Marquette district: [specimens 22881-22914]. No. 164 1893

Thompson, J. R.
[s.l.]: [s.n.], 1893

U. S. GEOLOGICAL SURVEY

FIELD SECTION BOOK

9-891

164

Marquette District

J. R. Thompson,

1893

LAKE SUPERIOR DIVISION.

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 number attached, showing the direction and amount of the dip. Denote a shaly or other very plainly bedded ledge by right parallel lines, and a ledge having a secondary structure by wavy parallel lines running in the direction of the strike, with dip arrow and number attached as before. The greatest care must be taken to avoid confusing slaty or schistose structure with bedding, and in all cases where there is the least doubt about the true bedding direction, 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 lines as 100 paces, and twenty of these spaces to 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. The ruling of the left-hand pages is also arranged so that, if desirable, a larger or a smaller scale can be used, eight inches, two inches, one inch, or one-half inch to the mile. With the two-inch scale, the squares outlined in black represent sections, and those in red, quarter sections and "forties," while the space between the blue lines is 200 paces.

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, the latter always being expressed from the north; for instance 4025, 250 *N.*, 300 *W.*, *Strike*, *N.* 78° *E.*, *Dip* 50° *S.* Then follow with a full description of the ledge. When topographical maps are used for locations this paragraph applies only in part.

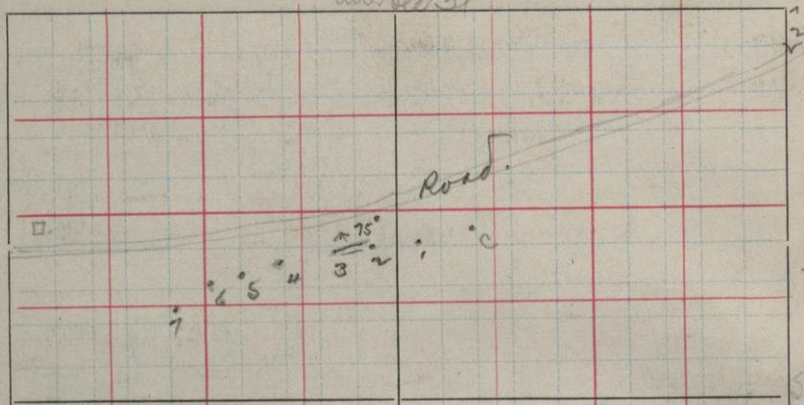
3. Collect a specimen from every ledge, or wherever there is a change of rock on any one ledge, taking care to get fresh material, unless for a special purpose the weathered surface is desired. In case of trips made on foot or in canoes, for long distances, neighboring ledges, unquestionably of one kind of rock, need not be specimened. The position and extent of the ledges not specimened should be marked on the map, with notes that each is of a rock identical with specimen so-and-so. Under the same conditions small-sized specimens, trimmed to a uniform size of 2 x 2½ x ¾ inches will be allowed, but in all other cases *large-sized specimens*, trimmed to a size of 3 x 4 x 1 inches, must be selected, in accordance with section 3, chapter IV, p. 44, Regulations of the U. S. Geological Survey. Specimens should not be placed together without protection in the collecting bag, as the fresh surfaces, important in determining the character of rocks, are thus destroyed. They should be damaged by no temporary mark, but the numbers should be at once marked in at least two places upon the inclosing paper or cloth bags. Specimens may be permanently marked in camp by painting the numbers upon them in white upon a black background, using Silver White and Ivory Black oil tubes for color, with turpentine as a diluent.

4. 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.

5. Forward this note book as soon as filled as registered mail matter to C. R. Van Hise, U. S. Geologist, Madison, Wis.

S. T. R.

Cent. Sec 31



Location of Champion mine Shafts measured from the S.E. cor. of Sec 31.

	West	North
C.	2105 ft.	1210 feet
#1	2370 "	1120 "
#2	2695 "	1000 "
#3	2920 "	940 "
#4	3120 "	900 "
#5	3490 "	800 "
#6	3900	650
#7	4260	400 "

Last house on Street North 1150 — N. side W. end West 5130.

Champion Book

Begin with #20334.

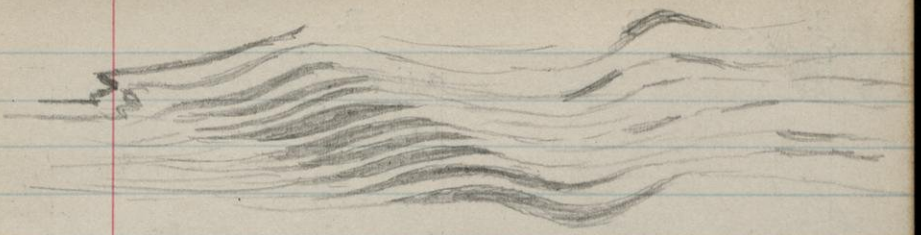
~~#20334~~ 22881 A little west of the N. sec. line
#~~20335~~ 22882 of Sec 31. a small ledge of #20334
15'x2' much crinkled. containing
lenticular bunches of quartz usually
small. some seem very like water
worn pebbles
#20335 is a vein 8" wide apparently
interbedded These two are in contact
the ledge is within 100 feet of a
granite outcrop.
dip about 70° N. strike E. 35-40° N.
but in 200' west the granite cuts across
it

~~#20336~~ 22883 Dike 300 feet in granite. Distance to
compare with those found in
sim formation

#20337 22884 Mica Schist beneath jasper outcrop
It seems a gradation from the jasper
location later.

~~#20338~~ 22885 Dike of this striking 30° across formation
location later 100 ft. east seems to be
another exposure, very small, of the same
dike

S.	T. paces			R. Barom	
(31 32 / 6 ◇ 5) North				2575	S.E. corner Sec 31
	98			2610	Road
	101				(Garnetiferous Green schist Conglom) (?) Border
	117			2620	" " (?)
	172			2610	
	202			2625	
		W. 10.			Micaceous jasper Strike W. 14° S
	250			2620	contorted " " (very)
	274			2615	
	275			2608	Dip N II
	362			2608	To Ry Bank
	370			2620	Center Main track
	439			2620	
	511			2620	
	537			2610	
		E. 30		2610	(Well Yellow Ochre jasper upper Hor)
	523				
		W. 9		2618	" "
	585			2615	
	680			2610	
	734				upper Slates
	745			2570	Center Road
	796			2540	
	867			2515	swamp
@	1019			2500	Center Ry track



Sketch showing how shearing destroys the siliceous band + changes the jasper to a micaceous schist.

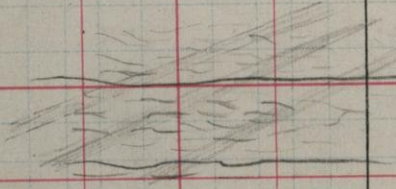
NW S.E. corner of Sec 21. at Champion Mich.
This corner seems to be in the granite, but no ledges to 300' South. It is in the midst of tremendous granite boulders. like the Michigamme district

JP Jasper folded closely axis of folds plunges N.W. at about 60°. Also much sheared.

Supposed to be close to ¼ post from Pit

S.	T.	R.	
E. 22° S			
(a) East	590	2495	Alma Ry. Tracky
		2565	See line & Road
		2630	
(B)		2615	
(B) North			On line
North	70	2605	Huron Bay Ry
	113	2590	
	193	2580	
	343	2550	
	475	2535	
	565	2535	

The strike of the schistosity is across the strata from N.W to S.E. at an angle of ~~28° 30°~~ + the whole rock shows small cracks like the sketch



To wagon Road crossing between depots
E line Sec 31
Beaver Hotel Utah
Road opp. last house on street, near N. line Sec 31

Sept. 27, 1893. Spits of Snow.
On top of big hill back of School House
covered with dense bush. The whole
hill is a great upheaval of jasper
greatly sheared, great smoothed, rounded
surfaces appearing every where
One on ledge of the white banded jasper
The white bands disappear entirely
near a severe shistosity plane and
beyond that in the strike of the same
strata there is a great deal of actinolite
and also much magnetite. In places
streaks of magnetite ¼" wide and several
feet long can be found

	S.	T.			R.	
					1740	at. 12'00 M.
					1710	Hotel steps
					1715	opp store
					1715	office + No 3 shaft
					1700	No 6 shaft
					1692	½ way "6–7
#7	North				1695	#7 shaft
		100			1705	
#7						
	S 7° N	75			1680	Hum Bay Ry track
		125			1660	
			W 20 S	50	1665	
				100	1660	swamp
		245			1665	
		293			1660	swamp
	#7a	310			1662	
		400				swamp apex
#7a		600	approx			granite
#7a	W 24° S	29			1670	ledge
	#7b	510			1682	at Edge of granite dike
#7b	S	30			1660	
	N.	9			1680	dike.
		20			1665	
	W 25 N	9			1680	
		25			1665	

Sept. 28. 1893 7.30 AM

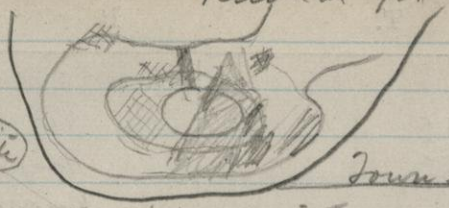
Ravine N & S

Knoll N.W & S.E - 20 E - 80 W. 40 wide

This knoll is of crystalline schist
~~#20339~~ 22886 #20339 containg large amounts of #20340
~~#20340~~ 22887 & #20341 appearing to me to be granite & sheared
~~#20341~~ granite intrusions. The schist has then
22888 been extremely contorted afterwards cut
by a large greenstone dike 30 or 40 ft
wide with several side offshoots from it
~~#20342~~ is this greenstone dike
22889 From this knoll a ridge runs.
S 50° W. 257 paces at about the
same elevation to the ledge of #20334 & 20335
and in 30 paces more to granite outcrop
At one place less contorted than the other
the knoll dipped 60° N. Strike E 25° W

S.	T.	R.	
#7b. S 50° W	22	1665	greenstone
	90	1680	Ridge 50' wide
	257 20 N.		ledge #20334
	282	1695	old granite
#7a N. 0		1695	1695
E. 36½ S	73	1680	Rhyolite
	211	1665	end of low ground
	224	1666	ledge schist
	230	1670	
	252	1672	
#7c	276	1685	
#7c N.	11		
N 38 E	23	1688	Top of knoll
	46	1660	Swamp

Crystal at #761



S. swamp 200' New granite

Town line

The boundary of this granite seems to strike E. 7° N. What I have called "new granite" apparently lies all N. of this line

greatly cut up with granite intrusions ledge goes 60' E

Large stump used as fence post.

Granite intrusion in schist cut by greenstone dyke
Same granite intrusion in nearly interbedded. See photo

S. T. R.

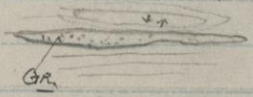
(7c)	E. 25° N	35		1680
		55		1660 Swamp
		40-50		Diorite dike
	W. 50 S	36	60 S	1680 ledge schist
		12		1665
		140		1660 Point projecting southward
	S	50	E 1-30	diorite 30 × 20
	E 30° S	24		1680 ledge schist
		46		1660 swamp
(7b)	S 9° E			
		34		1675 Diorite 20 × 30
		57	~~15 W~~ 15 W	1675 Schist
				1680
		67		1670 Ravine course with strike
(7D)		82		1685 schist dip 58°-60°
		90		1680
		97		1660 Swamp 50' wide
(7D)	S 50 W	30		1685 Schist
		50		1660 swamp
	S 10° W	40		exposure "new" granite
	N 30 E	30		1660 swamp

~~#20343~~
#22890
~~20344~~
22891

Granite with small piece of schist attached
The schist near to granite
This schist is not greatly contorted it dips N. 60°
Strike (N. 33 E) I think wrong should be E 33 N
DRS.

large ledge 50'x30'

In one place a reversed fold but close to it an intrusion
Strike (N. 30° E / E 30 N.?) of interbedded granite



granite (new) beyond

cut by diorite dike

S.	T.			R.	
(7D) N,25°S	58			1670	
S47°E	20			1660	
	48			1665	New granite
	53			1670	diorite dike in
(7E)	84			1690	granite ledge
7E N 52°E					
	15-35				ledge granite schist inclusion
	115			1685	
		E52S. 35		1700	
		W52N 20		1685	
		40		1660	Swamp
	172			1680	
		20 N			granite
	217			1675	
		W52N	40	1665	swamp
		E52S	73	1705	Granite
	360			1700	
(#7F)	415			1720	
(7F) N,27°W					
	19			1705	red granite very small outcrop
	60			1695	Ry track & Rock piles
S27E	40			1720	
	60			1710	
	100			1720	

granite striking S 20° W

Approx course of N. boundary of granite at this pt

22892 Shipped.

~~*20315~~ From an inclusion of the schist in granite
22893
Bearing of No 3 Shaft House

S.	T.			R.	
				(1715)	
C. Shaft.				1730	11:30 A.M.
(C1)	W. 205'	13			15' south of post wall
(C1)	S. 11° W.	68		1720	E. end. diorite outcrop
			10 W	1720	
		130		1730	edge of dock
				1710	
		167		1710	Swampy ground East
(C2)		196		1712	
		226		1720	granite
		231		1730	ledge
		260		1725	
		300		1735	ledge
			E 30 S 30	1725	
			50	1740	ledge
C2	S. 5° W.	70		1715	ledge small
		85			
(C2)	E. 14° S.			1712	Along Road following edge
		80	S. S	1715	Granite
			20 S	1735	"
		142		1710	outlet of swamp
			S 30° W. 120	1700	
			S 30 E 25	1725	Granite
		211		1725	Granite
(C3)		241		1730	Granite

Should be about 1715

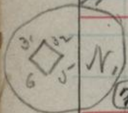
nearly covered by rock pile

~~#20346~~
22894

This is the nearest point of the granite to the mine

of swamp

running S. 30° W.

	S.	T.		R.	
				{1820 at 530	
(1)				{1760	Hotel 1 P.M
				1745	(1760 2 P.M)
	N,	365		1740	on Ry train
(2)	W 9½ N				Corner of Ry
(2)	W. 9½ N	48	10 N	1750	In Ry cut
			40 N	1740	
		76			Ry [illegible]
			4 S		ledge white jasper
			10	1750	
		102			" " "
			9 S		
			18	1750	
		120			
			15 S		Quartzite
			19 S		Conglom
			~~[illegible]~~		Jasper some are just
			27	1750	
			30 - 6W	1750	Strike W. 35° D.
			50	1760	
~~(2)~~	(3)	283		1760	
3	S. 40 W	102		1760	Corner of burn
	S	S 25° E	47	1790 }	Diorite
	(4)		59	1800 }	

Sept. 28/93

Wagon Road across C & N. W. Ry W. of Depot

Strike E 23 S. dip 77° N. Jasper much sheared

" E 18° S dip 70° N.

~~#20348~~ 22896 Conglomerate

West Strike E 5° S dip 45° N. ~~#20349~~ 22897

dip E 60° N. great accommodation of strata

Great knob of actin. schist. crinkled. Schistosity strikes N. 50° W

Wagon Road runs level W. 5° N

S.	T.	R.	
(4) W. 15 S	105	1795	Diorite
	50	1765	
E. 20° N	10	1800	Diorite
~~N 55° E~~		1815	(4)
	38	1810	Diorite
	78	1800	
~~S 10° E~~	(4)	1820	
E. 20 S	22	1825	Diorite
	46	1810	
	53		ledge
(5)	61	1815	actin schist white bands
(5)		1810	
N 30° S	20	1810	
	27	1800	end ledge
	South 10	1790	
N. 45° E	24	1815	
	25	1800	
	~~S 45° S~~ 12	1810	
	15	1800	
	25	1800	
	30	1815	
S. 40 E		1820	
	70	1810	
	29	1820	ledge schist dip 60° N
		1805	= #2039

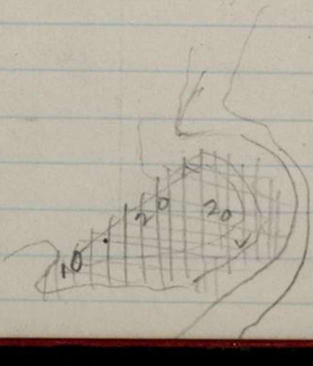
6-7479

From pt. (4) a ridge runs S. 50 W to (C_3) approx the lowest place 100' E of C_3 No exposures show.

Probably diorite extends to knoll south

On top of actin schist ledge much contorted at West end Strike W. 32° S. dip 68° N
E end " S 35° W dip 58° N.
greatly distorted + in places brecciated
#~~20347~~ 22895 Shows this schist which is very tough to break. This grades directly but gradually
#~~20337~~ 22884 into #20337

Strike E 30 N.



S. T. R.

(2) W9½N 160 1780 3. P M
(6)

(6) S.14E 51 1790 Jasper E.30 N dip 60
jasper cut by diorite
91
(8) 123 1800

(8) ~~S17W 60~~ ~~1820 approx ledge as before~~
N.50°E 25 1805 Diorite
E 50 1805

N.30 1800
S 30 1790
E 70 1800 greenstn Conglom
80 1790

W30N 16 1790 Actin Jasper
N 12 " "

(8) S. 1790
10 5E Diorite
22 Diorite in Road
56 1770 schist like
E 5 " "
E 22 " "
79 1760 "
5W " " "
84
E 25-50 Actin olive schist

This dioritic series about E. & W.

Strike N. 10° W. very crinkled dip 47° W
" N. 5° E " " dip 46° W.

~~#20347~~ 22895

" Strike W. 7° S Schistosity W. 20° N dip 65° N
~~20348~~ 22896

Continuous nearly with Cut by two nearly parallel
dikes of #20338 course W. 5° N
Strike W. 15° S dip 50° N

	S.		T.		R.	
(8)	S	79			1750	
		94			1735	
	(9)	169			1735	
		209	W. 40	1733	1755	
		260			1730	
		330			1750	Granite
		340			1775	
(9)	W. 8° N	100			1735	edge low ground
		151			1760	
			3 N.			Old actin schist
		193			1760	
		207			1780	
			5 N			ledge #20350
			W 45 S	15		
				27 5 W		New granite
		233			1790	
			5 N			Diorite dike
		242				ledge
			1 [illegible]			actin schist &
			10 [illegible]			Contact of schist
			20 [illegible]			
			8 Width			
		373			1810	On diorite dike
		north	8		1810	ledge actin schist
			15		1790	cut by diorite & granite
			35		1790	
			55		1810	

Drainage W of this knoll and to the east of the Granite, which is 300' long

22898 Skipped.

intruded by granite Strike N. 5° W. dip 90° W

~~#70360~~

22899

Contorted & sheared

Granite I think very close to contact of Gr. & Old schist

large ledge

with "new" granite see photo.

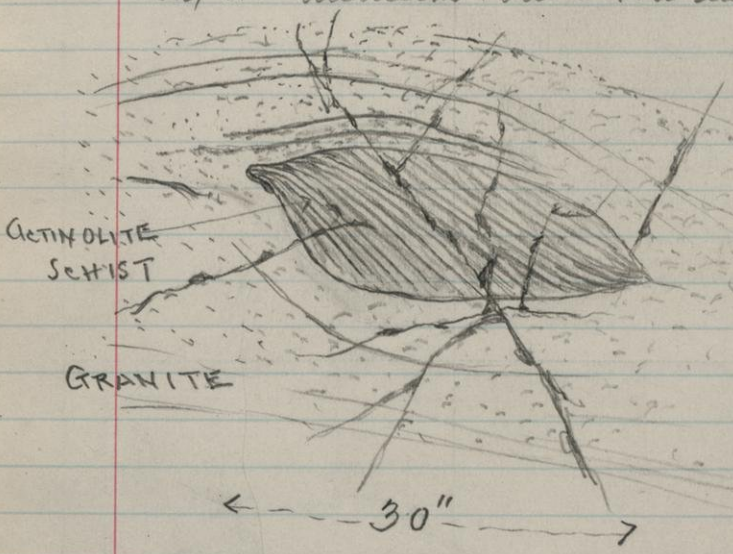
large ledge of newer granite with great inclusions of the schist. It is hard to tell whether it is more granite or more altered schist (extremely contorted Looks to me more like a fluidal contortion & not of bending the formation

"

S.	T.	R.	
	73		
	S 30 W	23	Granite
		60	1790 drainage going E
		75	1805
	S 45 W	50	1805
	N 60 S	30	1800 actinolite schist
		46	1790
C3		114	1840 granite
		89	granite
C3	N. 20		edge granite
C3	N.E 30		1800

Strike N. 6°S dip 50 N. Strikes into granite

In this particular knot of granite I found only one inclusion but it is a daisy

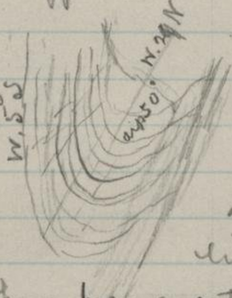


S. T. R.

	1990 at 12.15 noon
	1840 Hotel steps 7. a.m
	1815 (2) n Ry track 7.15
(1) N. 250	1835
(a) E 14° N 58	1835
(a) E 6° S 60	1830
(b) S, 35	1855
50	1890 dip 50 N. Strike W 5 S
(b) E, 13 N	18.40
87	1840
(c) S 10 E 27	Pits 75' long to east

Sept. 29. 1893. Very heavy frost

Actin schist bluff. 20' vertical shear striking with the schistosity
Schistosity W. 35° N.
The edge of the bluff where it is sheared off on N. side
is like this



Eastward the top of this hill is covered with outcrops of this actin schist like 20344 In places where shearing has been great it is actinolite + gar like 20337

Open pit contact upper + lower strike about E. 15° S. Shearing plane E. 25° S Jasper greatly contorted + sheared
~~# 20351~~ 22900 quartzite) Hill rises rapidly south
~~# 20359~~ 22901 Jasper)

On

S.	T.		R.	
(1) N.	370		1840	
(10) E 10° S				along track
	63			Contact
		S 70 S 5		
	263		1830	6' R.R. Cut
(11)	323			Ry fill 10' low ground 150' S&E
(11) E 2° N				
(12)	180		1830	
(12) N.			1810	
(13)	107		1845	Diorite Conglom
	W 30 N	69	1840	" " 50 x 10
		141	1815	DSS+A Ry track
(13)	148		1835	Cong. 50 x 15 Course W20N
	165		1825	
	196		1810	
	207		1805	DSS+A Ry track

(17) S. 200 feet Diorite contact

6—747

Beside the track apparently ledge
20' x 6' x 6. Greenstone conglomerate
which is at least 75% actin schist fragments
greenstone supplies a cement
In loose ledge at bottom

#~~20353~~ 22902 Dip 70° N. Strike E 10° S

#~~20304~~ 22903 Diorite fresh. This is from a fresh portion
of diorite conglomerate. It is in cut
along Ry track exposed 30 paces N side
of track. 10 H to 134 paces E of pt (11) 180
about E 12° N of (12)

?0' x 30' - 5 W E+W Immense fragments of typical vitreous quartzite
not sheared also some actinolite schist but
much smaller. General course of the ridge is E. 75° S.

Rather gradual slope N. to Union depot

edge of swamp

S. T. R.

(12) N.	107			1845	
	E.18S	84		1840 } 1860 }	Big outcrop Cong
		N. 20		1860	
		N 30		1840	. outcrop
		60		1840	
		E30°S 20		1860	Outcrop
		30		1850	
		S20W. 30		1855	outcrop
		E6°N.			
			25	1850	
	(x)		66	1840	Outcrop same
(x)	North	36		1830	
		66		1840	
			101	1830	Ravine N. 50 then N E to Ry track
(12) E11N				1910	10:20 AM
(13)	300			1890	
				1880	= Natural ground
		N. 30		1900	
		75		1890	

30' south of this course large exposures of this conglom.

Outcrop Dioritic penetrating actinolite schist
~~#20355~~ Strike E 10° S dip 68° W.
22904

Outlet of swamp further west along trail

see further ahead for further description

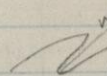
~~#20356~~ From very large inclusion of schist in
22905 dioritic conglom. 20 x 30

Base level of dioritic conglom. 120 x 50

This includes great masses of actin. chlit schist contorted but not greatly altered nor broken All impregnated with garnets. Beside these masses are others of wonderfully brecciated actin. schist and further still the almost pure diorite carrying fragments of quartzite schist etc

S.	T.			R.			
(13) E, 4° S				1900			
(14)	80			1900			
S 40 W							
(14) E	80	N 30 [illegible]		1900	Conglom	[illegible] Road	
	120			1900	Action Schist		
	170			1890	slope to Ridge		
S, 40 W				1900			
	124			1935			
~~[illegible]~~	207			1940	Open pit		
(14)				1915	12 M		
				1990	Hotel steps		12.15
				1995	"	"	12.45

Xing of R.R.+ wagon Road to E. Champion pit

Contorted + reversed folds 

hanging quartzite foot. Jasper

~~#20357~~ 22906 Hanging of Incaco open pit. South of Main Pit

~~20358~~ 22907 ~~#20359~~ 22908 -3' further in hanging the foot of this little pit standing verticle. between this and #20357 is the sheared jasper and micaceous ore
The appearance of the rock in the main open pit leads me to think an eruptive not far away, but can find no trace of such a thing on surface

(14) S.40 W 213

(15)

S.	T.			R.	
N.30 W	7			1975 } 1980 }	Jasper
S 3	3-10				Jasper
S. 15° W	27	left 5		2000	old shaft 60° N.
	74	right 8		1990	in pit
	80			2005	
W.30 N					Old shaft. ∠ W 5° N vertical (?)
				1985	
due W	27	N 20 W 10		1980.	Massive Quartzite " "
(16)	65			1995 } 2010 }	
(16) S 25° W	70			2025	Actin schist greatly
	100			2045	
	120			2060	" " "
W 15 N	34			2025	ledge jasper
+	48			2025	
	55			2005	
	75			2000	
+ S	20			2025	Bold outcrop
	25			2040	of actin schist old kind

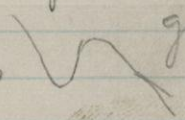
6—747

Strike of Contact approx E.5°S. ~~and E~~

Much contorted & sheared Slates seems to be about S 40° E

No 20357 + #20358 = sheared quartzite . E end + N side of pit 50' long x 25'
22906 22907

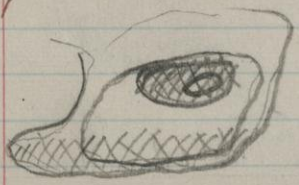
It looks as though there was a fold like this but the ground is so covered by old piles of rock that it is impossible to see definitely.



but sheared
#~~20360~~ + #20361
22909 22910

sheared

actinolitic
#~~20362~~ Dip 40° N Strike E + W.
22911



S. T. R.

Station	Bearing	Dist.		Elev.	Remarks
(16)	N			2010	
	(17)	20			
(17)	N.35°W				
	(18)	28		2000	
(18)	W.20°S	30		2000	old shaft
(14)	N.			1970	
		42		1960	
		55		1965	Outcrop [illegible] Conform
				1945	
		75	15 E	1960	Volcanic Breccia " "
		110		1950	DSS+A RR to Mine
		134		1945	
		145			ledge
		167		1960	
			E 10	1960	
			15	1945	
		188		1950	
		239		1915	M+N Round house
		220	approx	1915	to DSS+A track
(14)	E15°S			1980	
	(19)	142			Xing of RR + Wagon Road
(19)	S19°W	125		1995	
	(20)				

6—747

angle 70° to N. By rock pile judge it to be close to contact, Find no outcrops in rock piles of either shafts

Course of RR. E 3° S. in tangent for more than 1 mile

Track

S. T. R.

20

South

95

405

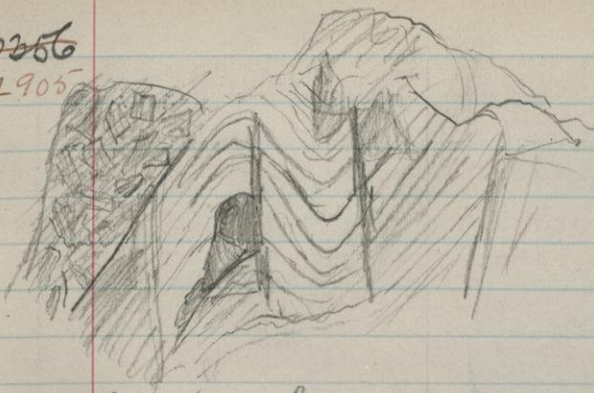
2025

Center of Open Pit

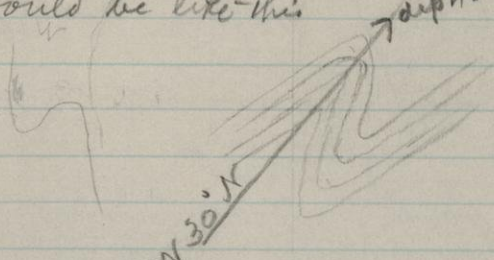
6—747

Shipe W. 30° N approx. Nothing shows but jasper
The dumps shows lots of extremely sheared quartzite
It is like a mica schist
To the south the hill rises very gradually
perhaps 50 feet in 200 or 250 paces.
Unable to find any ledges or exposures of
any sort E of this point to the Ely track

~~#20366~~
22905



While this folding is local I think it typical of the locality. The sketch is from a vertical face looking west Were this ~~flat~~ flanes of horizontally. The stratification would be like this



And I have seen this kind of structure in a good many places. I rather think there is a fold of this kind going around the great outcrops of eruptive conglomerate located here. So far I have been unable to locate any outcrops on the N side showing it however

S. T. R.

16

17

18 Oct. 1st

Ow. X. Wagon Road & R R west of dept.

14 (a)	S 11° E	2330	
(a1)	100	2335	
	80		Wagon Road — Eon
(a1)	S. 37° W		
	75	2365	
(a2)	215	2420	on N. slope of watershed
(a2)	W.		
	130	2435	
	W 58 W		
	30	2410	
	305	2420	
(a3)	355	2415	
14 (a3)	N. 15 W		
a4	70	2380	Center of road
16 (a4)	W. 13 S 123	2395	Sec line
		2410	
(a5)	6—747 794		

#1 Shaft. #1 faces S of this shaft a knoll of diorite. 10' high x 50-75' wide on top

#30363 Showing the impregnation of the jasper by iron
22912 at the Spurr Mine

Course S. 34° E

Course of road W. 15° S about 300 paces
E 15° N " 140 paces

S. T. R.

(a5) S. 34 W — Continuation of Street
W 30 W — So. outcrop

	30	2400	
	126	2390	
(a6)	268	2435	
	N. 100	2400	
(a6) W. 30 S			Along ridge
	12	2425	
	32 N.		
	57-20 W		#20363
	150	2355	
	W. 25		#20364
	190	2430	
	100 W.	2415	
	S. 50	2430	
	160	2460	
	252	2461	Center Road.
		2460	Hotel steps
(x) #2 Shaft N. 42		2460	
(x) N. 29° E		2460	
	97		Center of Road
(x1)	106	2460	
(x2) N.	125	2445	
	271	2405	
	496	2320 (?) 2335	

6—747

@5 ft W. edge of side walk

Quite a prominent knoll of volcanic ash (?)
#20363 22912
which is a small water shed

Thence running E & W.
small ravine

Course of road past hotel E & N

Course E. 8½ N.

S. (S) T. R.

(+1) N.350 E 150 Outcrop # ~~20 shal~~ 22913

This whole slope from here east seems to be this same material

(a)6 E 15 N 2420

33 2410 End outcrop

133 2365

#1 Champion shaft is about 40 feet in the foot wall of the ore body which lattes quite a curving south just west of #1
#3 #2 is on foot & #3 on the hanging wt. #3 dip is N. 75°
50 ft. east of #2 is a thick chlorite schist striking about E. 35° N & about vertical
Opposite #1 is also a chlorite schist occupying contact between jasper and quartzite.
This schist is greatly sheared, carries large unaltered garnets & in places highly impregnated with iron ore

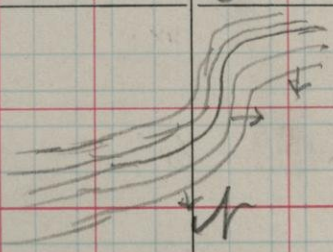
S.	T.	R.
NW SW 11	East 337 607	Corner of wire fence to telephone pole

Here at the W. end of this uplift dips facing the Champion Mine all along the end These are interspersed the strikes in a general way E&W.

In general the dips are all North

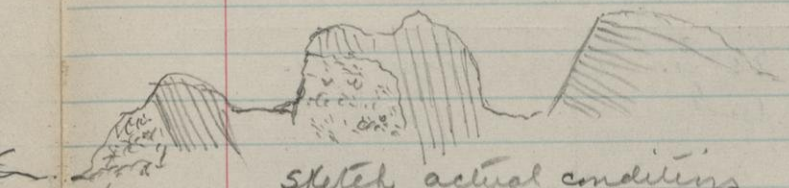
I found none south the strikes N. & S

are like this

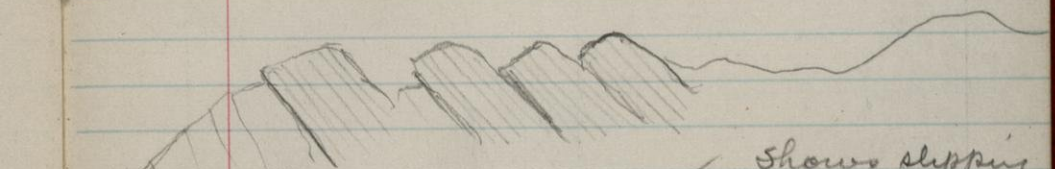


Humboldt. Oct. 3 93
On N. W. Corner of Sec 11.

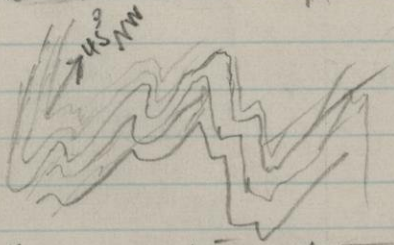
near by on line opp. shanty half log & half boards



Sketch actual conditions.



NE 5 Strike dip W. 45° Shows slipping along bedding planes



Sketch on line between N E. strike and E & W. Strike

S. T. R.

(1) E. 2 gN 280

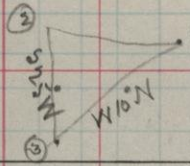
S. 75° E 182

E 15 N 72

(2) E 30 S 125

To R.R crossing sign

Ledge dark schist

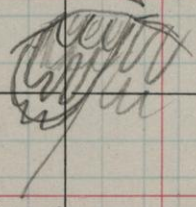


(3) Strike N. 25° E. Greatly crumbled & sheared
Also N. 10° E

100 ft. N. of (3) along brow Strike E 30° N

150° further Strike E + W

100 ft further

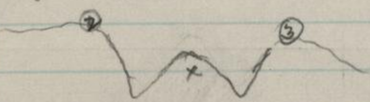


100 feet further E E 40° N

① On west line Sec 11 at Humboldt where Champion Road crosses it

greatly sheared St. N. 25° N, dip 65° N.

Right between ② & ③ are two valleys ~~with~~ a ridge in the middle from



which I took specimen No ~~20325~~ 22914. Could see no stratification. Is it Volcanic ash?
Strike als

S. T. R.

At. Clarksburgh Station

(1) S7°E 1163

S12°W 163

W30°S 133

S15°W 99 — To ledge of Merriams

255 — approx location of E + W. section line

On 1/16 post W. of Center of Sec Dimick [illegible]
course W. 11°S

(1/16) W. 110 — Adir Schist N.30 W

130 10N — " " "

(4) N.30°W 85

W30S 45°

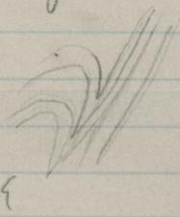
4 N30W50 — ledges same strike

4 N. ~~250~~ 275 — exploration

530 — swamp

#16568 - This shows evidence of severe folding probably reverse folding

Strike about N 35° W.

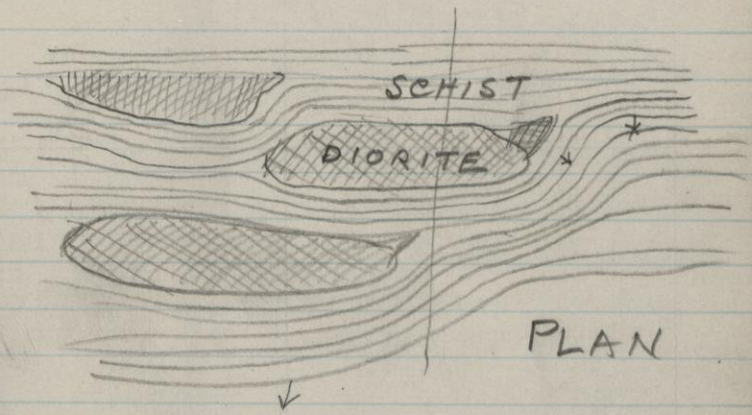


extremely folded & wrinkled
dip 42° N,

E. 30 S folded ~ dip about 20° S Chief folds are pitching S. 30° E and the general bearing of a horizontal section would be about E & W. I should judge

(Over)

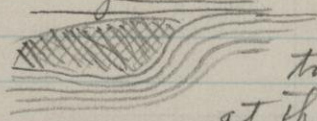
The bushes were very dense and very few ledges were visible.
In examining this elevation especially at the Top & at the west end the structure seemed as follows.



SECTION

The ledges of schist seem to me to show that this action has taken place. The schist dips N. &

the south side of the outcrop is nearly always a smooth face of rock nearly at 90° with the strata and smooth as though it had been smoothed by rubbing. My idea is that the formation had its N. dip previous to the eruption which lifted the whole and broke the strata in places and spread them apart. in places so that the strikes nowhere come N + S but only NE + SW. and so if followed gradually with evidence of great accommodation of strata changes into and E + W strike



This is shown time + time again at the W ends of the diorite exposures.

I coned find no evidence of a dome structure that is of the strata striking around the eruptive area + dipping away from it in all directions