound, describe geology and topography on any one of the major subdivisions of the Central Lowland.

(8) Explain the effects of glaciation on topography of Superior upland.
(9) Discuss line of division of Piedmont and Coastal plains.

(10) Locate examples of and account for five different types of shore features found in Coastal Plain.

(11) Where and what are (a) salt domes (b) Reelfoot Lake (c) Long Island (d) Black Belt (e) Finger Lakes (f) Cheseapeake Bay (g) Lake Pontchartrain (h) Tughill Plateau (i) Allegheny River (j) Mohawk Valley

(12) Which did you see on field trip (a) sink hole (b) sand dune lake (c) terminal moraine (d) dolomite upland (e) flat area on quartzite (f) outwash plain (g) water gap (h) superimposed stream (i) entrenched meander, (j) shore of Cambrian Sea.

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Field Trip, 1938

Bring lunch. Trip will be made regardless of weather unless deep snow. Assemble in front of Science Hall at seven-thirty A. M. sharp. Head south. South on Park Street to Regent. Turn right (west) on U. S. 18. Keep straight ahead on Regent to cemetery. Turn half left on S. Follow S. (west) to STOP 1 at terminal moraine. Continue west on S. one half mile STOP 2 on roadside on Campbells Hill. Continue west to Pine Bluff. Turn left (south) and follow S to Mt. Horeb. Pick up U. S. 18. Follow west to overhead R. R. crossing. Turn right on town road. Sink holes to left. Turn right (north) on F. STOP 3 at top of hill. Continue north on F one half mile. STOP 4 at top of hill to north. CAUTION for curve. Continue north down into valley. STOP 5 at Deneen School. Climb bluff opposite. Continue on F down valley. Leave F by keeping straight ahead. CAUTION for sharp right turn just after crossing creek from left. Pick up K. STOP 6 on sandy road half mile south of Dover School. Continue to U. S. 14 and turn left west on pavement. STOP 7 on sand dune in Arena. Continue to Tower Hill State Park. Turn right, north, into park to parking ground. STOP 8. Lunch here after inspecting bluff. Return to U. S. 14 and continue through Spring Green. Pick up 23 and go north. STOPS 9 and 10 on hill-CAUTION in parking. Continue north of Plain. Keep right on Main Street, then left on 23 to junction with W. Then right (east) on W to sign, "stop-see the waterfall." Keep ahead into gate. Stop at home to pay admission (5 cents) and ask about road which is dangerous in wet weather. STOP 11 at Weidman Falls. Return north and west on gravel road. Then turn right (north) at church. STOP 12 on highest part of road near conglomerate pit. Keep with county road. STOP 13 at church. Walk south a short distance to corner. Turn left (north) and keep on north leaving county road. CAUTION for steep hill down to Narrows Creek. Turn right (east) on 154 just north of bridge. STOP 14 at school house. If weather is dry keep straight ahead leaving state road. Turn right (south) then left (east) around house and over bluff to top of quarry. Sign "Danger-blasting," but quarry is closed. STOP 15 walk to edge of quarry. CAUTION in parking on narrow road. (If wet follow highway to Ableman, north on 136 into gorge - turn around and go back.) Continue into Ableman and pick up 136. Follow east to sign to North Freedom. Turn right (south) into North Freedom. Keep straight through North Freedom. Go south on gravel road keeping ahead across Seeley Creek. Ascend Baraboo Bluff STOP 16 to see terrace. Continue to second corners on highest point of Bluff. STOP 17. Continue ahead (south) across tops of bluffs and down south side. Pick up gravel road. At foot of hill turn left (east) on gravel. to left. Keep ahead into C. Follow C east to U. S. 12. Turn right (south) and follow to Madison. If wet turn around and retrace to W. Go east on W to 12, then 12 to Madison. Total distance estimated at 135 miles.

Geology 130

Mason

Physiography Of The United States

Examination, Dec. 14, 1938

Write on four questions only. Note that questions 1 and 2 are REQUIRED of everyone. Graduates and geology and geography majors are REQUIRED also to answer question 3.

1. Complete front and side vertical sections on accompanying sheet. Follow directions thereon.

2. Where (including province and section) and what are (physiographically) the following?

a. Mt. Monadnock
b. Walden Ridge
c. Whiteface Mt.
d. Shenandoah Valley
e. Blue Mountain
f. Lake George
g. Black River
h. Wyoming Valley
i. Caledonia Mts.
j. Somes Sound

3. State for each in a single sentence a proof which shows that: (a) more streams once flowed from the Folded Appalachians directly to the Atlantic than do so today, (b) the Folded Appalachians were once of much lower relief than today, (c) the uplift of the Folded Appalachians in recent geologic time has been intermittent, (d) the northern Folded Appalachians were once covered by the Coastal Plain, (e) the crests of the Folded Appalachians do not connect with the surface beneath the Cretaceous sediments of the Coastal Plain.

4. Draw a diagrammatic section from west to east across New England showing the main physiographic features and nature of bed rocks.

5. Outline with diagrams the steps in the history of the topography of the Adirondacks beginning with the formation of the bed rocks.

6, Discuss the effects of glaciation in Appalachian Plateau and outline area affected. Include effects on drainage south of ice margin.

Marcou

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Examination Mid-semester Nov. 16, 1938

Write on four questions only. Place X mark in space opposite numbers of questions left out.

Graduates and geology and geography majors REQUIRED to write on questions 4 and 5.

1. Discuss with diagrams the possible explanation of the Peneplain of the Piedmont Plateau.

2. Complete following sentences:

   (a) The Coastal Plain has recently been uplifted (with respect to sea level) without deformation because
   (b) The Coastal Plain once stood higher above water than now because
   (c) Without change in level, wave work has in places worn back the position of the shore of the Coastal Plain and in others advanced it toward the ocean because
   (d) The Sediments of the Coastal Plain once extended farther inland than they now do because
   (e) The Coastal Plain once extended farther northeast than it now does because

3. Describe and account for five different land forms which occur in the Driftless Area and which are due to the effects of glaciation of the surrounding region.

4. Discuss five different land forms which are found in the Coastal Plain and locate examples of each.

5. Outline with diagrams the stages in the development of the topography of the Superior Highland including the basin of Lake Superior.

6. Where and what are: (a) Blue Ridge, (b) South Mountain, (c) Mt. Mitchell, (d) Richmond Basin, (e) The Palisades (f) Fall Line, (g) French Broad River, (h) Trenton Prong. (i) Carlisle Prong. (j) Great Smoky Mts.

7. In single sentences state evidences which alone prove that: (a) the Piedmont was once mountainous, (b) the Piedmont was once more level than it is today, (c) the Piedmont was once covered by Coastal Plain sediments, (d) the Blue Ridge is not in harmony with the stage of erosion cycle of districts to west and to east, (e) rejuvination of streams has occurred in the Crystalline Appalachians.

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Six Weeks Examination Oct. 28, 1938

NO ONE IS TO WRITE ON MORE THAN FOUR QUESTIONS IN ALL.

Group I. Not less than three required for majors in Geography or Geology and graduates; optional with others.

1. Outline events leading to formation of Lake Superior.
2. Discuss evidences for and against the hypotheses of, peneplains as explaining the "soft rock" uplands of the Driftless Section.
3. Describe and account for three different ages of topography found on the unglaciated Baraboo quartzite, giving examples seen in the field.
4. Discuss briefly the definition boundaries, geology, and topography of Osage Section.

Group 2. For non-majors; one optional with graduates and majors.

5. Where (be definite but avoid stop numbers) did you see in the field trip (a) sinkhole, (b) Dresbach sandstone, (c) Lake due to sand dunes, (d) lake due to terminal moraine, (e) Prairie du Chien Upland, (f) peneplain on quartzite, (g) outwash terrace, (h) Maquoketa shale, (i) Cambrian conglomerate, (j) bed of lake due to outwash.

6. In areas thus far studied would you find good samples of (a) sand dunes, (b) uneroded drift plains, (c) interlobate moraine, (d) cuesta, (e) lake in basin in "hard rock", (f) monadnock, (g) maturely dissected till plain, (h) glacial lake plain, (i) pitted outwash, (j) loess hills.

7. Explain how it is known that the Superior Upland (a) was once mountainous, (b) these mountains were worn away before Cambrian, (c) the area was once entirely buried by "soft rocks."

8. List in two columns in proper order the facts observed at Weidman Falls and the interpretations based on them.

9. Explain why the Great Lakes and Till Plains sections are separated.

Group 3. Required for five credit students; optional with others.

10. Complete the following sentences sentences (no more counted).

(a) The gorge below Niagara Falls varies the width because _____.
(b) The tilted lava flows make hogbacks because _____.
(c) There are more sand dunes on the Michigan shore of Lake Michigan then there is on Wisconsin shore because _____.
(d) The terminal moraines of central Illinois are smoother than those of Wisconsin because _____.
(e) The lake level is ris rising at Superior because _____.

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES

Final Examination Jan. 31, 1938

Write on ten (10) questions only PLEASE mark on cover of book which questions you left out.

(1) Question required of graduates and majors in geology and geography; optional with others
Outline in parallel columns the FACTS and INTERPRETATIONS in proper order to show the physiographic history of the Baraboo district, Wis.

(2) Question required of all five credit students; optional with others
Locate in Appalachian Plateau good examples of (a) consequent stream, (b) obsequent stream, (c) subsequent stream, (d) stream capture, (e) river terraces, (f) entrenched meanders, (g) tributary valley blocked by outwash in main valley, (h) stream diversion due to glaciation, (i) hanging valley, (j) postglacial gorge

(3) Locate examples and account for two types of falls in the Driftless Area.

(4) Locate in Interior Lowland examples of (a) drumlins, (b) glaciated karst topography, (c) drainage superimposed on pre-Cambrian, (d) sand dunes, (e) abandoned lake bed, (f) upland on dolomite, (g) eroded drift plain, (h) pitted outwash, (i) clay till moraine, (j) outwash plain flat, ~~(i) cuesta due to dolomite on shale, (j) exhumed monadnock~~

(5) Complete following sentences: (a) The pre-folding drainage of the Folded Appalachian Province was presumably to the northwest because (b) The Folded Appalachians once had lower relief than now because (c) uplift of the Folded Appalachians has been intermittent because (d) It has been suggested that the Folded Appalachians were once buried under the Coastal Plain because (e) east-flowing streams in the Folded Appalachians have the advantage over others because

(6) List and locate examples of five different land forms of New England

(7) (a) Account for the stony soil of New England (b) Where else in provinces studied this semester do same conditions obtain?

(8) Account for the difference in glacial topography of southeastern Wisconsin and central Illinois (drift of same age).

(9) Explain what is meant by (a) destructional and (b) constructional land forms and locate two examples of each in Laurentian Upland

(10) Account for the Driftless Area

(11) Locate five different kinds of lakes (or swamps) which are found in the Coastal Plain. List in a table.

(12) What effect did continental glaciation have on the topography of the Coastal Plain (a) inside and (b) outside the limit of the ice?

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES

Examination Dec. 17, 1937

Write on four questions only and please place an X in space opposite numbers of questions you left out. Check to see that your name is on the separate sheet.

(1) REQUIRED OF ALL. On separate sheet.

(2) REQUIRED OF GRADUATES AND MAJORS in geology or geography. Discuss fully with diagrams five (5) possible explanations of the course of Susquehanna River across the Folded Appalachians.

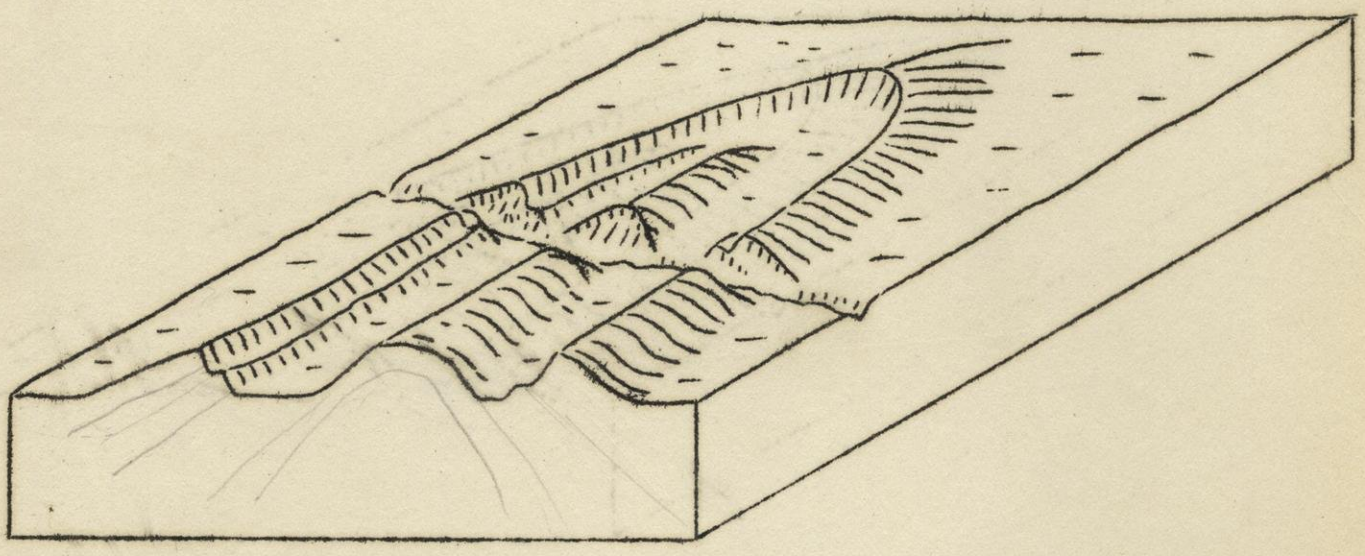
(3) Complete following sentences (no more counted) giving the best single explanation or evidence:
(a) The lower part of the Coastal Plain has been rather recently uncovered by the ocean because...
(b) The entire Coastal Plain was once farther above sea level than it now is because.....
(c) Glacial ice lingered longer in Connecticut Valley than on adjacent highlands because....
(d) The mountain tops of the Folded Appalachins are even because....
(e) Local glaciers once occuppied the valleys in Mount Washington because....

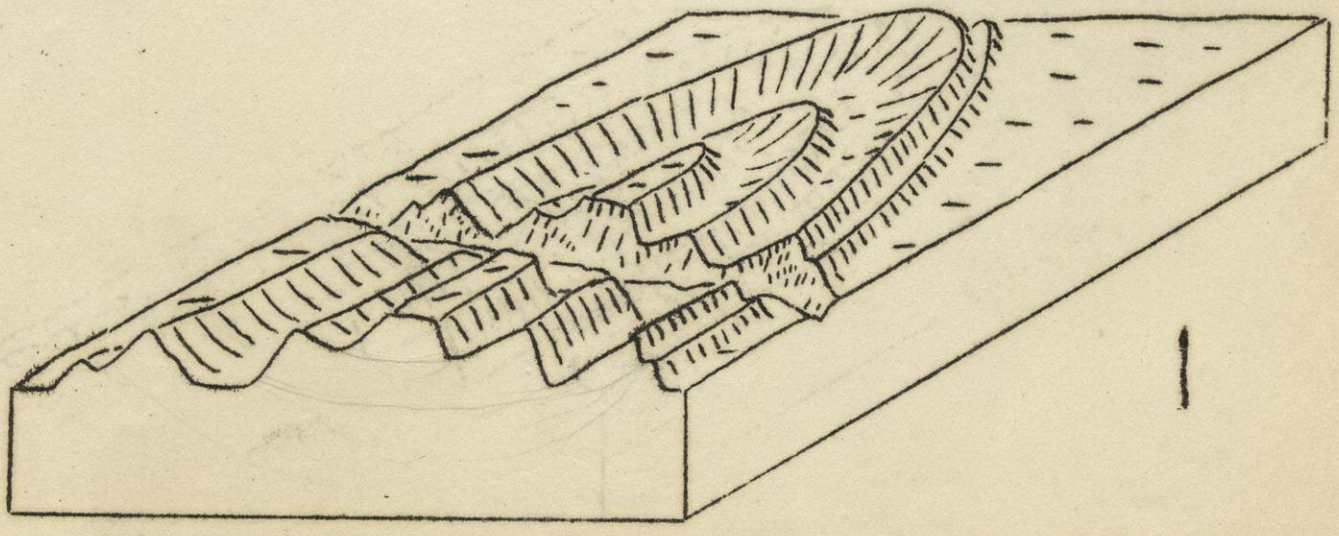
(4) Compare the processes which formed the outline of east coast of Florida with those which caused the outline of the Mississippi Delta

(5) Explain and locate examples of in New England, Folded Appalachians or Coastal Plain:
(a) definitely superimposed stream
(b) drowned inner lowland or vale
(c) subsequent stream
(d) karst topography
(e) entrenched meanders

(6) Where (physiographic province and subdivision, state) and what are:
(a) Yazoo River
(b) Reelfoot Lake
(c) Mt. Monadnock
(d) Black Belt
(e) Crowleys Ridge
(f) North Carolina "bays"
(g) Schooley Mt.
(h) Tortugas
(i) Harrisburg peneplain
(j) Delaware Bay

(;) Required of all PLEASE WRITE YOUR NAME FIRST.
Kindly fold across before placing in bluebook.
show NEATLY on ends of blocks and sides where needed the STRUCTURE which gave rise to the topography shown. Also indicate what the resistant layers probably are and where you would find examples of these features.





GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES

Midsemester examination Nov. 12, 1937

Write on four questions only and please mark X after numbers of questions you left out.
Note that there are two questions for graduates only and one for those who did not make the field trip

Questions for all

(1) Complete the following sentences (no more counted):
(a) The even crests of the trap ridges of New Jersey indicate
(b) Low relief of the Superior Upland indicates
(c) The presence of the peneplain right up to the crests of the escarpments which bound the Lake Superior Lowland indicates
(d) The similarity of the Weidman Falls gorge to the Narrows of Narrows Creek shows
(e) Change in slope of the surface of the hard rocks at the Fall Line indicates

(2) Complete following sentences giving the most important single line of evidence wich proves that:
(a) The Land at Blue Mounds has been uplifted at least feet
(b) The Piedmont was once a mountain range
(c) The Triassic of New Jersey was once covered by the Coastal Plain
(d) The pre-Cambrian peneplain has been tilted
(e) The Crystalline Appalachians once extended farther southeast

(3) Complete in bluebook the following table

	Formation	Where seen on trip	Characteristic topography
(a)	Galena		
(b)	Maquoketa		
(c)	Franconia		
(d)	Dresbach		
(e)	St. Peter		

(4) Describe five distinct kinds of topography found in Old Drift section of Interior Lowland

(5) Define five subdivisions of Interior Lowland

GRADUATES MUST WRITE ON ONE OR MORE OF FOLLOWING

(G1) Tabulate five distinct theories of the origin of Blue Ridge giving points in favor of and against each

(G2) Tabulate in separate columns the FACTS and INTERPRETATIONS which demonstrate the physiographic history at mouth of Blue Mound Creek

Substitute for 3 for those who did not make trip but no others

(3A) Complete following table in bluebook

	Name	Example studied this semester	Origin
(a)	cuesta capped by dolomite		
(b)	rock basin in vale		
(c)	drowned erosion topography on lake shore		
(d)	hogback on lava flow		
(e)	bed of glacial lake with no modern lake left		

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES

Examination Oct. 27, 1937

Write on four questions only and please mark with X in proper place on cover of bluebook which one you left out. THOSE WHO WERE NOT ON THE TRIP (but no others) may substitute questions 4A and 5A for questions 4 and 5.

(1) Illustrate by cross sections and locate as definitely as possible and example of:
(a) massive igneous rock topography.
(b) topography of tilted or folded sedimentary rocks of varying resistance.
(c) stony terminal moraine
(d) pitted outwash
(e) eroded drift plain

(2) Complete following sentences (no more counted. Copy entire sentence in bluebook):
(a) Mountain glaciers existed in the Adirondacks because....
(b) Part of the Adirondacks has .... drainage because.....
(c) Erosion of the fault scarps along the shores of Lake Superior was mainly accomplished before ..... time because.....
(d) The valley of Mississippi River (inner gorge) narrows downstream from LaCrosse because.....
(e) The northwest shore of Lake Superior is unlike its preglacial form ....

(3) Describe (limit two pages) the definition, boundary, geology, and topography of the Osage Plains

(4) Explain with diagrams the origin and nature of two distinct kinds of topography found on Baraboo quartzite.

(5) Where on trip (be as definite as possible but avoid stop numbers) did you see:
(a) Franconia sandstone
(b) Trempealeau formation
(c) Dolomite upland
(d) bed of lake enclosed by ice
(e) bench in quartzite
(f) entrenched meander
(g) sand dunes
(h) Sinkhole
(i) outwash
(j) lake enclosed by terminal moraine

(4A) Complete following as per question (2):
(a) The Niagara escarpment of eastern Wisconsin is unlike that of northwestern Illinois because....
(b) Erosion of the pre-Cambrian mountains was mainly accomplished before ..... time because .....
(c) The Shawnee Hills are rougher than the Pennyroyal Plateau because:.....
(d) The moraines of Wisconsin are rougher than those of same age in central Illinois because.....
(e) The basins of the Great Lakes are not blocked preglacial valleys .....

(5A) Where (be as definite as possible) could you find in areas studied examples (a) uneroded drift plain (b) loess hills (c) clay terminal moraine (d) falls due to outwash in Driftless Area (e) bed of lake enclosed by glacier (f) karst topography (g) gypsum cuesta (h) exhumed peneplain (i) ignoeus rocks in Interior Lowland (j) thrust fault escarpment.

GEOLOGY 130

Final Examination
February 2, 1937

Write on 10 questions.

1. Outline with diagrams the stages in the development of the topography of the Superior Highland including the basin of Lake Superior.

2. Describe and account for five land forms of the Southern Iowa and southern Illinois old drift region.

3. In single sentences state evidences which alone prove that:
   (a) the Piedmont was once mountainous,
   (b) the piedmont was once more level than it is today,
   (c) the Piedmont was once covered by Coastal Plain sediments,
   (d) the Blue Ridge is not in harmony with the stage of erosion cycle of districts to west and to east,
   (e) rejuvenation of streams has occurred in the Crystalline Appalachians.

4. Give and discuss fully three different interpretations of the level skyline of southern New England including attempts to date this surface.

5. Discuss two possible explanations of the absence of recessional moraines in southern New England.

6. Discuss fully at least four explanations of the present courses of streams which cross the Folded Appalachians from northwest to southwest.

7. Discuss the significance of entrenched meanders both in Folded Appalachians and elsewhere.

8. Account for five distinct types of shore features found in Coastal Plain and locate examples.

9. Using single sentences, for each state a phenomenon which proves that:
   (a) the Coastal Plain has been recently uplifted with little deformation,
   (b) the Coastal Plain once stood much higher than at present,
   (c) wave work has advanced parts of the shore of the Coastal Plain seaward without change in relative levels of sea and land,
   (d) the Fall Zone Peneplain is not the same as the Piedmont Plateau,
   (e) Coastal Plain sediments once extended farther inland than they now do.

10. What and where are: (a) salt domes, (b) Florida peninsula, (c) Mississippi embayment, (d) Reelfoot Lake, (e) Long Island, (f) Cape Cod, (g) Georges Banks, (h) Black Belt, (i) Chesapeake Bay, (j) Lake Pontchartrain.

11. Discuss four theories of the formation of the youthful glaciated valleys of the Appalachian Plateau of New York.

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES

Examination Dec. 18, 1936

Write on four questions INCLUDING THE FIRST.

(1) On separate sheet (required questions).

(2) State two evidences which indicate that the Folded Appalachians were once peneplained.

(3) Discuss two explanations of the drift terraces of the Connecticut Valley.

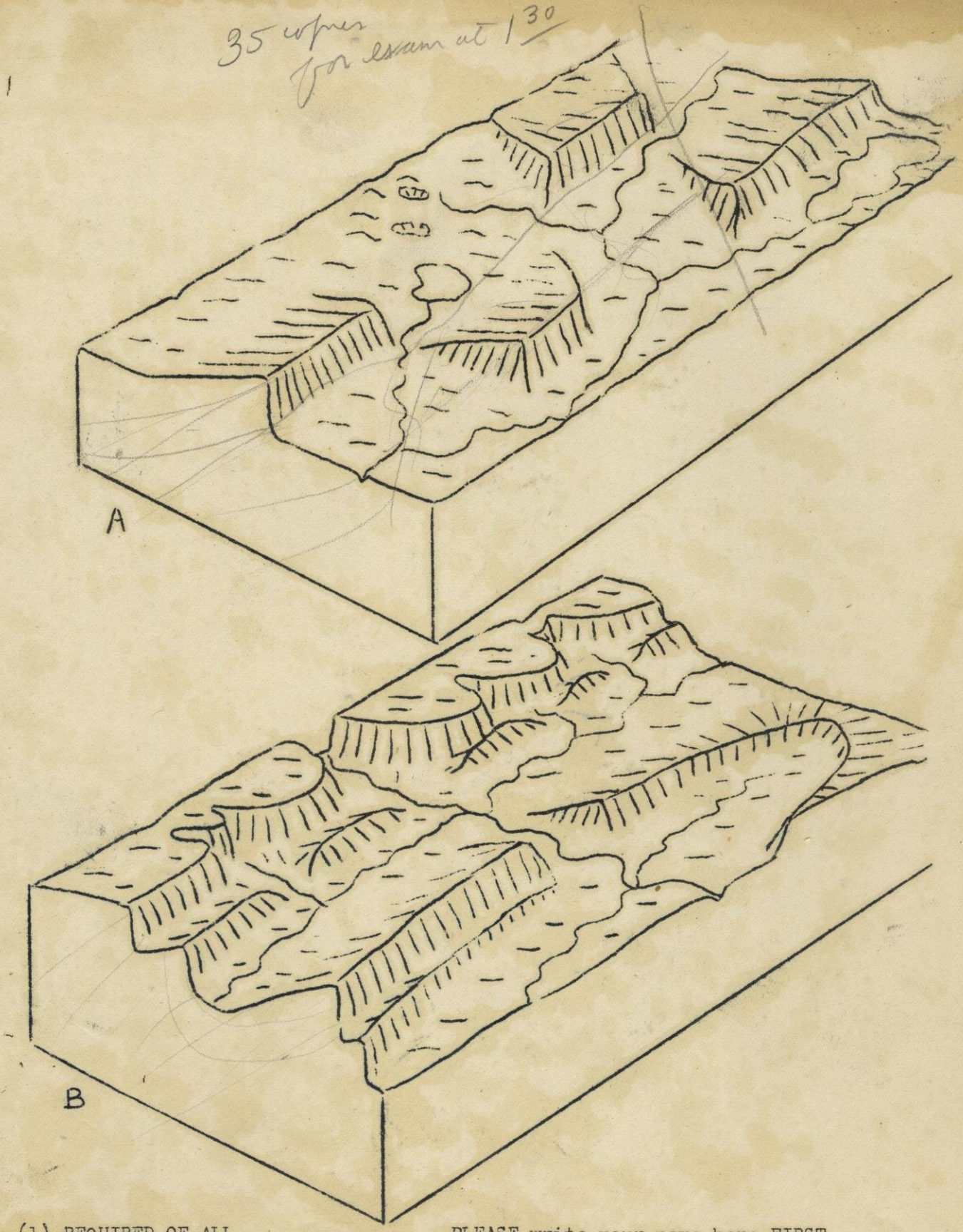
(4) Fill out in blue book the following table:

Name	Origin of physiographic classification	Physiographic Province	State
a. Reading Prong			
b. Citronelle formation			
c. Chesapeake Bay			
d. Yazoo River			
e. Selma Chalk			
f. Long Island Sound			
g. Sunk district			
h. Crowley's Ridge			
i. White Mountains			
j. Everglades			

5. Explain two theories of the horizontal marine terraces of the Coastal Plain.

35 copies for exam at 1:30

1



(1) REQUIRED OF ALL

PLEASE write your name here FIRST

.....

(a) Fill in on edges of blocks the simplest possible explanation of geolc y whic could account for the topography of each block. Answer rest of question n your bluebook. Explain everything you put on blocks.

(b) Tell just why you reached the conclusions and if area has been glac: ted.

(c) Where in eastern United States would you find examples of above condi ions?

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES

Midsemester Examination November 18, 1936

Write on any four questions and please mark on cover which you left out.

1. Outline in two parallel columns the facts and the interpretations which demonstrate the physiographic history determined at Weidman's Falls.

2. Complete the following sentences (only single grammatical sentences counted):

   (a) The valley of Wisconsin River narrows downstream because

   (b) The Ableman gorge was made by a superimposed stream because

   (c) A fault is inferred as the northwest boundary of the Triassic of New Jersey because

   (d) The Keweenawan lava flows have trellis drainage because

   (e) The drainage of the Blue Ridge is out of harmony with that to east and west because

3. Discuss at least three interpretations of the uplands of the Driftless Area.

4. Where in provinces thus far studied this semester could you find a good example of

   (a) glaciated karst topography

   (b) cuesta capped by shale

   (c) uneroded drift plain

   (d) drainage controlled by fault lines in massive rock

   (e) escarpment along outcrop of thrust fault

5. What effects did glaciation have upon topography in the Driftless Area (cite examples seen on trip)?

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Examination October 28, 1936

Write on four questions only. Please mark on cover of book the one you left out.

1. Complete the following sentences giving the best evidence which alone proves the point.

   (a) Lake Superior was deepened by glacial erosion because

   (b) The ~~Niagara~~ escarpment of ~~eastern Wisconsin~~ N. shore of Lake Superior is now unlike its preglacial condition because

   (c) The ~~peneplain of northern Wisconsin was~~ erosion of the Lake Superior faults completed before Upper Cambrian time because

   (d) Weidman's Falls ~~is not in its original location because~~ were caused by

   (e) The volume of Niagara River has not been constant because

2. Describe briefly the definition, boundary, geology and topography of the ~~Shawnee Hills~~ Osage Plains (two page limit). LAVA FLOWS.

3. Discuss with diagrams the effects on topography of three distinct ~~divisions~~ classes of bed rocks found in ~~northern Wisconsin~~. Superior Highland

4. Explain with diagrams the effects of glaciation upon the topography of ~~northern Wisconsin~~. the Adirondacks

5. Where on trip (be as definite as possible) did we see

(a) ~~Dresbach~~ Franconia sandstone	(f) St. Peter sandstone
(b) ~~Baraboo quartzite~~ Trempealeau formation	(g) Sand dune lake
(c) ~~Magnesian Upland~~ Lancaster "peneplain"	(h) ~~Sink hole~~ valley filled with non-glacial stream deposits
(d) ~~Military Ridge~~ Dodgeville "peneplain"	(i) Terminal moraine
(e) Maquoketa shale	(j) ~~peneplain~~ bench in on quartzite

HIPISSING AREA

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Examination October 28, 1936

Write on four questions only. Please mark on cover of book the one you left out.

1. Complete the following sentences giving the best evidence which alone proves the point.

   (a) Lake Superior was deepened by glacial erosion because

   (b) The Niagara escarpment of eastern Wisconsin is now unlike its preglacial condition because

   (c) The peneplain of northern Wisconsin was completed before Upper Cambrian time because

   (d) Weidman's Falls is not in its original location because

   (e) The volume of Niagara River has not been constant because

2. Describe briefly the definition, boundary, geology and topography of the Shawnee Hills (two page limit).

3. Discuss with diagrams the effects on topography of three distinct divisions of bed rocks found in northern Wisconsin.

4. Explain with diagrams the effects of glaciation upon the topography of northern Wisconsin.

5. Where on trip (be as definite as possible) did we see

   (a) Dresbach sandstone

   (b) Baraboo quartzite

   (c) Magnesian Upland

   (d) Military Ridge

   (e) Maquoketa shale

   (f) St. Peter sandstone

   (g) Sand dune lake

   (h) Sink hole

   (i) Terminal moraine

   (j) peneplain on quartzite

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Field trip, 1936

Bring lunch. Trip will be made regardless of weather unless deep snow. Assemble in front of Science Hall at seven-thirty A. M. sharp. Head south. South on Park Street to Regent. Turn right (west) on U. S. 18. Keep straight ahead on Regent to cemetery. Turn half left on S. Follow S. (west) to STOP 1 at terminal moraine. Continue west on S. one half mile STOP 2 on roadside on Campbells Hill. Continue west to Pine Bluff. Turn left (south) and follow S to Mt. Horeb. Pick up U. S. 18. Follow west to overhead R. R. crossing. Turn right on town road. Sink holes to left. Turn right(north) on F (sign "To ball park"). STOP 3 at entrance to park. Continue north on F one half mile. STOP 4 at top of hill. CAUTION for curve. Continue north down into valley. STOP 5 at Deneen School. Climb bluff opposite. Continue on F down valley. Leave F by keeping straight ahead. CAUTION for sharp right turn just after crossing creek from left. Pick up K. STOP 6 on sandy road half mile south of Dover School. Continue to U. S. 14 and turn left on pavement. STOP 7 on sand dune in Arena. Continue to Tower Hill State Park. Turn right into park and leave cars in parking ground. STOP 8. Lunch here after inspecting bluff. Return to U. S. 14 and continue through Spring Green. Pick up 23 and go north. STOPS 9 and 10 on hill-CAUTION in parking. Continue north through Plain (right and left turns) to junction with W. Turn right up hill(east). Follow keeping right to sign "stop-see the waterfall". Keep ahead into gate. Stop at home to pay admission (5 cents) and ask about road which is dangerous in wet weather. STOP 11 at Weidman Falls. Return north and west. Then turn right (north) at church. STOP 12 on highest part of road near conglomerate pit. Keep with county road. STOP 13 at church. Walk south a short distance to corner. Turn left (north) and keep on north leaving county road. CAUTION for steep hill down to Narrows Creek. Turn right on 154 just north of bridge. STOP 14 at school house. If weather is dry keep straight ahead leaving state road. Turn right (south) then left(east) around house and over bluff to top of quarry. Sign "Danger-blasting," but quarry is closed. STOP 15 walk to edge of quarry. CAUTION in parking on narrow road. Some cars will go below the house. (If wet follow highway to Ablenan north on 136 into gorge- turn around and go back. Continue into Ableman and pick up 136, Follow east to sign to North Freedom. Turn right (south) into North Freedom. If dry turn right on main street and make detour to west then east to see the Weidman kettle hole in S. E. corner of Sec. 3. Do not cross fence. STOP 16. Continue on poor road to pick up gravel road. (If wet keep straight through North Freedom and omit STOP 16.) Go south on gravel road keeping ahead across Seeley Creek. Ascend Baraboo Bluff STOP 17 to see terrace. Continue to second corners on highest point of Bluff. STOP 18. Continue ahead (south) across tops of bluffs and down south side. Pick up gravel road. At foot of hill turn left (east) on gravel. Keep ahead into C. Follow C east to U. S. 12. Turn right (south) and follow to Madison

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Final Examination February 4, 1936

Write on only 10 questions and please mark on cover of bluebook which you left out.

1. Required of all. Put your name on sheet first:
   (a) Fill out sides of both blocks with a reasonable interpretation of the geology. Explain all marks and symbols.
   (b) In bluebook explain why and how you reached your conclusions.
   (c) Tell where in eastern United States you could find similar features.
   Fold sheet and place in bluebook.

2. Required of all FIVE CREDIT students, optional with others.
   On the outline map of United States show with boundaries where needed and with proper explanation: (a) Piedmont Plateau, (b) Superior Highland, (c) Niagara cuesta, (d) Cumberland Plateau, (e) Reading Prong.

3. Outline with diagrams the steps in the physiographic history of the Laurentian Upland.

4. Discuss with diagrams the possible explanation of the Peneplain of the Piedmont Plateau.

5. Discuss the problem of the origin of the uplands of the Driftless Area, mentioning where you have seen them on field trips.

6. Describe five different kinds of lakes in the Coastal Plain and locate (in a general way) examples of each.

7. Complete following sentences:
   (a) The Coastal Plain has recently been uplifted (with respect to sea level) without deformation because
   (b) The Coastal Plain once stood higher above water than now because
   (c) Without change in level, wave work has in places worn back the position of the shore of the Coastal Plain and in others advanced it toward the ocean because
   (d) The Sediments of the Coastal Plain once extended farther inland than they now do because
   (e) The Coastal Plain once extended farther northeast than it now does because

8. Discuss the origin and form of the Mississippi Delta and its relation to the floodplain of the River above

9. Discuss four theories of the origin of the youthful glaciated valleys of the northern Appalachian Plateau.

10. Discuss the evidence for and against the hypothesis of peneplanation within the Appalachian Plateau.

11. Locate in Laurentian Upland examples of (a) exhumed peneplain not yet eroded, (b) Monadnock, (c) trellis drainage, (d) hogback ridge, (e) lake in pitted outwash plain (name not needed), (f) evidence of recent earth movement, (g) old drift, (h) cirque, (i) terminal moraine, (j) fault-line valley.

12. Explain origin of Lake Superior.

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Final Examination February 4, 1936

Write on only 10 questions and please mark on cover of bluebook which you left out.

1. Required of all. Put your name on sheet first!
   (a) Fill out sides of earth-blocks with a reasonable interpretation of the geology. Explain symbols.
   (b) In bluebook explain briefly how you reached your conclusions.
   (c) Tell where in eastern United States you could find similar features.
   Fold sheet and place in bluebook.

2. Required of all FIVE CREDIT students, optional with others.
   On the outline map of United States show with boundaries where needed and with proper explanation: (a) Piedmont Plateau, (b) Superior Highland, (c) Niagara cuesta, (d) Cumberland Plateau, (e) Reading Prong.

3. Outline with diagrams the steps in the physiographic history of the Laurentian Upland.

4. Discuss with diagrams the possible explanation of the Peneplain of the Piedmont Plateau.

5. Discuss the problem of the origin of the uplands of the Driftless Area, mentioning where you have seen them on field trips.

6. Describe five different kinds of lakes in the Coastal Plain and locate (in a general way) examples of each.

7. Complete following sentences:
   (a) The Coastal Plain has recently been uplifted (with respect to sea level) without deformation because
   (b) The Coastal Plain once stood higher above water than now because
   (c) Without change in level the Coastal Plain has in places worn back and in others advanced the shore of the Coastal Plain because
   (d) The sediments of the Coastal Plain once extended farther inland than they now do because
   (e) The Coastal Plain once extended farther northeast than it now does because

8. Discuss the origin and shape of the Mississippi Delta and its relation to the floodplain of the River above

9. Discuss four theories of the origin of the youthful glaciated valleys of the Appalachian Plateau.

10. Discuss the evidence for and against the hypothesis of peneplanation of the Appalachian Plateau.

11. Locate in Laurentian Upland examples of (a) exhumed peneplain not yet eroded, (b) monadnock, (c) trellis drainage, (d) hogback ridge, (e) lake in [illegible] plain (name not needed), (f) evidence of recent earth movement, (g) old drift, (h) cirque, (i) terminal moraine, (j) fault-line valley.

12. Explain origin of Lake Superior.

Schutte
Stetler
Antes Jacobsen
Chickering
Cole
Nadler Rowleston
Otley Cleveland Heise Saindarly
Mortensen Kittleman
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Kipp Robertson Burnham Stadsholen
McGraw Cabraham
Wilkie
Verge Grayson
Kunzman Crane
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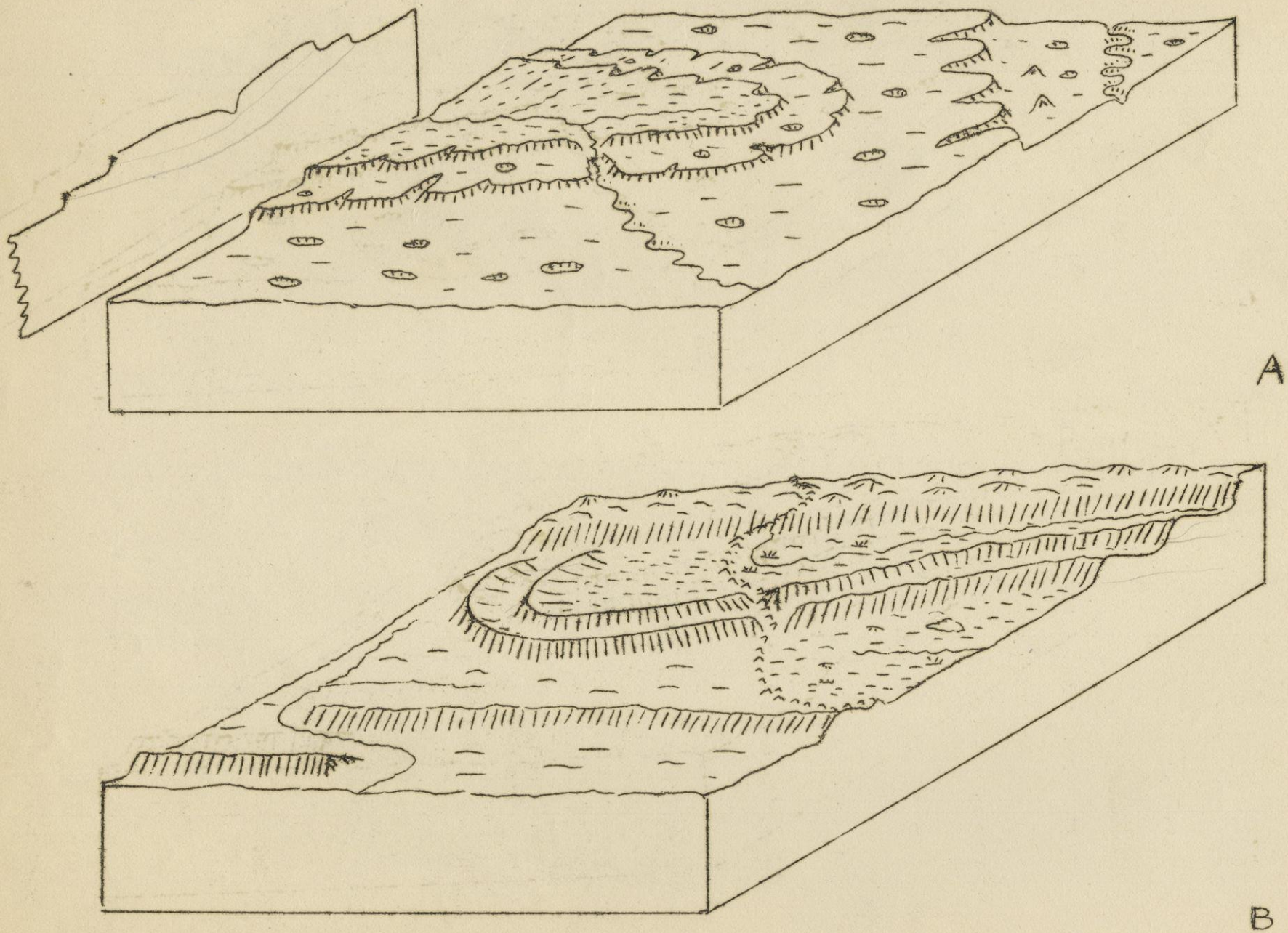
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GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Examination, Dec. 20, 1935

Write on any 4 questions and please mark on cover of your book which one you left out.

1. Complete the following sentences (single sentences only considered):
   (a) The even crests of the trap ridges of the Triassic Lowland indicate that

   (b) Long Island Sound indicates that

   (c) Horizontality of the lower coastal terraces indicates that

   (d) Recessional moraines are absent in New England because

   (e) The shape of the valley heads in the White Mountains shows that

2. Discuss three different explanations of the level skyline of southern New England.

3. Discuss evidences for and against the hypothesis of many erosion cycles in the Folded Appalachians.

4. Fill out following table in blue book:

Feature	Origin or physiographic term	Physiographic Province	State
Fall Zone			
Reelfoot Lake			
Mt. Monadnock			
Highlands of Hudson			
Narragansett Basin			
Walden Ridge			
Black Belt			
Yazoo River			
Watchung Mt.			
Rensselaer Plateau			

5. Discuss four possible explanations of water gaps in the Northern Folded Appalachians.

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Midsemester Examination November 20, 1935

Write in blue book on any four questions and please mark on cover the question you left out.

1. Complete (in book) the following sentences (only single grammatical sentences considered),

   (a) The sea bottom of Paleozoic time has been upraised in the latitude of Madison to an elevation of at least _____ feet.

   (b) The pre-Cambrian peneplain of Wisconsin was warped during uplift because

   (c) Military Ridge is more dissected on the north than on the south sides because

   (d) The Piedmont was once mountainous because

   (e) The Triassic Lowland was once buried by the Coastal Plain because

2. Account for two types of falls and rapids in the Driftless Area.

3. Outline in two parallel columns the <u>facts</u> and <u>interpretations</u> which demonstrate the physiographic history determined near Ableman, Wisconsin.

4. Complete (in blue book) the following table;

Feature	Where seen on trip (as definitely as possible)	Physiographic Significance (or origin)
(a) Franconia formation		
(b) Sand dunes		
(c) Outwash terrace		
(d) Swallow hole		
(e) "Clinkstone"		
(f) Alluvial floodplain (not outwash)		
(g) Exhumed monadnock		
(h) Dresbach cliff		
(i) Terrace in quartzite		
(j) Upland underlain by dolomite		

5. Discuss two hypotheses of the origin and age of the summit peneplain of the Baraboo district, Wisconsin.

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Examination Oct. 28, 1935

Write on four questions only and please mark on cover of your book which questions you left out.

I. Illustrate by cross sections the topography of
   (a) massive igneous rocks
   (b) steeply inclined lava flows
   (c) terminal moraine
   (d) pitted outwash
   (e) old clay drift

2. Complete the following sentences:
   (a) Local glaciers once existed in the Adirondacks because

   (b) The rounded summits of the Adirondacks are due to (1)_____,

   (2)_____.

   (c) The former mountains of northern Wisconsin were not destroyed by glaciation because

   (d) The terminal and recessional moraines of northeastern Illinois are lower and smoother than those of the same age in Wisconsin because

   (e) The preglacial drainage pattern has survived in certain parts of the Superior Highland because

3. (a) Describe four classes of ~~labor~~ lake in the Laurentian Upland each with different origin and
   (b) locate an example of each.

4. Summarize in not over two pages the (a) defination (b) boundaries, (c) geology, (d) topography, and (e) history of any one of the subdivisions of the Interior Lowland.

5. Summarize in not over one page the origin of the basin of Lake Superior.


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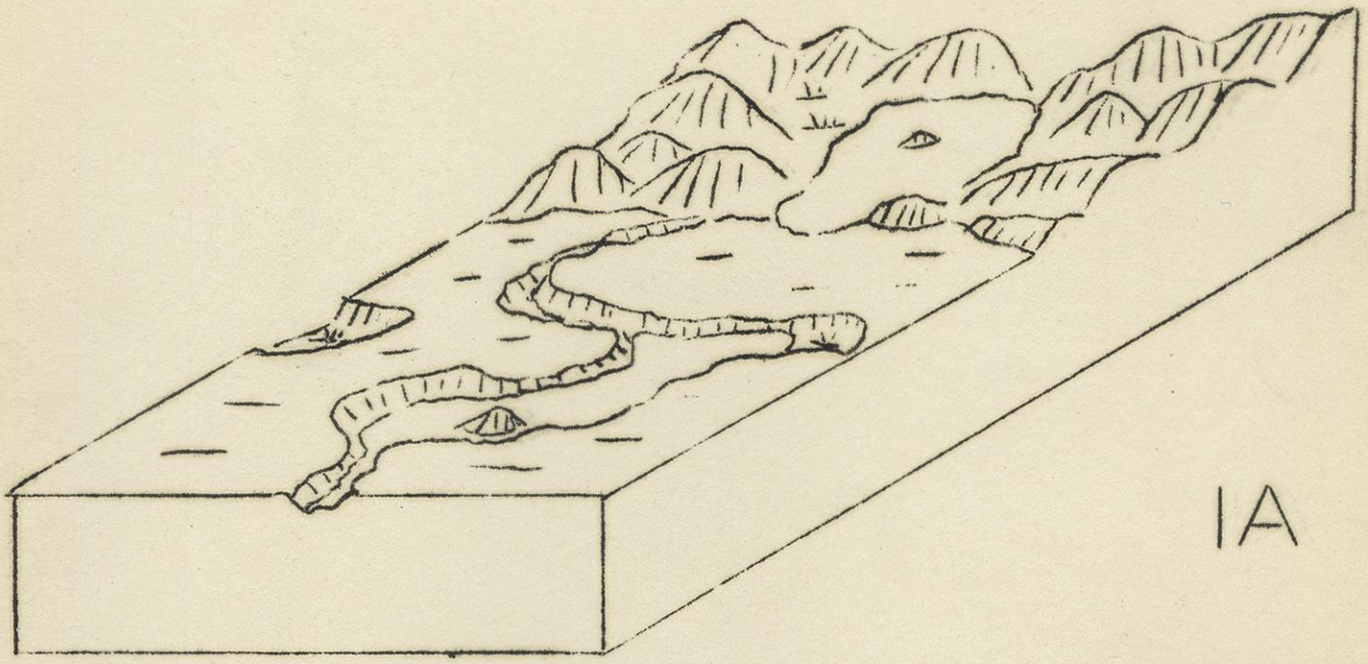

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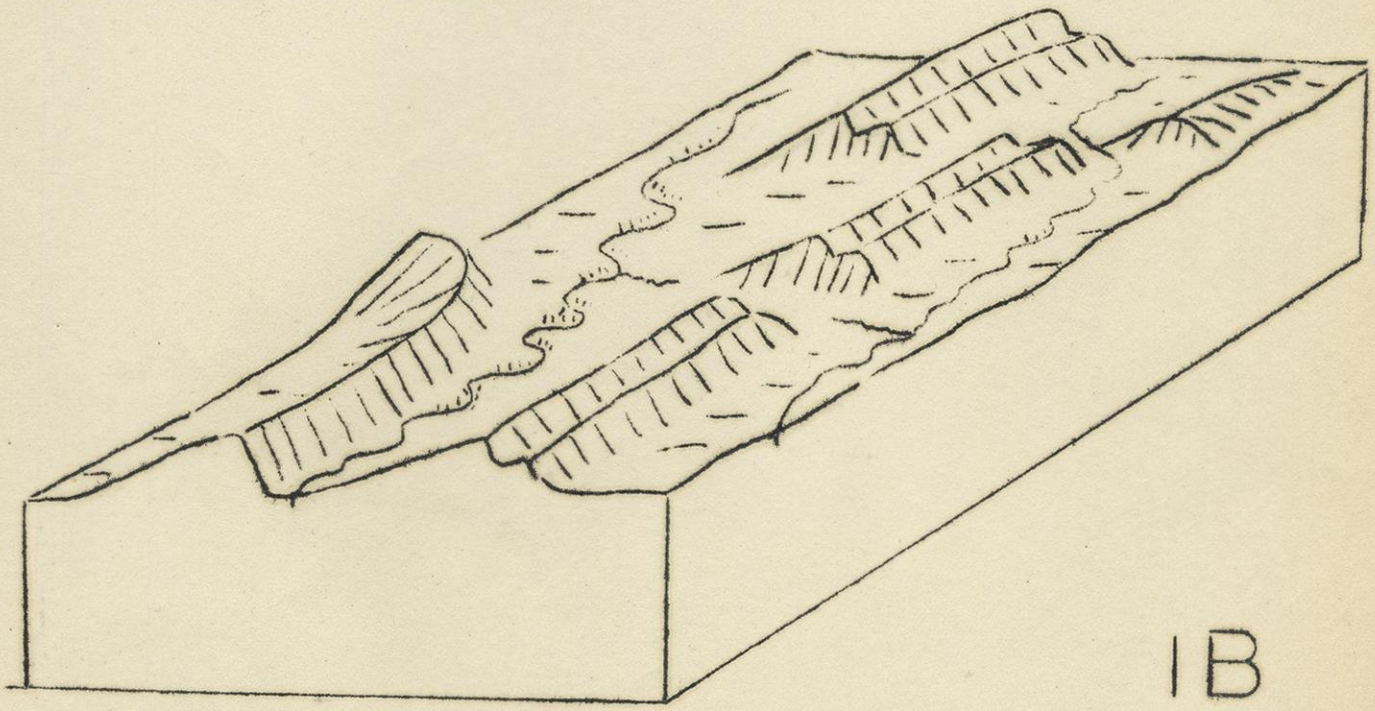

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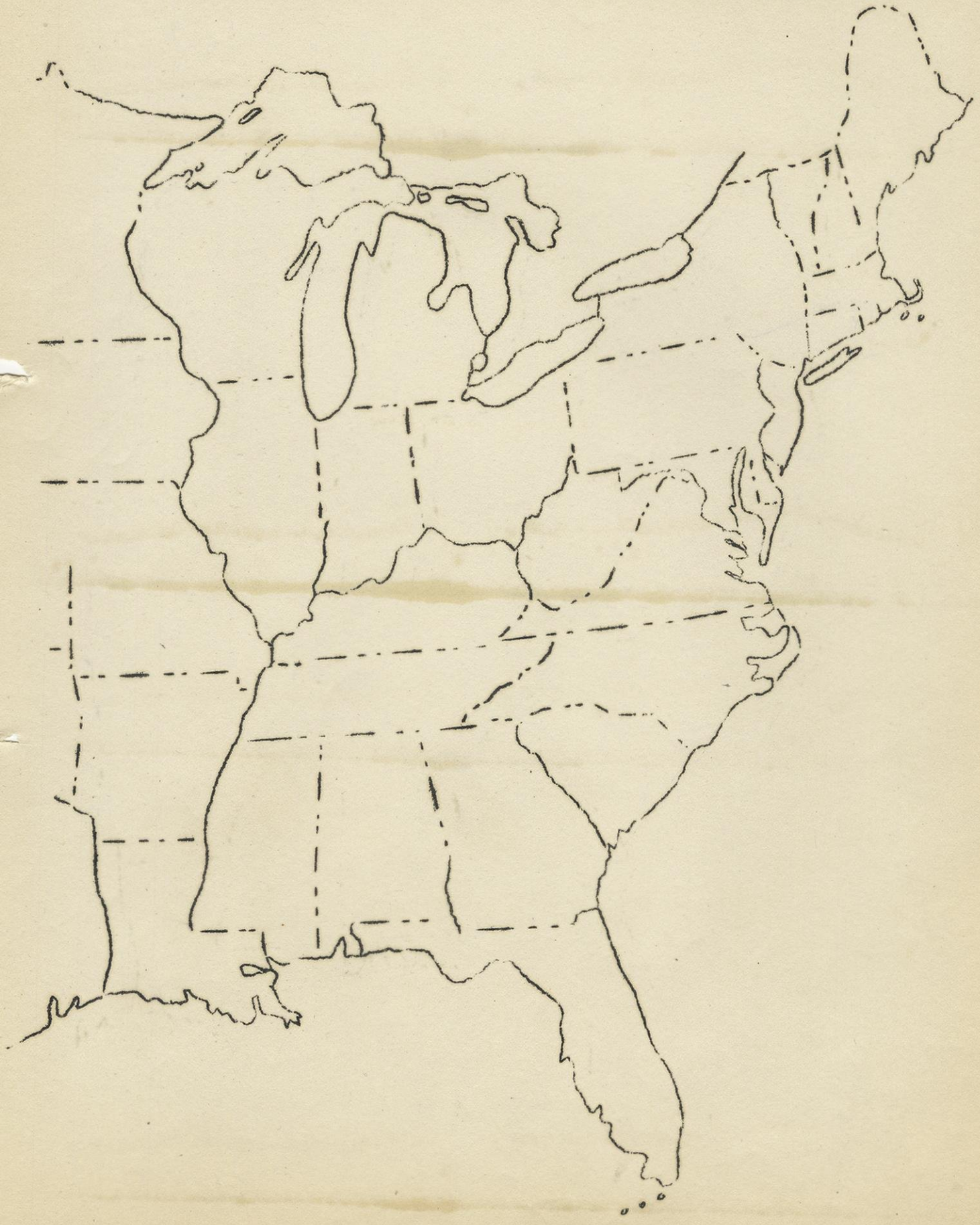
GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Final examination, Feb. 5, 1935

Only 10 questions to be written on. If more, the first 10 in book only will be graded. Please mark on cover which you left out.

(1) Required of all. Put your name on the sheet first.
(a) Fill out on sides of each block a proper interpretation of the geology which would give rise to the topography shown.
(b) In bluebook explain WHY you reached these conclusions and give proper physiographic names to the features.
(c) In bluebbok tell where examples of such topography have been studied in eastern U. S. giving physiographic provinces.

(2) Required of all FIVE CREDIT students, optional with others.
On the outline map of U. S. show with boundaries where needed and with proper explantion: (a) Folded Appalachians, (b) Adirondacks, (c) Tughill Plateau, (d) Driftless Area, (e) Coastal Plain

Write enough of following to make up 10 in all.
(3) Tabulate in bluebook giving name, physiographic province, state, and origin in one sentence: (a) Everglades, (b) Chesapeak Bay, (c) Tortugas, (d) Alleghony Front, (e) Taconic Mts., (f) Mt. Washington, (g) Champlain Valley, (h) Black Belt, (i) Lake Ponchartrain, (j) Crowleys Ridge.
(4) What evidences indicate that local glaciers once existed in eastern U. S. and where were they?
(5) Locate (using the outline map provided for question 2) the principal cuestas of the Great Lakes region and illustrate them with a diagramatic crosssection of Wisconsin at latitude of Green Bay.
(6) Discuss the two different explanations of the terraces of the Connecticut Valley.
(7) What two explanations have been advanced for the evenness of the crests of the mountains in the Folded Appalachians? Discuss fully.
(8) Show by a cross section the origin of the Nashville Basin with country adjacent to northwest and southeast.
(9) Discuss the controversy over the origin of the Finger Lakes of New York.
(10) Complete the following sentences: (a) the Niagara escarpment of eastern Wisconsin was altered in shape by glaciation because----
(b) the glaciated part of the Interior Lowland was not all covered by ice at any one time because---- (c) the Baraboo Range was once covered by Paleozoic rocks because----(d) the flat land near Mauston is not a peneplain because------(e) there are falls and rapids in the Driftless Area because----.
(11) What significance in erosional history is attached to the flat tops of the granite hills at Wausau, Wisconsin and to the flat tops of the hills immediately around Weidmans Falls (not on the quartzite).
(12) Referring to the great plain west of the terminal moraine in Adams and Juneau Counties, Wisconsin, state three kinds of plains (give origin of each) and two kinds of hills (origin) which occur.



GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Examination, Dec. 21, 1934

Write on any four (4) questions. Please mark on cover of bluebook which you left out.

1. Compare the processes which led to the difference in shape of the coast at (a) delta of the Mississippi, and (b) east coast of Florida.

2. Tabulate in bluebook answers for following:

Name	Physiographic Province	State	Origin in one sentence
(a) Natural Bridge			
(b) Everglades			
(c) Tortugas			
(d) Allegheny Front			
(e) Taconic Mts.			
(f) Mt. Washington			
(g) Champlain Valley			
(h) Sequatchie Valley			
(i) Lake Ponchatrain			
(j) Crowley's Ridge			

3. Explain not less than four theories each of which might account for the course of Susquehanna River across the Folded Appalachians.

4. Complete the following sentences (no more than one sentence counts).
   (a) The Coastal Plain has recently been uplifted without distortion because
   (b) The Coastal Plain was once much higher above sea level than it now is because
   (c) We know that the continental glacier lasted longer in the Connecticut Valley than on the adjacent highlands because
   (d) The Coastal Plain ends at Cape Cod because
   (e) Southeastern New England may be called a dissected peneplain because

5. Outline with a series of diagrams the physiographic history of the region from the Folded Appalachians to the Atlantic Coast. Diagrams must be neat, clear, and sufficiently explained.

GEOLOGY 130
Physiography of the United States

Midsemester Examination — November 30, 1934

Write on 4 questions only and please mark on cover of bluebook which you left out. Answer only in bluebooks.

- - - - -

1. Tabulate in bluebook as follows:

Name	Name of formation(s)	Physiographic term	Origin (one sentence)
(a) Tower Hill			
(b) Necedah Mound			
(c) Glover Bluff			
(d) East Blue Mound			
(e) Point Bluff			

2. State as definitely as possible where you saw on field trips (do not discuss origin)
   (a) meander scar
   (b) sediments of glacial lake
   (c) valley train
   (d) peneplain on quartzite
   (e) bed of lake formerly enclosed by outwash
   (f) mesa
   (g) water gap
   (h) terminal moraine
   (i) buried peneplain surface
   (j) sink hole

3. Outline in two columns with facts at left and interpretation at right the physiographic history deduced at Weidman's Falls.

4. Fill out following sentences:
   (a) Weidman's kettle hole does not prove glaciation of that spot because
   (b) The Narrows of Narrows Creek were made by a superimposed stream because
   (c) Hamilton Mounds was once buried in sandstone because
   (d) The basin of Lake Michigan is not a river valley blocked by drift
   (e) The Blue Ridge once lay farther southeast than it now is because

5. Referring to the plain of central Wisconsin west of the terminal moraine, fill out in bluebook

Kind of Plain	Physiographic term	Origin (one sentence)
(a) _____	_____	_____
(b) _____	_____	_____
(c) _____	_____	_____
Kind of hill		
(d) _____	_____	_____
(e) _____	_____	_____

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Examination, Nov. 2, 1934

Write on any four questions. Any one writing on more will be graded on the first four written. Please mark the question you have left out.

1. Show by a diagram typical topography developed on
   (a) massive granite
   (b) folded lava flows
   (c) terminal moraine
   (d) pitted outwash
   (e) folded quartzite and slate.

2. Explain the effects of glaciation on the topography of the Adirondacks.

3. Complete the following sentences:
   (a) Northern Wisconsin was once mountainous because
   (b) Northern Wisconsin was reduced to a peneplain because
   (c) Northern Wisconsin was peneplained before Cambrian time because
   (d) Northern Wisconsin was completely buried by sedimentary rocks then uplifted and exhumed because
   (e) Northern Wisconsin was glaciated more than once because

4. Illustrate in a single cross section five distinct topographic features of the Old Drift section of the Interior Lowland.

5. List the subdivisions of the Interior Lowland province and define briefly one of them which does not extend into Wisconsin.

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Final examination, Jan.31, 1934

Write on any ten (10) questions. Please mark on cover of bluebook which you left out.

(1) Describe and account for (a) five different land forms due to destructional processes and (b) five different land forms due to constructional processes which may be found in the Laurentian Upland.

(2) Discuss two distinct theories of the origin of the basins of the lower Great Lakes.

(3) Describe and account for five different land forms which occur in the Driftless Area and which are due to the effects of glaciation of the surrounding region.

(4) Describe and account for the Nashville Basin using a cross section.

(5) Locate in the Interior Lowlands examples of (a) drumlins, (b) karst topography, (c) superimposed stream, (d) sand dunes other than those seen on the field trips, (e) abandoned lake bed other than those seen on field trips, (f) uneroded drift plain, (g) pitted outwash plain, (h) terminal moraine made of clay till, (i) cuesta whose outline has been altered by glacial erosion, (j) partially exhumed monadnock.

(6) Discuss fully three explanations which have been given for the even skyline of southern New England.

(7) Using diagrams show how topography may be used to help work out the structure of folded sedimentary rocks.

(8) Using diagrams for each step outline the physiographic history of the Folded Appalachians.

(9) Discuss five different land forms which are found in the Coastal Plain and locate examples of each.

(10) Discuss the physiographic significance of the occurrence of fresh water in the Coastal Plain below present sea level.

(11) Discuss the effects of glaciation on the topography of the Appalachian Plateau including its effect on the region just outside the drift margin.

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Examination, Dec. 20, 1933

Write on any four (4) questions. Please mark on cover what one you left out.

(1) Tell where located including physiographic province and the origin of: (a) Cape Cod, entire peninsula, (b) Highlands of Hudson River, (c) Crowleys Ridge, (d) Manhattan Prong, (e) Champlain Valley, (f) Chesapeak Bay, (g) Marquesas Keys, (h) Long Island Sound, (i) Schooley Mountain, physiographic significance of, (j) Delaware Watergap.

(2) By what surface manefestations could you locate in the Coastal Plain (a) salt domes, (b) limestone bed rock?

(3) Compare the conditions which gave rise to difference in coastal outline of (a) the Mississippi delta and (b) the east coast of Florida.

(4) Discuss the two theories of the origin of the Natural Bridge of Virginia.

(5) Show by means of diagramatic corss sections the physiographic history of the country along a ~~northeast~~ northwest-southeast line from the Atlantic coast through Washington, D. C. to west border of provinces thus far studied this semester. Be sure to explain everything you show.

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Midsemester examination, Nov. 17, 1933

Write on any four (4) questions. Please mark on book the number of one you left out. Anyone writing on more than four questions will be graded on first four in book regardless of numbers.

(1) Where in the physiographic provinces thus far studied this semester could you find:
(a) glaciated karst topography
(b) trellis drainage due to fracturing of massive rock
(c) hogbacks due to inclined lava flows or sills.
(d) cuesta capped by shale
(e) eroded drift plain

(2) (a) Two theories have been proposed to explain the level plain of central Wisconsin. Discuss them and divide the plain into subdivisions due to different processes. Explain where evidence was seen in field.
(b) The hills which rise above the plain in central Wisconsin have been divided into two general groups on basis of origin. Discuss origins of each and proper physiographic terms for them giving evidence seen in the field.

(3) State for each in a single sentence what seems to you the best single line of evidence which alone proves that:
(a) northern Minnesota was once a mountain range.
(b) the area around Wausaw, Wisconsin, once had less relief than it now does.
(c) the Blue Ridge in South Carolina was once located farther to the southeast than it now is.
(d) the northwest border of the Triassic Lowland is along a fault.
(e) the basin of Lake Michigan is not simply a river valley blocked by glacial drift.

(4) Where and what are (give physiographic significance):
(a) Trenton Prong, (b) Palisades, (c) Fall Line, (d) Keweenaw Point,
(e) Hamilton Mounds, (f) Narrows Creek, (g) Honey Creek valley,
(h) Osage Plains, (i) Dripping Springs escarpment, (j) Rib Hill

(5) Discuss the physiographic history of the Piedmont and its drainage system.

geology

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Examination, Oct. 25, 1933

Write on any four (4) questions. Please mark on cover of bluebook the one you left out.

(1) State IN A SINGLE SENTENCE what seems to you the best single line of evidence which alone proves that:
(a) The peneplain north of Wisconsin Rapids was completed prior to the deposition of the Mt. Simon sandstone.
(b) The Wisconsin River is not in its preglacial course at Nekoosa.
(c) The Niagara escarpment of eastern Wisconsin is not in its preglacial form.
(d) The Franconia bench is not a remnant of an uplifted peneplain.
(e) The Second Moraine in Waushara County was formed not many years after the Outer Moraine.

(2) Where on the recent trips did you see an example of (locate as definitely as practicable):
(a) monadnock, (b) hogback, (c) pitted outwash plain, (d) sand dune, (e) rock terrace formed by shale, (f) cryptovolcanic structure, (g) fault line hill, (h) lake terrace, (i) outlier of escarpment, (j) water gap.

(3) Discuss fully the physiographic history demonstrated at Weidman Falls and vicinity.

(4) Discuss and compare the several possible explanations of the summit upland of the Baraboo quartzite range.

(5) Discuss the origin and physiographic history of the Lake Superior basin.

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Examination, Oct. 14, 1932

FIVE CREDIT students write on first question and any four others, five (5) in all.
THREE CREDIT students may write on any five (5) of the questions numbers 2 and up but not on first question. Anyone writing on more than required number of questions will be graded on first five written in book regardless of numbers.
PLEASE mark omitted questions on cover of your blue book.

(1) For five credit students ONLY
Draw a geologic and topographic cross section to show the nature of the border of the Superior Highland and Interior Lowland in Wisconsin

Remaining questions for all students
(2) Describe and account for two different kinds of lakes in northern Wisconsin not including Lake Superior.

(3) State in a single sentence the definite evidence which proves that:
(a) local mountain glaciers once existed in the Adirondack Mts.
(b) the pre-Cambrian mountains were worn down before Cambrian time.
(c) the Interior Lowland glaciated area was not all covered by ice at the same time.
(d) the Niagara escarpment of eastern Wisconsin was altered by glacial erosion.
(e) the Superior Highland was once entirely covered by the rocks which are now confined to the Interior Lowland

(4) Locate examples in regions thus far studied of:
(a) trellis drainage
(b) fault block mountains
(c) monadnock on peneplain (not partly exhumed).
(d) lake in rock basin
(e) old drift on crystalline rock

(5) Describe the most common cause for falls and rapids in the Driftless Area.

(6) What effects did the deposition of loess have on the topography of Iowa?

(7) Explain two theories of the cause of drift plains or till plains.

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Midsemester examination, Nov. 18, 1932

Write on any five (5) questions
Please mark omitted question
Please do not write on more than required number of questions; only first five in book will be counted
Please avoid changing order of questions

(1) Where; what geological formations are present at; what is origin of topography at each of following:
(a) Glover Bluff
(b) Hamilton Mounds
(c) Natural Bridge BE BRIEF
(d) Point Bluff
(e) Weidman Falls

(2) Where on field trips did you see (DO NOT DISCUSS ORIGIN):
(a) valley in Driftless Area with flat floor NOT due either to outwash or lake bed
(b) extensive area of sand dunes
(c) hogbacks
(d) bench due to shale protecting underlying rocks
(e) water gap
(f) recessional moraine
(g) stream terrace
(h) sink hole
(i) pitted outwash plain
(j) mesa

(3) It was once thought that the level plain around Necedah was an undissected peneplain due to stream work. Discuss.

(4) State concisely, each in a single sentence, ONE evidence each which proves that:
(a) the peneplain north of Wisconsin Rapids is of pre-Cambrian age
(b) a lake once existed near Petenwell Peak
(c) the Crystalline Appalachians once extended farther southeast
(d) the Piedmont Plateau was once largely covered by the Coastal Plain
(e) Weidman Falls did not always occupy its present position.

(5) Discuss the origin of the Weidman Kettle Hole stating origins of other somewhat similar enclosed depressions.

(6) Compare similarities in topography of the Piedmont Plateau and the Baraboo Bluffs and give TWO possible explanations which might apply to both.

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Examination, Dec. 19, 1932

Write on any five (5) questions. PLEASE mark on outside of your bluebook the question you did not write on. Do not write on more than five questions; anyone so doing will be graded on first five in book regardless of numbers.

(1) Discuss fully the evidence for and against the conclusion that the coastal part of New England was once a level plain due to erosion by streams.

(2) Account for and discuss possible theories of the course of:
(a) Hudson River
(b) Tennessee River

(3) Tablulate answers for following:

Name of feature	Physiographic Province	State	Origin (brief).
(a) Dougherty Plain	ANSWER IN BLUEBOOK		
(b) Okefeenokee Terrace			
(c) Trail Ridge			
(d) Everglades			
(e) Key West			
(f) Tortugas			
(g) Taconic Mts.			
(h) Fall Zone Peneplain			
(i) Mt. Monadnock			
(j) Hudson Highlands			

(4) Classify as to origin the lakes of the Coastal Plain and locate examples of each kind.

(5) Discuss five (5) different types of topography (land forms) which are found in the Coastal Plain and locate examples of each.

(6) For each of the following state a definite proof which alone proves that:
(a) The Coastal Plain has recently been uplifted.
(b) The Coastal Plain once stood much higher than at present.
(c) The Folded Appalachians were once almost completely levelled by erosion.
(d) The Connecticut Valley once held isolated ice masses.
(e) The presence of fresh water in Florida to below 1000 feet from the surface does NOT prove elevation of the land that amount.

EACH ANSWER SHOULD BE A SINGLE SENTENCE.

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Final examination, Jan. 30, 1933

All students must write on ten (10) questions, INCLUDING No. 1
Five credit students must also answer No. 2 which is for them ONLY.
Five credit students must hand in their Physiographic Diagrams completed by not later than Tuesday noon.

QUESTION REQUIRED OF ALL

(1) Refering to extra sheet fill in neatly a possible explanation of the geology and structure which accounts for the topography shown. Use common symbols and EXPLAIN THEM. Now answer in bluebook (a) just how and why you reached your conclusions, and (b) where in eastern U. S. you might find an example of this kind of structure and topography.

(2) QUESTION FOR FIVE CREDIT STUDENTS ONLY. Give the physiographic history which accounts for the cut-off meanders of the Allegheny River.

THREE CREDIT STUDENTS WRITE ON ANY NINE OF FOLLOWING AND FIVE CREDIT STUDENTS ON ANY EIGHT.

(3) What evidences indicate recent earth movements in the Lake Superior Basin?

(4) Account for the differences in glacial topography between southeastern Wisconsin and central Illinois (same age of drift).

(5) Describe and account for five different land forms in southern Illinois.

(6) In single sentences state evidences which alone prove that: (a) the Piedmont Plateau was once a mountain range, (b) the Piedmont was once more level than it is today, (c) the Piedmont was once covered by Coastal Plain sediments, (d) the Blue Ridge is not a fault scarp, but is due to erosion, (e) rejuvination of streams has occurred in the Crystalline Appalachians.

(7) Where and what are: (a) Watchung Mts., (b) Stone Mt., (c) Palisades, (d) Mt. Monadnock, (e) Mt. Washington, (f) Lower Connecticut Valley, (g) Upper Connecticut Valley, (h) Reading Prong, (i) Manhattan Prong, (j) Highlands of Hudson.

(8) State for each in a single sentence a proof which shows that: (a) more streams once flowed from the Folded Appalachians directly to the Atlantic than do so today, (b) the Folded Appalachians were once of much lower relief than today, (c) the uplift of the Folded Appalachians in recent geologic time has been intermittent, (d) the northern Folded Appalachians were once covered by the Coastal Plain, (e) the crests of the Folded Appalachians do not connect with the surface beneath the Cretaceous sediments of the Coastal Plain.

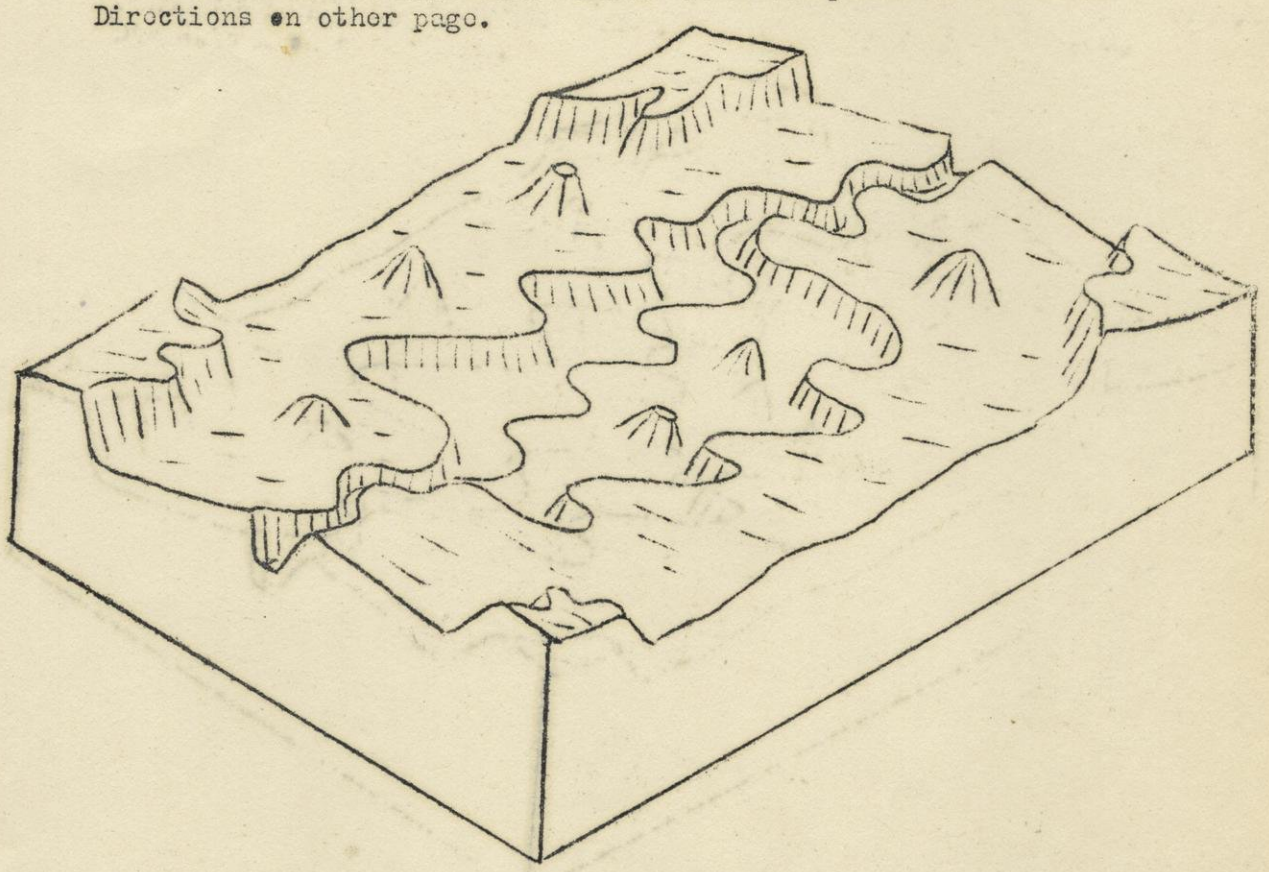
(9) Where and what are: (a) salt domes, (b) Florida Peninsula, (c) Mississippi Embayment, (d) Reelfoot Lake, (e) Long Island

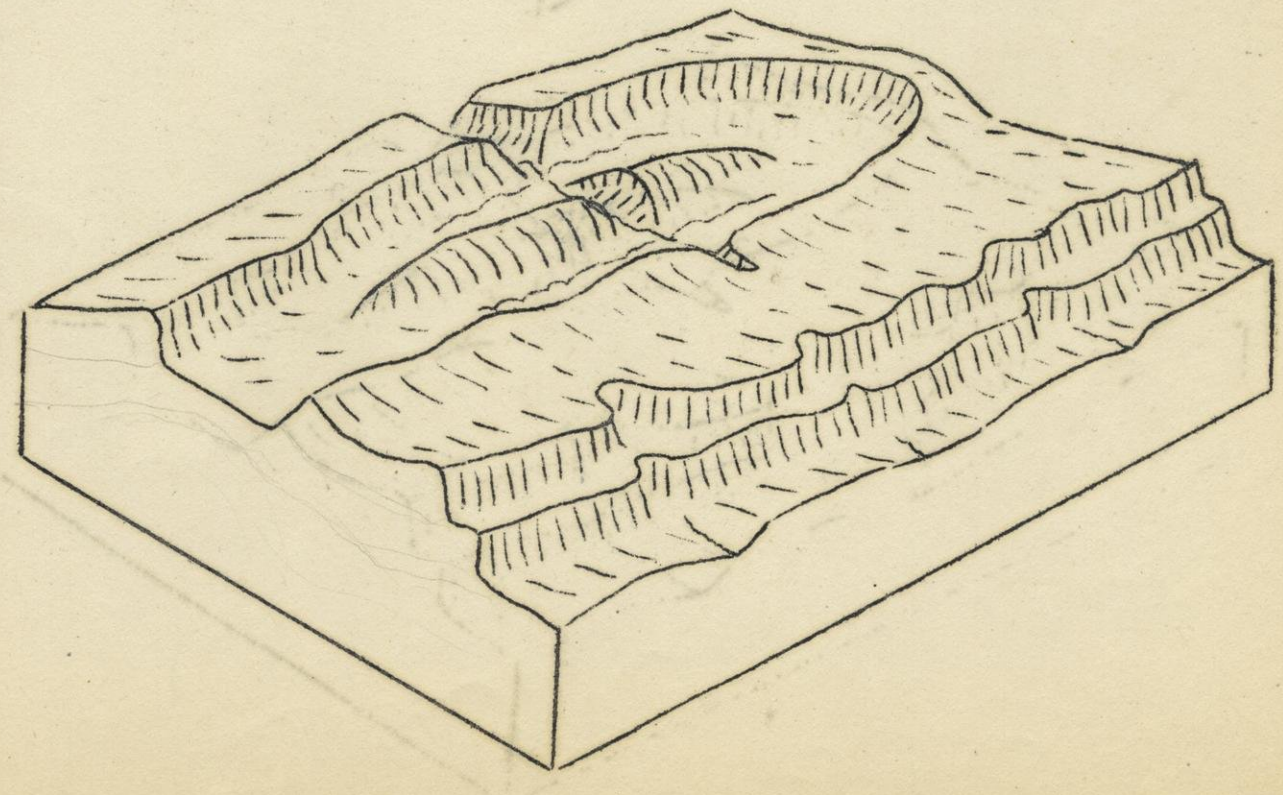
(10) Account for five distinct types of shore features in Coastal Plain and give examples of each.

(11) Discuss four distinct theories of the formation of the youthful valleys of the Appalachian Plateau in New York.

(12). Locate and describe in the Appalachian Plateau examples of: (a) consequent stream, (b) recent stream capture, (c) obsequent stream, (d) subsequent stream, (e) river terraces, (f) entrenched meanders, (g) tributary valley blocked by outwash in main valley, (h) glacial stream diversion, (i) hanging valley, (j) cuesta.

QUESTION NO. 1 If you want a copy to keep there are extras. PLACE YOUR NAME ON THIS SEET FIRST. Fold and place in bluebook. Directions on other page.





GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Final examination, Feb. 2, 1932

Write on ten (10) questions INCLUDING THE FIRST. Remember usual caution about writing on more than required number of questions. PLEASE MARK omitted question on cover of bluebook Extra copies of block diagram question can be obtained if you want to keep them. Grades may be obtained by mail or call Fairchild 1940-R not before Thursday

(1) ON SEPARATE SHEET

(2) Outline with diagrams the steps in the history of the topography of the Adirondacks beginning with the formation of the bed rocks.

(3) What evidences are there of several changes in level of the land during the erosional history of the Folded Appalachians?

(4) Draw a diagrammatic section from west to east across New England showing the main physiographic features and nature of bed rocks.

(5) Account for the form of the coast line in the Coastal Plain.

(6) Account for two distinct kinds of swamps in the Coastal Plain

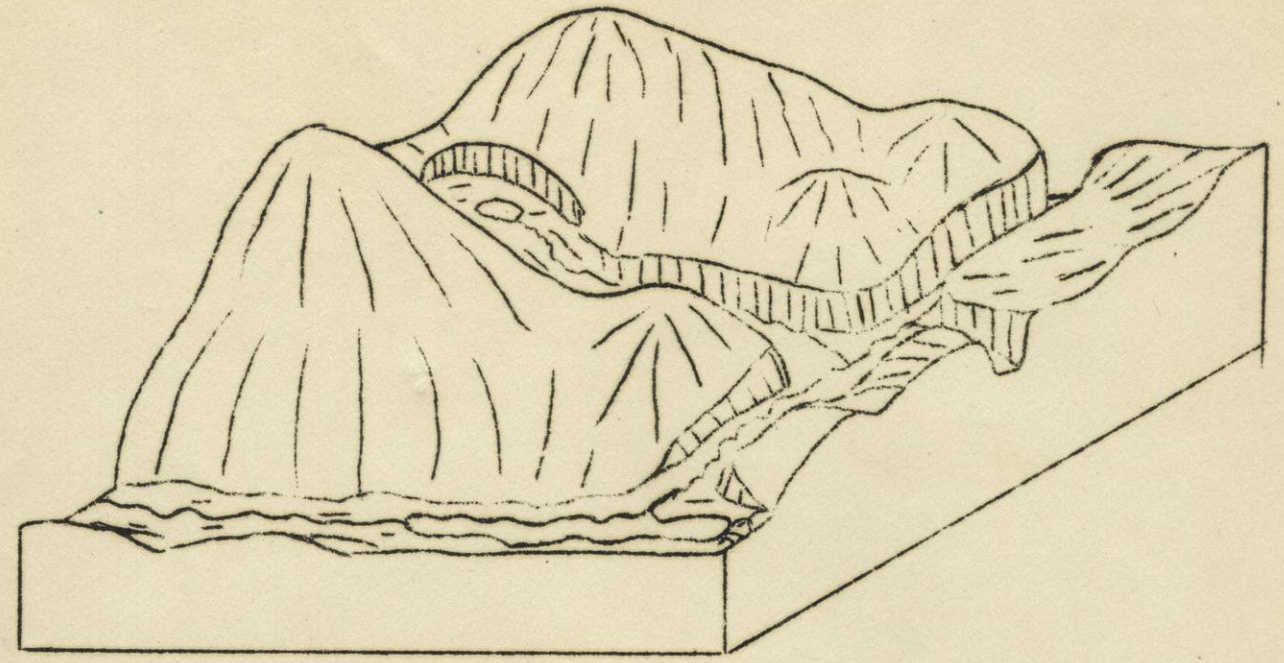
(7) Where and what are: (a) Finger Lakes, (b) Mohawk Valley, (c) Tughill Plateau, (d) Catskill Mountains, (e) Champlain lowland

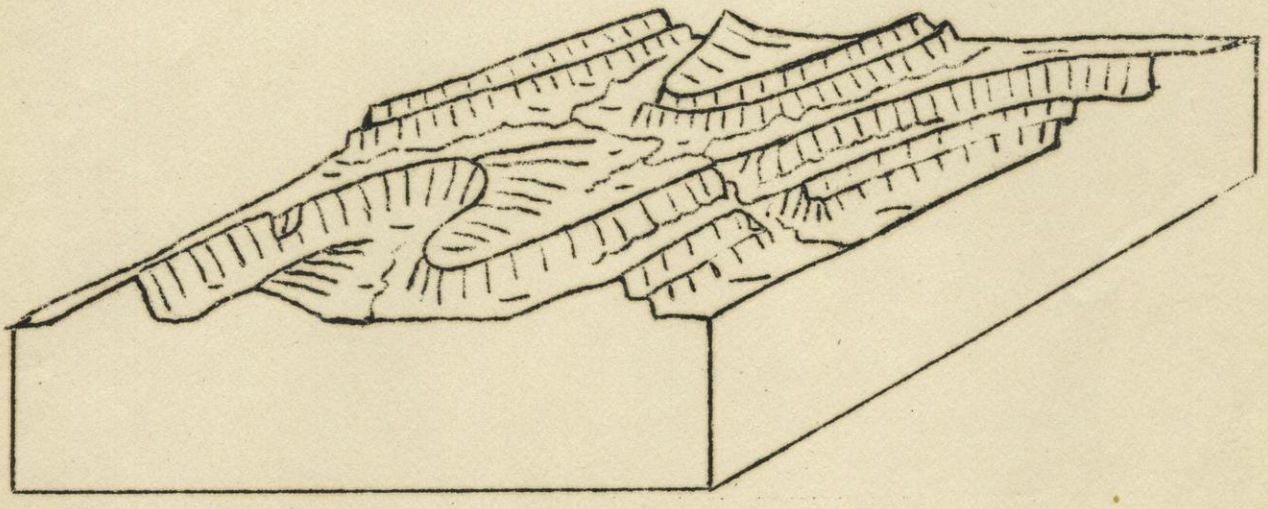
(8) Discuss two possible explanations of the relatively even crests of the mountains in Folded Appalachians.

(9) Outline the physiographic history of the Piedmont citing evidences.

(10) Illustrate by a cross section the characteristic geology and topography of the Osage Plains and locate them.

(11) Where in the field on trips in this course did you see: (a) peneplain on quartzite, (b) folded rocks in Interior Lowland, (c) pitted outwash, (d) glacial lake beach, (e) hogbacks, (f) St. Peter sandstone, (g) bed of lake enclosed by outwash, (h) stream terraces, (i) sand dunes





(1) REQUIRED OF ALL PLEASE write your name here FIRST

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On this sheet finish the edges of the blocks with the simplest explanation of the geology which will account for the topography. Be neat and use common symbols. Explain meaning of symbols on this page.

Now answer in bluebook (a) just how and why you reached your conclusions on the geology,

(b) list the types of physiographic features shown such as drainage pattern, kind of streams, etc.,

(c) tell where in eastern U. S. you would find examples of above conditions.

PLEASE fold this sheet and place it with answers in bluebook.

DO NOT FORGET NAME ON THIS SHEET

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Examination, Dec. 16, 1931

Students taking course for five (5) credits must write on first question and any four (4) others making five (5) questions in all.
Students taking course for three (3) credits must write on five (5) questions selected from the last six (6) questions given.
Anyone writing on more than five questions will be graded on first five written in book except that five credit students omitting first question will be graded C on that.
Please indicate what questions you omitted by marks in proper place on front of blue book.

(1) QUESTION REQUIRED OF ALL FIVE CREDIT STUDENTS; not for others.
Draw ideal cross sections to illustrate:
(a) eroded drift plain
(b) stony terminal moraine
(c) Keweenaw Point
(d) The Knobs and the associated highland and lowland
(e) Niagara Escarpment
Do not attempt block diagrams. Neatness and proper rendering of geological conditions will count.

FIVE CREDIT STUDENTS SELECT FOUR QUESTIONS FROM BELOW: OTHERS SELECT FIVE.
(2) Explain and compare two (2) rival explanations of the level skyline of southern New England

(3) Where and what are in terms of physiographic interpretation:
(a) Green Mountains
(b) Lookout Mountain
(c) Reading Prong
(d) Nantucket
(e) Mount Monadnock

(4) Show by cross sections the underlying geological conditions in:
(a) monoclinal ridge
(b) synclinal ridge
(c) anticlinal ridge
(d) ridge due to thrust fault
(e) salt dome

(5) What evidence indicates that the Coastal Plain sediments once extended much farther inland than they now do?

(6) Account for the relatively recent horizontal abandoned shorelines of the Coastal Plain and its embayments.

(7) Account for the lack of a Coastal Plain off New England.

WISHING EVERYONE A MERRY CHRISTMAS AND A HAPPY NEW YEAR!

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Midsemester examination, Nov. 20, 1931

Write on the first question and any four (4) others making five (5) in all. Please indicate on cover of bluebook which question you omitted. Anyone who writes on more than five questions will be graded on first five written, order in book to determine.

REQUIRED QUESTION

(1) On the block diagram locate exactly the following:

(a) Baraboo Bluffs
(b) Petenwell Peak
(c) Hamilton Mounds
(d) Skunk Hill
(e) Blue Mounds

DO NOT FORGET SECOND PART OF THIS QUESTION

In your bluebook give the physiographic significance of each.

(2) Fill in the geology on the sides of the blocks naming each formation where specific names were used in field.
Show the boundaries between major physiographic provinces.
Mark the terminal moraine.

(3) Where and what are (give physiographic significance and be brief):

(a) Fall Line (in eastern U. S.)
(b) Sand Ridge
(c) Palisades
(d) Pennyroyal Plateau
(e) Dripping Springs escarpment

(4) Outline briefly using diagrams if desired the steps in the physiographic history of the vicinity of Wisconsin Rapids giving where evidences were seen in the field.

(5) Where did you see in the field (do not discuss origin):

(a) mesa
(b) water gap
(c) escarpment of cuesta
(d) terminal moraine
(e) superimposed stream
(f) karst topography
(g) butte
(h) partially exhumed monadnock
(i) buried peneplain
(j) meander scar

(6) Discuss the nature and origin of two (2) of the typographic types found in the old drift area of Illinois

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Examination, Oct. 16, 1931

Write on FIVE (5) questions ONLY. Anyone writing on more than five questions will be graded on first five written in book regardless of their numbers

(1) Account for origin of three (3) distinct types of lake basins which are found in the Laurentian Upland using diagrams.

(2) By means of cross sections illustrate the physiographic history involved in two (2) different theories of the origin of the Lake Superior lowland.

(3) (a) Explain from physiographic standpoint the terms: Young Drift, Old Drifts.
(b) Illustrate by cross sections the principal topographic forms found in one of above areas.

(4) Someone tells you that the ancient mountains of Wisconsin were leveled by glacial erosion. Argue with him using simple terms and diagrams.

(5) Account for the following fact. The bed rocks of eastern Wisconsin and central Illinois are different (state what they are). In spite of the fact that there are virtually no outcrops in either district this difference affects the surface topography which is due to deposits of drift of essentially the same age.

(6) (a) Account for the drainage pattern of the Adirondacks considering glaciation among other factors.
(b) Do the same for the areas of Keweenawan lava flows.

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Final examination, Feb. 2, 1931

Write on ten (10) questions including the first. Grades may be obtained by mail on

(1) Question on separate sheet. QUESTION REQUIRED OF ALL. Answer in bluebook. Fold sheet amd place in bluebook.

(2) (a) Where did local glaciation occur in eastern United States?
(b) How recognized?

(3) Define, bound, and give most important characteristics of five (5) major subdivisions of the Interior Lowland

(4) Draw a cross section from Wausau, Wis. east through Lower Michigan to Ontario. Show the main topographic features with names and show geology which causes them.

(5) (a) What feature forms the boundary line between the Older or Crystalline Appalachians and the province to the southeast of them?
(b) Explain two (2) distinct theories of its origin.

(6) (a) Locate examples in the Appalachians of (1) superimposed and (2) subsequent streams.
(b) Tell how each class is recognized.

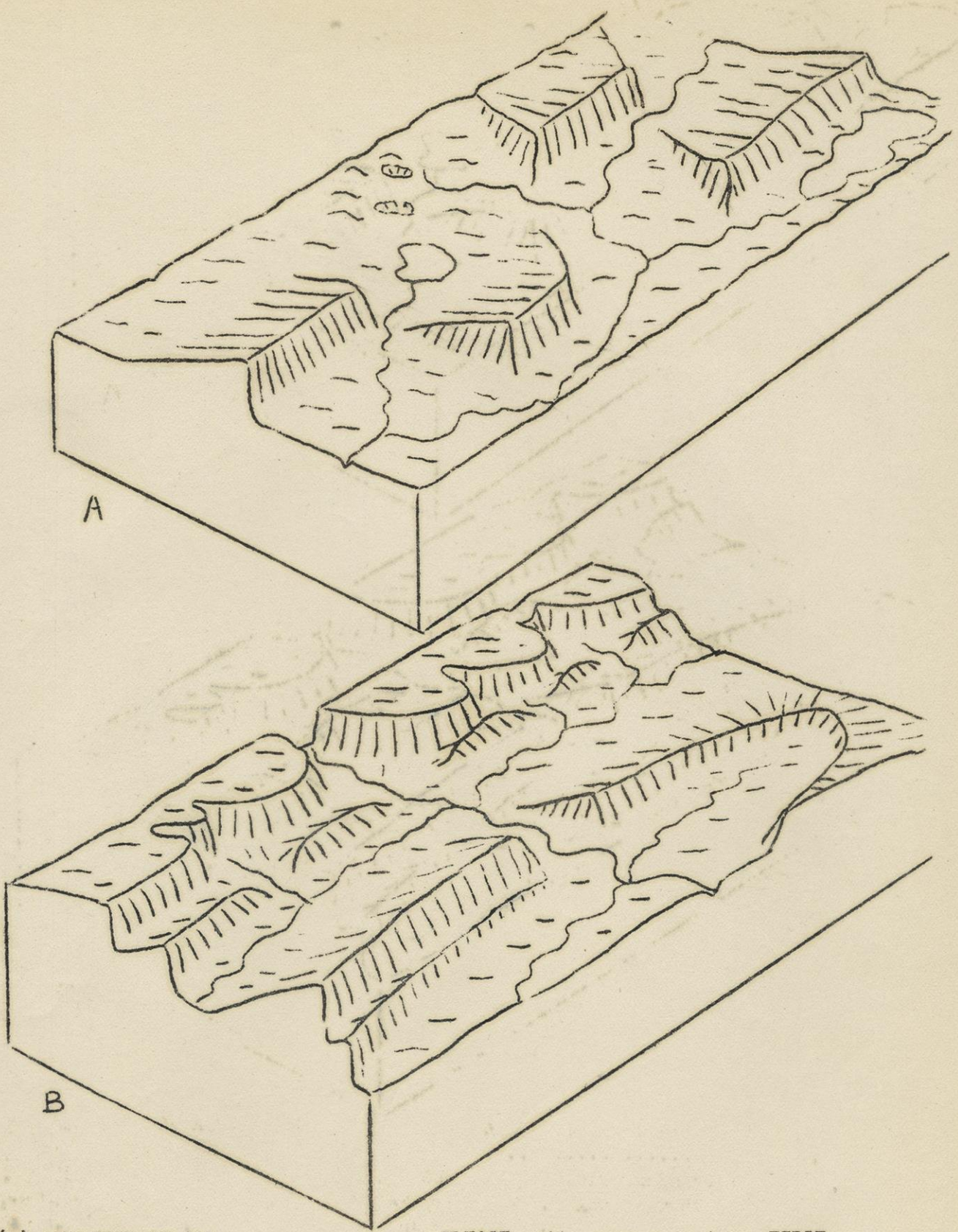
(7) State the field evidence that the last uplift of the Folded or Newer Appalachians has been interrupted at least once.

(8) (a) What is meant in eastern United States by the term "Cretaceous Peneplain" in the older literature?
(b) Discuss modern application of this term.

(9) Where and what is physiographic interpretation of (be brief):
(a) Long Island, (b) Black Belt, (c) Chesapeake Bay,
(d) Tortugas, (e) Allegheny Front, (f) Yazoo Basin,
(g) Finger Lakes, (h) Tughill Plateau, (i) Sequatchie Valley
(j) Walden Ridge.

(10) Why in much of the southeastern United States are the ridges underlain by sandstone and the lowlands by limestone although in Wisconsin the reverse is true?

(11) Discuss two (2) theories which account for the course of Tennessee River near Chattanooga, Tenn.



(1) REQUIRED OF ALL

PLEASE write your name here FIRST

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(a) Fill in on edges of blocks the simplest possible explanation of geol y whic could account for the topography of each block. Answer rest of question n your bluebook. Explain everything you put on blocks.

(b) Tell just why you reached the conclusions and if area has been glac ted.

(c) Where in eastern United States would you find examples of above condi ions?

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Examination, Dec. 12, 1930

Write on any five (5) questions

(1) Discuss fully four (4) theories each of which might account for the present course of Potomac River

(2) Account for the present course of French Broad River

(3) Discuss evidences for and against the theory that the Folded Appalachians were once eroded to a nearly level plain

(4) List the physiographic provinces which adjoin the Folded Appalachians stating where they are in relation to the Folded Appalachians

(5) Account for the shape of the shore line of New England

(6) Discuss two (2) distinct theories to account for the terraces of Connecticut Valley

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Midsemester examination, Nov. 17, 1930

Write on any FIVE (5) questions. Please avoid changing order of questions.

(1) Tabulate the following in columns given: (put in blue book)

Name	Kind of rock	Physiographic term	Origin (one sentence)
(a) Narrows of Narrows Creek	.....		
(b) Hamilton Mounds	.....		
(c) Table Rock	.....		
(d) Mile Bluff	.....		
(e) Blue Mound	.....		

(2) State definitely where each of the following was seen in the field:
(a) Black River Bench
(b) folded Paleozoic rocks
(c) glacial lake bed
(d) pitted outwash
(e) stony terminal moraine

DO NOT DISCUSS ORIGIN OF ANY

(3) Where and what are (be brief):
(a) Blue Ridge (southern part)
(b) Skunk Hill
(c) The Dells
(d) Shawnee Hills
(e) Triassic Lowland

(4) Discuss two (2) separate methods of origin (not the age of) of the flat upland of the Baraboo Bluffs

(5) Discuss fully the significance of the rock exposures at Nekoosa

(6) Give proof that much of the Piedmont Plateau was once overlain by the sediments of the Coastal Plain

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Examination, Oct. 17, 1930

WRITE ON FIVE QUESTIONS (5) only

(1) By means of cross sections show (a) the southern border of the southeastern Adirondacks, (b) the southern border of the Superior Highland

(2) Show by diagrams the kind of topography and drainage system (barring later effects of glaciation) which is normally formed on (a) alternating tilted quartzite and slate, (b) tilted lava flows, (c) massive granite, (d) granite or gneiss shattered along faults. Give also an example of each in the regions thus far considered in this course.

(3) Illustrate by cross sections the characteristic topography of: (a) young stony terminal moraine, (b) pitted outwash plain, (c) old drift plain, (d) drumlins, (e) lake margin on steep original slope.

(4) State answers each in a single sentence- no more will be considered. For each give one line of evidence which alone definitely proves that:

(a) the Superior Highland was once mountainous

(b) local glaciers once existed in the Adirondacks

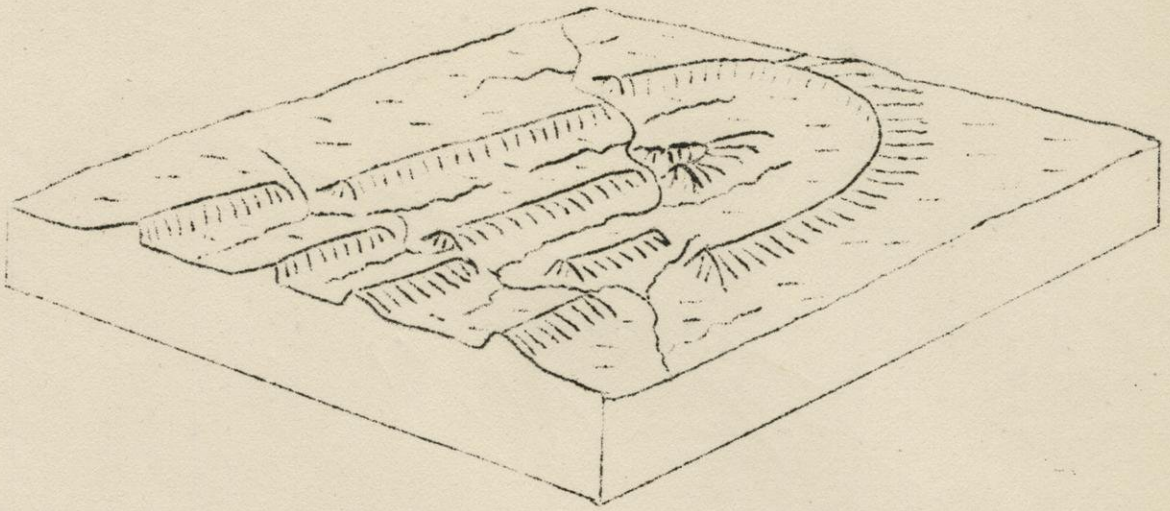
(c) the peneplane of the Superior Highland was developed in pre-Cambrian time

(d) the Wisconsin River near Wausau is a superimposed stream

(5) Account for the difference in topography of the glacial drift in Wisconsin from that of central Illinois (both same age).

(6) Discuss the origin of the Driftless Area including the latest interpretation

Question (1) Required of all. Write your name here FIRST .....



Fill in a plausible interpretation of the geology and structure on the edges and top of this diagram. Describe below on this sheet, NOT IN bluebook, a brief statement of just why you reached these conclusions. Explain everything you put on the diagram.

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES
Final examination, Feb. 4, 1930

Place names on books as ordinarilly done. Grades may be obtained by mail only. Write on ten (10) questions including (1).

(1) Fill in a plausible interpretation of the geology and structure on the edges and top of the block diagram, which is on second sheet, and describe below it on same sheet briefly just why you reached these conclusions. Be sure your NAME IS ON THIS SHEET. Note that this question is required of all.

(2) (a) In what kinds of glacial deposits are lakes abundant? (b) In what age or ages of glacial drift? (c,d) Give specific location of examples of each above.

(3) What significance in terms of erosional history is to be attached to (a) a granite hill with a flat top and (b) a flat-topped hill composed of horizontal dolomite overlying soft sandstone?

(4) Illustrate by a single cross section the structural relations, topography, general character of bed rock, and physiographic provinces along a straight line from Charleston, S. C., to Chicago, Ill.

(5) Discuss three (3) possible explanations of the relatively even summits of the Folded Appalachians, Triassic Lowland, and New England upland.

(6) What drainage pattern is present in the Folded Appalachians and why? Use sketch to illustrate.

(7) Where in New England would you find (a) evidences of local glaciation, (b) drumlins, (c) river terraces, (d) eskers, (e) mountains composed of folded and strongly metamorphosed sediments, (f) faulted trap ridges, (g) coal deposits, (h) superimposed drainage, (i) sandstone bed rock, (j) watergap.

(8) Draw a geologic cross section to illustrate the relations of the Adirondacks to the New England Province. Section need not extend far into latter.

(9) (a) Account for the stony soils of New England. (b) Where else in area thus far studied would you find similar soil conditions?

(10) Describe and account for the narrowing and disappearance of the Coastal Plain toward the northeast.

(11) Why are there valuable harbors in the large bays of the Coastal Plain like Chesapeake Bay and not behind the sand beaches like those off North Carolina?

(12) What and where are (be brief): (a) Finger Lakes, (b) Tughill Plateau, (c) Keweenaw Point, (d) Alleghony Mountains, (e) salt domes, (f) Lake Chicago, (g) Niagara cuesta, (h) Florida Keys, (i) a lake district in unglaciated territory, (j) Sequatchie Valley.

GEOLOGY 130
PHYSIOGRAPHY OF THE UNITED STATES

Examination, Dec. 11, 1929

CAUTION: Please do not write your name on your bluebook but sign it on card which will be sealed until all books have been graded. Please hand in books upside down. This is done to insure fairness to all so far as is possible. Please avoid asking for a second book if possible.

Write on five (5)

(1) By means of a geological cross section show the relations which exist between the Appalachian Plateau, Folded Appalachians, and Older Appalachians. BE SURE TO EXPLAIN FULLY what every symbol and line means not with text but in a legend.

(2) What physiographic features thus far studied retarded the growth of Boston in favor of cities farther to the southwest along the Atlantic coast? Explain fully.

(3) Discuss the rival theories of the course of Tennessee River.

(4) Illustrate by sketches WITH EXPLANITORY LEGENDS (a) monoclinal ridge, (b) synclinal ridge, (c) anticlinal ridge, (d) method by which end of plunging anticline can be told from end of synclinal basin.

(5) Where and what are: (be brief) (a) Walden Ridge, (b) Hudson Highlands, (c) Taconic Mountains, (d) Manhattan Prong, (e) Great Valley

(6) Describe briefly the essential geologic and topographic features of New England which make it a separate physiographic province

GEOLOGY 130

SPECIAL EXAMINATION, DEC. 6, 1929

(1) Illustrate by geological cross section the relations which exist between the Laurentian Upland and the Interior Lowland

(2) Where and what are (be brief)?
(a) Trenton Prong, (b) Blue Ridge, (c) Blue Grass, (e) Lake Chicago, (f) Superior Highland, (d) Great Smoky Mt., (g) Reading Prong, (h) Green Mts., (i) White Mts.

(3) Discuss difference of topographic expression of massive rocks and stratified or banded rocks, latter both gently and steeply inclined.

(4) Illustrate by geological cross section the type of tocks and topography found in the Triassic Lowland

(5) In what areas thus far studied has local glaciation occured? How known?

(6) Discuss the two opposed interpretations of the erosional history of New England

(7) Discuss the two opposed theories of the orign of the terraces of the Connecticut Valley

(8) Explain the topographical effect of normal faulting on a monoclinal ridge.

(9) How is it known that certain rivers are of the superimposed class?

(10) What provinces does New England resemble and why was it made a separate province?

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Midsemester examination, Nov. 15, 1929

Write on any FIVE (5) questions. CAUTION: PLEASE DO NOT PUT YOUR NAME ON YOUR BLUEBOOK but sign it after same number on card which will be passed around as before.

(1) Illustrate by a single cross section the structural relations, topography, and general character of bed rocks of the Older Appalachians, Piedmont Plateau, Triassic Lowland, and Coastal Plain.

(2) Show by a diagram the geologic structure, topography, and geologic formations of the Nashville Basin and adjoining highlands.

(3) Tabulate in form given in example (be brief):

	Name	Geological formation(s)	Physiographic origin
Example	Sheep Pasture Bluff	Dresbach, Franconia	Outlier of Franconia bench surrounded by Dresbach escarpment
(a)	Rabbit Rock		
(b)	Natural Bridge		
(c)	Weidmans Falls		
(d)	School Section Bluff		
(e)	Mosinee Hills		

(4) State definitely where each of the following was seen on field trips:
(a) Peneplain on quartzite, (b) young drift terminal moraine,
(c) Franconia bench, (d) bed of lake formerly enclosed by outwash terrace,
(e) step between two so-called "upland surfaces"

(5) What and where is? Tabulate and be brief using sketches.
(a) Watchung Mountains
(b) [illegible] Gogebic Range
(c) Fall Line
(d) Blue Ridge
(e) Osage Plains

(6) Discuss arguments for and against the interpretation of the uplands of the Driftless Area as dissected peneplains citing examples seen in field.

Geology 130,
Special examination, Oct. 25, 1929

(1) Outline not less than 5 stages in the development of the present topography near Wausau, Wis.

(2) Where in Laurentian Uplands would you find:
(a) cirques
(b) remnants of old peneplain not yet reached by later erosion
(c) a large area which was not reduced to the pre-Cambrianapeneplain
(d) outliers of Paleozoic rocks
(e) fault contact with Paleozoic rocks

(3) State concisely in a single sentence a single line of evidence which definitely proves that:
(a) the Adirondacks had local glaciers after the last continental glaciation
(b) faulting in Adirondacks took place at least in part after deposition of adjacent Paleozoic rocks
(c) Superior Highland was glaciated more than once
(d) Lake Superior basin once overflowed via St. Croix River
(e) pre-Cambrian peneplain of Superior Highland has been tilted sinc e formation

(4) Where on the recent trip did you see in Superior Highland:
(a) area covered by old glaciation
(b) dendritic g drainage pattern
(c) pre-Cambrian residual soil
(d) pre-Cambrian peneplain still covered with Paleozoic rocks
(e) slightly dissected pre-Cambrian penenplain

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Examination, Oct. 18, 1929

Write on all questions. CAUTION: PLEASE DO NOT PUT YOUR NAME ON BLUEBOOK Write your name after same number as that on cover of bluebook on the card. This card will be sealed until after the books have been graded thus insuring fairness to all.

(1) With reference to the Superior Highlands explain the effects on topography of (a) banded and (b) massive rocks telling what kinds of rocks make up each class and where you would find typical examples of each class (a) and (b).

(2) Name and locate (a) area of local glaciation, (b) small area of pre-Cambrian rocks entirely separated from the main area, (c) area of pre-Wisconsin drift, (d) area of pitted outwash plain with lakes, (e) five monadnocks.

(3) State concisely in single sentences a single definite line of evidence, (one for each) which proves that (a) the Laurentian upland was once mountainous (b) it was worn down to a peneplain before Cambrian time, (c) the peneplain around Wausau has been dissected since Cambrian time, (d) glaciation had nothing to do with the destruction of the mountains, (e) water flowed from the glaciers along stream valleys.

(4) Where on the recent trip did you see (locate as specifically as possible): (a) quartzite monadnock, (b) undissected remnants of the pre-Cambrian peneplain. (c) outwash in valley giving also another term for this, (d) bowlders of disintegration, (e) pre-Wisconsin terminal moraine.

(5) Outline the stages in the development of the topography of the Adirondacks

GEOLOGY 130

PHYSIOGRAPHY OF THE UNITED STATES

Field trip, 1937

Bring lunch. Trip will be made regardless of weather unless deep snow. Assemble in front of Science Hall at seven-thirty A. M. sharp. Head south. South on Park Street to Regent. Turn right (west) on U. S. 18. Keep straight ahead on Regent to cemetery. Turn half left on S. Follow S. (west) to STOP 1 at terminal moraine. Continue west on S. one half mile STOP 2 on roadside on Campbells Hill. Continue west to Pine Bluff. Turn left (south) and follow S to Mt. Horeb. Pick up U. S. 18. Follow west to overhead R. R. crossing. Turn right on town road. Sink holes to left. Turn right (north) on F. STOP 3 at top of hill. Continue north on F one half mile. STOP 4 at top of hill to north. CAUTION for curve. Continue north down into valley. STOP 5 at Deneen School. Climb bluff opposite. Continue on F down valley. Leave F by keeping straight ahead. CAUTION for sharp right turn just after crossing creek from left. Pick up K. STOP 6 on sandy road half mile south of Dover School. Continue to U. S. 14 and turn left west on pavement. STOP 7 on sand dune in Arena. Continue to Tower Hill State Park. Turn right, north, into park and leave cars in parking ground. STOP 8. Lunch here after inspecting bluff. Return to U. S. 14 and continue through Spring Green. Pick up 23 and go north. STOPS 9 and 10 on hill-CAUTION in parking. Continue north to Plain. Keep ahead on Main Street, east on B leaving 23, continue to junction with C. Thence left (N) on C to P F. Leave P F at top of hill near school house and keep left, right, then left to sign, "stop-see the waterfall." Keep ahead into gate. Stop at home to pay admission (5 cents) and ask about road which is dangerous in wet weather. STOP 11 at Weidman Falls. Return north and west on gravel road. Then turn right (north) at church. STOP 12 on highest part of road near conglomerate pit. Keep with county road. STOP 13 at church. Walk south a short distance to corner. Turn left (north) and keep on north leaving county road . CAUTION for steep hill down to Narrows Creek. Turn right (east) on 154 just north of bridge. STOP 14 at school house. If weather is dry keep straight ahead leaving state road. Turn right(south) then left (east) around house and over bluff to top of quarry. Sign "Danger-blasting," but quarry is closed. STOP 15 walk to edge of quarry. CAUTION in parking on narrowroad. Some cars will go below the house. (If we ~~t~~ follow highway to Ableman, north on 136 into gorge - turn around and go back.) Continue into Ableman and pick up 136. Follow east to sign to North Freedom. Turn right (south) into North Freedom. Keep straight through North Freedom. Go south on gravel road keeping ahead across Seeley Creek. Ascend Baraboo Bluff STOP 16 to see terrace. Continue to second corners on highest point of Bluff. STOP 17. Continue ahead (south) across tops of bluffs and down south side. Pick up gravel road. At foot of hill turn left (east) on gravel. Keep ahead into C. Follow C east to U. S. 12. Turn right (south) and follow to Madison.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES
Review questions, first semester, 1945-46

These questions are for review study. Many have been used in former examinations; future examinations may be taken from them although the wording will probably be different. Use wall maps in studying them!

QUESTIONS for majors and graduates in GEOLOGY or GEOGRAPHY

1. Discuss origin of both uplands and terraces on Baraboo quartzite.
2. Discuss the several theories of origin of uplands of Driftless Section outside the Baraboo Range.
3. Explain the several processes which formed the basins of the Great Lakes.
4. Describe structure and physiographic history of Arbuckle and Wichita Mts.
5. Discuss the several theories of origin of the Carolina "bays".
6. Describe and account for the several types of topography found on the Baraboo quartzite and give localities where each was seen in field.
7. Discuss points for and against four distinct origins of water gaps.
8. Discuss points for and against five different hypotheses to explain the Blue Ridge escarpment.
9. Discuss evidences of former peneplains which exist after uplift and erosion with comments on validity.
10. Discuss the problem of peneplain "stairways".
11. Compare appliciability of evidence of peneplains in folded and horizontal bed rocks.
12. Discuss relative merits of different explanations of course of Tennessee R.
13. Discuss stream piracy and stream adjustment including effects of underground drainage.
14. Describe entrenched meanders comparing them with floodplain meanders; discuss significance of meanders in general.
15. Explain by diagrams the topographic effects of faulting on ridge formed by a single inclined resistant layer.
16. Discuss the several explanations offered for the New England upland.
17. Discuss theories of the Connecticut Valley terraces.
18. Discuss the hypothesis that remnants of many partial peneplains may be distinguished in Ridge and Valley and New England provinces.
19. Discuss problems of origin, discrimination, and age of Coastal terraces.
20. Discuss the several hypotheses of origin of Finger Lake type valleys.
21. Outline in parallel columns in proper order the FACTS and INTERPRETAIONS based on each which demonstrate the physiographic history of any specific locality visited on field trips or studied in class or laboratory.
22. Discuss explanations of the scarcity of recessional moraines in eastern U.S.
23. Discuss erosion surfaces of Piedmont Plateau compared with both surface beneath Coastal Plain and summit of Blue Ridge.
24. Explain origin of limestone caverns including that of natural bridges and other surface effects.
25. Discuss the problem of attaching geologic dates to erosion surfaces.
26. Discuss origin of submarine canyons and river channels.

QUESTIONS for non-majors

1. Be able to define in simple terms all of the provinces studied.
2. Be able to describe the boundaries of each province in terms of escarpments, geological boundaries, etc.
3. List and describe characteristic topography of each bed rock formation and Pleistocene deposit seen on field trip.
4. Explain "constructional" and "destructional" land forms giving examples.
5. Explain difference between Driftless Area and Driftless Section.
6. What kinds of drift occur in Driftless Section? in Driftless Area?
7. Describe evidence of former high levels of Great Lakes.
8. Give evidence of postglacial uplift in Great Lakes region.

9. Discuss the different outlets from the Great Lakes and their record at Niagara Falls.
10. Explain and give examples of cuesta, hogback, vale (inner lowland), escarpment, endmoraine, interlobate moraince, drumlins, outwash, etc.
11. Explain origin and give examples of consequent, subsequent, superimposed, antecedent, obsequent streams.
12. Account for the courses of major streams of Osage Section.
13. Locate examples and describe effect of wind on topography of Central Lowland.
14. Discuss variation of texture of drainage giving examples.
15. Describe and account for more than one type of falls and rapids in Driftless Section.
16. Describe and account for differences between topography of Great Lakes and Till Plains sections.
17. What evidences demonstrate glacial erosion of bed rock in Central Lowland?
18. What evidence shows tilting of earth's crust in NE U. S.?
19. Describe and account for the several types of land forms of southern Till Plains.
20. Classify the typical land forms of Central Lowland into constructional and erosional (destructional) giving eample of each. Same for Superior Upland.
21. Locate and account for the Coteau des Prairies.
22. Classify bed rocks of Superior Upland according to their effect on topography, describe land forms on each giving examples.
23. Classify the different kinds of lakes according to origin found in any provinces studies giving example of each.
24. Descibe the physiographic history of Baraboo range stating where evidence of each step is found; same for Superior Upland.
25. Describe effects of glaciation on topography of Central Lowand including Driftless Section; same for Superior Upland.
26. Outline steps in physiographic history of Coastal Plain giving proofs of each step.
27. Classify according to origin the shore features of Coastal Plain giving an example of each.
28. Locate and account for land forms of Coastal Plain due to different processes, including stream erosion, submergence, earthquakes, intrusions, solution, coral growth, uplift, etc.
29. Outline the physiographic history of Piedmont Plateau giving evidence of each step.
30. What explanations could account for the observed drainage patterns of the Piedmont Plateau giving their distribution.
31. Account for direction, pattern, and texture of drainage of southern part of Blue Ridge province.
32. Account for the fine texture of soil erosion gullies in Blue Ridge.
33. What evidence indicated instability of divide between Mississippi and Atlantic drainage in southern Blue Ridge?
34. Account for the difference in level of surface around headwaters of Blue Ridge streams and Piedmont Plateau.
35. Compare the topography of two major divisions of Piedmont which are based on difference in bed rocks.
36. List and account for different types of land forms in Piedmont Plateau.
37. Name several of the resistant types of bed rock which make the ridges of the Ridge and Valley Province.
38. Show with diagrams the topographic criteria of pitching anticlines, and synclines; be prepared to place structure on block diagrams.
39. Explain with diagrams structural phenomena of Ridge and Valley such as anticline, anticlinal mountain, syncline, synclinal mountain, monocline, monoclinal mountain, thrust fault, normal fault, window, pitch of fold.
40. Outline the simplest explanation of Physiographic history of Ridge and Valley province; what complications do some insert in this history?
41. Explain origin and significance (more than one theory of even ridge crests in Ridge and Valley province.

42. Account for the drainage system and drainage pattern of Ridge and Valley.
43. Compare the problem of finding records in topography of past uplifts in Ridge and Valley and in Appalachian Plateau provinces.
44. Explain why the Appalachian Plateau averages higher elevation than that of Ridge and Valley province.
45. Account for preservation of weak rocks on some of highest elevations of Appalachian Plateaus.
46. Account for the high elevation and drainage of Catskill Mountains.
47. What effect did glaciation have on topography of Allegheny Plateau (a) within glaciated area and (b) outside glaciated area?
48. What relation does Appalachian Plateau have to rock character and structure?
49. State evidence for and against regional peneplaination of Appalachian Plateau considering different sections.
50. Locate examples in Appalachian Plateaus of glacial deposition, glacial erosion, stream capture, anticlinal mountain, anticlinal valley, sink holes through sandstone, sandstone escarpment, limestone escarpment, hanging valley, ridge along thrust fault, monoclinal ridge, subsequent valley, cuesta, entrenched meander, lake due to glacial outwash blocking, stream diversion due to glaciation, etc.
51. Explain the theory of regional superposition of drainage in eastern U. S.
52. Discuss evidences of regional peneplaination of Ridge and Valley stating which of them are positive proof of such.
53. Contrast processes which made the coast line in (a) eastern Florida and (b) Mississippi Delta.
54. Discuss Mohawk Valley as to origin, bed rocks, and glacial phenomena.
55. Discuss Tughill Plateau as to origin, bed rocks, and glacial phenomena.
56. Why is New England not included with other hard rock provinces to the SW?
57. Account for the stony soils of New England comparing them with soils of Superior Upland.
58. Locate examples in New England of local (alpine) glaciation, drumlins, ice-contact terraces, stream-cut terraces, ridges due to trap rock, superimposed stream valley, eskers, granite mountains, monadnock, limestone (marble) valley, Triassic rocks, glacial lake bed, etc.
59. Describe and account for form of shoreline of New England.
60. Account for Long Island, Nantucket, Marthas Vineyard, Cape Cod, Georges Ban, Gulf of Maine including geologic history during Pleistocene.
61. List and account for characteristic land forms found in each of provinces studied.
62. Discuss geology, structure, and topography of the principal mountain districts of New England.
63. Discuss geology, structure and erosional history of Reading Prong.
64. Explain various methods or manners of glacial retreat as shown in eastern U. S., i.e. normal, stagnation, constant melting.
65. Describe evidence of local or alpine glaciers in eastern U. S.
66. Compare different explanations of the summit levels of Adirondacks.
67. Describe and account for drainage pattern of Adirondacks.
68. Discuss glacial history of Adirondacks.
69. Discuss geology and topography of St. Lawrence Valley in U. S.
70. Account for the rectangular valleys of SE Adirondacks.
71. Account for valley of Black River on NW side of Adirondacks.
72. Outline physiographic history of any province thus far studied.
73. Describe outlines of mountains of Adirondacks comparing them with Blue Ridge mountains. Account for observed forms.
74. Locate and example each in Adirondacks of fault line scarp, marginal ice drainage, glacial lake, outwash, local glacier, falls, valley along fault line, nunatak.
75. Illustrate topography of Interior Low Plateau by a section E-W through Nashville Dome. Show geological formations which determine topography.
76. Explain why Interior Low Plateau was separated from adjacent provinces.

77. Discuss each section of Interior Low Plateau using a cross section which shows important geological formations.
78. Discuss distribution and topographic effects of limestone solution in Interior Low Plateau; compare with Ridge and Valley.
79. Discuss erosion cycle as developed in limestone including last stages.
80. Explain effects of continental glaciation on topography of Interior Low Plateau.
81. Discuss distribution and significance of entrenched meanders in both Interior Low Plateau and other provinces.
82. Be prepared to complete sentences giving the proof of each statment such as: The land (at a given point on marine sediments) has been uplifted at least so many feet; The Superior Upland was reduced to a peneplain before---; New England Upland may be regarded as a peneplain because-; Even skylines are poor proof of former peneplains because, etc. etc. etc.
83. Be prepared to locate and explain examples of various land forms found in any province thus far studied.
84. Give geological nature of and account for origin of any of the well-known features studied in class or on field trip such as Rib Mountain, Reading Prong, Narrows of Narrows Creek, Teays' Valley, etc. etc. etc. Localities will be chosen because they illustrate a particular process.
85. Be prepared to illustrate relation of any province to its neighbor at a given point by means of a topographic-geologic cross section, example, the overlap of the soft rocks of Central Lowland onto the hard rocks of Superior Upland, major escarpments, etc. etc.etc.
86. Account for Crowleys Ridge and associated drainage phenomena.
87. Justify a proposed change in location of west border of Superior Upland.
88. Justify a proposed change in southern border of Driftless Section.
89. Account for course of Yazoo River and other similar phenomena.
90. Compare shoreline of Embayed Section of Coastal Plain with that of other sections.
91. Name, describe and locate an example of several different types of glacial and meltwater depositional topography in any province.
92. Describe and locate examples of glacial erosional topography in any province
93. Be prepared to give brief summaries of geology and topography of any section of any province.
94. Contrast topography and land forms of Driftless Area with that of adjacent glaciated region.
95. Account for the definite boundary of Driftless Section on E. side.
96. What significane on erosional history has the presence of fresh water to considerable depths below sea level in Coastal Plain?
97. Compare topography of areas of Wisconsin drift with those of older glaciations; include soils.
98. Discuss problem of separation of Triassic Lowland as a separate province.
99. Discuss problem of placing the boundary of Coastal Plain in Texas.
100. Discuss origin of wind gaps (more than one method).

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Laboratory directions, edition 1945-46 Central Lowland, East of Mississippi River

5 credit students are expected to put in at least 4 hours a week in laboratory work. It is essential to set aside a definite time to do this so that it will be done on time and not put off until it is too late. Completion dates for reports must be adhered to (see calendar). Late reports not excused in advance may be denied any credit. Ordinarily all work should be done in Room 206 or 207. Do not remove maps from these rooms without permission of instructor in advance otherwise someone else may be prevented from working. On leaving the work when you finish plese put the maps into a neat pile. This will also prevent loss of articles which get concealed under the maps. Do not forget the map of the U. S. which is given to each student and keep it up to date with features to be shown and locations of small maps. It may be called in for inspection at any time. These maps may be left in a drawer in 206 or in 207 both at your own risk. Rolled maps may be found on the tables. Plese do not remove them from the room at any time. Consult references in books in library. Folios may be taken to laboratory for period you work only. Please return them promptly. Relief models may be consulted in halls. Maps do not have to be studied in the order here given. Keep rough notes in pencil so as to avoid damage to maps from leaky pens. Completed reports should be on ordinary 8½" X 11" paper either in ink or typed. Hand these in in folders for paper clips are a nusiance. Colored diagrams help greatly if the work is neatly done. Cross sections may be drawn with aid of ruler only. Do not exaggerate scale to a misleading extent. 5 to 10 times horizontal is enough and some should not be exaggerated at all.

General. Place on your map of U. S. : (a) location of every small map used with key in margin, (b) boundaries of provinces and sections as shown in text except for a few suggested changes, (c) Niagara Escarpment, (d) Prairie du Chien (Magnesian) Escarpment, (e) Traverse-Dundee (Onondaga) Escarpment (f) lake plains adjacent to modern Great Lakes including basins of Lake Oshkosh and Lake Wisconsin, (g) actual boundary of unglaciated portion of Driftless Section.

Great Lakes Section

Urbana, Ill. See model in hall.
Account for Yankee Ridge drawing an E-W cross section. Do not exaggerate vertical scale too much. How do you know that most of the streams have eroded postglacial valleys? See text, pp. 512-515.

Oconomowoc, Wis. See map of Quaternary geology of SE Wisconsin.
Draw and E-W cross section of Lapham Hill with same vertical scale as for Yankee Ridge on Urbana, Ill. Explain difference. Lapham Hill is part of what? See p. 477. What are the flat areas around the lakes? What are oval hills in SE corner of map? Draw cross section through one of the lakes except Pewaukee using smae vertical scale as before.

South Haven, Mich.
Note two stages in formation of the dunes (class notes). Compare with topography of a terminal moraine or interlobate moraine. Why are the Michigan dunes so much bigger than those of Wisconsin-Illinois side of Lake Michigan?

Calumet City, Ill.
What features record higher lake levels than the present? Illustrate by a cross section reducing horizontal scale one half; Vertical 1"= 160'

Sun Prairie, Wis. Describe the oval hills. Note variations in their shapes such as double and triple forms, offset drumlins, more than one crest in line, etc. Use map of Quaternary geology of SE Wisconsin to find evidence of moraines. How do contours display these?

Niagara River and vicinity, N. Y. See Folio 190 and read legend on back of map. See also large scale map of gorge. Account for the falls. What evidence shows that there was an interglacial Niagara Falls? How did this affect erosion of present gorge? Where are the two narrow places formed when water from upper lakes did not come through Lake Erie? pp. 495, 499

Till Plains Section

Belleville, Ill., areal geology. See Folio 195 and Illinois Geol. Survey Rept. of Investigations 19, part 1. What was nature of original surface of the drift and why? What has happened since? What is cause of the hills which rose above original surface? List the different types of topography which MacClintock discriminated which are present in area of map. Account for flat floors of larger valleys. Compare evidences of widening with those of filling. See pp. 507-511

Driftless Section

Kendall, Wis. Note the two distinct summit levels and the flat plain of NE corner and account for them. Illustrate by cross section.

Galena, Ill. Folio 200. See pp. 522-525 Draw a cross section to show the "two story" topography. What two explantions have been given of its cause ?

SUMMARY. Finish final copy of your summary outside of regular la b. hours. In it do not copy the questions as such. Do not copy material from text or other sources. Be brief and stick to essentials. Make answers to questions explicit, not just yes or no. After the answers to the questions (give name of each map) write a general summary NOT OVER FOUR PAGES LONG on following outline. Tabulate data where possible. No credit for more than 4 pages.

Definition. Be brief and stick mainly to facts. Give any alternative names

Boundaries. Include boundaries of sections. Do not just give names of adjoining provinces or sections but state what boundary consists of such as difference in elevation or geology.

Geology. Kind of rock is more important than age; give column if possible.

Topography. Stick to facts which can be seen in field. Include statment of both local relief and elevations above sea level. In some provinces data on both geology and topography may be combined in a single table.

History of the present topography. This is the interpretation of facts to demonstrate why the present surface exists. Explain fully and clearly every essential step in development. Use diagrams if they will help but BE SURE you mention them in your discussion. They are not separate stunts. Make diagrams clear and neat. Colors help if neatly done. For this province you may defer the peneplain controversy to your field trip report. Where there are debatable conclusions the diffent views should be mentioned even if very briefly giving some statement of the evidence which supports each.

END

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES
Central Lowland west of Mississippi River, Laboratory
Edition of 1945-46

Place on your map of United States: (a) limits of province and sections using geological map of Minnesota to revise northeastern boundary to exclude a large area of drift-covered pre-Cambrian rock, (b) border of unglaciated area, (c) areas of pre-Cambrian bed rock still left in province, (d) name, Flint Hills, (e) name Niagara escarpment with outline in Iowa, (f) limits of Lake Agassiz (p. 580), (g) quadrangle maps with key to names.

Western Young Drift Section

St. Paul, Minn (geological). Account for difference in size of Mississippi gorge above and below Ft. Snelling (p. 585). Compare topography of red and gray drifts. In what types of glacial deposits do you find lakes? Account for lakes in flood plain.

Boone, Iowa. What was original topography just after glaciation? How known? Why is valley of Des Moines River so deep and why so few and short tributary valleys? (p. 584) Illustrate topography by a section of uneroded part about two miles long.

Wall map (rolled) of outlet of Lake Agassiz. Use also glacial map and see pp. 579-583. How do the contours show beaches? Why are they at several different levels. What happens to them farther north than this map? Account for the lakes in the outlet valley and for Cottonwood Slough valley.

Dissected Till Plains Section.

Milo, Iowa. See glacial map on wall. What is geologic age of surface drift?, What was topography immediately after glaciation? How known? In what stage of erosion cycle is the area now? Account for flat floors of main valleys. Illustrate topography by a cross section about 4 miles long including both a remant of original surface and a flat valley floor. Use same vertical scale as with Boone, Iowa.

Smithville, Missouri. Compare original topography before postglacial erosion with that of Milo, Iowa and account for difference.

Osage Section

Foraker, Oklahoma. Geological map of Oklahoma. Account for the escarpment in NE corner and illustrate by a cross section through it. Show the hard layer in the section (geology students also show names of formations).

Tishomingo, Indian Territory (Oklahoma) and geological map of Arbuckles (rolled) See Folio 98. Read parts which will help on pp. 1, 2, 6, 7. Locate and account for the hogbacks near Nebo and Sylvan. What term is applied to the level granite areas? When was most of the erosion of the uplift done ? See class notes and sections A-A' and E-E'

Geological map of Kansas. Account for the east-facing escarpments. Why is western boundary of Central Lowland located where it is? (p. 606).

Summary of province on outline given before. Include in your discussion of boundaries the reasons for changing the limits to northeast. Be sure you discuss any special problems in proper place, not separately at end.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Laboratory questions-Superior Upland- edition of 1945-46

Wausau, Wisconsin.
See also geological map and relief map of Wisconsin, text p. 540; Wisconsin Geol. Survey Bulls. 16, pp. 592-600, 36, pp. 369-375. What evidences found on these maps prove that this area was once mountainous? What evidence found on topographic map demonstratesthat these mountains were eroded to a peneplain? Where do you now find remnants of this peneplain which have not been subsequently eroded? How deep are the vallyes eroded into the peneplain allowing 100 feet for outwash in main vallyes? What are the usual proofs of glaciation of a given area? If you went into the field near Wausau would you find it as easy to use these?as around Madison?

H oughton and Calumet, Michigan
Text pp. 543-544. Map mounted on cloth from Prof. Paper 154. Geological map of Lake Superior Region, 1935. Map of structure of Lake Superior Region. Make a small sketch without too much exaggeration of vertical scale showing geologic structure of Keweenaw Peninsula. Account for the escarpment just west of Lake Linden. Follow it across all the maps. Why not as well marked everywhere? Why do rocks northwest of the escarpment make hogbacks? Locate definitely a good example of one. Account for the valley across the ridge which forms the present water route across the peninsula. Use map of glacial lakes to locate the highest glacial lake shoreline. How does land below this level differ in topography from that above? What is origin of Wheal Kate?

Brainerd, Minn. See glacial map of U. S. also text pp. 544-551
Would this map be in Superior Upland if we followed Fenneman's tentative boundary? Account for topography in (a) area SE of Brainerd, (b) NW part of map, and (c) NE of Woodrow.

Superior and Duluth, Wis- Minnesota. Text pp. 551-552 and other maps of Lake Superior Region. Draw a sketch cross section to show geologic structure of this portion of the Lake basin. Account for the escarpments both northwest and southeast of the lowland at Superior. Account for (a) Minnesota Point, (b) Manitou Falls, (c) valley of Nemadji River, (d) level land at Superior, (e) curves in state boundary as here given. See map of harbor. What evidence demonstrates tilting of the land since glaciation? What evidence demonstates how high the waters of the glacial lake rose upon the land? Give maximum level of Lake Duluthm in this part.

Wall map of bottom of Lake Superior. See other maps of the region. Account for the plateau on which Apostle Islands lie. What is significance of the peculiar topography of the east half of Lake Superior?

Wealthwood, Minn.
Account for the ridges on the NE shore of the lake. Have you seen any on the shores of the Madison lakes? If so where?

Summary. In placing the boundary of Superior Upland on you map follow the revised location in Minnesota and NW. Wisconsin. Show also (a) area underlain by Lake Superior sandstone in dota, (b) area submerged by Lake Duluth (Keweenaw Point west), (c) Wisconsin terminal moraine, (d) border of drift outside of moraine once thought to be old. In proper places discuss why the boundary was revised and compare topography of massive, banded and soft bed rocks. Also discuss difficulty of locating province boundary as well as origin of Lake Superior basin.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Laboraotry questions, Coastal Plain, edition 1945-46

Embayed Section.
Camp Mills, N. Y. Roll map of Long Island
Read the parts of legend on back of unmounted copy which apply. Account for (a) the two moraines, (b) pitted outwash between the moraines near Old Westbury, (c) plain south of outer moraine, (d) bays on N. shore (text pp. 19-21), (e) Long Beach, (f) swamp inside of Long Beach. Draw a sketch simplified from that in text showing (a) Cretaceous cuesta, (b) moraines, (c) outwash plains.

Sandy Hook, New Jersey, block diagram, and geological map.
Account for the highlands of Navesink and for the shape of Sandy Hook

Ocean City, Md.-Del. Account for (a) the form and location of the beach, (b) dotted areas on beach, (c) processes now going on in lagoons. In what direction did sea level last change or did land move?

Choptank, Md. Geological edition and Folio 182. Text pp. 24-34.
List in proper order the steps in physiographic history which are shown by evidence on this map only.

East Gulf Plain section.
Vicksburg, Miss. To what sectic oes the west half belong? Considering the "cycle of erosion" to what stages do the east and west parts of map belong? What difficulty in making the comparison? Account for junction of Yazoo and Mississippi Rivers here instead of farther north. (Text p. 91). Account for stategic importance of Vicksburg during the Civil War. Account for Centennial Lake. What does the name suggest as to its age. Note attempt to cut off this bend during the Civil War.

Sea Island section.
Aiken, S. C.
Find underlying formations as shown on geological map of U. S. In what division of the section is this map. Suggest possible modes of origin for the depressions on the upland. Account for flat valley floors. In what part of cycle of erosion is this area?

Florida section.
Tsala Apopka, Florida. See text p. 47. Account for (a) the very rough topography of the western part of map and (b) the more level NE part.

Mississippi alluvial plain section.
Reelfoot Lake, Tenn. Text pp. 85-87
Account for (a) the lake, (b) high area north of Tiptonville, (c) greater effect of earthquake on the floodplain than on adjacent uplands.

West Gulf Plain section
Eldorado, Ark. Text pp. 100-109 What are underlying formations? In what stage of erosion cycle is this area? Account for flat swampy valley bottoms, Find what subdivision of section is shown here.

Addicks, Tex. Text pp. 112-114 What is underlying formation? What is the subdivision of the section? What atage in cycle of erosion? Suggest possible modes of origin of the depressions. Note the contour interval.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Laboratory questions, Piedmont Plateau, Edition, 1945-46

Gastonia, N. C.
Find from geological map of U. S. the different kinds of bed rock in this area. What does nature of bed rock show as to original topography? What features of the map suggest that this area was a peneplain prior to the last uplift? Give two possible explnations of the dendritic drainage. Find some s treams which appear to have had their courses influenced by nature of rock. Name them. Draw a cross section of part of the area to show relation of present valleys to restored peneplain surface.

Elkton-Wilmington Folio No. 211.
Read sections on Physiographic Divisions, Surface Features and Geologic history which apply to the Piedmont. Study cross section on p. 15 of folio (note errors in its legend and make proper correction). Then compare slope in feet per mile of (a) surface beneath Coastal Plain and (b) exposed upland of the Piedmont. Explain reason for difference.(text p. 126)

Warm Springs, Ga. and geological map of Georgia.
Find the geological formations. Account for the mountains and for course of Flint River. Account for the occurence of patches of unmapped Tertiary gravel on the summits of the mountains. Do you find evidence of an upland peneplain at lower levels? Explain.

Dadeville, Ala.
Find bed rock formations of this area. What is its relation to the Fall Line? Account for course of Tallapoosa River and for the drainage pattern. Do you find evidence of a Piedmont peneplain? Explain.

Talking Rock, Ga. and geological map of Georgia.
Text plate III shows physiographic provinces here present. What relation do the boundaries between them have to bed rock geology? What are the bed rock formations? How do they affect topography? Name a notable instance of this. Account for the entrenched meanders and for the steep valley sides. Text p. 134. What eivdence suggests a former peneplain ?

Passiac N.J.-N.Y. block diagram and geologic map of N. J.; Folio 157.
See also text pp. 145-152.
What significance is attached to the straight border of the hills in NW corner? What evidence is appealed to in order to demonstrate a former peneplain whose level was that of the ridge tops? What geological significance is attached to name of the village of Short Hills? Account for the gaps in some of the ridges of diabase and for the lack of streams in some of them . Draw a cross section showing bed rock geology obtaining data from section on geological map of N. J.

Summary. In you summary discuss in proper places(use former outline) (a) reasons for and against making the New Jersey area of Triassic a separate physiographic province, (b) three possible methods of origin of the relatively even upland of the Piedmont, and (c) evidence of burial of the entire area by the sediments of the Coastal Plain. Place on map of U. S. (a) areas of Triassic rocks, (b) name Trenton Prong, (c) terminal moraine, and (d) border of glaciated area.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Laboratory questions, Blue Ridge, Edition 1945-46

Refer to geological map of U. S. and to maps of such states as are available. Folios can be consulted in library or drawn for duration of period only. Air views of the Blue Ridge are found in Geogr. Review, 29: 565, figs. 7, 8.

Pisgah, NC-SC See Folio 147
Note difference in level of the French Borad ans South Saluda valleys and account for it. What is the drainage pattern? What evidence can you find of past drainage changes? Why did they occur?

Mt. Mitchell, NC-Tenn. See Folio 124
Mt. Mitchell is the highest mountain of the province. What kind of rock is found in it? What are two phenomena which determine relative rate of weathering of the bed rocks?(See Text p. 176 and class notes).
Using the place names on the map what can you tell of the outlines of the mountains? What significance have the broad valleys within the mountains? What is probable explanation of the entrenched meanders on this map?

Antietam, Va.-Md. See geological map of Virginia.
What kind of rock makes up the three prominent ridges? the valleys?
Can you find any relation between entrenched meanders and the belts of hard rock? Explain.

Fairfield, Pa. Folio 225
What geological phenomenon is related to the line between Blue Ridge and Gettysburg plain? What kind of rock underlies each? What kind of rock makes up the highest ridges? What phenomenon on these ridges may indicate that their crests were once part of a regional lowland? See structure sections to see if position of layers might cause a different interpretation. Could the explanation given for Happy Hill, Wisconsin also be used here? Explain.

Saluda, NC-SC Draw a profile with vertical scale not less than 1 inch = 2000 feet from Hendersonville to Columbus. On this distinguish three distint levels. What have these been termed, (text pp. 179-182) Put name on each. Can you find evidence of a northwesterly shift of the divide? Explain why such might occur. (text p. 191).

Summary on usual outline. Pay particular attention in proper paragraph to the several hypotheses of origin of Blue Ridge escarpment (text pp. 162, 186-194). Use diagrams to help explain these but be sure to mention each one in the text as well. Defer the problem of water gaps to report on Ridge and Valley province. Explain the drainage pattern and texture in proper place. Also why small gullies form in weathered materials.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Laboratory questions, Ridge and Valley, Edition 1945-46

Be sure to refer to geological maps and to models on stairs. Also air views in Geog. Rev. 29: 566-576 on reserve shelf.

Chattanooga, Tenn. and Folio 6.
Why has the course of Tennessee River as shown on this map attracted so much attention? State the two hypotheses which have been advanced to account for it. Do not discuss their relative merits except in your Summary. (Text, pp. 276-277)

Delaware Watergap, edition 1922.
Read legend on back. Study the cross section and tell the nature of the evidence formerly used to demonstrate that several cycles of erosion have occured in this area. Reserve comment on merits of this idea to your Summary. How did they try to give geological dates to these surfaces?

Greenland Gsp, W. Va., and geological map of West Virginia. See also air views both cited above and in Von Engeln, Geomorphology, p.328. Draw a cross section with SAME VERTICAL AND HORIZONTAL SCALES from NW corner of map across the major ridges. Show the geological formations which cause each of the ridges.

Natural Bridge Special, Va. and geological map of Virginia.
In what kind of rock is the Bridge? It has been explained as a leak through a meander, as a survival of capture of a longitudinal stream via a cavern, and as a leak below falls. Give your opinion of merits of these three rival hypotheses. What other physiographic province is shown on this map?

Harrisburg and New Bloomfield, Pa. Geological map of Pennsylvania.
Draw a cross section at right angles to ridges NW from Heckert Gap. USE SAME VERTICAL AND HORIZONTAL SCALES and explain why you have to. Show the geoligical formations which account for each of the ridges. What name is applied to the streams between the ridges?

Hollidaysburg, Pa. Geological map of Pennsylvania.
Account for Loop Mountain illustrating its origin by means of an E-W cross section just north of McKee Gap. Show the formation which makes the ridge. Account for Tussey Mt.

Summary. Use the standard outline. Include under Topography diagrams of monoclinal, synclinal and anticlinal mountains. Explain how you distinguish an anticline from a syncline on the contour map. Include pitching folds. Use your class notes to write up history including (a) explantions of both water and wind gaps, (b) evidence for an against records of a number of partial cycles of erosion, and (c) efforts to date cycles of erosion, Put on map of U. S. the terminal moraine and the border of the glaciated area continuing both across adjacent provinces.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES

Laboratory questions, Appalachian Plateaus, edition 1945-46

For aerial views see Geogr. Rev. 29: 577-584, 1939

Foxburg, Pa, topography and edition showing structure; Folio 178.
How is geologic structure shown? Study carefully the level of the highest hills in relation to rock structure. State what it is. Then compare the merits of two explantions of this fact. (Text pp. 250-293) In what stage of erosion cycle is this area now? Find the original or type locality of the Parker Strath. What might account for abandonment of old stream course. Study text, pp. 301-304, 317-319. Last list the events in physiographic history which may be read from the legend of this map with no information from other districts. Was this area glaciated?

Watkins Glen, N. Y. Folio 169 Text pp. 313-319
Locate definitely good examples of the three types of topography described in class, also valley filled by outwash, and a hanging valley. Reserve discussion to your summary.

Katterskill, N. W. Block diagram of this area is found in Guidebook 9A of 16th International Geological Congress. Also see text, pp. 204-206, 319-323. What physiographic provinces occur within this map? What evidence shown here demonstrates that the divide between drainage to NW. and that to E. is shiftling? What could bring about such a condition? Illustrate changes with diagrams.

Davis, W. Va. Geological map of West Virginia.
What relation has the almost enclosed Cannan Valley to geological structure? Illustrate your answer with a sketch cross section. Do not forget the low hills in center of the valley. Show the resistant formations.

Randolph, N. Y. Lobeck, Handbook of Allegheny State Park.
Can you find the border of the glaciated area reflected in topography. Explain how and check with glacial map on wall. See text, p. 317 for explanation of drainage changes outside glaciated area which led to formation of Allegheny R. How is old course found? Trace outwash from terminal moraine into the present valley. Do you find any evidence of an older and higher outwash filling? Locate examples definitely.

Summary. Include in proper place a statement as to the primary cause of preservation of the Plateau wheras the same formations were eroded farther west. Also discuss the problem in demonstrating evidences of successive uplifts compared to the same in the Ridge and Valley province. Also include discussion of four processes which cooperated in making the glaciated youthful Finger Lake type of valleys. Also discuss the effects of glaciation outside the ~~xxifx~~ till border. Has there been more than one glaciation of part of the Plateau? State evidence and show on your map both the borders of Wisconsin and of pre-Wisconsin drifts across the province (wall map.)

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES
Laboratory questions, New England, Edition 1945-46

Eatport, Me., geological and structure maps; Folio 192.
What relation does topography have to geologic structure? To direction of glacial motion? List in order the events since continental glaciation proved by this map alone.

Hartford, Ct. Wall map of Connecticut showing glacial geology.
Explain two explanations which have been offered for the terraces.
Text. pp. 373-375, 386-391; Connecticut Geological Survey Bull. 47, pp. 19-27

Passadumkeag, Me.; glacial map of Maine.
Draw a sketch of the quadrangle showing the eskers. What origin is given for such eskers?

Hawley, Mass-Vt.
What evidence does this map show of a rejuvination of erosion?
Illustrate by a sketch cross section showing the restored and preserved pre-uplift surface. How much relief did this surface have?

Summary as usual. Discuss in proper place (a) why New England is made a separate province and (b) problem of scarcity of recessional moraines including evidence of local glaciation.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES
Laboratory questions, Adirondacks, Edition 1945-46

Lake Placid, N. Y. Good pictures of area found in N. Y. State Mus. Bull. 193 (library)
Account for the shapes of the mountains. Locate examples of drainage changes (text. pp. 398-407); of local glaciation.

Elizabethtown, N. Y.
Account for the rectangular pattern of valleys shown in SW part of map.
Locate examples of local glaciation (text, pp. 408-409)

Lowville, N. Y. Text, pp. 325-326, 395-396, 406-407.
Account for the areas which contain kettles in E part of map. Compare shapes of hills here which rise above general level with that of the hills west of Black River. Explain the difference. The valley of Black River has been thought to have contained a marginal lake during the melting of the last glacier. Give an alternative view.

Summary as usual. Make it brief for such a small area but include the alternative views on origin of the Adirondack skyline. Kay's ideas can be found in Geol. Soc. America. Bull. 53, p. 1618, 1942.

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES
Laboratory questions, Interior Low Plateau, Edition 1945-46

Greenbrier, Tenn. Geological map of Tennessee.
Account for the escarpment north and west of Nashville. (Text, pp. 415-419, 431-434) When could the meanders of Cumberland River have first been formed?

Georgetown, Ky. Geological map of Kentucky, 1929
Account for topography of ridge tops. (Text pp. 427-431) Does the cross section of ridges prove that the country was once a peneplain? Discuss alternative views. What bearing do meandering streams have on this problem?

Cub Run, Ky. Geological map of Kentucky.
Text pp. 445-448. Account for the shape of valley of Nolin River. What causes the upland in NW part of map (give geological name of formation)? Why are there sinkholes in E part of map?

Hollow Springs, Ky. Geological map of Kentucky.
Text. pp. 415-419. Account for the Plateau of the Barrens including origin of the name.

Vienna, Ill. Geological map of U. S.
Account for the several cuestas which cross the area. Why are they not continuous? What geological formation causes the highest one? What is origin of wide valley from Karnak east through Mermet? (Text, p. 90).

Summary as usual. Be sure to show on your map the boundary of the Shawnee Hills which is not in the text book. Where do you find it? Your map must be completed and handed in with this exercise. It must include boundaries of all provinces and sections as well as location of every quadrangle studied in laboratory. All written work must be in long enough before the final exam so that it can be graded and returned on the day before the exam.

GEOLOGY 130

Personal

PHYSIOGRAPHY OF EASTERN UNITED STATES
Review questions, first semester 1939-40

These questions are for review study and contain many which have been used in examination questions. Future examination questions may be drawn from them but will often be worded differently. Study these questions in connection with your text, the maps in its back, the Lobeck's diagrams of the U. S., and the geological map of the U. S. Be sure you understand WHY changes were made in class from interpretations in text.

Questions for majors in geography or geology or graduates.

1. Discuss with diagrams three possible explanations of the leval uplands and terraces of the Baraboo Range, Wisconsin.
2. Discuss three different interpretations of the uplands of the Driftless Area excluding the Baraboo Range.
3. EXplain relation of basins of the Great Lakes to bed rock
4. Explain three hypotheses of origins of basins of Great Lakes giving points for and against each.
5. Describe structure and physiographic history of Wiehita and Arbuckle Mts., Oklahoma.
6. Discuss three theories of the origin of the Carolina "Bays".
7. Describe and account for four different types of topography found in Baraboo quartzite, Wisconsin.
8. List four possible explanations of water gaps in Ridge and Valley provinces, illustrate each with diagrams and list briefly points for and against each.
9. List five possible explanations of location and form of Blue Ridge escarpment. Illustrate each with diagram and list briefly points for and against each.
10. List briefly four criteria used to demonstrate former peneplanation of a given area at more than one time; discuss points for and against each considering both regions of horizontal and folded bed rocks.
11. Discuss course of Tennessee River explaining why it has attracted so much interest.
12. Discuss "stream piracy" and "stream adjustment" including effect of subterranean drainage.
13. Discuss significance of "en trenched meanders" and compare them with other meanders.
14. Explain by means of diagrams the effect of normal faulting on form of a ridge caused by an inclined resistant layer.
15. Give and discuss fully three interpretations of the origin of the New England upland.
16. Discuss two interpretations of the drift terraces of Connecticut Valley.
17. Discuss evidences for and against the presence of remnants of many partial peneplanations in Ridge and Valley and New England provinces.
18. Discuss the problem of the Pleistocene terraces of the Coastal Plain.
19. Discuss four explanations of the youthful glaciated valleys of Appalachian Plateaus.
20. Outline in parallel column in proper order the facts and their interpretations which demonstrate the physiographic history at any specific locality visited on field trips or studied in laboratory.
21. Discuss explanations of slight development of recessional moraines in New England.
22. Explain relation of erosion surfaces formed in Piedmont including discussion of origin of Piedmont Upland.
23. Explain origin of limestone caverns including their topographic effects.

24. Discuss problem of attaching geologic dates to peneplains.
25. Discuss briefly the origin of submarine canyons and river channels of Atlantic Coast.

Questions for undergraduate non-majors.

26. Define in simple terms all of provinces studied giving their essential features in a single short sentence.
27. Trace the boundaries, i.e. escarpments, rock contacts, etc. of each physiographic province studied.
28. Tell where the several bed rock formations were seen on field trip.
29. Explain differences between "constructional" and "destructional" land forms giving examples of each.
30. Account for nonglaction of part of Driftless Section; explain why some glaciated territory is included in this section.
31. Describe boundaries, geology and topography of each major section of central lowland (limit two pages each.)
32. What kinds of drift are found in the Driftless Section? Explain.
33. Give proofs of former higher levels of Great Lakes and of earth movements since then.
34. What effect has changes in outlets of the Great Lakes had on Niagara Falls? Locate the different outlets.
35. Explain origin of cuesta, vale, hogback, inner lowland, terminal moraine, outwash giving examples of each in Central Lowland.
36. Explain origin of consequent, subsequent, superimposed, antecedant streams giving examples of each.
37. With regard to Osage Section, explain relation between structure and ~~geology~~ topography.
38. Account for direction of major streams of Osage Section.
39. What effect has wind work had in topography of Central Lowland--locate examples.
40. Compare "texture" of drainage in Baraboo quartzite and adjacent soft rocks. Explain and locate other examples.
41. Describe and account for rapids and falls in Driftless Section.
42. Describe and account for difference between Great Lakes and Till Plains sections.
43. What evidences indicate extensive glacial erosion of bed rock in Great Lakes Section.
44. Describe and account for land forms of southern Till Plains in Illinois.
45. Describe, account for, and show with diagrams different land forms of Central Lowland classifying into destructional and constructional.
46. Locate and account for Coteau des Prairies.
47. Show by cross section the border between Central Lowland and Superior Upland.
48. Describe and account for the land forms of the Superior Upland classifying them into destructional and constructional.
49. What three major divisions can the bed rocks of Superior Upland be divided? Describe topography of each, giving an illustration.
50. Describe and account for different kinds of lakes found in Superior Upland.
51. Outline with diagrams the physiographic history of Superior Upland.
52. Outline with diagrams physiographic history of Baraboo district.
53. Explain effect of glaciation on topography of Superior Upland--and Driftless Section of Central Lowland.
54. Locate, describe and account for land forms seen on field trip.
55. Describe boundaries, geology, and topography of each of the several sections of Coastal Plain.
56. Illustrate with diagrams physiographic history of Coastal Plain.
57. List and account for different types of (a) lakes and swamps (b) shore features found in Coastal Plain.
58. Locate and account for land forms in Coastal Plain due to wave action, river erosion, submergence, earthquakes, intrusions, solution, wind work, coral

59. Outline with diagrams the physiographic history of Piedmont.
60. Account for drainage pattern of Piedmont giving more than one explanation.
61. Account for drainage of southern Blue Ridge.
62. What indicates drainage changes on eastern side of Blue Ridge Province?
63. What two major divisions of bed rocks in Piedmont? Compare topography of each.
64. List and account for land forms of the Piedmont.
65. What kinds of bed rock of Ridge and Valley are most resistant. Name several formations which are ridge-makers.
66. What topographic criteria show an anticline, a syncline, direction of dip of layer--use diagrams.
67. Explain with diagrams anticline, anticlinal mountain, syncline, synclinal mountain, monocline, monoclinal mountain, thrust fault, normal fault, "window", pitch of fold.
68. Using diagrams, outline physiographic history of Ridge and Valley Province.
69. Account for longitudinal and transverce streams of Ridge and Valley Province.
70. Discuss significance of even ridge crests and overlap of Coastal Plain on history of Ridge and Valley Province.
71. Why is it more difficult to distinguish old erosion levels in Appalachian Plateau than in Ridge and Valley Province.
72. Why does Appalachian Plateau average higher elevation than the adjacent Ridge and Valley Province.
73. Explain elevation and drainage of Catskill Mountains.
74. Discuss effects of glaciation on drainage of Appalachian Plateau both inside and outside glaciated area.
75. Discuss relation of Appalachian Plateau to bed rock character and structure.
76. State evidences for and against regional peneplaination of Appalachian Plateau.
77. In Appalachian Plateau, locate examples of topography due to glacial deposition, glacial erosion, stream capture, anticlinal fold, synclinal basin, synclinal valley, sandstone escarpment, hanging valley, ridge due to thrust fault.
78. Explain theory of regional superposition of drainage in Ridge and Valley Province.
79. What evidences positively prove former peneplaination of Ridge and Valley Province.
80. Contrast shore lines of eastern Florida and delta of the Mississippi River.
81. Discuss the drainage phenomenon of Mohawk Valley in relation to bed rocks and glacial lakes.
82. State reasons for separating New England from hard rock provinces to south.
83. Account for the stony soil of New England citing other instances of same phenomenon.
84. Locate in New England examples of local or alpine glaciation, drumlins, ice-contact terraces, trap rock ridges, superimposed stream, eskers, granite mountains, monadnock, limestone valley, Triassic rocks, glacial lake bed.
85. Account for the shoreline of New England.
86. Account for Long Island, Marthas Vineyard, Nantucket, Cape Cod, Georges Bank, Gulf of Maine.
87. List and account for land forms of New England.
88. Discuss geology, structure, and topography of the three principal mountain districts of New England.
89. Compare Reading Prong and northern Blue Ridge.
90. What physiographic evidence demonstrates a fault in South East side of Reading Prong.
91. Explain two hypotheses of manner of ice retreat in New England.
92. What indicates the former presence of local glaciers in New England? Where else are the same phenomena found in eastern U. S. ?
93. What significance may be attached to the absence of recessional moraines in New England?

94. What demonstrates relatively recent uplift of New England including post-glacial uplift?
95. Why did the continental ice sheet last longest in valleys of New England rather than on uplands?
96. Account for trellis drainage contrasting requisite conditions with those leading to dendritic drainage and giving examples of both types.
97. Compare contact of hard rock of Adirondacks and of Wisconsin with adjacent soft rocks.
98. Account for drainage pattern of southeastern Adirondacks.
99. Discuss glacial history of Adirondacks.
100. Discuss geology and topography of St. Lawrence Valley in U. S.
101. Why are Adirondacks made a separate province?
102. Distinguish between "fault scarps" and "fault-line scarps" in Adirondacks.
103. Account for course of Black River on Southwest side of Adirondacks.
104. Outline with diagram, physiographic history of Adirondacks.
105. Explain two processes which led to rounded mountain tops of Adirondacks and compare with topography of Blue Ridge.
106. Locate in Adirondacks land forms due to faulting, moraine blocking, ice scour , peneplaination, marginal ice drainage, glacial lake, outwash, local glaciers.
107. Illustrate topography of Interior Low Plateau by geologic cross section from West to East through Nashville Dome.
108. Explain reasons for separating Interior Low Plateau from adjacent provinces.
109. Discuss geology and structure of each section of Interior Low Plateau using geologic sections.
110. Where in Interior Low Plateau are caverns most numerous--why?
111. Describe the topographic cycle in limestone.
112. Account for the lowlands in Interior Low Plateau where strate were raised highest.
113. Explain effect of glaciation on topography of Interior Low Plateau.
114. Account for entrenched meanders of Interior Low Plateau and their significance in physiographic history.
115. Be prepared to complete sentences each of which states a fact of physiographic history by giving the principal definite proof. Examples are:

    The land at (a point of known elevation) has been uplifted at least _____ feet.

    The Superior Upland was peneplained before adjacent soft rocks were deposited because _____

    The Superior Upland was once buried by soft rocks because _____

    _____

    New England was reduced to a peneplain because _____

    _____

    The hard rock surface buried under the Coastal Plain is not the Piedmont Upland because _____

    _____

    The Highland Rim Upland may be accounted for either by _____ _____ or _____ .

    Etc., etc.

116. Be prepared to locate as definitely as possible and account for typical examples of land forms either seen on field trip or studied in class or laboratory. Such are Rib Hill, Keweenaw Point, Ableman Narrows, Shawnee Hills, The Knobs, Mt. Mitchell, Mt. Washington, Reading Prong, Highland Rim, Teays Valley, Finger Lakes, Allegheny River, Mohawk Valley, Black Belt, Cheasapeake Bay, Lake Pontchartrain, Reelfoot Lake, etc.

117. Draw generalized geologic section showing physiographic features from Wausau, Wisconsin east through Sturgeon Bay to Ontario.
118. Same from Charleston, South Carolina northwest to Cairo, Illinois.
119. Same from east end of Lake Ontario east to Mt. Desert Island, Maine.
120. Same from southeast corner of Kansas northwest to Salina, Kansas.
121. Same from Tuscaloosa, Alabame, southwest through New Orleans to the Gulf.
122. Same from Wichita Falls, Texas, southeast to the Gulf.
123. Account for Crowley's Ridge.
124. Account for Yazoo River and locate other examples of the same phenomena.
125. Account for suggested change in western border of Superior Upland.

GEOLOGY 130

PHYSIOGRAPHY OF EASTERN UNITED STATES

Extra readings for all graduates and
for majors in geology and geography.
Edition of 1940-41.

These readings either present discussion of subjects inadequately treated in the text or are more recent than the text. They are the basis for class discussion and will help greatly in following such. Exam questions for graduates and majors will involve an understanding of these problems, and these references.

See also Lobeck, A. K., Geomorphology, 1939, for land forms and discussion of their origin, (use the index), and Atwood, W. W., Physiographic Provinces of U.S., 1940. All these books are on reserve shelf in library. Please report any which are missing both to librarian and instructor.

Central Lowland, East

MacClintock, Paul, Physiographic divisions of the area covered by the Illinoian drift-sheet in southern Illinois; Illinois Geol. Survey, Rept. Investigations, No. 19, pt. 1, 1929.

Martin, Lawrence, Physical geography of Wisconsin: Wisconsin Geol. and Nat. Hist. Survey, Bull. 36, pp. 1-366, 1932.

Shepard, F. P., Origin of the Great Lakes Basins: Jour, Geology, vol. 45, pp. 76-88, 1937.

See also references for field trips.

Central Lowland, West.

Moore, R. C., The relation of mountain folding to the oil and gas fields of southern Oklahoma: Am. Assoc. Pet. Geol., Bull., vol. 5, pp. 32-48, 1921 (for structure of Arbuckles and Wichitas).

Tomlinson, C. W., The Pennsylvanian system in the Ardmore basin: Oklahoma Geol. Survey, Bull. 46, pp. 47-66, 1929.

Kay, G. F. and Apfel, E. T., The pre-Illinoian Pleistocene geology of Iowa: Iowa Geol. Survey, vol. 34, pp. 16-69, 1929.

Superior Upland

Martin, Lawrence, Physical geography and Pleistocene of Lake Superior region: U. S. Geol. Survey, Mem. 52, pp. 85-116, 427-459., 1911.

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Thwaites, F. T., Glacial Geology of part of Vilas County, Wisconsin: Wisconsin Acad. Sci., Trans., vol. 24, pp. 225-228. 1929.

Thwaites, F. T., Kansas Geol. Society Ninth Ann. Field Conference Guide Book pp. 109-125, 1929.

See also references for field trips.

Coastal Plain

Cooke, C. W., and Melton, F. A., Discussion of the origin of the supposed meteorite scars of South Carolina; Jour. Geology, vol. 42, pp. 88-104, 1934.

Ewing, Maurice and others, Geophysical investigations in the coastal plain: Geol. Soc. America, Bull., vol. 48, pp. 753-812, 1937; vol. 50, pp. 257-296, 1939.

Prouty, W. F., "Carolina Bays" and elliptical lake basins: Jour. Geology, vol. 43, pp. 200-207, 1935.

McCarthy, G. R., The Carolina Bays: Geol. Soc. America, Bull., vol. 48, pp. 1211-1226, 1937.

Fisk, H. N., Depositional terrace slopes in Louisiana: Jour. Geomorphology, vol. 2, pp. 181-200, 1939.

Russell, R. J., Louisiana stream patterns: Am. Assoc. Pet. Geol., Bull., vol. 23, pp. 1199-1227, 1939.

Piedmont

Bascomb, Florence, Cycles of erosion in the Piedmont province of Pennsylvania: Jour. Geol., vol. 29, pp. 540-559, 1921.

Blue Ridge

Wright, F. J., The Blue Ridge of southern Virginia and western North Carolina: Denison Univ. Bull. Sci. Lab., vol. 22, pp. 116-132, 1927; The erosional history of the Blue Ridge: ibid, vol. 23, pp. 321-344, 1928: The older Appalachians of the south: ibid, vol. 26, pp. 143-250, 1931.

Ridge and Valley

Thompson, H. D., Drainage evolution in the southern Appalachians: Geol. Soc. America, Bull., vol. 50, pp. 1323-1356, 1939.

Meyerhoff, H. A. and Olmstead, E. W., The origin of Appalachian drainage: Am. Jour. Sci., 5th ser., vol. 32, pp. 21-42, 1936.

Stose, G. W., Age of the Schooley peneplain: Am. Jour. Sci. (5th Ser.) Vol. 38, pp. 461-476, 1940.

Mackin, J. H., The Origin of Appalachian drainage, a reply: Am. Jour. Sci., 5th Ser., vol. 36, pp. 26-53, 1938.

Ashley, G. H., Studies in Appalachian mountain sculpture: Geol. Soc. Am. Bull., vol. 46, pp. 1395-1436. 1935.

Johnson, D. W. A theory of Appalachian geomorphic evolution: Jour. Geol., vol. 39, pp. 497-508, 1931.

Rich, J. L., A bird's eye cross section of the central Appalachian mountain and plateau: Geogr. Review, Vol., 29, pp. 561-586, 1939.

Appalachian Plateaus

Cole, W. S., Development and structural control of erosion surfaces: Jour. Geol., vol. 45, pp. 141-157, 1937; Rock structure and peneplain expression: Jour. Geol., vol. 43, pp. 1049-1062, 1935.

Holmes, C. D., Glacial erosion in a dissected plateau: Am. Jour. Sci. 5th Ser., vol. 33, pp. 217-232, 1937.

Tarr, R. S., Drainage features of central New York: Geol. Soc. America, Bull., vol. 16, pp. 229-242, 1905.

Fairchild, H. L., Seneca valley physiography and glacial history: Geol. Soc. America, Bull., vol. 45, pp. 1073-1110, 1934.

Rich, J. L., Recognition and significance of multiple erosion surfaces: Geol. Soc. America, Bull., vol. 49, pp. 1695-1722, 1938.

New England

Tarr, R. S., The peneplain: Am. Geologist, vol. 21, pp. 351-370, 1898.

Davis, W. M. The peneplain: Am. Geologist, vol. 23, pp. 207-239, 1899.

Adirondacks

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Interior Low Plateau

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Prouty WF

Carolina Bag and then origin

GSABG3: 167-224, 452

GEOLOGY 130
PHYSIOGRAPHY OF EASTERN UNITED STATES
Review questions, first semester, 1945-46

These questions are for review study. Many have been used in former examinations; future examinations may be taken from them although the wording will probably be different. Use wall maps in studying them.

QUESTIONS for majors and graduates in GEOLOGY or GEOGRAPHY

1. Discuss origin of both uplands and terraces on Baraboo quartzite.
2. Discuss the several theories of origin of uplands of Driftless Section outside the Baraboo Range.
3. Explain the several processes which formed the basins of the Great Lakes.
4. Describe structure and physiographic history of Arbuckle and Wichita Mts.
5. Discuss the several theories of origin of the Carolina "bays".
6. Describe and account for the several types of topography found on the Baraboo quartzite and give localities where each was seen in field.
7. Discuss points for and against four distinct origins of water gaps.
8. Discuss points for and against five different hypotheses to explain the Blue Ridge escarpment.
9. Discuss evidences of former peneplains which exist after uplift and erosion with comments on validity.
10. Discuss the problem of peneplain "stairways".
11. Compare appliciability of evidence of peneplains in folded and horizontal bed rocks.
12. Discuss relative merits of different explanations of course of Tennessee R.
13. Discuss stream piracy and stream adjustment including effects of underground drainage.
14. Describe entrenched meanders comparing them with floodplain meanders; discuss significance of meanders in general.
15. Explain by diagrams the topographic effects of faulting on ridge formed by a single inclined resistant layer.
16. Discuss the several explanations offered for the New England upland.
17. Discuss theories of the Connecticut Valley terraces.
18. Discuss the hypothesis that remnants of many partial peneplains may be distinguished in Ridge and Valley and New England provinces.
19. Discuss problems of origin, discrimination, and age of Coastal terraces.
20. Discuss the several hypotheses of origin of Finger Lake type valleys.
21. Outline in parallel columns in proper order the FACTS and INTERPRETAIONS based on each which demonstrate the physiographic history of any specific locality visited on field trips or studied in class or laboratory.
22. Discuss explanations of the scarcity of recessional moraines in eastern U.S.
23. Discuss erosion surfaces of Piedmont Plateau compared with both surface beneath Coastal Plain and summit of Blue Ridge.
24. Explain origin of limestone caverns including that of natural bridges and other surface effects.
25. Discuss the problem of attaching geologic dates to erosion surfaces.
26. Discuss origin of submarine canyons and river channels.

QUESTIONS for non-majors

1. Be able to define in simple terms all of the provinces studied.
2. Be able to describe the boundaries of each province in terms of escarpments, geological boundaries, etc.
3. List and describe characteristic topography of each bed rock formation and Pleistocene deposit seen on field trip.
4. Explain "constructional" and "destructional" land forms giving examples.
5. Explain difference between Driftless Area and Driftless Section.
6. What kinds of drift occur in Driftless Section? in Driftless Area?
7. Describe evidence of former high levels of Great Lakes.
8. Give evidence of postglacial uplift in Great Lakes region.

9. Discuss the different outlets from the Great Lakes and their record at Niagara Falls.
10. Explain and give examples of cuesta, hogback, vale (inner lowland), escarpment, endmoraine, interlobate moraince, drumlins, outwash, etc.
11. Explain origin and give examples of consequent, subsequent, superimposed, antecedent, obsequent streams.
12. Account for the courses of major streams of Osage Section.
13. Locate examples and describe effect of wind on topography of Central Lowland.
14. Discuss variation of texture of drainage giving examples.
15. Describe and account for more than one type of falls and rapids in Driftless Section.
16. Describe and account for differences between topography of Great Lakes and Till Plains sections.
17. What evidences demonstrate glacial erosion of bed rock in Central Lowland?
18. What evidence shows tilting of earth's crust in NE U. S.?
19. Describe and account for the several types of land forms of southern Till Plains.
20. Classify the typical land forms of Central Lowland into constructional and erosional (destructional) giving eample of each. Same for Superior Upland.
21. Locate and account for the Coteau des Prairies.
22. Classify bed rocks of Superior Upland according to their effect on topography, describe land forms on each giving examples.
23. Classify the different kinds of lakes according to origin found in any provinces studies giving example of each.
24. Descibe the physiographic history of Baraboo range stating where evidence of each step is found; same for Superior Upland.
25. Describe effects of glaciation on topography of Central Lowand including Driftless Section; same for Superior Upland.
26. Outline steps in physiographic history of Coastal Plain giving proofs of each step.
27. Classify according to origin the shore features of Coastal Plain giving an example of each.
28. Locate and account for land forms of Coastal Plain due to different processes, including stream erosion, submergence, earthquakes, intrusions, solution, coral growth, uplift, etc.
29. Outline the physiographic history of Piedmont Plateau giving evidence of each step.
30. What explanations could account for the observed drainage patterns of the Piedmont Plateau giving their distribution.
31. Account for direction, pattern, and texture of drainage of southern part of Blue Ridge province.
32. Account for the fine texture of soil erosion gullies in Blue Ridge.
33. What evidence indicated instability of divide between Mississippi and Atlantic drainage in southern Blue Ridge?
34. Account for the difference in level of surface around headwaters of Blue Ridge streams and Piedmont Plateau.
35. Compare the topography of two major divisions of Piedmont which are based on difference in bed rocks.
36. List and account for different types of land forms in Pidemont Plateau.
37. Name several of the resistant types of bed rock which make the ridges of the Ridge and Valley Province.
38. Show with diagrams the topographic criteria of pitching anticlines, and synclines; be prepared to place structure on block diagrams.
39. Explain with diagrams structural phenomena of Ridge and Valley such as anticline, anticlinal mountain, syncline, synclinal mountain, monocline, monoclinal mountain, thrust fault, normal fault, window, pitch of fold.
40. Outline the simplest explanation of Physiographic history of Ridge and Valley province; what complications do some insert in this history?
41. Explain origin and significance (more than one theory of even [illegible] and Valley province.

42. Account for the drainage system and drainage pattern of Ridge and Valley.
43. Compare the problem of finding records in topography of past uplifts in Ridge and Valley and in Appalachian Plateau provinces.
44. Explain why the Appalachian Plateau averages higher elevation than that of Ridge and Valley province.
45. Account for preservation of weak rocks on some of highest elevations of Appalachian Plateaus.
46. Account for the high elevation and drainage of Catskill Mountains.
47. What effect did glaciation have on topography of Alleghany Plateau (a) within glaciated area and (b) outside glaciated area?
48. What relation does Appalachian Plateau have to rock character and structure?
49. State evidence for and against regional peneplaination of Appalachian Plateau considering different sections.
50. Locate examples in Appalachian Plateaus of glacial deposition, glacial erosion, stream capture, anticlinal mountain, anticlinal valley, sink holes through sandstone, sandstone escarpment, limestone escarpment, hanging valley, ridge along thrust fault, monoclinal ridge, subsequent valley, cuesta, entrenched meander, lake due to glacial outwash blocking, stream diversion due to glaciation, etc.
51. Explain the theory of regional superposition of drainage in eastern U. S.
52. Discuss evidences of regional peneplaination of Ridge and Valley stating which of them are positive proof of such.
53. Contrast processes which made the coast line in (a) eastern Florida and (b) Mississippi Delta.
54. Discuss Mohawk Valley as to origin, bed rocks, and glacial phenomena.
55. Discuss Tughill Plateau as to origin, bed rocks, and glacial phenomena.
56. Why is New England not included with other hard rock provinces to the SW?
57. Account for the stony soils of New England comparing them with soils of Superior Upland.
58. Locate examples in New England of local (alpine) glaciation, drumlins, ice-contact terraces, stream-cut terraces, ridges due to trap rock, superimposed stream valley, eskers, granite mountains, monadnock, limestone (marble) valley, Triassic rocks, glacial lake bed, etc.
59. Describe and account for form of shoreline of New England.
60. Account for Long Island, Nantucket, Marthas Vineyard, Cape Cod, Georges Ban, Gulf of Maine including geologic history during Pleistocene.
61. List and account for characteristic land forms found in each of provinces studied.
62. Discuss geology, structure, and topography of the principal mountain districts of New England.
63. Discuss geology, structure and erosional history of Reading Prong.
64. Explain various methods or manners of glacial retreat as shown in eastern U. S., i.e. normal, stagnation, constant melting.
65. Describe evidence of local or alpine glaciers in eastern U. S.
66. Compare different explanations of the summit levels of Adirondacks.
67. Describe and account for drainage pattern of Adirondacks.
68. Discuss glacial history of Adirondacks.
69. Discuss geology and topography of St. Lawrence Valley in U. S.
70. Account for the rectangular valleys of SE Adirondacks.
71. Account for valley of Black River on NW side of Adirondacks.
72. Outline physiographic history of any province thus far studied.
73. Describe outlines of mountains of Adirondacks comparing them with Blue Ridge mountains. Account for observed forms.
74. Locate and example each in Adirondacks of fault line scarp, marginal ice drainage, glacial lake, outwash, local glacier, falls, valley along fault line, nunatak.
75. Illustrate topography of Interior Low Plateau by a section E-W through Nashville Dome. Show geological formations which determine topography.
76. Explain why Interior Low Plateau was separated from adjacent

77. Discuss each section of Interior Low Plateau using a cross section which shows important geological formations.
78. Discuss distribution and topographic effects of limestone solution in Interior Low Plateau; compare with Ridge and Valley.
79. Discuss erosion cycle as developed in limestone including last stages.
80. Explain effects of continental glaciation on topography of Interior Low Plateau.
81. Discuss distribution and significance of entrenched meanders in both Interior Low Plateau and other provinces.
82. Be prepared to complete sentences giving the proof of each statment such as: The land (at a given point on marine sediments) has been uplifted at least so many feet; The Superior Upland was reduced to a peneplain before---; New England Upland may be regarded as a peneplain because-; Even skylines are poor proof of former peneplains because, etc. etc. etc.
83. Be prepared to locate and explain examples of various land forms found in any province thus far studied.
84. Give geological nature of and account for origin of any of the well-known features studied in class or on field trip such as Rib Mountain, Reading Prong, Narrows of Narrows Creek, Teays Valley, etc. etc. etc. Localities will be chosen because they illustrate a particular process.
85. Be prepared to illustrate relation of any province to its neighbor at a given point by means of a topographic-geologic cross section, example, the overlap of the soft rocks of Central Lowland onto the hard rocks of Superior Upland, major escarpments, etc. etc.etc.
86. Account for Crowleys Ridge and associated drainage phenomena.
87. Justify a proposed change in location of west border of Superior Upland.
88. Justify a proposed change in southern border of Driftless Section.
89. Account for course of Yazoo River and other similar phenomena.
90. Compare shoreline of Embayed Section of Coastal Plain with that of other sections.
91. Name, describe and locate an example of several different types of glacial and meltwater depositional topography in any province.
92. Describe and locate examples of glacial erosional topography in any province
93. Be prepared to give brief summaries of geology and topography of any section of any province.
94. Contrast topography and land forms of Driftless Area with that of adjacent glaciated region.
95. Account for the definite boundary of Driftless Section on E. side.
96. What significane on erosional history has the presence of fresh water to considerable depths below sea level in Coastal Plain?
97. Compare topography of areas of Wisconsin drift with those of older glaciations; include soils.
98. Discuss problem of separation of Triassic Lowland as a separate province.
99. Discuss problem of placing the boundary of Coastal Plain in Texas.
100. Discuss origin of wind gaps (more than one method).

Th. 10-12

Tu 1:30-3:20

Text: Fenneman: Physiography of Eastern United States Raisz - maps & landforms of the U.S

Put on card: Name; what pre-requisite offered; what major ~~is~~ (if one)

Credits (5 required if offered as science requirement)

hours of lab to be fixed. start next week 4 hrs per week - hrs assigned T Th 1:20 - Appts

need: paper; pencil, ruler or x-sec. paper not too fine mesh ; folder

First assignment: 449-463 calendar will be prepared

Field Trip Oct 29 or Nov 5

Define physiography; geomorphology

Rocks; bed rocks sedimentary, igneous, metamorphic HARD, SOFT

Unconsolidated or mantle rock Soils

Structure or arrangement of rocks in earth , folds, faults

Alterations: processes

weathering : processes, climate, time

erosion: processes, climate, time, cycle of erosion

Result= surface forms, topography due to desturctional processes

Topography due to constructional forces

Glaciation

Uplift

Vulcanism

wind

Geologic column formations, names, dates

PHYSIOGRAPHIC PROVINCES definition

Standardization of treatment

Definition

Boundaries by natural features

Geology, kind vs age

Topography, facts

History, interpretation of origin of present surface.

Maps

Sept 26, 45

Central Lowland, East of Mississippi River

449-463

Definition: an area of relatively low elevation and low relief underlain by nearly horizontal soft sedimentary rocks

Boundaries

E and SE: from St. L. River to Ohio R. land rises abruptly 600 to 1000ft.; from there west follow edge of glacial drift where it affects preexisting topography

S: land ~~becomes lower and bed rock lies farther below younger unconsolidated materials~~ Shawnee Ridge in basal Penn. ss

W: Mississippi River excepting small parts of Till Plains and Driftless sections, W. Y. Drift E of Miss. R.

N: edge of pre-Cambrian hard rock area, generally much higher or what is nearly same, edge of ~~young~~ glacial drift

Geology

Glacial drift with associated water deposits, (lake and stream) (a) young drift with marked constructional features (Wisconsin) (b) old subdued or eroded drift (Illinois) (c) extra-glacial drift

Pennsylvanian

shales with some ss, ls, and coal beds

Pottsville (Saginaw) sandstone

Mississippian

Chester, alternating ls, ss, sh, (very local, much of outcrop outside drainage)

"Mississippi lime",

Shale (Coldwater)

Marshall ss (in Michigan)

Devonian

shale (Ohio and part of Antrim)

Traverse and Dundee lss

Detroit River dolomite with salt

Silurian

Salina dolomite with salt and gypsum

Niagara dolomite

Ordovician

Richmond-Maquoketa shale

Galena (Trenton), Black River dolomites (or Plattin)

St. Peter sandstone

Prairie du Chien dolomite (Lower Magnesian)

Cambrian

Trempealeau (ss grading through siltstone to dolomite below)

Franconia dolomitic ss

Dresbach ss and sh

pre-Cambrian

hard rocks, quartzite, granite etc (in small areas only)

Structure- basins, uplifts (Illinois-Michigan) dips gentle, very local disturbed areas

next 463-486

Subdivisions or Sections

Great Lakes | Driftless | Till Plains

Great Lakes Section

Topography

Cuestas on resistant formations with lowlands modified by glaciation throughout all the province

Defer history

Outline of Great Lakes after Antevs

Rate of uplift	Niagara Gorge	Outlets	Upper Lakes	Ontario Basin	Ottawa lowland
Uplift	Upper Great Gorge	Pt. Huron	Modern	L. Ontario	Dry
None	Ongiarga gorge	North Bay, Pt. Huron	Nipissing	Submerged	Dry
Uplift Sinking? Uplift	Niagara Glen Cantilever	N. Bay	Taylor lakes Beaches valley submerged	Submerged	Ottawa Sea
Uplift	Devils Hole	Pt. Huron	Algonquin 3	Champlain Sea	Champlain Sea
None	Old narrow gorge	Kirkfield Pt Huron Chicago	Algonqin 2	L. Iroquois	Ice
Uplift	First gorge	Pt. Huron	Algonquin 1	L. Iroquois	Ice
Uplift	Ice	Ft S W	Lundy, Warren, Wayne, Whittlesey Chicago, Oshkosh etc	Ice	Ice

Erosion of outlets = Times of max. discharge

Sept 28

463-486 next 487-499

Great Lakes section

Definition: area including Great Lakes in which topography is ~~dominated~~ has by constructional glacial topography including lake basins

Boundaries:

E: edge of the Appalachian Plateau, much higher land

S: edge of lake plain Buffalo to Fort Wayne; thence edge of drift with lakes and outwash plains to Delavan

W: edge of young or Wisconsin drift Delavan to Wis. Rapids thence edge of province (border of higher hard rock area) to Marquette, Mich.

Geology:

As for whole province

Topography:

Drift topography

Cuestas and lowlands

Basins of Great Lakes in latter on softest rocks, shale, salt, gypsum, weak dolomite

Draw section on board showing Prairie du Chien, Galena-Platteville, Niagara, Tranverse-Dundee, and Marshall cuestas.

Glacial features: drumlins, eskers, moraines. outwash plains dunes Kettle moraine of Wisconsin Drift, young and stony

Draw diagram

Drift does not entirely obscure cuestas

History: special problems, (1) origin of basins of Great Lakes inc. (2) preglacial drainage (3) why glacial topography is so accentuated (4) Why are sand dunes present in the humid region

next time 487-499

next time 499-518

GT 1

487-499

Great Lakes history-special problems ① what was preglacial drainage?
④ Why sand dunes are present
③ why drift is so rough { Nature of material - angle of repose when wet
Lobation of ice with concentration of waters

② Origin of lake basins

Lake basins-facts

Basins are on weak rocks separated by cuestas but locally crossing the lessers one of the Devonian lss

Systems of lakes

Superior outside the Prairie du Chien cuesta extending into pre-Cambrian area over an area of weak rocks

Winnebago-Georgian Bay-Ontario on Ordovician shale

Michigan-Huron, Erie on Silurian salt-bearing beds plus Devonian shale crossing Traverse-Dundee cuesta

Basins appear to be rock-bound all but Erie below sea level

Cuestas show only small breaks, no major valleys

No major outlet valleys known. Rock surface in N. Ohio slopes NE

Lake bottom in Superior, Huron, Michigan very irregular

Origin

Alternatives:

preglacial valleys plus drift dams

2 " " plus drift dams plus depression to NE

3 " " plus " " plus " " plus ice erosion

Checks: all processes are possible and must be present. Problem is relative importance of each. Deep filled valleys known but not as deep as lake beds.

Depression proved by decline of Coastal Plain to NE

Ice erosion " rough bottom plus large amount of fresh drift to S plus smooth escarpments like Niagara

1952

Glacial history- do not attempt details.

Lobation-result of lake basins not their cause

Original outlets-St. Croix, Wisconsin, DesPlaines, Maumee-Wabash

Residual ice at first in basins

Later outlets-across lower Michigan, Mohawk valley,

Low level of lakes shown by Mackinac Valley etc.

Last drainage across Canada, Kirkfield and Ottawa

Earth movement-proof cause? - effect

Check on varying widths of Niagara gorge. Rate of erosion

See next page

later work:

now find area subsiding relative to sea level (is sea rising?)

why no movement in S part of glaciated area?

gravity is normal

movement begins at edge of pre-Cambrian hence continuation of an ancient movement

499-518 next time 518-536

Till Plains section

Definition. Glaciated area E. of Mississippi River in which glacial constructional topography is not conspicious

Boundary. Division from Great Lakes section at edge of prominent outwash and morainal topography with lakes

Geology. Pennsylvanian down to Ordovician, otherwise as for whole province
Drift both Wisconsin and Illinoian ages, latter showing much more wezthering-gumbotil with loess cover. Note that loess is in no way directly associated with Iowan drift. All the till has much more clay than farther north. Little sand or gravel

Topography. Due to bed rock. Devonian lowlands S of Sandusky; Louisville to away Indiana; Toledo to Chicago
Shawneetown cuesta = S edge of province
Mississippi lime cuesta S of St. Louis
Uplands of Devonian lime
Coal Measures lowland (except for sandstone hills)

Due to drift: Illinoian area. MacClintocks classification:
Rock hills, types 1, 2, 3
Glaciated karst 4
Moraines, eroded6, uneroded 5
Till Plains, eroded 8, uneroded 7
Alluvial plains 9

1933

Loess not thick enough to affect underlying topography
Wisconsin area:
Till Plains or ground moraine
Moraines few, low, gentle except a few interlobate areas.

high moraine - Bellefontaine O, 1540

History. Special problems only
1. Why are the till plains so flat? clay Till + older Lake deposits
2. Why is karst present? Slopes of gravel in moraines
3. Why are the valleys filled with having flat floors of silt? - blocking of mouths by later
4. Why are some of valleys so wide? (Illinois, Wabash) caused Lake drainage overflows
5. Why is so much of area prairie? Soil ? climate ?
6. Is there any valid evidence of peneplaination? no
7. Why are streams superimposed on irregular rock surface? Thick drift

518-536 Renew next time
next 559-588

DRIFTLESS SECTION

Definition: area never covered by continental glaciers although surrounded by drift PLUS a fringe where drift is negliable in amount

1953 Drift vs till. Choice of name? Driftless Area vs Driftless section

Bndaries: N from Vernona = border of Wisconsin drift sharpest contrast
W from Wisconsin Rapids follow approximately edge of hard rock to near Bloomer or Chetek
NW follow edge of thicker drift much of way along Prairie du Chaien escarpment to Mississippi River
W follow edge of thicker drift approximately along top of Devonian and Niagaran escarpments to N. of Clinton, Ia

SE follow edge of drift to Verona= better would have been to follow Rock River to border of Wisconsin drift near Janesville
This area would then be taken from Till Plains and put with landscape it more closely resembles

The Driftless Area proper has vey indenite boundary on North, west, less so to SE

Possibly dritless area on pre-Cambrian of Wisconsin valley excluded

Geology: Cambrian to lower Silurian Draw ideal section of cuestas
Pleistocene- glacial lake deposits
outwash
loess
some glacial till in "attenuated border"

1949

Topography: Cuestas separated by lowlands. Cap rocks firmer sandstones, shale of sandstone area, and dolomites Lack of karst Butler - moraes
1951 Plain of central Wisconsin = bottom of Lake Wisconsin
Trench of Mississippi River
Undercut bluffs and truncated spurs
Outwash fill. Lake Pepin. Terraces
Width related to elevation of dolomite

Trench of Wisconsin R.
relation of width to geology terraces
Filling of unglaciated tributaries-lakes falls, rapids

Baraboo Range topography-field trip

Driftless section, review next 559-586

Peneplain, or peneplane, definition? Process of origin weathering and slope wash

Other types of plains:

Building up by water ✓
Wave erosion
Erosion of a soft formation down to a harder one.
Lateral erosion of streams - gravels on upland, (climate)
- pediplain; "panplain," "etchplain"

Limitation of erosion when force is insufficient to remove material
" by earth movement

Problem of uplifted and dissected peneplain

Evidence of former low level

Even skyline vs effect of distance particularly in horizontal strata

Uneroded remnants vs effect of resistant strata, dolomite vs ss, etc.

Bevel of layers vs spontaneous development due to longer exposure.
Solution effects - Level of streams - uniformity of slopes

Two-story valleys vs effect of hard and soft strata

Entrenched meanders vs spontaneous growth during erosion

Older views

(1) One upland= an error in fact Bain, Van Hise

(2) Series of cuestas all one cycle - Martin, who failed to allow for bevel

(3) Two peneplains-Trowbridge who filed to explain how upper one survived making of lower surface

(4) One peneplain beveling ~~lowered~~ at the crests-Bates or pediplane?

(5) One mature surface with lower relief than now and solution effects producing some bevel

1952

Glaciation of surrounding area and cause of Driftless Area

Course of Mississippi River- structure, capture vs superposition

Reversal of Wisconsin River during glaciation

History of ~~entire area~~ subprovince = that of Driftless + glaciation of surrounding areas

559-588 Central Lowland west of Mississippi River next 588-605

Definitionx

Definition. Area of low relief and low elevation underlaind by xxxxxx approximately horizontal soft rocks - W of prairie area

Boundaries. Separated on E from other part of Lowland by borders of Till Plains and Driftless sections, I. E. Mississippi R. except for small part of SE Iowa and the attenuated border fx of drift in NE. Iowa and SE Minnesota

NE- will change boundary from F's dotted one to edge of pre-Cambrian where heavily drift covered.

W. follow higherx border of higher land except across Nebraska where take edge of glacial drift. Escarpments clear in N and S. Dakota, Kansas, Oklahoma and Texas

S. exclude high mesas and rugged topography of Texas up to Brazos R

SE edge of Cretaceous of Coastal Plain N. to Atoka, Okla.

E follow W side of Ouachita Mts. to McAlester, thence straight line across Arkansas Valley to Muskogee, thence edge of Pennsylvanian shale leaving out the higher, rougher plateau on Boone chert etc to Missouri River NE of Sedalia, Mo.

S follow edge of thick drift just N. of Missouri River to just S. of St. Louis

Subdivisions

Western Young Drift= area much like Great Lakes section except for part of Iowa which is like Till Plains

Dissected Till Plains= Kansan drift

Osage= unglaciated area, ~~generally~~ mainly low plains + ouerlap

Geology

Same section as eastern area through Pennsylvanian bearing rocks

Add: (1) Permian shale with some sandstone, limestone, gypsum-baring

(2) Cretaceous shale with some sandstone and limestone (3) Tertiary in Turtle Mt, ND

Drifts: Wisconsin mainly rather stony but more clay in Iowan in c SW Minnesota and central Iowa NW drift is gray, NE. is red

Quaternary sandy terraces of Oklahoma etc. part outwash, part derived from west.

Western Young drift section.

Definition= area of Wisconsin (ine and Iowan) drifts excluding drift-covered hard rock area of NE Minn.

Boundaries= mainly geological Iowan very irregular, why?

Geology= general section but Cretaceous lies on older rocks.

Considerable areas of pre-Cambrian even after revision of border; quartzite and granite

Drift: mainly gray till; red near Twin Cities

Two major lobes split by Coteau des Prairies (rock core?)

Lake Agassiz

Topography= mainly glacial forms becoming till plain type in Iowa Basin and beaches of L. Agassiz eroded outlet, tilting

Defer history

588-605

Dissected Till Plains

Definition= area of Kansan drift, an eroded drift plain with Nebraskan drift exposed in valleys-more eroded than Illinoian

Boundaries= edge of drift to W and S except for very scattered Nebraskan
Illinoian drift to E. a contrast in erosion
Wisconsin and Iowan drift to N. with no endmoraine everywhere

Geology= St. Peter to Cretaceous-west dip
Kansan and Nebraskan drifts both with gumbotil surface.
Loess cover thickest adjace to Iowan and on Missouri R bluffs
loess of two ages, older red

Topography= an original drift plain minus any marginal moraines now edoded almost to maturity so that only narrow strips left on divides
Nebraskan gumbotil forms terrace on valley sides. Many valleys reach rock.
Rock hills more abundant in Missouri; some rock escarpments
Loess hills of drift margins, constructional. Eroded- cat steps
Transitional zone of loess-altered topography
Flood plains of main streams
Channel of temporary Mississippi

History. Special problems
1 How tell preglacial from interglacial stream courses?
2 Preglacial course of Mississippi?
3 Interglacial courses of Mississippi?
4 Glacial course of Mississippi and Lake Calvin?
5 Loess, has it any relation to Iowan drift?

605-630

Osage Section

Definition= unglaciated area of plains with cuestas

Geology: Permian and Pennsylvanian, shales with thin layers of limestone, sandstone, gypsum. Permian largely red and has more limestone westerly dips with irregularities
Quaternary, sandy river terraces with dunes
PreCambrian and Paleozoic in Arbuckles and Wichitas

Topography:

Cuestas, number variable because resistant beds not continuous
In Kansas 15 on limestone, 2 on sandstone, 1 on gypsum, 1 on chert
Remember only major ones
Flint hills on cherty ls (Permian)
Chatauqua Hills W of Independence, Kas.
Gypsum Hills

Arbuckles
Add to F's section
Permian-Wichita red beds
Pennsylvanian- Pontotoc arkose, conglom. to 500'
Great Unconformity-peneplain or pediment
Glen group, ss, sh, cg. ls to 15000 ft

Pontotoc nearly horizontal, older beds tilted.
Hogbacks on Viola lime, Hunton lime, Sycamore lime
Upland on Arbuckle lime.
Lowlands on Simpson and weak beds between hogbacks
Upland bevels layers 5 to 10 f.p.m. much less than surface below Cretaceous (40 f.p.m.)

Wichitas
Igneous core, pre-Cambrian
Hogbacks on Arbuckle,
Unconformable horizontal Permian red beds

History of entire province.
Deposition of sediments with interruptions so not all parallel - Pontotoc unconformity
Long period of erosion. Layers beveled, peneplain or normal development ?
Glaciation: Nebraskan, Aftonian interglacial, Kansan, Yarmouth interglacial
Wisconsin (Iowan), period of recession and dep of younger loess,
Wisconsin (Mankato) Lake Calvin during Illinoian?

Problem: is Arbuckle upland pre-Pontotoc or pre-Cretaceous? No similar surface in nearby Wichitas ..
Problem: how did parallel drainage of Oklahoma originate?
Tertiary cover? Coastal Plain cover? Same??

537-558

SUPERIOR UPLAND

Definition- Portion of Laurentian Upland of pre-Cambrian rocks which lies in U. S. = a region of old rocks which have been reduced to low relief

Boundaries- Wholly geologic but badly obscured by glacial drift
On S. follow border of Driftless Section although this puts some thin sandstone into Superior Upland Border of hard rocks traced by great increase in boulders
On W. follow border on 1932 map of Minnesota (which is mostly edge of Cretaceous)

Geology- Bed rock
All pre-Cambrian except a few areas of Cambrian and Cretaceous mainly near S and W. borders- igneous and metamorphic= HARD although some shale and sandstone in Lake Superior Basin
Divisions do not all follow geologic age. No definite column possible (mainly Huronian)
1 Banded rocks include both tilted metamorphosed sediments and tilted lava flows (mainly Keweenawan)
2 Massive rocks are large areas of same material, granite, gneiss, gabbro, slate
3 Soft rocks are Upper Keweenawan shale and sandstone= Lake Superior sandstone

Drift
Mainly very stony and bouldery Wisconsin drift. Gray and Red in Wis. Minnesota. Much outwash and other assorted drift
Marginal drift of north-central Wisconsin one thought to be pre-Wisconsin, a thin drift with some areas almost driftless. Not deeply weathered or eroded most areas.

Topography.
Rock controlled
Plateau of areas away from Lake Superior. Some isolated hills.
Peneplain and monadnocks- Definition of terms= conclusion
Rounded hills of massive rocks
Hogbacks of banded rocks; iron ranges; gaps
Basin of Lake Superior-fault boundaries; normal boundaries?
Drift controlled
Marginal moraines or endmoraines; shapes of lakes in
Pitted outwash plains; shapes of lakes in
Ground moraine and drumlins
Eskers, kames
Causes of red and gray tills
Causes of boulders
Thin drift area of north-central Wis.; sandstone crags in
Lake bottom and beaches

History-
(1) Ancient mountains (2) erosion to peneplain which crossed down-folded and down-faulted sandstone of L. Superior Basin
(3) Submerged with deposition Upper Cambrian through Silurian; bearing on age (4) Superposition of drainage on uplift; renewed down-warping of Superior Basin; some renewed faulting
(5) stripping of Paleozoic cover, little erosion of hard rocks Wausau district, claim of later peneplain; erosion of L. Sup. basin to level?
(6) Glaciation incl. erosion, lake history and later tilting

Coastal Plain 1-13

Atlantic Plain and general

General
Definition of whole province = lowland area of eastern and southern U. S. underlain mainly by slightly consolidated sedimentary deposits

Boundaries+ outer edge = continental (shelf) slope(s)
inner edge = border of Cretaceous sediments Cape Cod to Brazos River, Texas, thence follow river to Balcones fault escarpment, following that to Rio Grande

Major subdivisions= continental shelf, submerged
Embayed section= Cape Cod to Cape Lookout

Continental shelf
Outer limit = top of descent to deep ocean depth 300 to 600 ft.
Topped by sand with shells.
Depth to solid rock moderate to 2500 along Atlantic coast, except Florida Gulf Coast, well over 15000 feet Geophysical data suggest a steepening dip of top of hard rock with no terrace

Topography
Profile of equilibrium Depth of sand transport ??
Width 300 to 5 miles Holes near coast Steeper slope not over 1 in 20 common, maximum about 1 in 10
Barrier beach near shore-origin
Submarine canyons and channels

Cut or built terrace? Present opinion: cut at lower sea level

Land portion-general

Geology
Cretaceous to Recent sediments= sand, some sandstone, very hard in places; mud and shale; marl, chalk and limestone
Dip steepens downward with increasing age.
Isostacy Evidence for and against. Compaction?
Sediments reast on an ancient peneplain in most places crystallins, some places on Jurassic marine sediments

Topography
Little is orignal sea bottom except near to coast. Most is deeply eroded with firmer formations making cuestas
Slopes low because of soft material "Belted plain"
Dendritic drainage, little suggestion of control by rock resistance

History shows many ups and downs. Former hard to explain by isostacy

Embayed Section
Definition= area north of Cape Lookout

Geology= Pleistocene terrace sands and gravels. marine and fluvial, former much better sorted little clay or silt,
50-90 % in max grade, better bedded, truncated x-b, light colored
fluvial, 2 maxima, mainly not over 20% in each, some boulders , dirty, dark colored, till-like, lenticular, channel fillings
Glacial drift, Long Island north
Miocene, marls, sands
Eocene, marl, greensand
Cretaceous, upper and lower Sands, gravels, clays
Underlying rocks, mainly crystalline, smooth surface

Cape Hatteras test well

Pleis.-Plio sand	180	180	
Miocene sd, clay	815	995	
" limestone	605	1600+	
Olig. clay, sd	138	1738	
Eocene limestone	482	2220	
sh	650	2870	+
marl, sh	164	3034	
U. Cret. ss, clay	113	3147	+
sh	513	3660	
ss	628	4288	
sh	512	4800	
ss	1370	6170	
sh	305	6475	
ss	109	6584	

Topography
Cuestas, mainly on cemented marl or sand
Lowlands on clay, Long Island Sound
Major cuesta on Cretaceous minor on Miocene Georges Bank
Moraines of Long Island etc.
Outwash plains, pitted and smooth
Drowned valleys and lowlands, amount of sinking to 1200 ft
Offset of rivers at Fall Line
Terraces, discrimination from stream forms
Cooke vs Flint, criteria of submergence= shore features
Flint finds only a barrier at 160-180 ' found only to S
Surry scarp at 90 traced 375 miles
Suffolk scarp at 20-25 with marine fossils below
Submarine level 240 to 330?
Cape May= Sangamon + an early outwash= Gardiners clay of L. I. interg
Erosion topography increasing inland Pensauken is warm climate= Wicomico

History
Sedimentation through Miocene. Farther S the big break in sed is at close of Lower Cretaceous
Erosion after Miocene, big valleys formed
Pleistocene changes in level of sea or land
Glacial control theory-difficulties
Age of land deposits- times of greater or less rainfall so either glacial or interglacial No agreement yet
Cause of offset of streams cannot be capture because all in same direction Effect of bars most probable

Limestones
Miocene 605
Eocene 1132
U Cret. Chalk 113
L. Cret. 315
480
380
170

C. Hatteras cont.
Lower Cret. ss 116 6700
+ ls 315 7015
ss 415 7430
sh 155 7585
ss 175 7760

+ ls 480 8240
ss 260 8500
dol 90 8590
+ls 290 8880
sh 100 8980
+ls 170 9150

sh 728 9876
granite 176 10054 T.D.

Sea Island

C

Fenlem 606 Univ. 6-5336

Sea Island section 38-46

Definition- area without marked bays Cape Lookout to Divide N. of Florida

Geology- mainly pre-Miocene sediments
sands and marls locally cemented

Topography, from inland out:
Submature hills in older formations= Sand Hills, Red Hills or Fall Line Hills Relief to 350, elev to 600
Upland abo ve marine terraces= Tifton Upland, relief 50 to 100 Miocene cover
Eroded terraces Brandywine and Coharie
Little eroded terraces, Sunderland and younger. Trail Ridge barrier beach at 170
Sea Islands and salt marshes below 25 (includes dunes and "Bays")
Bays occur between Savana and Nolfolk Elliptical shape elongated NW-SE Rims of sand highest Not in river flats

History- Cretaceous and Eocene sedimentation, Miocene after break
Pliocene? gravel apron fluvial
Erosion
Pleistocene submergence or rise of sea level

1950

Bay controversy
Meteorite scars magnetic highs, parallelism (Wells)

Rotary currens, gyroscopic action - known beach ridges - [illegible]

Artesian springs plus rotary currents (Johnson)

1952

Florida Section 46-65
Definition = plateau projecting into ocean

Boundary, arbitrary on N

Geology sand underlain by great thickness of limestone over 13000 in S
some Pliocene? gravel

Topography
June 1948
Karst on limestone where sand is thin, lake district where thick
Terraces marked only to 100 = level of Okefenoke swamp
less eroded below 45= Pensacola terrace
Low swampy country with limestone near surface in Everglades lake
Shore features, most wave work on E side, lagoons like Indian River
Keys = coral reef to E. eroded limestone to W. reef dead
1952 living reef offshore
Marquesas and Dry Tortugas= atolls

See Jour Geol 58; 261

Main PC drawings ice pack - peneplain apparent I.

65-83

East Gulf Coastal Plain

Definition: W of divide N of Florida to floodplain of Mississippi

Boundaries: Fall Line zone is a transitional and not abrupt Other boundaries definite except against Florida

Geology:

Pleistocene terraces to 170
Loess along Miss Bluffs
Limestone in Florida

Pliocene: Citronelle gravel, upland gravels of Florida
shell marl in Florida

Miocene clay etc Alum Bluff group

Oligocene. Vicksburg lime under Catahoula ss

Eocene Ocala lime of Florida,
sand, marl Midway S Wilcox, Claibourn, Jackson group

Cretaceous Selma chalk and Ripley sand to E.
Sands, gravels, etc. Eutaw and Tuscaloosa

Topography

1 Fall Line hills, on Eutaw and Tuscaloosa
2 Black belt on Selma chalk - prairie
3 Ripley cuesta on sand= Pontotoc Ridge gives out to E.
4 Flatwoods on Midway clay
5 Red Hills-Buhrstone cuesta on Wilcox sand and Clayton lime 300-400'
6 Jackson Prairie on clay and Vicksburg lime
7 Southern Pine Hills on Citronelle gravel and Catahoula quartzite= Tifton Upland to E.
8 Loess Hills of Miss R. Bluffs - cliffs

History

Ancient peneplain on pre-Cretaceous rocks
Sedimentation- two periods of limestone dep. once thought to correlate with two peneplains inland
Uplift and erosion
Formation of Citronelle alluvial mantle (may correlate with Highland Rim surface inland)
Uplift, erosion, formation of terraces corresponding to interglacial intervals?
Shaw had terraces to 550 ft but more terrace than intervals.

East Gulf Coastal Plain

Geology		Topography
Qs	coastal sand, gravel	Terraces to 100 ft. supposed to dip beneath delta of Miss. R.
Pc	continetal sand and gravel, Citronelle	High divides, terraced?, to 550 Southern Pine Hills
Mab	AlumBluff clay	Valleys within Pine Hills
Mt.	Catahoula ss	Foot of Pine Hills Cuesta
Ov	Vicksburg limestone	Jackson Prairie
Ej	Jackson-Ocala limestone, clay	
Ec	Claibornem sands, Buhrstone ss	Red Hills and Burhstone cuesta
Ew	Wilcox sand	
Em	Midway clay	Flatwoods
Kr	Ripley sand, clay	Pontotoc Ridge (N), Ripley cuesta (s)
Ks	Selma chalk	Blackbelt (pinches out to E.)
Ke	Eutaw sand	Fall Line Hills
Kt	Tuscaloosa sand, gravel	

83-99

Mississippi Alluvial Plain

Definition= floodplain including some islands of higher land and delta

Boundaries= bluffs at edge of highlands; ocean;

Geology

Pleistocne alluvium, silt and clay 150-200' in valley, over 350 at New Orleans, possibly much more in part of delta
Salt domes of Five Islands
Older formations in Crowleys Ridge

Topography

Bluffs of boundary straight.
Crowleys Ridge 200 m long
Main River meanders in large curves relation of width of channel to material of banks Towheads Chutes Meander belt 18 X channel width
No meanders below N. O. cause? Effects of earthquake
Abandoned channels or oxbows Natural levees, artificial levees
Distributaries Swamps Point lakes due to joining of levees
Yazoo type of tributaries
Crevasse outlets braided= depositing streams - seldom permament
Delta- contrast with Nile- cause
permanence of channels- mud lumps - jetties at mouth
Fives Islands

History

Dep of Coastal Plain sediments
Preglacial or early glacial alluviation= top of Crowleys Ridge, etc.
Layfayette problem Tenn-Cumberland course
Glacial events= low sea level, outwash farther north but possibly erosion below due to change in level Changes in course near Cairo
Interglacial events = high sea level with alluvial filling -
loess problem
Settling or compaction vs isostacy Effect on tributaries
Flood problem

100-120 West Gulf Plain

Definition

Boundaries- reason for exclusion of Lower Cretaceous S of Brazos River and above Balcones escarpment

Topography and geology- follow cross section and map in book

Meaning of "Cross Timbers"
Sabine Uplift and syncline to W
Cuesta capping in part limestone, iron cemented ss
Hockley scarp facing sea, origin?
Marine terraces, stream terraces
Delta plain with bays between projections
Pimple prairies, earthquakes

Edwards escarpm.
White rock
Nacogdoches
Kisatchie

1953

History

Sedimentation
Faulting-intrusion of salt domes and volcanics
Erosion
Pliocene gravel plain-possible connection with High Plains
Uplift and erosion-Pleistocne changes of sea level

1952

General Review of Coastal Plain History

1. Peneplain on crystallines and Triassic-formation probably includes Jurassic sedimentation and ~~possibly~~ Lower Cretaceous also
2. Sedimentation-Upper Cretaceous on with both submergence and times of uplift. Mainly marine down dip, some land deposits higher up
3. Isostacy-settling and compaction vs real crustal movement
4. Erosion uplift
   Pliocene gravel plain-climatic significance??
6. Pleistocne changes in sea levels-Pacific subsidenece?
   Possible tilt down to north-isostacy??
7. Formation of Mississippi floodplain by last rise of sea level, by glacial drainage from N
5. Glaciation in north
8. Final rise of sea level

(1) Peneplain? break at base of upper K
(2) Sedimentation
(3) Pliocene or early Q gravel mantle(?)
(4) uplift + erosion - Tilting - low sea level
(5) Glaciation in N - start of Miss R. valley
(6) changes in sea level - low in glacial - high in interglacial - settling of Miss delta. causes of terraces - altitude of terraces
(7) Present floodplain of Miss R and part W... - deposition of loess. delta

Special features of C.P. Terraces - origin; number

Carolina Bays
Salt domes
Pimple Prairies
fresh waters

Crowley's Ridge
buried ...

NE

121-145

Piedmont Plateau

Definition= area of moderate elevation underlain mainly by hard rocks, a terrace or tableland at foot of higher mountains to NW separating them from the lower Coastal Plain

Boundaries
SE = Fall Zone or contact with soft sandy beds of Coastal Plain
NE= Hudson River
NW= an abrupt rise to higher land or in S part an abrupt descent to the Great Valley

Geology
Hard rock -areas granite, gneiss, schist, slate, marble, etc.
Soft rock area- Triassic red sandstone, shale with intrusive and extrusive traps all tilted and much faulted

Topography-
Hard rock area
General rolling upland with very few isolated mountains or hills.
Dissected with narrow valleys mainly in dendritic pattern
Isolated hills more numerous in S. Stone Mt. massive granite
Contrast of average slope of upland with slope under Coastal Plain
Rapids of Fall Zone
Exceptional localities
1952 Parrs Ridge. Highest part a quartzite. Theories of terracing, of warping
1943 Trellis drainage area of Georgia. Tallulah gorge and falls Dahlonega Plateau

Piedmont, cont.

Lancaster lowland inside of Parrs Ridge

Low Piemont= major Triassic area of Va to NJ
is divided into two lowlands by Schuykill-Susquehana divide
Trap ridges- lowlands on shales etc.
Watchung Mts. water and wind gaps.
Effects of glaciation- Lake Passaic
Lancaster-Frederick Lowland in part on limestone
Chester valley

History
Ancient Mts. evidence
Peneplain before Coastal Plain dep. Fall Zone Peneplain
age may be just before Upper Cretaceous
Upland surface not this level unless there is an abrupt fault or fold at foot of mountains but may be cause of even crest of Watchung Mts.? Fomer extent of Coastal Plain inland?

Later peneplain of Piedmont explicable either by bending or faulting or later origin. Projected runs above Coastal Plain Defer origin to consideration of Blue Ridge
Uplift and erosion of later plain making Triassic lowlands
Problem of convexity of hilltops.
Glaciation in north

Weeks, W. B. South Arkansas stratigraphy---- A. A. P. G. 22, 953-982, 1938

Very thick pre Upper Cretaceous section. Big break with erosion at base of Upper K

McGlothlin, T. General geology of Mississippi A. A. P. G. 28, 29-62, 1944

Also shows morst marked break at base of Tuscaloosa, Also one at base of Eocene

Richards H. G., Subsurface stratigraphy of Atlantic Coastal Plain between New Jersey and Georgia A. A. P. G. 29, 885-955, 1945

Gives a good map of basement and some sections. No marked breaks indicated and no Jurassic

Imlay, R. W. Jurassic formations of Gulf Region A. A. P. G. 27, 1407-1533, 1943

Places completion of Fall Zone peneplain as early Upper Cretaceous

163-180 Blue Ridge

Definition= Belt of mountains west of Piedmont and SE of Great Valley south of the gap in Pennsylvania
Why the name?

Boundaries= mostly an abrupt rise from lower land both to NW and SE Sw end not so well marked.

Geology+ = NW side mainly Cambrian quartzites. Toward N this covers entire width. In wider southern part hard crystallines, granite, gneiss, schist marble

Topography=
Ne end to Roanoke R mainly a single ridge or group of ridges (up to 3)
12-14 m. wide All capped by quartzite or hard schist or granite
Water gaps of Potomac, James, Roanoke
Wind gaps-relation to stream capture decreasing number of water gaps
Crest fairly level, 200-4000 ft between gaps. Mainly rounded knobs
Causes of level summits

Sw from Roanoke
Mountains to 6000+ and up to 70 miles wide. Great Smokies etc.
Quartzite mts. to NW bordered by overthrust. Higher than most of mts. Divide close to SE side or Blue Ridge escarpment
Mt s subdued, some cones. Mainly forested. Some "balds"
not many cliffs. coarse drainage
Problem of different levels. Some prominent.

Mon 11:00

Eg gneiss
Awl Ag granite
A gg gneiss AC5 marble
AW schist

180-194 Blue Ridge, cont.

Asheville peneplain or broad valley now dissected 200-400 ft
= area where disintegration of rock favored widening
effect of barrier of quartzite to west
= top of Blue Ridge escarpment because of shift in divide
Other similar broad valleys-Ducktown, etc. All on feldspathic rocks although not all such rocks make lowlands

HISTORY
Always mountainous
Evidence for and against a subsummit peneplain or series of peneplains
Level summits in some places
Large areas of subdued topography on uplands= Shooley level
Broad valley bottoms= Harrisburg level = same age as Piedmont?

Origin of escarpment to east. Note youthful features of rapid streams and falls
Evidence of original drainage to NW like New and French Broad Rs
Evidence of recent stream capture. Elbow of capture, gaps
Cause of greater vigor of streams flowing SE
Theories
Faulting. For: abrupt line, known in some places along Triassic
Against: border locally irregular, many outlying mts.
Folding. Same, rocks do not fold
Marine planation of Piedmont
For: possible
Against: Piedmont upland extends behind outliers
No coarse gravel deposit known except possibly in Pliocene
Two peneplains of same or different ages.
How can peneplains grow laterally? Confusion of though with floodplains or pediments
Why should escarpment be so abrupt and youthful?
How could upland peneplain survive making of adjacent lower one?
Pediment
Origin of pediment or peniplain Occurence in west, E. slope of Andes
Against: no gravels recorded Superposition of drainage?
convexity of hilltops? Climate?
Difference in resistance of bed rock adequate in N. not in S.
Inheritance from downfauled wedge of Triassic
For: known to N. SW edge indefinite
Against: no evidence in S.

Cause of dissection of broad valleys within mts of hard rock
uplift vs erosion of a barrier

195-203

Ridge and Valley 195-226

195-203

Definition
Belt underlain by folded and faulted sedimentary rocks = Lowland with ridges

Boundaries
NW = Adirondacks Mts. of crystalline rock, mainly pre-Cambrian
SW = Coastal Plain
SE = Piedmont, then Blue Ridge, then New England, all of crystalline rock and for much or most of distance a thrust fault which brought hard rocks over much softer rocks
NW S of Adirondacks= escarpment marking edge of less folded formations
Subdivisions, not vital importance except N part glaciated

Geology
Sedimentary rocks, not much altered by metamorphism.
Most abundant = shale
Limestone and dolomite most important toward SW
Hard sandstones, semi-quartzitic
Age= Paleozoic, Cambrian to Carboniferous

structures
Structure

Ridge-making sandstones
Pottsville= Pennsylvanian
Pocono= Mississippian
Oriskany-Chemung= Devonian
Catskill
Medina-Tuscarora-Clinch-"Shongun"= basal Silurian

Topography
Lowland with long, narrow, even-crested ridges - structure of ridges
Water and wind gaps
Disappearance of ridges
Ridges of different elevations, mainly very narrow crests
Rock terrace of major valleys 1000-1500 below crests
Entrenched meanders-relation to ridges
Drainage pattern = trellis, why

203 end
226

Northern Disvision = Hudson-Champlain Section

Definition
Glaciated part of province

Boundary
St. Lawrence Valley and Adirondacks
Cross Mohawk Valley at fault escarpment near Schenectady
Devonian-Catskill escarpment inc. Devonian lime escarpment
Other side, E and Se = metamorphic rocks, Green and Taconic Mts. + Reading prong (all N England)

Geology
Only one ridge former= Medina, Clinton, Shongum cong.
Rocks locally metamorphosed shale, lime, slate
Glacial drift largely lake sediments including delta of Mohawk tilted shorelines of L. Champlain

Topography
Kittatiny Mt. / Miniature mt. topography E of Catskills
2 Rock terraces and gorge of Hudson
Hudson water gap in New Eng. Province
Terraces of drift- here consider mode of retreat of ice

History-defer

226-255 Middle Section

Definition= from edge of glacial drift to New-Tennessee divide

Geology= Cambrian to Pennsylvanian

Penn.	Pottsville of anthracite district
Miss	Mauch Chunk shale
	Pocono ss
Dev.	shale
	Onondaga lime
	Oriskany ss
	Helderburg lime
Sil.	ss, sh, ls
	Tuscarora-Medina ss, cg.
Ord.	shale, lime
Camb.	lime and shale

Topography

Happy hunting ground for examples of relation of folding to land forms, especially the Antracite region
Rock terrace or Harrisburg peneplain
Entrenched meanders
S part-eveness of ridges not well displayed

255-278 Southern section

Definition= area from New-Tenn divide to SW end

Geology

More faulting, fewer ridge formers than farther N.E.
Walden and Lookout sss= Penn
Ft. Payne chert= Miss
Red Mts. and Clinch sss= Silurian
Knox dolomite

Topography
Upland or Schooley level.
Lower levels-assumptions behind levels
Coosa level
Problem of course of Tenn R. below Chattanooga

capture
superposition
antecedence

Problems of Ridge and Valley

(1) Why do streams locally disregard nature of rock and cross ridges leaving valleys on soft rock?
Problem of an "original surface" after folding Triassic deformation?
Change of position of folds and faults with depth.
Relative amounts of erosion before and after reaching the "Schooley" level
(a) theory of antecedent streams- their probable direction
Examples of possible antecedent streams New, French Broad, etc.
(b) Development of subsequent streams- relative number of such
Piracy by "ntlantic streams. (Davis.) Wind gaps not very common
Are there weak points in ridges at present (or abandoned) gaps?
What, if any, relation do gaps have to rock structure and thickness?
(c) Adjustment of streams on a super-peneplain (Willis, Campbell, etc.)
Tipping of a super-peneplain
Alluviation of a peneplain= superposition
(d) Superposition either by (1) surficial structures or (2) burial (after erosion) by sediments of Coastal Plain (Johnson)

Summary: most streams are subsequents hence much capture
does stream pattern suggest superposition?
(2) Cycles of erosion-how many and how discovered?
Evidence= even skylines of crests
buried "peneplain" below Coastal Plain
Tests=
are ridges as even as they look to naked eye?
relation of elevation to structure. Low dip higher; anticline higher than monocline; syncline higher than anticline; ends of folds higher than middle; ridges lowest near gaps
formation of ridges-sides= talus or gravity slopes
could long narrow ridges vary much in elevation?
alternatives (1) ridges were once levelled and have been since lowered parallel to that
(2) eveness was developed spontaneously
(3) ridges have not been eroded since Schooley level
(4) ridges vary in elevation-does each show a level or does this knock out whole idea?
Check on evidence of terraces
Abundant in valleys-different levels
Absent in water and wind gaps Do later have a relation to terraces?
Are terraces due to parallel lowering? from one peneplain
Are terraces due to eroded hard rock barriers?
At least one terrace is supported by (1) wide extent (2) same level as Piedmont upland, (3) entrenched meanders with gravels
Must consider solution of limestone vs peneplaination by slope wash
Poser: if erosion extends horizontally only, forming terraces then how is it that so many terrace levels are now found on divides? Projected sections. Horizontal correlation, Coastal Plain sediments
Limestones should indicate low lands
Edwards lime = Lower Cretaceous before a period of uplift and erosion, about 95 million years ago
Selma-Austin chalks once correlated as Schooley
Vicksburg-Ocala-Tampa (mid Tertiary) once correlated as Lafrisburg

195) Appalachian summary, cont.

Some now call mid Tertiary = Schooley surface
Time since Vicksburg dep about 19 m. years
Time since start of Pliocene about 7 mil. yrs
Pleistocene time about 1 m. yrs

(3) Dating of old surfaces.
Original idea that top of ridges = base of Cretaceous= Schooley level (wtfm?)
would make that about 95 m. yrs old.
Could ridge tops survive that long? Relative erosion before and after out of proportion. Erosion since totally inadequate to account for Coastal Plain sediments (70X)
Must follow a surface beneath sediments of known age.
Example in Wisconsin
Difficulty in Appalachian region. Must introduce curves
Known peneplain below Upper Cretaceous. Evidence at SW end of folded belt. Relief about 100 ft.= true peneplain not confused with marine or stream leveling

Summary
Streams mainly adjusted to present structure. No "final" adjustment possible
All known processes except the superpeneplain must have had a part in making present landscape
Problem is the relative importance of each.
If superposition occured it applies to N. part mainly also to course of Penn.".
One Terrace - Harrisburg peneplain - seems well supported = level of Piedmont.
Schooley not proved "beyond reasonable doubt".
as regional affair

Appalachian Plateau 279-304

Definition-

A relatively elevated district of prevailingly horizontal sedimentary rocks which lies NW of the belt of pronounced folded sediments

Boundaries-

Province is higher than all adjoining lands but has no continuous escarpment at border.

From SW end where passes beneath Coastal Plain follow escarpment of Pottsville ss 1000 ft high across Tenn and S. Ky.

N. Ky and S. Ohio follow edge of Mississippian, not well marked

N Ohio rise is gradual with no marked escarpment

E. of Cleveland rise is on shales and siltstones of Devonian

E. of Buffalo follow escarpment of Onondaga and Helderberg limestones but detour N to include the Medina-Capped Tughill Plateau.

Facing Ridge and Valley follow escarpments due to Catskill cg., Pocono ss, Pottsville ss.

Geology-

Sedimentary rocks, mainly shale from Ordovician to Permian age

Escarpment makes= Pottsville ss, Pocono ss and siltstone; Catskill ss and cg.; Onondaga ls, Oriskany ss, Helderburg ls; Medina ss , Ord. lss.

Pennsylvanian is coal bearing= Coal Measures

Earliest oil fields in Pa. etc.

Structure= a broad spoon-shaped syncline or geosyncline with many minor rolls especially in N. Some faults both thrust and normal.

Topography consider under sections

Allegheny Mts.

Definition= high SE part of the Plateau in Pa and W. Va.

Boundary= edge of the much dissected transitional belt where folds are more common than to NW.

Topography-

Anticlines form ridges: Chesnut Ridge, Laurel Hills, Negro Mt. each of which brings up resistant Pottsville or Pocono ss. Some show monoclinal ridges. Next to impossible to make out definite "surfaces" although many have tried by means of cross sections.

Unglaciated Allegheny Plateau

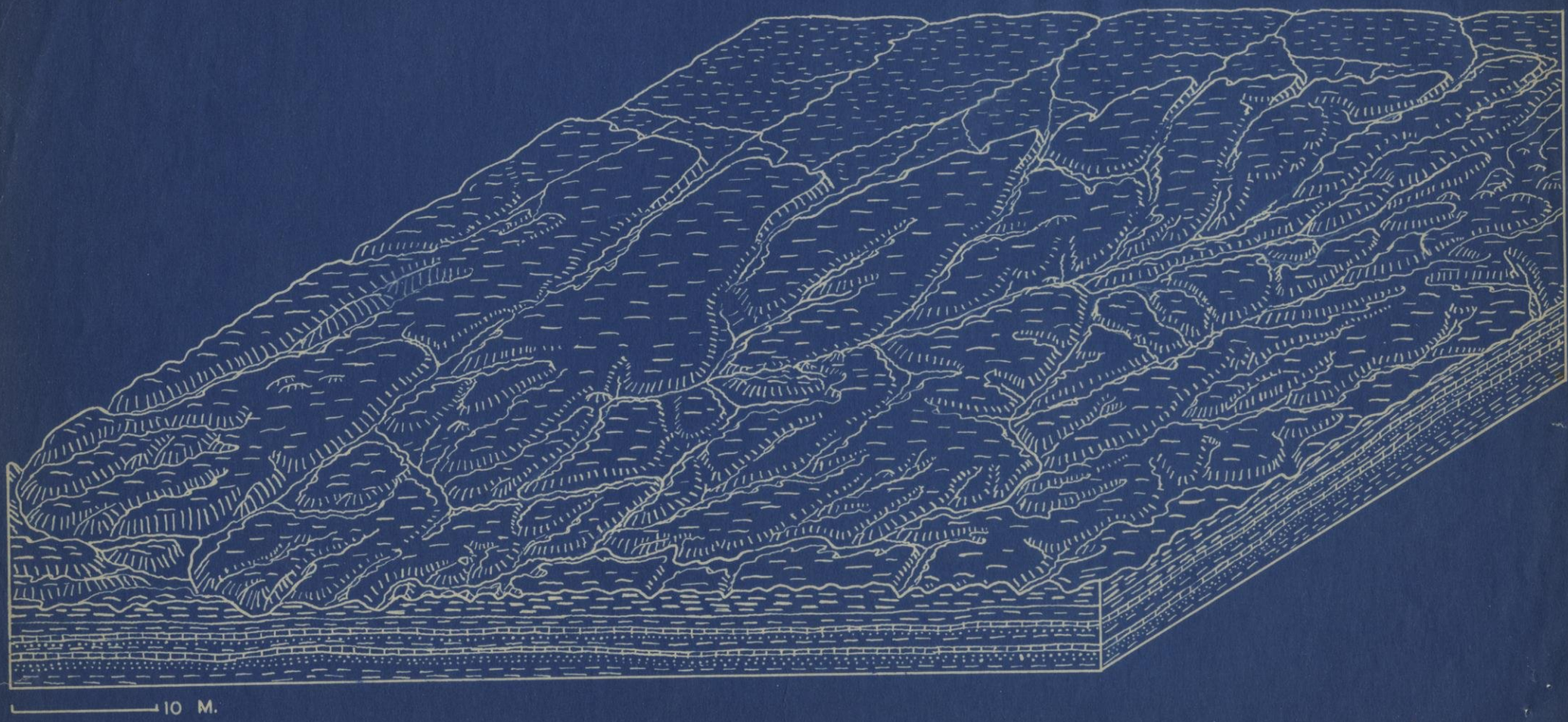
Definition= pleateau west of the high folded ridges

Boundary. Terminal moraine to N.

Topography- much lower than plateau to SE, 1200 to 2100 elev.

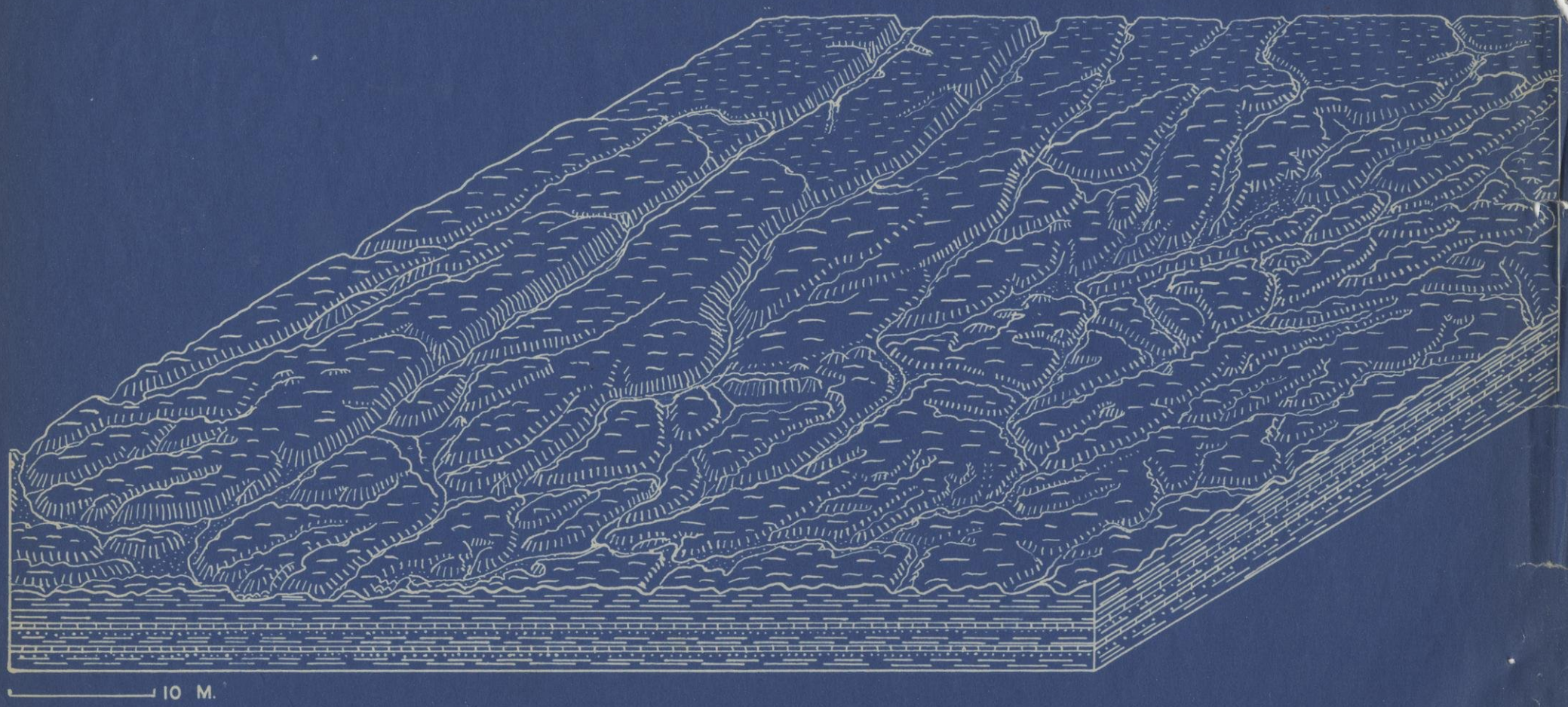
A basin rimmed with Pottsville ss but with a surface lower than rim. Is upland a peneplain? It pays no attention to minor folds but is everywhere about same level above streams.

Indirect effects of glaciation to N. Outwash fill; ponding of tributaries; diversions of drainage. Abandoned valleys like Teas valley Cut off meanders Parker strath= bottom of preglacial mature valleys. Orgainization of Alleghany River



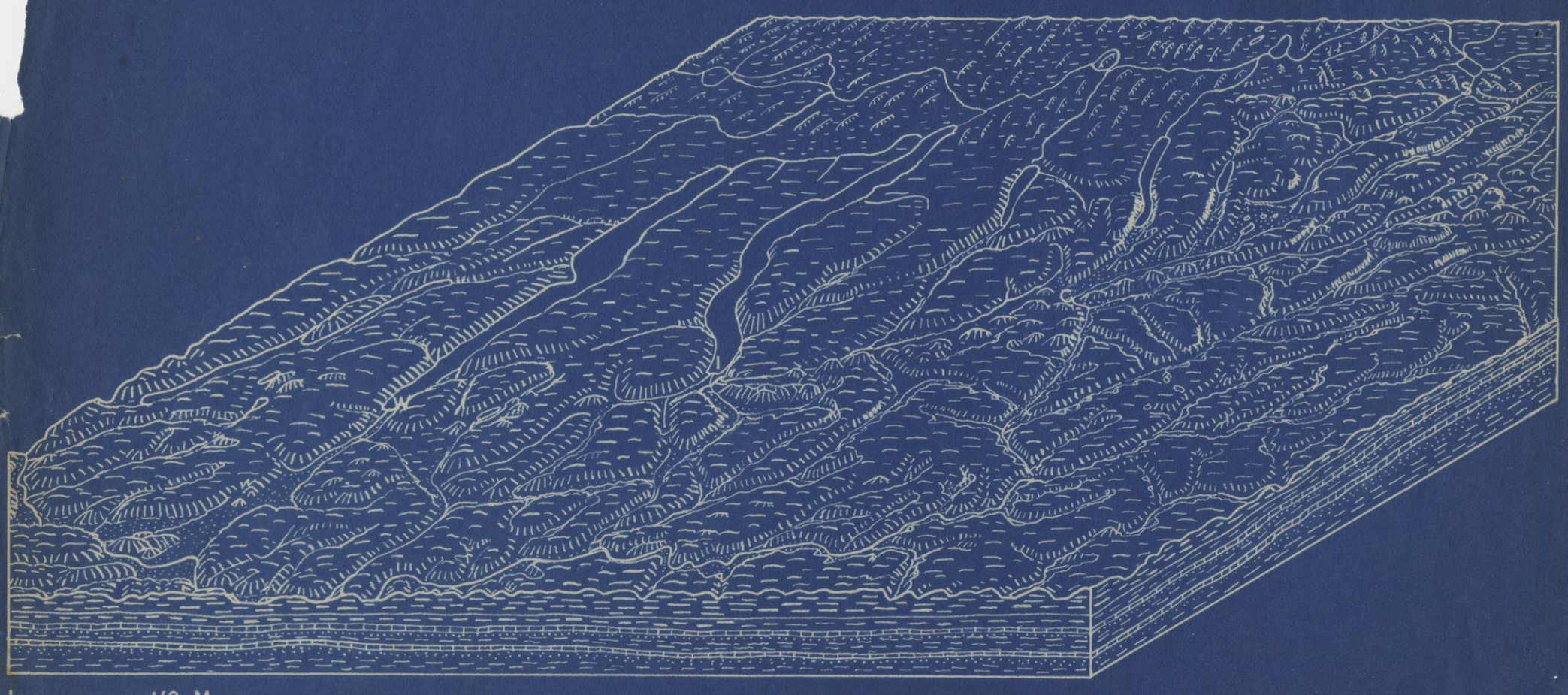
FINGER LAKE REGION – PREGLACIAL

F. T. THWAITES. 1933



FINGER LAKE REGION – INTERGLACIAL

F. T. THWAITES. 1933



FINGER LAKE REGION - PRESENT

F. T. THWAITES. 1933

25099
5.8

304-323 Glaciated Allegheny Plateau

Definition- area N of edge of Wisconsin drift

Boundary- No definite Terminal Moraine except west of Salamanca reentrant
Omit Mohawk Section N of Onondaa-Helderburg escarpment

Geology- mainly shale and siltstone. Only resistant formations are Chemung because of siltstone, sandstones of Portage, thin Tully ls and themajor one of Onondaga ls, Oriskany ss and Helderburg ls.

Topography- Elev. 1200-2000 Relief 300-1000
1. Mainly subdued glaciated erosional topog. Mainly ground moraine, Terminal moraine and outwash, in part pitted in valleys only
2. Finger Lake valley type= glaciated youthful valleys which locally extend below sea level. Valleys long, straight, locally sharp shoulder at top, mainly extend N-S, locally join across between such valleys
3. Unglaciated gorges on slopes of type 2 and joining them E-W. Dry waterfalls with plungepools hanging tribs.

Explanations of topography. defer general history
Type 1 is definitely preglacial erosion slightly altered by glaciation
Type 3 is definitely postglacial due to (a) superimposed streams and (b) marginal ice drainage
Type 2 has been explained by:
(a) reversal of stream direction from consequent to S to obsequent to N through erosion of Mohawk-Ontario basin on weak shales and salt-bearing rocks (Fairchild) 1951
(b) erosion by meltwater from ice which is particular might account for absence of definite divides between the glaciated young valleys and trib. of Susquehanna 1950
(c) glacial erosion of through valleys in effort to maintain enough area for flow or because deep valleys had thick enough ice to permit plucking bed rock thus making fiords. 1949
(d) erosion by interglacial streams diverted by older glaciations.
Conclusion: All 4 are possible and must have occured. Only question is relative importance. Great depth plus straighness seems to require glacial erosion but other methods helped greatly 1952

Catskill Mts. 319-323
Higher level protected by an old delta deposits of Devonian ss and cg.
Dip slope to SW, escarpment to N and E. lev. to 4204
Drainage coarse texture Explanation hardness not permeability
2 story topography- cycles or effect of differences in resistance?
Recency of Hudson-Mowhawk valleys evidenced by stream captures
Some evidence of local glaciers.

Mohawk section 323-342
Lowland along outcrop of weak Ordovician shale and Silurian salt-gyp. rocks. Niagara ls only west of typical area;
Not a wide valley but low rock hills. Preglacial divide at Little Falls.
Tughill Plateau to N. = cuesta capped by Medina underlain by Ord. lss.
Separated from Adirondacks by subsequent Black River which follows contact. glacial lake outlet

Cumberland Mts. = highlands which rise above Cumberland Plateau in Va. Ky, Tenn. include area where faulting and folding has raised the resistant Pottsville ss
Pine and Cumberland Mts. have inclined strata

Appalachian Plateau, end 342 -

Cumberland Gap on a cross fault, not a true windgap due to diversion

Cumberland Plateau= area of more resistant rock than to N. hard ss.
Broken by Sequatchie anticline in part a valley and where not broken through=
Crab Orchard Mts.E of this plateau is distinctly synclinal.
Some sinkholes go through ss to ls below.
course of Tenn R

History of entire province.
Sedimentation at same time as folded bed to E. formations thin toward interior of continent hence less folding and faulting
Uplift with some folding and faulting
Erosion.
(a)
Problem: does the even skyline mean anything?
Skyline level varies much in elevation. No marked levelness where there are anticlinal mts.
Very hard to distinguish effect of level strata from those of baselveling
(b) Major point for peneplain is disregard of structure by upland level. +
Presefvation of shale on parts of upland.
Ridges wide where on resistant bed, broken down to knobs on softer ones.
All high ridges related to folding or faulting.

Studies by projected profiles mainly ignore geology (swing)
(c) Find (in N.) 4 levels: Upland; Allegheny; Lexington; Parker strath.
Last represent preglacial maturity of valleys.
Streams not controlled by structure. Surfaces so definite
the lower ones cannot be due to parallel reduction of older
But how could a higher surface survive the making of a lower peneplain?
Has not diversion of drainage due to glaciation deranged entire set up?
Cannot evenness of divides be explained by adjustment to stream levels instead of inheritance from a summit level?
Glaciation of N. part with effects on drainage felt outside.
Organization of Allegheny-Ohio drainage. pre-Wis
Formation of Finger Lake type valleys.
Erosion of meltwater channels and postglacial gorges.

3/6

343-358 New England

Definition= northward continuation of both Piedmont and Blue Ridge which is glaciated

Reading Prong,

Boundary= E side of the less metamorphosed rocks of Hudson Valley, then follow river to sea so as to exclude Triassic of N. J.

Geology

Carboniferous granite Csi
pre-Cambrian gneiss ARgn
younger sedimentary schists (ph, As)
C and O limes now marbles
Paleozoic rocks, Cambrian, Devonian, Silurian, Penn including early Pal volcanics SCv and later Pal. volcanics CDv
Triassic sediments and trap (Newark)

Glacial drift, no distinct evidence of more than the Wisconsin
very bouldery tills, much outwash, eskers of Maine, lake & marine clays

Structure

Closely compressed with late P_el. intrusions late D
3 periods of folding, Ordo. and late Penn or Permian
thrusts prominent to W. confuse sequence of formations,
Appalachian age folds only in part, folds & wr older

Topography

No such distinct division into Piedmont and mountains as farther S
Elevation related to hardness and distance from sea. The Piedmont-like Upland is much dissected.
Mountain groups= White, Green, Taconic SW of
White = area over 1500' from Mt. Katahdin down to Ct. R.
extends into Canada
granite and schist
1952 Elev. to 6290 Rounded mts. glaciated, local glaciers
Green= Archean gneiss and met. sediments. thrusts to W.
Elev. to 4000 Range crossed by streams.
Taconic= mts. separated by a marble valley.
Metamorphic Paleozoics, thrusts.
Not parallel ridges like R. and V. hence excluded
Rensselaer Plateau on metamorphics to W.

1953

New England Upland 358-376
Monadnocks-type in New Hampshire, a schist mt. on a divided

Reading Prong= projection of crystallines W of Hudson with some infolded or infaulted Paleozoics
= Highlands of NY-NJ Storm King crossing
resemble Blue Ridge. Type of Schooley Peneplain

Seabord Lowland
area below 400-500 Smoother than upland, few monddnocks except mt. Desert Island
1954 Carboniferous lowlands of Boston-Naragansett Basins.

Connecticut Valley Lowland
Triassic area, a structural depression with dip E.
faults, effect on topography of trap ridges.
course of Ct. River.
Drift terraces

New England, last 376-391

History:

1 Ancient mountains of 3 periods of formation
2 Long period of erosion prior to Upper Cretaceous Fall Zone peneplain. This surface now makes up the rather steeply inclined and smoother coastal belt where it is exhumed.
3 Evidence of superposition of streams on Cretaceous, extent of burial?
4 Further erosion. Upland surface.
Controversy over terracing. Locally it is pronounced but mostly there is as much terrace slope as interval betweens terraces.
Can locally be seen but mainly based on projected profiles based on old inaccurate maps. "Personal equation"
Barrell- theory of marine terraces.
Meyerhoff and Hubbell, non-marine terraces, Pond, also Johnson faulting of one peneplain

Tarr-Davis controversy= how flat is a peneplain? GSA 16:499-516, 1904
Peniplane - form of mt. monadnock elev 500+

5 Dep. of later Tertiary among mountains as proved by outlier in Vermont.
6. Preglacial erosion High level of land shown by Georges Bank etc.
7. Glaciation. No positive proof of pre-Wisconsin despite wide extent of such in middle west. Known to S in Pennsylvania., N. J.
Wisconsin drift mainly ground moraine on hard rocks.
Very few true marginal deposits although many marginal terraces and drainage channels. Top of Mt. Washington glaciated
Explanations: (a) Steady retreat of ice front under a uniform marine climate
(b) Recessionals formed but lost on steep slopes and buried under outwash, etc. in valleys
(c) Wholesale stagnation because of mountains melting through to N. Flint's evidence = ice contact terraces, diagram This proves only that stagnant ice masses lingered in valleys after uplands were freed. Lower terraces stream eroded after before all buried ice had melted.
1951/1953 Testimony of varved clays demonstrates ice retreat with minor rejunvinations. Overridden outwash same.
Faint marginal traces have been discovered. Kettle valleys were sites of lateglacial lakes.
Controversy over downwasting vs back wasting, really both had to occur.
Eskers formed in stagnant ice, cross hills.
formed either in tunnels or section by section.
1954 Alpine glaciation of high mountains, age?
Erosional features-fiorded coast, no true fiords except locally, escarpment under Bay of Funday.
Regional submergence. Marine clays of ice retreat now uplifte yet shore is one of submergence.
Little Postglacial wave work because of hard rock plus effect of rising. Shorelines vague.

Adirondacks 392-410

Definition. Hard rock mountains and plateau of northern N. Y.

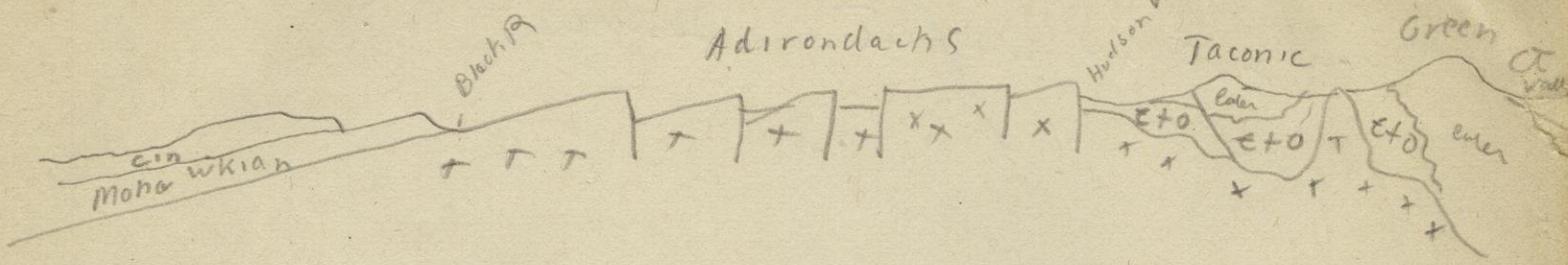
Boundaries
Area of pre-Cambrian between two structural troughs ix and overlapping Paleozoic to S.
For convenience include the small area of little-disturbed rocks of St. Lawrence Valley

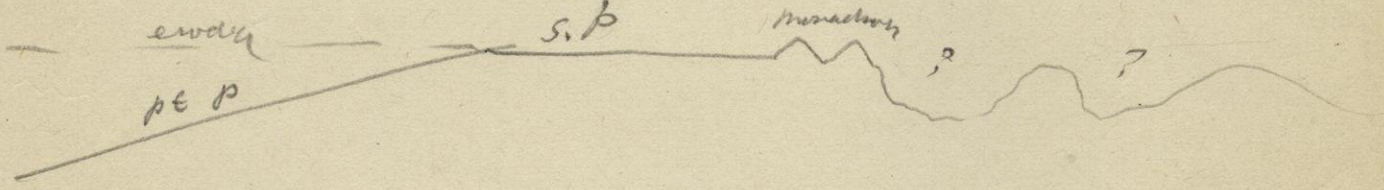
Geology
Pre-Cambrian granite and gabbro (anorthosite)
Grenville sediments altered to schist and marble
Some Potsdam sandstone, very hard Ordovician ss + sh
Glacial drift, thin, much stratified - lake sediments
Structure strike E*W faulting NNE much of it later than Paleozoics, problably Taconic (late Ordovician) age.

Topography
Western Plateau-like upland Wide valleys
Mountains to E.half, lev to over 5000 Rounded
Some valleys controlled by faults. Two types, open and not controlled by faults and the fault valleys which are narrow and straight
1703 cirques in high mts.

History
Pre-Cambrian mountains
Peneplaination
Burial by Paleozoics
Taconic revolution and faulting
Continued sedimentation after erosion
Uplift and erosion
Problem of upland. Is it due to two intersecting peneplains as along Fall Zone or is skyline due to faulting of the pre-Cambrian peneplain (Marshall Kay)
Erosion of Kowka Mohawk and St. Lawrence valleys Champlain
Glaciation
Evidence of complete burial not as clear as for Mt. Washington
No striae in valleys
Melting through as nunatak during recession
Stratified drift in valleys = pitted outwash
Stagnant ice blocks in valleys, not open-water lakes
Local glaciers made small cirques.

Section from Kay GM Northern allegheny synclinorium
GSA .53. p 1618, 1942





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Interior Low Plateau411-427

Definition= area of dissected sedimentary rocks higher than Coastal Plain and lower than Appalachian Plateau or essentially the Mississippian Plateau plus West Kentucky Coal Field ~~and xpx~~

Boundaries Was once included in Central Lowland
SE= Pottsville escarpment and where that is faint, edge of Mississippian
N= border of drift along Ohio R. plus unglaciated part of Indiana
W= Coastal Plain along Tenn. R.

Geology. Very closely related to topography Pleistocene
Pennsylvanian-coal bearing sh and ss
Pottsville ss to 300 ft in W. Kentucky escarpment
Mississippian-Chester ss, ls, sh cuestas
Limestones, Chester, St. Louis, Warsaw Karst
Kinderhook-Osage sh and ss including chert with underlying shale (Knobstone of Indiana) Ft. Payne
Devonian- black shale, some ls below
Silurian- ls and dl thins out to S
Ordovician- ls/sh/ls lowlands including much karst

Structure-Cincinnati-Nashville arch syncline of W Kentucky

Highland Rim section
Definition= Mississippian Plateau surrounding Ordovician lowland
Includes Norman upland & Mitchell Plain of Ind
Geology- Waverly-Ft. Payne chert; Knobstone siltstones, ls above

Topography-Conical knobs are outliers of upland. Farther back rolling karst Pennyroyal district of Ky. sinks, blind valleys, ponds

1953

2 427-448
Blue Grass section.
Definition= Ordovician area of Ky only
Boundaries- Ohio R. and edge of App. Plateau; edge of Highland Rim W, S Knob country
Geology-Inner Bluegrass= Ordo. ls. as high as Highland Rim
Outer Blue Grass mainly shale, some lime outside that
Some floodplain deposits above streams
Topography- lime = karst, rolling uplands.
shale= gullied area
Streams entrenched meanders valleys to 500'

Nashville lowland
Definition= Ordovicain of Tenn only omitting area much infested with outliers (Elk basin)
Boundary= chert-capped escarpment
Geology- limestone
Topography- wide valleys in ls= mainly the Cumberland valley + Duck V basin well below Highland Rim level, 400-600 ft.
Entrenched meanders
glades= bare rock areas
gravel-filled valleys

Shawnee Hills
Definition= area of Pennsylvanian and Chester rocks includes region of Granville, Ind. + Shawneetown Ridge
Geology-see above Note silt-filled trib. of Ohio

Interior Low Plateau cont.

Topography- cuestas. Outer one = Dripping Springs escarp.
Karst even within sandstone belt. Mamoth Cave
Faulted district-intrusive rocks-fluorspar mines.

History-entire province
1 Doming during late Paleozoic uplift -
2 Erosion
3 Coastal Plain dep
4 Was entire area peneplained (Lexington)? Evidence for- bevel of formations extension to Piedmont etc.
Against- extension of summit level across highest parts of Coastal Plain; presence of much higher Cumberland to E.
Does Nashville basin indicate a later halt? Or is it simply a phase of dissection of Highland Rim?
Structural explanation Cuestas. Development of karst
5 Erosion of wide valleys in which streams meandered=Parker strath course of Tenn R subsequent on C.P.?
6 Aggradation of old valleys (due to an early glaciation?)
7 Erosion of gorges; uplift or organization of Ohio R due to early glaciation Formation of entrenched meanders Changes from lateral erosion. (ingrown meanders)