

W. A. Seaman Section 21 48-29

#8. 150 paces North, 80 East of SW corner July 20, 1946
 A fragment (?) of pegmatite (about 30 x 40^{mm}) composed mostly of coarse microcline. A few smaller fragments of pegmatite. A few thin fragments (?) of biotite schist Biotite 0.1^{mm}
 Fragment of finely granular material (mostly quartz, under 0.1^{mm}) similar to matrix but lighter color. Matrix of finely granular quartz (0.1^{mm}) with a small % dark material very finely disseminated in irregular spots or mottlings 1 to 2^{mm} across, and with numerous grains (?) about 0.5^{mm} altered to iron hydrate.
 Strike about E & W. Dip steep south. Conglomerate (or conglomeratic quartzite). Probably Ajibik or Mesnard.

#9. 155 paces North, 80 East of SW corner (5 paces N of #8). July 20, 1946
 Fragments of pegmatite (coarse microcline and quartz), from 2 to 30^{mm}. (to 2^{mm})
 Fragments of rock with alkalic and calcic f eldspar, quartz and chlorite (or biotite) 1/2^{mm}.
 Matrix much like #8 except appreciably more feldspar and chlorite but less quartz.
 Strike E & W. Dip 80° to 90° southward. Conglomerate (Ajibik or Mesnard?)

#10. 250 paces North, 20 East of SW corner. July 20, 1946
 Feldspar, both alkalic and calcic 20% to 2 x 5^{mm}
 Quartz, fairly even sized grains 40% 1^{mm}
 Biotite and (?) chlorite 20% 0.3^{mm}
 Sericite. Much of the feldspar appears to be 5% altering to (or from) sericite.
 Unidentified. Probably includes ends of feldspars, fine quartz, edge of biotite, etc. plates and sericite. 15%
 Strike, - N 70° W, etc. (Folded). Dip 60° (etc) northeastward. Quartz monzonitic gneiss phase of a graywacke. Probably Kitchi graywacke.

W. A. Seaman Section 29 48-29

#10. 440 paces North, 30 East of South 1/4 post. June 13, 1946
 Cleavage flashes abundant in specimen. 20-40% under 0.1^{mm}
 some may be graphite, others may be mica division (Mica, chlorite or chloritoid)
 Graphite, earthy. Enough to mark paper. ?? earthy
 Strike, - S 85° W. Dip, about vertical. Bijiki (footwall) graphitic slate.

#11. 460 paces North, 330 west of South 1/4 post. June 13, 1946
 From south edge of dump. Pit is 60 and more paces to the North.
 Iron hydrate. 50-70% earthy 1/2^{mm}
 Quartz, disseminated in 1/2^{mm} grains or spherules and in veins to 2^{mm}, the quartz completely filling the narrow ones but only lining the edges of the wider ones. 10%
 Hematite, in grains or spherules 1/2^{mm} 2%
 Unrecognized, disseminated through "limonite" 20-30%
 Ore from west pit at Dalliba (or Phoenix) Mine.

#12. 320 paces North, 400 West of South 1/4 post. June 13, 1946
 Quartz, minute grains 20-40% 0.1^{mm}
 Minute cleavage flashes, a few elongated 10% to 0.1^{mm}
 apparently not chlorite
 Chlorite 20% to 0.1^{mm}
 Unrecognized, perhaps largely chlorite 40%± under 0.1^{mm}
 A 10 to 12^{mm} wide quartz vein cuts across the bedding at 60° to 70°. The bedding is slightly bent on either side of the quartz vein.
 Strike, - E & W. Dip, -80° north. Fine graywacke, probably upper Goodrich.

#13. 40 paces North, 280 West of East 1/4 post. July 1, 1946
 Graphite 30-70% Earthy
 Cleavage flashes, some of them graphite perhaps, others mica division (Mica, chlorite, chloritoid?) 20% to 0.1^{mm}
 Pyrite 5% 1/2^{mm}
 Cleavage at 30° to bedding.
 Strike, - East and West. Dip near vertical. Bijiki (foot?) graphitic slate (or slaty graphite).

W. A. Seaman Section 29 48-29

#14. 600 paces North, 590 East of East 1/4 post. August 17, 1946
 Amphibole (dark greenish black) makes up 15% to 2 x 5^{mm}
 the bulk of some beds, scarce in others.
 Chlorite, the principle mineral in the 20% 0.1^{mm}
 finer grained beds that lack amphibole
 Clinocllore or other chlorite in partial 1% to 3^{mm}
 rosettes and plates lining cavities and seams.
 Biotite 1% to 0.2^{mm}
 Quartz, mostly in veins and cavities 5% " 1^{mm}
 Chlorite ± amphibole, biotite, etc. 40-60% " 0.5^{mm}
 Unidentified light colored material 10-20%
 From a test pit in foot (?) of Bijiki, on north side. May be a Clarksburg dike in part.

#15. Same test pit. August 17, 1946
 Like the finer grained part of #14.
 Chloritic schist.
 May be a sheared Clarksburg dike.

#16. 840 paces North, 360 West of SE corner. August 22, 1946
 (West side of old railroad cut).
 1/2 to 1^{mm} rosettes of chlorite 5% 0.2 to 0.5^{mm}
 Chlorite, mostly in parallel position along 30% 0.05^{mm}
 the rock cleavage surfaces.
 Unrecognized, including considerable graphite 65% under 0.1^{mm}
 Chloritic schist, quite graphitic. Some beds (not showing in specimen, contain considerable pyrite.
 Strike-near E. & W. Dip, -nearly vertical.

W. A. Seaman Section 30 48-29

#6. From waste dump, about 590 paces N. 280 West of South 1/4 post May 16, 1946
 Material is probably from the water filled pit that is about 520 paces N, 150 West of East 1/4 post; or a little more than 100 paces southeastward.
 Crust of rhombohedral carbonate (Calcite or dolomite? -non-rusting), lines the re- form surface of a large vug and varies from 5 to 10^{mm} thick.
 Calcite or dolomite in narrow veins.
 Calcite or dolomite disseminated through- 10-40%
 out the specimen in rhomb cleavage flashes to 1/2^{mm}
 Hematite and iron hydrate, intimately mixed 20-50% earthy
 Hematite spherules disseminated through upper (or outer) part of carbonate crust to 1/2^{mm}
 May be a little Manganese oxide or hydrate present.
 Lean Bijiki ore.

#7. Same locality as #6. May 16, 1946
 Hematite (in 10^{mm}) beds or bands 40% earthy
 Hematite and iron hydrate ("Limonite") mixed 40% earthy
 Non-ferrous(?) rhombohedral carbonate 5% to 1/2^{mm}
 Unidentified hematite, "limonite", carbonate perhaps manganese oxide or hydrate, etc. 15% earthy to 0.1^{mm}

Bijiki iron ore. Probably 55%± iron.

#8. 540 paces North, 420 West of South 1/4 post. May 16, 1946
 Quartz, rather even grains with fine 70-90% to 1/2^{mm}
 quartz in between.
 Chlorite, and (?) other dark material 5-15% under 0.1^{mm}
 between the grains
 From southwest edge of exposed westward plunging anticline of Goodrich quartzite. Dark gray or "black" quartzite.

#9. 320 paces South, 300 East of West 1/4 post. May 21, 1946
 (About 275 paces NW of #8, and apparently on the NW edge of same anticline).
 Goodrich quartzite like #8, except probably a little more dark material between the quartz grains. Black quartzite. Dip 80° WNW.

#5. Same location as #6 and #7. May 16, 1946
 Granular quartz (recrystallized chert?) 30% 0.1^{mm}
 "Limonite" some in earthy yellow-brown spots and some in pseudomorphs after Grunerite rosettes 2 to 3^{mm} diameter. 40% earthy
 Magnetite (partly altered to hematite), hematite, hard "limonite", etc. 10-30% earthy to 0.05^{mm}
 Bijiki iron formation. Lean ore phase.

W. A. Seaman Section 30 48-29

#10. 200 paces South, 200 East of West 1/4 post. May 21, 1946

Magnetite	10-20%	0.05 ^{mm}
Quartz (recrystallized chert?)	50%	0.05 ^{mm}
Grünerite, mostly in rosettes 2 ^{mm} diam.	20-30%	1 ^{mm} long
"Ilmonite" spots 3/4 ^{mm} diameter	5%	earthy

Beds from 1^{mm} to over 10^{mm}. Some beds about 1/2 magnetite, others mostly recrystallized chert. Beds or layers of grünerite in between the magnetite rich and the more siliceous layers.

Strike, -N. 80° W. Dip, - 50° northward. Within 10 paces of a very strong magnetic belt to the north.

Grüneritic phase of the Bijiki iron formation (foot-wall(?) side).

#11. 490 paces North, 10 West of South 1/4 post. May 22, 1946

Reddish brown garnets	1-5%	3/4 ^{mm}
Chlorite or altered chloritoid plates	2%	3/8 x 1 ^{mm}
"Ilmonite" coatings to 3/4 ^{mm} on joint planes and in veins.		earthy
Graphite	large amount	earthy
Abundant cleavage flashes		under 0.05 ^{mm}

Strike N 85° E, Dip, -80° northward. Interbedded with graphitic slate, slaty graywacke and recrystallized chert beds. Garnetiferous slaty graphite or graphitic slate.

#12. 520 North, 240 East of South 1/4 post. June 3, 1946

Abundant cleavage flashes	under 0.05 ^{mm}
Considerable graphite	earthy
"Ilmonite" and quartz in numerous veinlets to 1 ^{mm} wide at various angles to the cleavage.	

Strike, - presumably north of east. From shallow trench running north to northeasterly across the formation. Graphitic slate or slaty graphite. Presumably foot slate on south side of Bijiki iron formation. Northwest of Marine pit.

#13. 620 paces North, 190 East of South 1/4 post. June 3, 1946

Quartz veining in brecciated graphitic slate. A little pyrite showing, and in one cavity the quartz crystals are coated with 0.05^{mm} crystals that may be marcasite. A little "Ilmonite" and earthy brownish-black to black material in fragments of what is probably wall rock.

Strike, - N 80° E. Dip, -60° S. Veining or fault breccia in the footwall slate. From the north side of a pit about 250 paces NW of Marine Pit. This pit is perhaps on the north side of the same trough as the Marine Pit.

W. A. Seaman Section 30 48-29

#14. 170 paces North, 80 East of South 1/4 post June 4, 1946

Grünerite, partly in rosettes and partly interlaced.	60-80%	to 1 ^{mm} long
A small amount of micaceous material		0.05 ^{mm}
A little magnetite		0.05 ^{mm}
Some fine quartz (recrystallized chert?)		0.05 ^{mm}
Prominent coatings of iron rust (hematite and iron hydrate) on joint planes and other weathered surfaces.		

Strike, - northeasterly. Dip, -northwesterly (overturned?). Only a few paces north of a strong magnetic belt.

Bijiki iron formation, grünerite phase.

#15. 355 paces North, 5 paces West of SE corner June 6, 1946

Quartz grains	40%	to 0.5 ^{mm}
Silice and fine earthy dark material between the grains	20%	
"Ilmonite" in disseminated 0.5 ^{mm} spots	2%	
Unrecognized, dark gray to black	35-40%	under 0.05 ^{mm}

Strike, -South 80° west. Dip 85° northward. Goodrich quartzite.

#16. 5 paces North of #15. June 6, 1946

Similar to #15. Numerous quartz grains to 1^{mm}, but most of them finer than in #15. Rock not quite so dark. Contains about 1% finely disseminated pyrite.

Strike and dip the same as #15.

Goodrich quartzite.

#17. 430 paces North, 570 West of SE corner. June 8, 1946 (South side of Marine Mine Pit).

Angular slab like fragments of chlorite schist with chlorite from microscopic size up to 3/4^{mm} plates. Angular fragments of very fine to earthy hematite.

Strike, -North 60°-65° East. Dip, -steep northward (overturned). Brecciated (thrust faulted?) hanging wall of Bijiki iron formation.

#18. 450 paces North, 580 West of SE corner. June 8, 1946 North side of Marine Pit.

Fragments (perhaps broken beds) of earthy hematite containing 1^{mm} and smaller grains (?) of quartz. Fragments or broken bands of recrystallized chert (quartz 0.05^{mm}) Quartz, rhombohedral carbonate, hematite, "Ilmonite" and a little pale greenish, earthy mineral in seams, veins and cavities.

General strike, -ENE. Dip, -steep, almost vertical to steep north to steep south. Brecciated Bijiki iron formation.

W. A. Seaman Section 30 48-29

#19. 450 paces North, 580 West of SE corner June 8, 1946 North side of Marine Pit.

A few fragments of earthy "Ilmonite" and hematite, with much open space lined with reniform, hard steely hematite and graphite, and cavities partly to entirely filled with hard earthy hematite or iron hydrate.

Same location, strike and dip as #18 and #17. Brecciated Bijiki iron formation, ore phase.

#20. Same location as #17, #18, and #19, but apparently a little farther north (foot). June 8, 1946

Minute cleavage flashes or crystal faces, most, but not all parallel to the bedding. Cleavage almost parallel to bedding. Probably mica. to 0.02^{mm}

"Ilmonite" coating on weathered surfaces and in 1/4^{mm} seams. Mostly dark gray. Some thin, more greenish beds. Little or no graphite.

Slate. Loose material from talus slope on north side of Pit. Strike, dip and exact position not available.

#21. 470 paces North, 530 West. East end of Marine Pit. June 8, 1946

"Ilmonite"	60-90%	Earthy
Graphite, small blades in a few small cavities and seams	1%	1/2 ^{mm}
Rhombohedral carbonate (not ferruginous?) in cavities, to 5 or 6 ^{mm}	1/2%	1 ^{mm}
Blackish irregular spots to 1 ^{mm} . Appear altered to "Ilmonite".	5%	

Strike, -N 60 to 75° E. Dip, -65° northward. Bijiki iron formation. Ore

#22. 120 paces North, 170 West of SE corner. June 29, 1946

Chlorite	30-50%	0.05 to 0.1 ^{mm}
Biotite	10%	0.05 ^{mm}
Quartz probably more than	10%	to 0.1 ^{mm}
Elongated cleavage or crystal faces, dark, greenish black (Amphibole?, Tourmaline?)	1-	to 0.3 ^{mm} long.

Chloritic schist. Perhaps Michiganme-Clarksburg. Strike, -Nearly East and West. Dip, -Steep north. Chlorite schist or chloritic slate. Bijiki or Michiganme (?) slate?.

W. A. Seaman Section 30 48-29

#23. 290 paces North, 30 West of East 1/4 post. August 31, 1946 From northern pit of a north and south line of pits across the iron formation.

Quartz (recrystallized chert)	60%	0.05 to 0.1 ^{mm}
In nearly pure beds to 2 ^{cm} thick and also disseminated in darker beds with iron oxide.		
Grünerite, developed mostly perpendicular to the bedding, slightly radiated.	30%	1 ^{mm} long.
Magnetite, hematite, "Ilmonite", etc.	10-5%	Earthy to 0.02 ^{mm}

In darker beds with fine quartz. Strike probably about N 70° E and very steep. From northern strong magnetic belt of Bijiki (so called "Greenwood") that approaches here to within 40 paces of the southern strong magnetic belt labeled Bijiki, on 1930 Michigan Geological Survey map of this area. (The belts merge into one near the end of the fold about 200 paces to the west).

Bijiki Iron Formation.

#24. 360 North, 30 West of East 1/4 post. August 31, 1946 From one of the southern pits of a line of pits across the iron formation.

Grünerite, in rosettes and interlaced.	50%	to 1 ^{mm} long.
Graphite, around and between the grünerite	10-30%	Earthy
Magnetite, (considerable mixed with the graphite).		Less than 0.1 ^{mm}

Grünerite-graphite phase of the Bijiki Iron Formation. Strike and dip-see #23.

#25.

W. A. Seaman Section 31 48-29

#27. 45 paces South, 45 East of North 1/4 post. August 29, 1946

Grünerite, mostly interlaced.	50-80%	to 2 ^{mm} long.
Brown, nearly spherical spots of brown streaking scaly material. These show on the weathered surface and may be an alteration of similar shaped dark greenish black spots throughout the specimen.		
Magnetite	1-5%	1 ^{mm} aggregates
over	5%	0.1 ^{mm}

Strike, -South 70° ± West. (curves). Dip, -about vertical. Grades northward into grünerite schist and south and west into the material of specimens #28 and #29. Bijiki iron formation. Grünerite phase.

#28. 70 paces South, 10 east of North 1/4 post. August 29, 1946.

Quartz (apparently recrystallized chert).	60-80%	0.05 to 0.1 ^{mm}
Magnetite	2%	under 0.1 ^{mm}
Grünerite	1%	0.5 ^{mm} long
Unrecognized	15-35%	under 0.1 ^{mm}

Bijiki iron formation, lean phase.

Strike, -North 70° East, quite closely folded (closed folds?). Dip, -about vertical.

#29. 1 foot South of #28.

Fine granular material, probably mostly recrystallized chert.		
"Ilmonite" veins 0.1 ^{mm} running in various directions.	95%	to 0.03 ^{mm}
Narrow (0.05 ^{mm}) veinlets stained greenish black or black.		

Strike and dip, same as #28. Bijiki iron formation, recrystallized cherty lean phase.

W. A. Seeman Section 32 48-29

#12. 580 paces South, 550 East of NW corner. June 14, 1946

Grünerite, some spherically radiated (in some 70% to 1 1/2 mm beds all in rosettes), some interlaced and in some layers developed perpendicular to the bedding. Magnetite, disseminated through the grünerite bands and also forming nearly pure magnetite bands 5-30% under 0.1 mm. Graphite, disseminated. 1-10% Earthy

Strike a little north of east in general, but considerably folded and in some places crumpled. Dip, -70° to 90° overturned(?) to the northward.

Bijiki Iron formation, Grüneritic phase.

#13. Same locality, strike, dip and date.

Shows one or more beds of finely recrystallized chert. Is less folded than #12.

#14. 820 paces East, 820 South of NW corner. August 1, 1946

Grünerite, mostly interlaced and varying much in size in different layers. Probably over 50% to 1 mm long. Magnetite, Considerable over 10% under 0.1 mm

Strike, locally northeast. Dip, -45° NW. About 300 paces SE of specimens #12 and #13, but at least twice that far along the strike.

Bijiki iron formation, grüneritic phase.

#15. 450 paces South, 300 West of North 1/4 post. June 26, 1946

Quartz (grains or recrystallized chert) 20-50% to 0.15 mm. More abundant in some beds, scarce or lacking in others.

Graphite, abundant in some beds and streaks and on slickensided surface. 5-20% Earthy

Quartz, (vein) in irregular veins, streaks or folded beds, and in lens shaped spots 2 or 3 mm long and 5 mm thick. 20% 1/8 mm "grain"

Unrecognized 10-50% under 0.2 mm

Strike, -North 75-80° E. Dip, - 85° (Overturned?) South.

Foot slate and graywacke of Bijiki. May be on north (or NW) side of anticline (or nose) as there is Goodrich quartzite to the West of this place that strikes to the south of this exposure.

W. A. Seeman Section 32 48-29

#16. From 3 feet south of specimen #15. June 26, 1946

Quartz grains 70% to 1 mm
Pyrite cubes 1/2% to 1/2 mm
"Limonite" spots, some from weathered grains, others irregular and elongated 5% 1/2 to 1 mm x 2 mm
Gray to gray green scaly, soft 1-5% under 0.1 mm
Chlorite 1-2% " "
"agnetite Trace " "
Unrecognized, light to dark gray and some to greenish black and black. 20% " "

Strike and dip, same as #15. A bed, only a few feet thick in graywacke and slate. Presumably grades down into the Goodrich quartzite which is striking toward a point a few paces south of here, from an outcrop a little over 100 paces to the east.

#17. 600 paces North, 580 East of SW corner. July 6, 1946

Quartz grains 5% to 1 mm
Garnet dodecas, pale reddish brown 1-1 1/2% 1 1/2 mm
Biotite 5% to 0.2 mm
Chlorite 10% 0.1 mm
Scaly material, probably mostly chlorite and mica. 50% to 0.1 mm
Fine, earthy to scaly material (not identified) 20% under 0.05 mm

Chloritic schist. Clarksburg-Michigamme. Contains some fragments or concretions from a few millimeters to several centimeters. These have less chloritic material and more very fine sandy material.

Strike, North 80° West. Dip, - about vertical ± 5°.

#18. 430 North, 130 paces East of South 1/4 post. July 8, 1946

Rounded fragments (up to several centimeters) of -
Granular quartz (0.5 mm) with a core (or central cavity) with coarse chlorite (or altered biotite), secondary striated feldspar (Albite?), and pyrite, etc.
Chlorite, mica and garnet (all to 0.5 mm)
Quartz grains (0.1 mm) finer chlorite, etc.
Quartz to 1 mm, fine chlorite, amphibole (dark greenish black 2 mm long), Hard "limonite" spots (to 2 mm).

Matrix of dark greenish black amphibole, most of it about 1 x 2 mm, with fine quartz packed between.

Specimen (not trimmed) is from a boulder or fragment over 2 ft. across embedded in the Clarksburg coarse tuff. Boulder may be Ajibik conglomerate. Tuff strikes near E & W but is much contorted with dips more commonly near vertical.

W. A. Seeman Section 32 48-29

#19. 430 paces North, 130 East of South 1/4 post. July 19, 1946

One foot south of specimen #18

Fine gray granular material, probably largely quartz 50% to 0.05 mm
Chlorite 20% to 0.1 mm
Biotite 5% to 0.1 mm
Biotite or chlorite 15% to 0.1 mm
Garnets (reddish brown) 1-2% 1 mm

Strike, -in general near East and west with nearly vertical dip, but locally closely folded or contorted.

Chlorite schist matrix of the Clarksburg Tuff.

#20. 430 paces North, 100 East of South 1/4 post. July 9, 1946

Angular fragments of

Granular quartz (grains 0.3 mm)
Granular quartz and calcite or dolomite.
Fine granular quartz, chlorite and a rusting rhombohedral carbonate
Fragments mostly fine chlorite (0.05 mm)
Fragments largely biotite with some chlorite and dark amphibole

Matrix, - Quartz grains to 1 mm
Chlorite 1 mm
Biotite 1/2 mm
Garnet 1 1/2 mm
Some greenish black amphibole to 1 1/2 mm

Strike, -near East and west and vertical, but much contorted.

Clarksburg Tuff, near axis of syncline.

#21. 40 paces North, 20 West of SE corner July 25, 1946

Granular quartz (recrystallized chert?) 40% to 0.2 mm
Colorless to pink quartz, in veins & dissem. 5% to 1 mm
Brownish red garnet 5-10% 1/2 mm
Grünerite (mostly confined to light colored beds) 10%-20% 1 mm long
Chlorite 10-20% to 0.1 mm
Greenish black amphibole (in dark bands) 1-2% 1 mm long
Balance, mostly fine quartz, chlorite, grünerite, etc.

Strike, North 80° West. Dip, -60° southward. Crumpled.

Bijiki iron formation, near or at top with a little Clarksburg Ash.

#22. Same location as #21.

May show more garnet in some beds than #21. Specimen was supposed to have been from a few inches above (or below) #21, but formation is so badly crumpled that it appears that this is practically the same as #21.

W. A. Seeman Section 32 48-29

#23. 60 paces North, 20 West of Southeast corner. July 25, 1946

Grünerite, interlaced and mainly 40% 1 mm
parallel to the cleavage of rock
Granular quartz (recrystallized chert?) 10% under 0.1 mm
Chlorite 10% " "
Garnet, brownish red 10-20% 1/2 mm
Unidentified material finer than above but likely much the same 25-30%
Magnetite under 5% under 0.1 mm

Strike, -North 60° West. Dip 70° North.

Bijiki Iron formation, probably near the top. Much like specimens #21 and #22.

#24. 240 paces North, 110 West of South 1/4 post. October 14, 1946

Muscovite, sericite (or other light mica) 50% to 0.1 mm
Garnet, reddish 5% 2 mm
Chlorite or other fine scaly (?) dark mineral 5% under 0.1 mm
Quartz, fine granular 10% under 0.1 mm
Quartz, sericite or other light material 20% under 0.1 mm

Strike, -North 60 to 70° West. Dip, -steep north.

Mica Schist. Emergent slate above Nagawnee Iron formation or a slaty phase of the overlying Goodrich.

#25. 35 paces North, 20 West of SE corner. October 18, 1946

Grünerite 10% to 1 mm long
Quartz, granular (Recrystallized chert?) 20% under 1/2 mm
Chlorite 10-20% under 0.1 mm
Garnet, reddish, pale 20% to 1 mm
Magnetite practically lacking
Unidentified, fine and mostly light 30-40%

Chlorite is mostly in the dark bands. Beds up to 3-4 mm thick and quite evenly bedded.

Strike, -about North 50-65° West. Dip, -80° southwestward.
From north edge of grünerite rock and a few inches southwest of garnet-amphibole-mica-chlorite schist.

Bijiki iron formation at about the base of the Clarksburg.

#26. 55 paces North, 20 West of SE corner October 18, 1946

Grünerite, partly radiated 30% to 1 mm long
Granular Quartz (recrystallized chert?) 10% to 0.1 or 0.2 mm
Granular quartz in a few broken bands or fragments of beds 5% to 0.3 mm
Amphibole, quite dark but may be more grünerite underlain by chlorite 5% to 1 mm
Garnet, brownish, red. Abundant in some beds 2% to 2 mm
Chlorite 10-20% to 0.1 mm

Strike, dip, etc. -same as #23. Bijiki iron formation, probably with fine Clarksburg Ash.

W. A. Seaman Section 32 48-29

#27. 70 paces North, 200 West of SE corner October 18, 1946

Angular fragments, up to several centimeters, of,-

Rhombohedral carbonate (Ankerite) to 1^{mm}, quartz (recrystallized from chert?) to 0.1^{mm}, with a little chlorite (to 0.1^{mm}). Bijiki I.F.? Biotite, chlorite and quartz (all about 1^{mm}) Biotite, chlorite and rhombohedral carbonate (each about 1^{mm}) Dark, porous, very fine grained fragments. Irregular, more or less rusty holes perhaps resulting from the removal of soluble fragments like the first mentioned.

Matrix of chlorite, biotite, quartz, rhombohedral carbonate (each to 1^{mm}) and greenish black amphibole to 1 x 3^{mm}.

Strike,-northwesterly. Dip,- steep (80°?) northeasterly. Clarksburg Tuff.

#28. One foot northwesterly along the strike from #27. October 18, 1946

Ankerite (or other iron bearing rhomb carbonate) 50-75% to 1^{mm}
 Quartz 5%±? under 1^{mm}?
 Biotite 5% 0.1^{mm}
 Chlorite 10% to 0.1^{mm}
 Chlorite or biotite or other dark mineral 5-10% to 0.1^{mm}
 Garnet, fayalite or other brown hard mineral with poor cleavage 0-5% to 1^{mm}

Coating of iron rust (hydrate) & micaceous material on weathered parts. Strike and Dip. This is from a fragment of carbonate phase of the Bijiki Iron formation included in the Clarksburg Tuff as described under specimen #27.

#29. 75 paces North, 215 West of East 1/4 post. October 19, 1946

Quartz grains 50% to 0.3^{mm}
 Chlorite 20% to 0.1^{mm}
 Unidentified material between grains, probably quartz, chlorite, etc. 30% under 0.1^{mm}

Strike,-North 75° West. Dip,-vertical to 70° (overturned) northward. Black Goodrich quartzite.

#30. 80 paces South, 440 West of East 1/4 post. October 25, 1946

Grünerite, interlaced 80% 1^{mm} long
 Quartz (recrystallized chert, thin bed) 5% 0.1^{mm}
 Magnetite 1% under 0.1^{mm}
 Chlorite 5% 0.1^{mm}
 Quartz (recrystallized chert?) disseminated 5% 0.1^{mm}
 Graphite 1% earthy

Strike and Dip,- Folded and faulted, see sketch North
 Bijiki Iron formation, Grünerite phase, near or at east end of overturned syncline. ↑

Spec. #30.

W. A. Seaman Section 32 48-29

#31. 5 paces North, 740 West of East 1/4 post. October 25, 1946

Chlorite 30% 0.05^{mm}
 Chlorite or altered chloritoid 1-2% 1^{mm}
 Graphite, shows on some surfaces A little earthy
 Unidentified, probably chlorite, etc. 70% under 0.1^{mm}

Strike,-North 70° to (going eastward) N 60°. Nearly vertical. Some thin ferruginous and cherty beds interbedded with it. Probably Upper Bijiki (Hanging) or Michigamme Slate or schist.

#32. 540 paces North, 560 East of SW corner November 11, 1946

Chlorite 40% 0.1^{mm}
 Biotite 15% 0.2^{mm}
 Chlorite or biotite 40%± under 0.15^{mm}

Strike, - North 60° West. Dip, - may be steep to the southwestward but bedding very indistinct. Cleavage of the rock is almost vertical.

Chlorite-Mica Schist. Fine phase of the Clarksburg.

W. A. Seaman Section 33 48-29

#1. 20 paces North, 35 East of SW corner July 30, 1946

Amphibole, greenish black, sub-fibrous 30% to 2^{mm} long
 Chlorite 30% 0.05^{mm}
 Biotite 5% to 0.1^{mm}
 Quartz 1-5% 0.5^{mm}
 Garnet, brownish red 2% 1^{mm}
 Chlorite, biotite and end views of amphibole, and perhaps other dark minerals 20% 1^{mm} to under 0.1

Strike,-North 65° west. Contorted. Dip nearly vertical and also various. Clarksburg. Matrix or fine phase of the Tuff.

#2. 2 paces South and 1 pace East of #1. July 30, 1946

More or less angular fragments, from a few ^{mm} to several cm, of,-

Quartz (recrystallized chert) 0.1^{mm}, chlorite (under 0.1^{mm}), a little fine magnetite and an appreciable amount of grünerite (to 1^{mm}). Granular quartz, almost pure, 0.1^{mm}; probably recrystallized chert. Red garnet dodeca (2^{mm}), chlorite (to 1^{mm}), with a little biotite and greenish black amphibole. Gray, granular mineral (under 0.05^{mm}) and perhaps quartz, with a little biotite and perhaps 20% fine chlorite (or biotite and chlorite).

Matrix of chlorite, greenish black amphibole and some biotite, with a small amount of quartz grains (?) and a few small garnets.

Strike and Dip as in #1. Clarksburg Tuff.

#3. Same location as #2. Taken to show better the weathered surface. Shows more dark amphibole in some of the matrix.

#4. 40 paces East, 190 South of the West 1/4 post. October 19, 1946

A few fragments a few cm long and a few mm thick of,-

Granular quartz to 0.5^{mm} with a few to 1^{mm}. These quartzose fragments show in some a few pyrite crystals (1^{mm}) surrounded in some spots by yellowish vermiculite (or altered mica). Barely small fragments (to a few mm long) of graphite, earthy but with barely visible cleavage or crystal faces that may be mica. Matrix, or bulk of the rock,-

Fine granular quartz (0.2^{mm}) in which are a few grains of quartz to 1^{mm}.

It may be that the "fragments" mentioned are merely broken and widely separated parts of beds.

Strike,- about North 75° East, but enough folded so strike is in question. Dip 80° northwestward, and steep in other directions. The general strike may be northwesterly, but locally bedding was seen striking N. 75° E. Goodrich or gradational phase into the Bijiki.

W. A. Seaman Section 25 48-30

#10. 340 paces South, 670 West of East 1/4 post. June 25, 1946

Grünerite, a small part radiated and in 60-70% to 1^{mm} long
 rosettes, some with a core of chlorite
 Quartz, fine granular (recrystallized chert?) 20-30% 0.1^{mm}
 Chlorite, mica, graphite 5% under 0.1^{mm}
 Magnetite perhaps 5% " "

Strike,-locally N 80° ± E, but much folded in the vicinity, Dip,- S or SSE at varying high angles.

Bijiki iron formation, grünerite phase.

#11. From 1 to 2 feet above #10, same location June 25, 1946

Grünerite (or perhaps cumingtonite or other amphibole), mostly in rosettes. 70-80%± to 1^{mm} long
 Chlorite, occasionally as a center of a rosette of grünerite, but more often seen as spots irregularly placed in or between the rosettes. 5% 0.1^{mm}
 Magnetite 5-10% to 0.2^{mm}
 Graphite, quite abundant in some narrow seams or beds 1-2% earthy

#12. From a 3 inch vein one foot above #11. June 25, 1946

Quartz, hard earthy hematite and hard steely iron hydrate.

Vein dips northward at varying angles, cutting the Bijiki Iron formation.

#13. From 1 to 2 feet above #12. June 25, 1946

Grünerite, partly to mostly in rosettes 60-70% to 1^{mm} long
 Magnetite, octs 15%± 1/2 to 1^{mm}
 Quartz, granular (recrystallized chert?) 5% 0.1^{mm}
 Graphite, considerable in some beds and seams and some between the grünerite crystals 1-5% earthy
 Chlorite (?) 5-10% under 0.1^{mm}

Bijiki iron formation, grünerite phase.

#14. 10 paces eastward along the strike from #10 to #13. June 25, 1946

Grünerite, much of it in rosettes 50%± to 1^{mm}
 Magnetite, disseminated 20% to 0.5^{mm}
 Finer magnetite in beds with some grünerite 20% 0.1^{mm}
 Chlorite, graphite, quartz, etc. 10% to 0.1^{mm}

Strike and Dip,- About same as #10-12, but dip 60° to 70° NW (overturned?)
 Bijiki iron formation, strongly magnetic grünerite phase.