Steep Rock Lake ; Western Utah: [specimens] 40327-40343, 42628-42654. No. 347 1901-1902

U. S. GEOLOGICAL SURVEY

FIELD SECTION BOOK

9-891

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.

347.

Stub Rock Lakes, (sp 1-3)

W. N. Merriam

1902

Specimens 40327-40343,

+

western Utah, (sp. 4-

G K Gilbert, 1901

sp. 42628-42654

Steep Rock Lake, Ont.
(W.N.Merriam.)
(Merriam's numbers 1, 2, 3, etc.)

40327 (1.) From the west side of the southeast arm of Steep Rock lake. Near line between 253 and 254 x. Large exposures of the conglomerate carrying chert fragments, striking west of north and east of south. Dip high to west

40328 (2.) Crossing a line between 253 and 254 x, a narrow belt of red weathered cherty limestone striking a little east of north and west of south. A few paces to the west is a large ridge of massive greenstone running nearly north and south. West of this ridge of greenstone, in a valley running about north and south very schistose rocks are exposed. They vary from a light colored talc schist to greenish schist. Along the east side about 400 paces south of the lake and lying on the west flank of a high ridge, are quite large exposures of the limestone weathering red. The valley runs through the west side of 252x, 872x, and through the center of 873 x.

40329 (3.) Just west of the southeast arm of Steep Rock lake on south side of lake soon after turning west around the point.

40330 (4.) Near Shores mill at northwest point of Steep Rock lake.

40331 (5.) About one-half mile west from 4.

40332 (6.) A little over a mile from the mill to the west. A series of these schists run to the northeast. In places they show the red weathering which would indicate that they carry considerable carbonate. Small masses of iron material show in the drift near the mill (Shores).

40333 (7.) From small island south of float ore show on this island, the larger masses lying on the east end. On the long sand beach just southeast of this island are numerous small fragments of ore, and the sand itself carries a large percentage of iron. No other beach on the lake shows nearly so much iron sand, and beaches both to the east and west but a short distance show only a very small percentage

A conglomerate or breccia near the base of the limestone shows nicely at the northeast end of Steep Rock lake near the east line of 125 e.

40334 (8.) From the west side of the southwest arm of Steep Rock. The rocks on the west side of this arm seem to be nearly uniformly of this rock.

40335 (9.) From the east side of the southwest arm of Steep Rock lake near "Burnt Camp". A spheroidal weathering rock similar in appearance to those of the Vermilion range.

40336 (10.) Coarse fresh greenstone lying just south of the irony material on 819 x. The irony material shows over a distance of some feet in one trench.

40337 (11.) Just north of the iron, not over 100 feet between 10 and 11. South of this point nearly to the railroad the rock is granite and greenstone. There are several ages of each. Along the railroad from the first bridge east of Atikokan to the second bridge are almost continuous exposures of the banded graywacke, slate, and quartzite much contorted in places, and metamorphosed to a mica-schist to some extent.

40338 (12.) Shows these rocks. Near the bridge east of Atikokan the greenstone cut by granite shows.

40339 (13.) West of this a very fissile shale, whitish and like some in the Moose lake country, Minnesota, shows to the station. Shown by 13. The strike seems to be about northeast-southwest, dip high to the north. The strike of 12 seems to be more east and west, and dip is nearly vertical.

40340 (14.) Granite rock between railway and 819 x.

40341 & 40342 (15 & 16.) About one-half mile east of Atikokan and about 1/4 miles south of railroad, has been prospected for iron.

40343 (17.) Three specimens from 817 x and 816 x. Lying south side of slates and in contact.

Western Utah. 1901.
(G. K. Gilbert.)

Specimens representing cavernous erosion of igneous and sedimentary rocks, veins, oolite, and intraformational conglomerate. (Gilberts numbers 1, 2, 3, etc., Survey numbers 42628, 42629, etc.)

Cavernous Erosion.

In the desert region of western Utah I noticed much honeycombing of rocks which I did not understand. In various rocks more or less massive there are developed small caves. Often they are bounded outwardly by a superficial skin of exceptionally firm rock, explained, as I suppose, by cementation through the evaporation of percolating water at the surface. They are often bounded in other directions by structure planes of various kinds -- bedding, joints, and the walls of veins. Elsewhere they show no relation to structure planes. The method of formation appears to comprise scaling and crumbling of the surface layer inside the cave, and a clearing out of the debris by wind. Examining the interior of such a cave one always sees partly separated scales, and finds other scales on the floor. In some instances saline efflorescence was found on the cave walls.

The rocks exhibiting the caves in greatest abundance are rhyolite and granite. Either sandstone or limestone comes next in order of abundance, and I saw cavernous basalt at one locality The photographs I give you represent numerous small caverns in rhyolite and two caverns in limestone-breccia. The limestone locality is in the House Range, the exposure being toward the northwest; the rhyolite body is a small butte between the Fish Spring and Deep Creek ranges; all in western
42628 Utah. Specimen No. 1 (No. 42628) is from one of the caves photographed in the breccia of a shear zone. Speci-
42629 mens Nos. 2 (No. 42629) and 3 (42630)
42630 are from the caves in massive lime-stone at the same locality.

I noted that all of the localities where the structure was conspicuously exhibited are affected by a desert climate. All about the base of a small range, called Granite Rock, in the Salt Lake Desert the caves are numerous; but Mr. W. D. Johnson, who climbed the mountain, told me that the higher parts -- 3,000 to 4,000 feet above the desert -- had no caves. Mr. Johnson also reported no caves on the summits of the lofty Deep Creek Range, although the granite of the peaks seemed similar to the cavernous granite of the base. Afterwards, in crossing the mountain region of Colorado on

the Denver and Rio Grande Railway, I kept a lookout for the phenomenon, but did not discover it in the granites of that more humid region. And still later, in visiting the Grand Canyon district in Arizona, I found cavernous erosion only in the Aubrey sandstone, near the top of the cliff, where it is sparingly exhibited. Some years ago I observed it in a Permian sandstone on the edge of the Painted Desert of Arizona, and some photographs of loose blocks were made in that locality.

Veins.

The veins to which I refer occur in heavy-bedded limestones, of Cambrian age, seen in the Fish Spring and House ranges. In the Fish Spring Range where the occurrence is most frequent, the rocks are intricately faulted, and there is little evidence of flexure. The range as a whole is a block uplift between faults, and with a pronounced dip toward the west. The general mass is divided, by faults crossing the range obliquely, into secondary masses, into a great number of blocks. In some places a single bed of limestone will be seen to be suffused by more or less lens-shaped veins; and some layers were found so much more susceptible to veining than others that I used the veins to a certain extent as horizon markers.

In other parts of the range the veins occur in many beds through a vertical r range of hundreds, or perhaps thousands of feet.

In a part of the House Range called Swasey Mountain a body of limestone at least a thousand feet thick has a banded structure throughout, and the prevailing color of the rock is nearer to white than to the dark gray of the unaltered limestone. Specimen No. 4 (No. 42631) if from this locality. The specimens numbered 5 (42632,42633, 42634,42635,42636,42637) are all from t the Fish Spring Range, and specimen 6 (42638) is from a low range in White Valley about 10 miles west of the House Range. 42654 much fractured limestone, cemented with silica and showing differential weathering. (locality not given)

42631
42632
to
42637
42638
42654

Oolite.

In the same series of Cambrian limestones certain horizons are characterized by oolite. In some cases beds from 2 to 10 feet in thickness are composed of fine oolite of ordinary character. In other localities, and probably at different horizons, the spherules are larger, and my notes indicate an extreme diameter of about one inch. One limestone bed about 200

feet thick contains at several horizons a peculiar pattern suggesting the marking of a zebra. The body of the rock is of pale-gray color, and there are bands of darker gray making an angle of about 20 degrees with the bedding, so as to suggest false bedding. The color of these darker bands is given by minute oolitic grains.

I have observed oolite in process of formation on the shores of Great Salt and Pyramid lakes. The grains seem the form especially in the breaker zone and drift landward in dunes. They are often to be found cemented so as to constitute a normal oolite. On the shore of Pyramid Lake the grains range up to probably one-fourth inch in diameter. An oolite formed in this way would almost necessarily have the spherules in contact one with another but you will observe that these Cambrian oolites, at least for the most part, are composed of grains which do not touch, being separated by walls of the matrix. It seems, therefore, probable that their segregation took place after the deposition of the calcareous mud. Specimen 7 (42639) is the "zebra" rock from the House Range. Specimens numbered 8 (42640 to 42649 inclusive) are also from the House Range. Specimen 9 (42650) is from the Fish Spring Range, and 10 (42651) is from one of the Desert Buttes west

42639
42640
to
42649
42650
42651

of the Simpson Range. The rocks are all Cambrian.

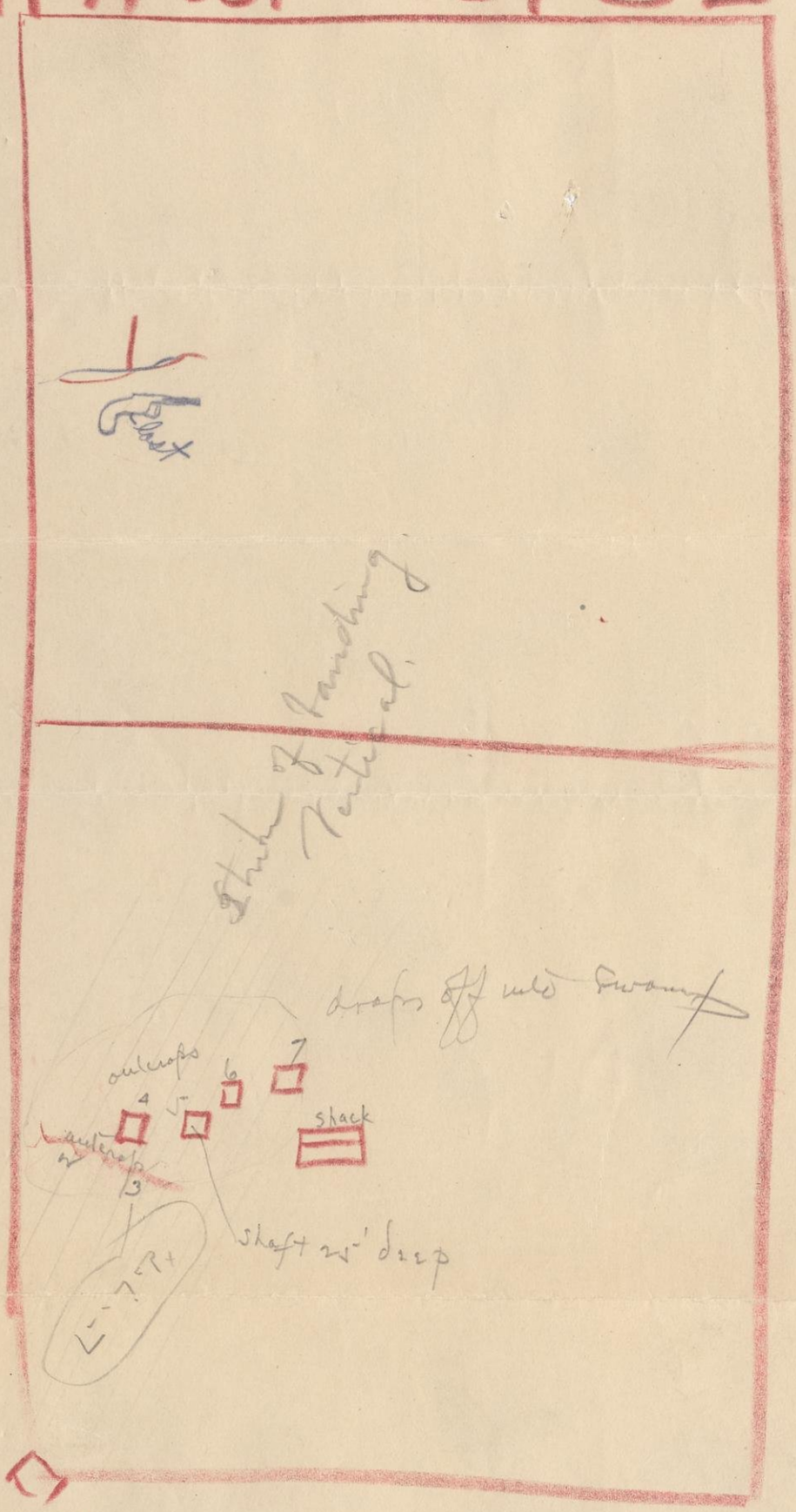
Intraformational conglomerates.

In the Fish Spring Range there is a considerable series of Silurian rocks, chiefly an alteration of shales with limestones, the shales being on the whole the thicker. In this series a very large number of limestones, probably twenty or thirty in a range of 1,000 feet, are conglomerates. I found no evidence that the pebbles were derived from older rocks. They resemble the associated normal limestones, rather than the underlying Cambrian. In the conglomerates are fossils, especially trilobites, always in a fragmentary condition. I hand you
42652 two specimens, numbered 11. (42652
42653 and 42653)

Specimens - 47126-47846

Specimens sent in by ~~H B~~ Howland, (1903)

HW Cor sec 4 62-11



W 1/4 sec 4

Minnesota

No other description. (Vermilion range)

Specimens from area West of Vermilion Minn. included in map sent in by Sabenius. Area surveyed by J. U. Sabenius for Lake Superior Consolidated Iron Co.

40344 S.W. 1/4 sec. 3-61-16. At and near Pike River Rapids.

40345 S.W. 1/4 sec. 3-61-16. Near Pike River Rapids.

40346 S.W. 1/4 sec. 3-61-16 near Pike River Rapids.

40347 S.W. 1/4 sec. 3-61-16 North of Pike River Rapids.

40348 Sec. 5-61-16. 480 paces N. of sec.

40349 " " 1700 " " " " .

40350 " " 750 " " " .

+ 10 " west of sec.

40351 Sec. 6-61-16 325 paces S of S.W. cor.

40352 " " " "

40353 " " 885 p. S. of W. 1/4

40354 " " "

40355 " 22-62-16. 500 p. N. of S.W. 1/4

40356 " 33-62-16 1000 p. N.E. of E 1/4 post.

40357	Sec. 33-62-16	337 N. of E. 1/4
40358	" 33-62-16	S.E. cor.
40359	" 2-61-17	60 W. of N.E. cor.
40360	" 2-61-17	900 N. of E. 1/4 post.
40361	" 2-61-17	630 N. of E. 1/4 post.
40362	" 2-61-17	300 N. of sec. p.
40363	" 2-61-17	300 N. of sec.
40364	" 2-61-17	460 W. of N. 1/4 post.
40365	" 2-61-17	620 W. of N.E. cor.
40366	" 3-61-17	420 N. of E. 1/4 post.
40367	" 3-61-17	1665 N. of S.E. cor.
40368	" 3-61-17	740 W. of N.E. cor.
40369	" 3-61-17	925 N. of S.W. cor.
40370	" 3-61-17	800 N. of S.W. cor.
40371	" 3-61-17	600 N. 46 E. of S.W. cor.
40372	" 3-61-17	369 N. 46 E. " " " "
40373	" 3-61-17	" " " "
40374	" 3-61-17	126 N. 46 E. of S.W. cor.
40375	" 6-61-17	317 N. of S. 1/4 post.
40376	" 6-61-17	317 " " " "
40377	" 6-61-17	317 " " " "
40378	" 6-61-17	500 E. of S.W. cor.
40379	" 6-61-17	755 N. of S. 1/4.
40380	" 6-61-17	200 N. 50 E. S.W. cor.
40381	" 6-61-17	317 N. of S. 1/4 post.
40382	" 7-61-17	50 S. of N.W. cor.
40383	" 7-61-17	55 S. of N.W. cor.

40384	Sec. 8-61-17 - 315 W. 20 N. Sec.
40384	" 8-61-17 - 610 N. of sec.
40385	" 8-61-17 - 610 N. of sec.
40386	" 8-61-17 - 1650 N.
40387	" 8-61-17 - 210 W. 25 N.
40388	" 10-61-17 - 850 N. S.W. Cor.
40389	" 10-61-17 - 843 N. 330 E. of S.W. Cor.
40390	" 10-61-17 - 708 N. S.E. Cor.
40391	" 10-61-17 - 67 S. of S.E. Cor.
40392	" 10-61-17 - 672 N. 330 E. of S.W. Cor.
40393	" 10-61-17 - 672 N. 330 E. of S.W. Cor.
40394	" 12-61-17 - 1400 P.S. + 300 W. N.E. Cor.
40396	" 12-61-17 - 1400 S. 300 W. N.E. Cor.
40396	" 12-61-17 - 1400 S. 300 W. N.E. Cor.
40397	" 12-61-17 - 1400 S. 300 W. N.E. Cor.
40398	" 15-61-17 - 938 S. 200 W. N.E. Cor.
40399	" 15-61-17 - 302 S. 330 E. N.W. Cor.
40400	" 15-61-17 - 1270 S. 10 E. N.W. Cor.
40401	" 15-61-17 - 1510 S. 25 E. N.W. Cor.
40402	" 17-61-17 - 364 N. W. 1/4 P.
40403	" 20-61-17 - 400 N.
40404	" 20-61-17 - 500 N. 50 E.
40405	" 20-61-17 - 120 N. W. 1/4 P.
40406	" 20-61-17 - 66 E. 742 S. W. 1/4 P.
40407	" 22-61-17 - 620 S. 20 E. N.W. Cor.
40408	no description
40409	" 22-61-17 - 260 S. 35 E. W. 1/4 P.

40410	Sec. 22-61-17	1008 S. of W 1/4 Post.
40411	" 29-61-17	759 N. W 1/4 P.
40412	26-61-17	317 S. 20 W. N.E. Cor.
40413	26-61-17	443 S. 24 E. N.W.
40414	29-61-17	959 N. W 1/4 P.
40415	32-61-17	1650 N.
40416	35-61-17	198 S. N.W. Cor.
40417	35-61-17	700 E. 270 S. S.W. Cor.
40418	35-61-17	760 S. N.W. Cor.
40419	35-61-17	
40420	9-62-17	1279 S of N.E. Cor.
40421	18-62-17	345 W. & 20 N. S.E. Cor.
40422	30-62-17	250 S. of S. W 1/4 P.
40423	30-62-17	110 S. 5 E. W 1/4 P.
40424	30-62-17	110 S. 5 E. W 1/4 P.
40425	7-61-18	775 E. W. 1/4 P.
40426	7-61-18	225 N. S 1/4 P.
40427	7-61-18	475 S. W 1/4 P.
40428	7-61-18	450 N. S 1/4 P.
40429	9-61-18	5354 E. N 1/4 P.
40430	9-61-18	400 E. 125 S of W 1/4 P.
40431	9-61-18	450 E. 225 S of W. 1/4 P.
40432	9-61-18	1978 S. 45 W. N.E. Cor.
40433	10-61-18	375 S. of S.E. Cor.
40434	11-61-18	800 S. 62 W. N.E. Cor.
40435	11-61-18	30 N. W. 1/4 P.
40436	11-61-18	685 S. N.E. Cor.

40437	Lee.	11-61-18	200 No. of W. ¼ P.
40438	"	11-61-18	" " "
40439	"	13-61-18	600 S. of W. ¼ P.
40440	"	13-61-18	460 S. of E. ¼ P.
40441	"	16-61-18	1674 S. 500 W. NE Cor.
40442	"	16-61-18	1731 S. 500 W. NE Cor.
40443	"	16-61-18	2000 S. 500 W. NE Cor.
40444	"	13-61-18	445 S. 50 E. NW Cor.
40445	"	18-61-18	790 N. of S. ¼ P.
40446	"	18-61-18	566 S. of N.W. cor.
40447	"	18-61-18	500 S. of W. ¼ P.
40448	"	18-61-18	150 N of S. ¼ P.
40449	"	18-61-18	1600 N. of S. ¼ P.
40450	"	18-61-18	1850 N. of S. ¼ P.
40451	"	18-61-18	930 S. of W ¼ P.
40452	"	18-61-18	1400 N. of S. ¼ P.
40453	"	21-61-18	862 N. of S.W. Cor.
40454	"	21-61-18	298 N. of W. ¼ P.
40455	"	21-61-18	32 3 (?) N. of W ¼ P.
40456	"	21-61-18	700 S. 500 W. NE Cor.
40457	"	21-61-18	652 N. of W. ¼ P.
40458	"	21-61-18	770 S. 500 W. of NE. Cor.
40459	"	21-61-18	800 N. of S.W. Cor.
40460	"	24-61-18	485 S. of E. ¼ P.
40461	"	24-61-18	739 S. of N.W. Cor.
40462	"	24-61-18	739 S. of N.W. Cor.
40463	"	24-61-18	N.E. Cor.

40464	Sec.	24-61-18	8195' S. of N.W. Cor.
40465	"	25-61-18	100 S. of N.W. Cor.
40466	"	25-61-18	840 S. of N.E. Cor.
40467	"	25-61-18	310 S. of N.E. Cor.
40468	"	28-61-18	113 S. 1140 E. of N.W. Cor.
40469	"	28-61-18	1170 E. 250 S. " "
40470	"	28-61-18	693 S. 1250 E. " "
40471	"	28-61-18	113 S. 1140 E. " "
40472	"	28-61-18	800 S. 1250 E. " "
40473	"	28-61-18	693 S. 1250 E. " "
40474	"	30-61-18	1890 N. 1020 E. of N.W. Cor.
40475	"	31-61-18	100 N. 1170 E. of N.W. Cor.
40476	"	31-61-18	400 S. of N.W. Cor.
40477	"	31-61-18	300 E. 50 S. " "
40478	"	35-61-18	2400 N. 45° W. of S.E. Cor.
40479	"	36-61-18	208.71 W. of E. 1/4 P.
40480	"	2-62-18	1000 E. N.W. Cor.
40481	"	2-62-18	1858 E. 522 S. N.W. Cor.
40482	"	2-62-18	1455 E. 335 S. " "
40483	"	2-62-18	230 E. 448 S. " "
40484	"	2-62-18	230 E. 45 S. " "
40485	"	3-62-18	345 W. 50 S. of N.E. Cor.
40486	"	13-62-18	360 W. 340 N. of W. 1/4 P.
40487	"	26-62-18	1580 W. 600 S. E. 1/4 P.
40488	"	28-63-18	400 W. 100 N. S.E.C.
40489	"	33-63-18	150 W. 100 S. N.E. Cor.

along Miller Trunk Road.

40490	Sec.	1-60-19	400 N. 100 E. of N.W. Cor.
40491	"	2-60-19	360 E. 85 S. of S.W. Cor.
40492	"	18-61-19	1015 N. 5 W. of S.W.C.
40493	"	18-61-19	W. 1/4 P.
40494	"	27-61-20	660 S. & 660 E. N 1/4 P.
			Bank Surgeon P.
40495	"	36-61-20	195 S. 60 E.
40496	"	36-61-20	100 S. 60 E. of S 1/4 P.
40497	"	4-58-21	94 W. 445 S. W. Center.
40498	"	6-58-21	60 N. 15 E. of W. 1/4 P.
40499	"	6-58-21	1450 E. 500 S. of W 1/4 P.
47000	"	6-58-21	60 N. 15 E. of W 1/4 P.
47001	"	6-58-21	" " "
47002	"	6-58-21	450 E 250 N. of S.W. Cor.
47003	"	6-58-21	225 E. 50 N. of S 1/4 P.
47004	"	6-58-21	450 E. 250 N. S.W. Cor.
47005	"	10-58-21	E. 1/4 P.
47006	"	1-58-22	80 E. & 78 S. of S.W. Cor.
47007	"	34-59-22	600 N of W 1/4 P.
47008	"	3-60-22	480 E. 65 N. of S 1/4 P.
47009	"	10-60-22	680 S. of N.E. Cor.
47010	"	10-60-22	230 S. & 200 W. of E. 1/4 P.
47011	"	18-60-22	265 N. & 200 E. of W. 1/4 P.
47012	"	18-60-22	600 E. & 100 S. of N. 1/4 P.
47013	"	18-60-22	70 N. of W. 1/4 P.
47014	"	18-60-22	70 N. of W 1/4 P.
47015	"	18-60-22	70 N. of W 1/4 P.

47016	Sec.	3-61-22	343 1/2 E. & 980 S. of N.W.C.
47017	"	3-61-22	540 E. 980 S. " "
47018	"	4-61-22	925 E. 32 N. " "
47019	"	35-61-22	700 S. 210 E. " "
47020	"	13-60-23	1000 N. 35 W. of S. 1/4 P.
47021	"	13-60-23	1000 N. 35 W. " " "
47022	"	23-60-23	250 E. 800 N. of S.W.C.
47023	"	23-60-23	800 W. 660 S. of N.E.C.
47024	"	23-60-23	800 S. of N.E. C.