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Pigeon Point, Minnesota, No. 3: [specimens] 11497-11606. No. 44 1885-08

Williams, George Huntington, 1856-1894

[s.l.]: [s.n.], 1885-08

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PIGEON PT.

AUG 18-25-85

No. 3.

U. S. GEOLOGICAL SURVEY
FIELD SECTION BOOK

No. 44.

August, 1885

Pigeon Point, Minnesota.

G. H. Williams.

11497-11606.

Survey of the Pre-Cambrian Rocks of the N. W. States.

INSTRUCTIONS.

1. Ordinarily at least two pages of this book will be devoted to one section. On the left hand page place a map of as much of the section as has *actually been seen*. Denote rivers, lakes, marshes, etc., by the usual topographical signs. Denote the ledges of rock, when no structure is made out, by cross-hatching, making the cross-hatching cover as nearly as possible the areas occupied by the exposures. If the rock is a massive one, but still more or less plainly bedded, use the same sign with a dip arrow and figure attached, showing the amount and inclination of the dip. Denote slaty or other very plainly bedded rocks by lines running in the direction of the strike, with figures and a dip arrow attached as before. In all cases where there is the least doubt about the true bedding directions, indicate it by a query. To each exposure on the face of the map attach the number of the specimen representing it. In mapping the section count each of the spaces between the blue line as 100 paces, and twenty of these spaces as one mile, or 2,000 paces. Usually the southeast corner will be placed at the bottom of the page, or at the first black line above the bottom of the page, and at the right hand side. If, however, for any reason, it is desirable to show portions of an adjoining section, the southeast corner may be shifted up, or the map may be turned around and the north placed at the left hand side of the page.

2. On the right hand page place the notes descriptive of the exposures. Begin in each case with the number of the specimen, placing the number on the left hand side of the red line, after which give in order on the right of the same red line the position of the ledges as reckoned in paces from the southeast corner of the section, and the dip and strike when observable, for instance: 4025 | 250 N., 300 W., *Strike, N. 6° E., Dip, 50° E.* Then follow with as full a description of the ledge as possible.

3. The ruling of the left hand page is also arranged so that a smaller scale can be used. Each one of the black lines may represent a section line and the red lines quarter sections and "forties." The scale of the maps may thus be reduced, if desirable, to two inches to the mile (the ordinary town plat scale.)

4. Collect a specimen from each separate ledge of rock, or wherever there is a change of rock on any one ledge. In case of trips made on foot or in canoes, for long distances, neighboring ledges, unquestionably of one kind of rock, need not be sampled, the position and extent of the ledge being marked on the map, with a note that it is of a rock identical with specimen so-and-so. Under the same conditions small sized samples, trimmed to a uniform size of $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{2}$ inches will be allowed, but in all other cases *large sized specimens*, trimmed to a size of $3 \times 4 \times 1$ inches, must be selected, in accordance with § 3, chapter IV, p. 44, Regulations of the U. S. Geological Survey. In all cases collect chips for slicing. All specimens are to have numbers painted on them, in white on a black background, in the field.

5. On the last twenty-five pages of the book give, as may seem desirable, a general account of the examination of the region mapped in the previous pages, correlation of observations, sketches, cross sections, etc., etc.

6. Forward this note book, as soon as filled, as registered mail matter, to R. D. IRVING, U. S. Geologist, Madison, Wis.

SUMMER OF 1885.

GEO. H. VILLIAMS.

Field-Notes taken on Pigeon Pt.

Minn.

July 28th — Aug. 25th 1885.

No. 3.

AUG. 18.

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quite sandy) and in one place there are so many white quartz pebbles as to form a regular conglomerate.

The dip of these rocks is 15° - 20° somewhat E of South. They are cut by regular vertical N. S joints.

Some near the water at the west end of the point break into splintery pieces and apparently have no bedding.

Afternoon: Traced the contact line of the felsite and gray gabbro west of the bay between the point and Ficherman's Point. The belt of red syenite seems to come to an end at short distance east of the high round knoll upon wh. we took the photographs. West of this the rock is all typical gray gabbro, rather nodular and often porphyritic in the larger masses. This is especially the case along the

11497 southern edge of the mass
from the second knoll west
of where the photographs were
taken. granitic in structure
and not very fresh.

11498 Coarsely mottled pink felsite
glassy and much inclined
S. W. of the above.

11499 Trap from the west end of
the big dyke running along
the south slope of the high
knolls near the contact of
the felsite and gray gabbro.
It encloses fragment of the
latter. The specimen shows
part of such an inclusion
which is penetrated by very
fine veins of trap.

Mr. Bayless' specimens:

11500 Felsite from Pt. Y.

11501 Gray mottled felsite near the
contact with the gray rock
behind Pt. Y.

11502 Same str. nearer to the con-
tact.

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11503

Fair ridge behind the shingle beach lying west of Pt V.

11504

From the second ridge behind the same shingle beach.

11505

Felsite weathering white. west end of the bay east of

11506

the east exposure of rock in this bay - Felsite which weathers red.

Wednesday, August 19th 1885.

Road westward from the camp along the lake shore - all rocks appear the normal gray felsites (quartzites) - with their regular dip strike -

At the point just before turning into Waus-wau-goning bay are unmetamorphosed fissile slates and interstratified harder bands. Dip 20° E of South -

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11507 Scarcely altered slate from the shore.

From the bluff a short distance further north, all interstratified, come:

11508 finely bedded slate.

11509 harder gray slate.

11510 Compact, brown gray quartzite.

From near the shore.

11511 Sandy slaty felsite.

11512 On the contact further back, mottled felsite.

11513 Gray-black, massive rock, free of iron.

At the first point beyond north of the long shingle beach inside of Wans-wan-ging Bay (east side) the contact belt appears.

11514 Distinctly mottled felsites, red and green - with felsite inclusions. One very large irregular one of quartzite.

AUG. 19.

111

Some rocks here look like red syenite but are really only part of the contact zone.

The next point, the last one before the bay turns to the NE, is composed of gray ^{gabbro} ~~syenite~~, between wh. and the contact belt comes an intermediate rock (11516)

The gray gabbro here is very typical and just like the prevailing rock at Region Pt. It is occasionally porphyritic with immense glassy feldspar crystals. It weathers into the usual nodular masses. In some places it seems to be injected with masses of the typical coarse grained red syenite.

The first rock exposed on the opposite side of the bay is a huge trap dyke with cross columnar structure. It is mostly very coarse grained and mottled.

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11518 This dyke incloses large masses of a white rock very coarse grained which is composed almost entirely of feldspar.

The rest of the shore along toward Kat Point is mostly an alternation of trap dykes and shingle beaches. The former cut finely bedded slates which appear to be but little altered. These all dip 15° S.E. There are also some felcites like those at the point; some mottled, some spotted; others plain.

The mass of Mt. Josephine is composed of typical gray gabbro without decided porphyritic structure.

11519 found near the summit.

Thursday, August, 20th 1885.

Could only work for two hours on account of a hard, continuous rain - Long NE storm.

The high ridge which runs along the south bank of the Pigeon River, near its mouth, is gray gabbro, in some places very porphyritic. It also contains locally much green feldspar-hornblende in irregular patches and appears exactly like the rock found at Pt. B.

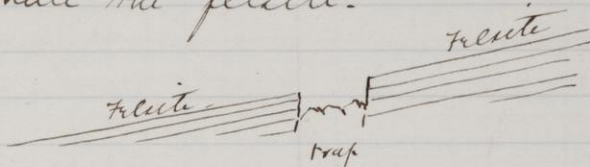
To the south of this ridge, separated from it by a narrow hollow is another nearly as high which extends at least as far west as the Parkerville Trail. This is composed of felsite banded on both the north & south sides by a huge trap dyke.

At the foot of the Palamides which are composed of felsite, the trap forms a hollow, having

Aug 20. & 21.

114.

weathered much more rapidly
than the felsite.



A number of curved
shingle beaches lie in the
area back (west) of the camp
marking higher levels of the
lake.

Friday, August 21st 1885.

Went along the lake shore
S. W. of the camp. This is composed
of hard gray felsite dipping E. of S.
about 20° (11520) There are in
places remarkably spotted (11521)
often with large spots like
11460.

Not very far back from the
shore there are cut by a narrow
belt of quartz porphyry which
does not seem to produce the
usual mottled contact belt

in the felsite which is seen
all along the edge of the red,
syenite and the gray gabbro-
Near the felsite this porphyry
11522 is full of inclusions - (11522)

The porphyry is not anywhere
porphyritic but in places is brown
and easily cupreous, externally,
11523 } resembling some of Rosenbusch's
11524 } "Minette" from the Vosges Mts.

North of this quartz porphyry
belt is a narrow band of fine
11525 grained gray gabbro (11525)
This is succeeded toward the north
by the felsites having the usual
11526 dip. (11526.) There is no contact
belt here, probably because
the gray rock is present in
such a small amount.

Further west the porphyritic
structure of the Quartz porphyry
becomes very marked. It
11527 weathers almost a vermilion
red in places. (11527) It includes
11528 great numbers of dark fragments
of all shapes & sizes (11528.)

AUG. 21.

116.

11529

In one place this darker gray rock is developed in quite a large mass by itself surrounded on all sides by the porphyry (11529)

Can this be the same as the included fragments? No

This gray rock is apparently only a fine grained variety of the gray gabbro which forms a narrow band north of the porphyry. It weathers away & has formed a hollow. Here a tongue or apophysis seems to have penetrated the porphyry.

The true inclusions are hard, blue & cryptocrystalline. They look like trap, but one resembles the very porphyritic gray rock. The red porphyry is everywhere very much faulted and weathered. Fresh specimens could not be found. The fact that it here forms a ridge and not a hollow seems due to the fact that it is so full of hard inclusions which often make up $\frac{2}{3}$ of the entire mass.

AUG. 21.

117.

Walked in a straight north line from the calcite vein. Found a long series of coarsely bedded felsite, dipping E of S 15° - 20° , which terminated at the summit of the ridge in a hollow, on the other side of which the quartz porphyry ~~the quartz porphyry~~ ridge with its trap inclusions was again exposed. It is here much wider than it is further east. The trap inclusions weather out leaving depressions in the red porphyry. (11531)

11531

The felsite on the other side of the hollow is compact and brown. Slight mottled (11530)

11530

This hollow between the felsite and the porphyry may represent a trap dyke; especially as Mr. Bayley found a large one on the south side of the porphyry slightly further to the east. (11532)

11532

Made another n.s. section starting between the points "7" & "2"

on the south side, west of the camp. First came evenly bedded normal felcites. & slates dipping E of S. These extend some distance northward to near the summit of the ridge. Then begins a fine grained red syenite marble, with a horizontal parting. (11533)

11533.

11534

Beyond this on the edge of a ridge running eastward is a nearly white extreme felcites. (11534)

This ridge extends northward and terminates in very high bluffs toward the N. & W. The northern edge of this is the gray gabbro.

The red syenite extends all along the western face of this ridge as far as can be seen from the deep hollow back of Point 2. This red rock is sometimes coarse grained (Summit of the ridge near the gray) (11535); sometimes (near the gray) very dark in color & full of iron

11535

11536.

AUG. 21.

119

11537

At the base of the NW corner of this ridge under the gray rock felsite crops out in contact with the gabbro and forming inclusions in it. The enclosing rock is in structure like the coarsest grained varieties of the red syenite; this like the gray gabbro in color. This place looks as tho the eruptive rock had here formed an outflow.

11538

The hollow at the base of this ridge is covered with large loose blocks of the red syenite. There also extend some distance north of the ridge.

Mr. Bayley made a N.S. section some distance farther W. He was on the high ground skirting the deep hollow on the west.

11539

Pink felsite from near the lake shown - first ridge -

11540

Darker felsite from a short distance further north.

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120

11541

Red granite from strata further north. This is the western continuation of the high ridge on which I walked on the east of the hollow.

Saturday, August 22nd '85.

March of the Pigeon River just around the bend (American side) are some almost unaltered

11542

slates, black in color, which dip 10° S E. (11542)

These are overlaid by a massive rock just above the water edge, which somewhat resembles trap (11543) but grading above into the fine grained gray rock, of which this point seems to be principally composed. (11544)

11543

(11544)

11545

On the further side of the little chert track there is a big trap dyke. (11545) Runs E.W.

AUG. 22.

121

- Beyond (East) of this place we have pink & blue pelites with many interstratified slate bands -
 11546 (11548) extending high up the bluff but everywhere capped by the gray gneiss which seems to have cross-bedded them. They all dip E of S.



Pigeon Bay.

- South shore of the north arm of
 11548 Pigeon Point (Canada)
 Very fine slate dipping S.E. (11548)
 These extend up to the great central
 11549 gray bluff. They are interstratified with occasional quartzite bands as at Pigeon Falls. (11549)
 and are cut by a large trap dyke
 11547 which skirts the shore (11547)
 The slates are not altered more than six inches from the
 11550 edge of this. (11550) is the contact.

11551. Further west the trap of this dyke becomes porphyritic. (11551)

American Side. Started at the "arch" west of the large trap dyke No. (1.) and moved westward to the mouth of the River. A short distance west of the arch a fine grained grayish rock appeared to run into the massive gray gabbro. Its exact nature could not be made out in the field. A small projecting point of it resembles felsite (11552). It is cut by veins or dykes of red syenite (11553) and in some places contains so much red feldspar as to appear to grade into the red granite or syenite. (11554)

Beyond (west of) this is a large trap dyke whose northern contact edge forms the shore line for some distance. It is therefore very fine grained black splintery & as to resemble felsite more than trap. It turns & runs S.W. into the gray gabbro.

Still further on some large

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123

11555.

blocks of fresh gray gabbro have fallen down from the high bluffs above, exposing some fine fresh surfaces which were unusually lighter colored. (11555)

11556.

West of this point and of the wall upon the face of which the word "ENINI" etc., is scratched in the moss (vid. D.D. Owen's Report), the soft unmetamorphosed slates appear in a small bay along with a white calcite vein about 3-4 ft wide. These dip S.E. & are protected toward the lake by a large trap dyke. (11556)

The gray gabbro which rises in a very high bluff seems here to recede from the bay and expose a low platform of slates and felsites which are filled everywhere with trap dykes. These latter are at times so abundant that the slate themselves can only be occasionally seen. They are all covered with such a heavy growth of brush & timber that

their close examination was impossible. No contact phenomena of any sort were seen on this side.

11557 Farther on the slates are well exposed for some distance up the hill. These are very finely bedded. (11557)

11558 is the rock overlying the slates and felites in the bluff at the corner.

Sunday, August 23^d 1885.

Islands — The north arm of Susie Island is a big trap dyke - str. 20° S. of W.
 11559 This contains much red feldspar and is very porphyritic on the west side (11559)

11560 The point north of this is felite (11560) and slate dipping 20° E. of S. This extends all along the north side.

On the south side of the

11561 trap dyke slate again appears, and opposite it across the bay, some finely glaciated grooves running 20° N of E.

Just around this point is a large trap dyke like 11559 with red feldspar. It is coarse

11562 grained in the center (11562); fine and blue without red

11563 feldspar in the edge (11563)

These dykes are like those found yesterday on the north arm of Pigeon Point (11551)

11564 of slate from this contact.

Lucille Island presents high bluffs to the south which are composed of a greenish gray rock with dull green slate and large cupreous of some bisilicate.

11565 from the top of the bluff - shows traces of copper.

11566 same - fresher specimen with more of the bisilicate.

- 11567 Compact reddish rock looking like felsite inclusions but occurring all over the top of the bluff in veins or dykes.
- 11568 Farther down near the foot of the bluff - contains much red feldspar.
- 11569 Much of this rock is amygdaloidal some of it coarsely so with calcite and epidote.
- 11570 At the base of the bluff on the water are beautifully colored and banded felsites having the normal dip and strike. These eruption rock seems to have broken through and crossflowed them.

There is no felsite on the ^{north}~~south~~ side of the island near the east end

On the morning of the 23^d, Mr. Bailey made an excursion into the felsites back of our camp. The rocks forming the bluff directly behind (west of) the tents are red granite which is very

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11572 full of small dark inclusions (11572)
11571 is same of this rock free from the
inclusions from the base of
the bluff further to the east.
The inclusions increase in size
and abundance as this bluff
is ascended.

11575 contains calcite

11574 from the north contact of this area

11573 " " south " " " "

This area of syenite or
granite seems to be entirely
surrounded by felsite.

11576 is from a trap dyke cutting the
felsite on the N.W. side of this
red rock. It runs 70° S. of W.
It may be a continuation of the
great trap dyke forming the
southern edge of the red rock
farther west.

11577 On both side of this dyke the
felsite is banded which appears
on the surface in apparent "flow-
age lines"

On the top of this ridge the rocks
become much confused so that
it is impossible to determine

T.

R.

11582 Diabase or Gabbro

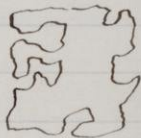
their exact relations.

11578 Mottled felite - from a large inclusion (?) in the darker rock.

11579 Felite - apparently cupriferous - contains macroscopic quartz grains.

11580 The quartz in this felite increases in size and often has the appearance of being eaten into by a basic magma.

There is much pyrite on the joints of the enclosing rock.



11581 Same rock containing slate inclusions.

11582 Banded felite on the south edge of the ridge.

Crossed the hollow which separates this ridge from the one next north of it. This is a mixed zone representing the gray belt which borders the red on the north, but it is here free of inclusions of any sort.

The succeeding hollow is low &

Swampy - probably filled with
felsite

11583. Gray gabbro(?) top of the 2^d ridge -
11584 From the talus of this ridge - Looks
like a black quartzite.

11585 From the trap dyke running over
the top of this ridge -

11586 From the south edge of this dyke -
Conglomerate with eruptive cement. (?)

11587 Mottled felsite north of the
trap dyke - Inclusion in the
gray rock.

11588 Light unmottled felsite.

11589 Coarse gray rock with large
blue lath-shaped feldspars
It looks like an inclusion
in the finer grained gray -

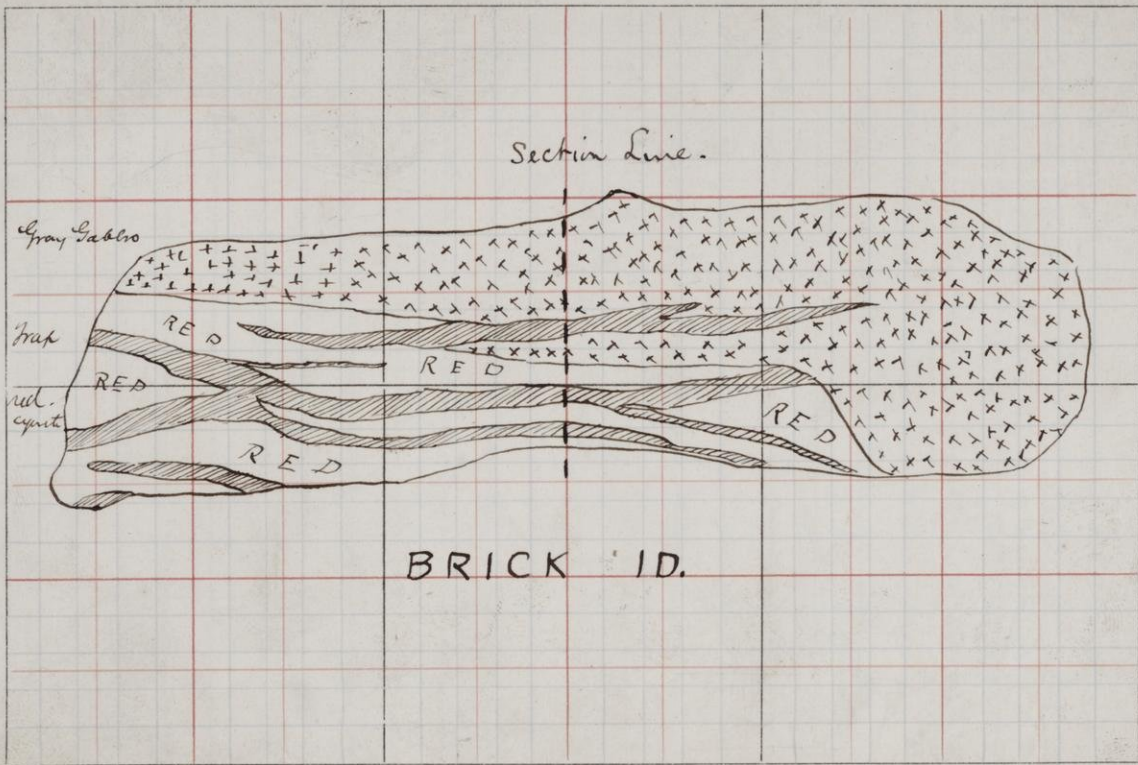
Hand Specimen
writing

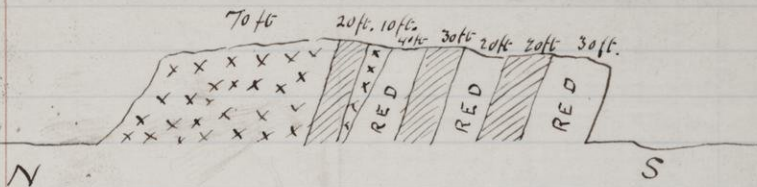
11590 Coarsely mottled felsite.

Afternoon of Sunday the 23rd

Brick Island.

11591 Red syenite from Little Brick Island





Section across Brick Island.

- 11592 Porphyritic ^{like 590 very coarser} gray rock forming the ~~northern~~ ^{southern} half of the island.
- 11593 Coarse grained red syenite from the first band south of the above. Not red rock (W.S.B.)
- 11594 Trap from the last band south.
- 11595 Red rock " " " " "

The red rock occurs in dykes in the gray rock; the trap as dykes in both.

Beece Rose Island - a continuation of Lucille.

11596. Augitic rock like No. 11566.
- 11597 Melaphyre (?) purple with green spots.
- East end of Beece Rose Id
- 11598 Trap from a dyke on the shore in the S. E. Corner.

Aug 23 + 24.

131.

11599

Mygdaloid from S.E. corner with
epidote + chlorite.

Monday, Aug. 24th 1885 -



N.

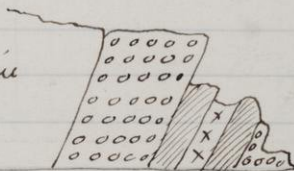
S.

Section of Luceia Is.

South Shore. About $\frac{1}{2}$ of the way from
the eastern end there is a remar-
kable exposure of ribbon like
dykes of different eruptive rocks
which skirt the shore, running
somewhat less south of west
than it does.

11600

a + a' - the typical
prevailing rock of
the island.



a. b. c. b'. a'.

Angite cupress in a gray grand mass.

11601 b. & b' trap

11602 c. - a brownish-red porphyrite full of small inclusions of the trap (b) along its sides.

At the western end of this island there is another superb exposure of these dykes.



a. b. c. d. e. f. g.

a prevailing rock of the island.

b porphyrite -

11603 from near the contact with a fine-grained granitic mass -

11604 from the center of dyke b. reddish-brown.

c - Red syenite like that on Brick Island.

d

11605 e Black porphyrite with beau-

AUG. 24. 25.

133.

tiful porphyritic crystals. This is glassy near the edge of the dyke.

11606 A red cyanite band was encountered 125 ft below the surface in the shaft of the Susie Island silver-copper mine.

Tuesday, Aug 25th 1885

Embarked at 2 A.M. from Susie Island on board the "Mollie Spencer" (tug) bound for Duluth. Arrived there at 6 P.M.



