Washington D.C., Missouri, Wyo. Hartville Dist., Washington northeastern, New Mexico, British Columbia and Vancouver, Island, Pennsylvania: [specimens] 46136-46216. No. 390 1902-1904

Leith, C. K. (Charles Kenneth), 1875-1956
[s.l.]: [s.n.], 1902-1904

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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.

Notebook 390.

Sp. 46136-46216.

Washington, D.C. (1902)

Missouri (1903)

Wyo. Hartville Dist (1904)

Washington, Northeastern (1904)

New Mexico (1904)

British Columbia and
Vancouver Island (1904)

Pennsylvania (1904)

S. T. R.

Dec. 25

Granite Quarry, Washington, D.C.

Jan. 3

Shepard

46136. Banded crystalline limestone. Shows beautiful differing coarseness of bedding. Footwall of ore.

46137,8,9 & 41. Set shows beautifully the development of schistosity in a cherty limestone and replacement by iron.
46141 is the ore, but still contains carbonate. Common phase.

46142. Dense white chert. Ferrous aluminum silicate according to chemist.

46143. Malachite bearing iron ore. Shows typical irregular malachite crystals in rosette forms.

46144. Dense limonite. Under the microscope shows intimate mixture of limonite with chalcedonic quartz in v veins and rosettes. Evidently entire rock secondary.

46145. Dense ferruginous chert finely banded.

45146. Fine chert with irregular aggregates of limonite apparently representing carbonate alterations.

46147. Fine banded ferruginous chert. Looks like schistose limestone slightly altered.

46148. Looks like typical taconite. Under the microscope ferruginous parts are seen to contain carbonate; indeed shows that the iron is nothing but a replacement of carbonate.

In general the microscope shows the replacement of limonite by ore for this entire set.

Hartville Dist Wyo

46136

46136
7
8

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46144

46148-7

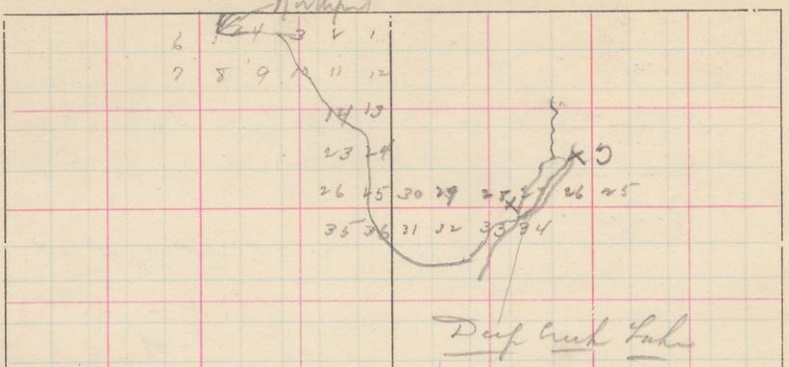
46145

Vienna N.M. A [illegible]

[illegible]

Stevens County

S. T. 39 R. 40 & 41 E



46147A

Rossland, B.C. July 15 to 16 /04 10

46/145A
46/149
46/150
46/151

46154

46153

46154

46155

46156

Eddy

Reynolds

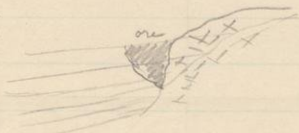
Colville + Newfont

Spreyer

V/6

[illegible] Michael Kulgen [illegible]

[illegible]



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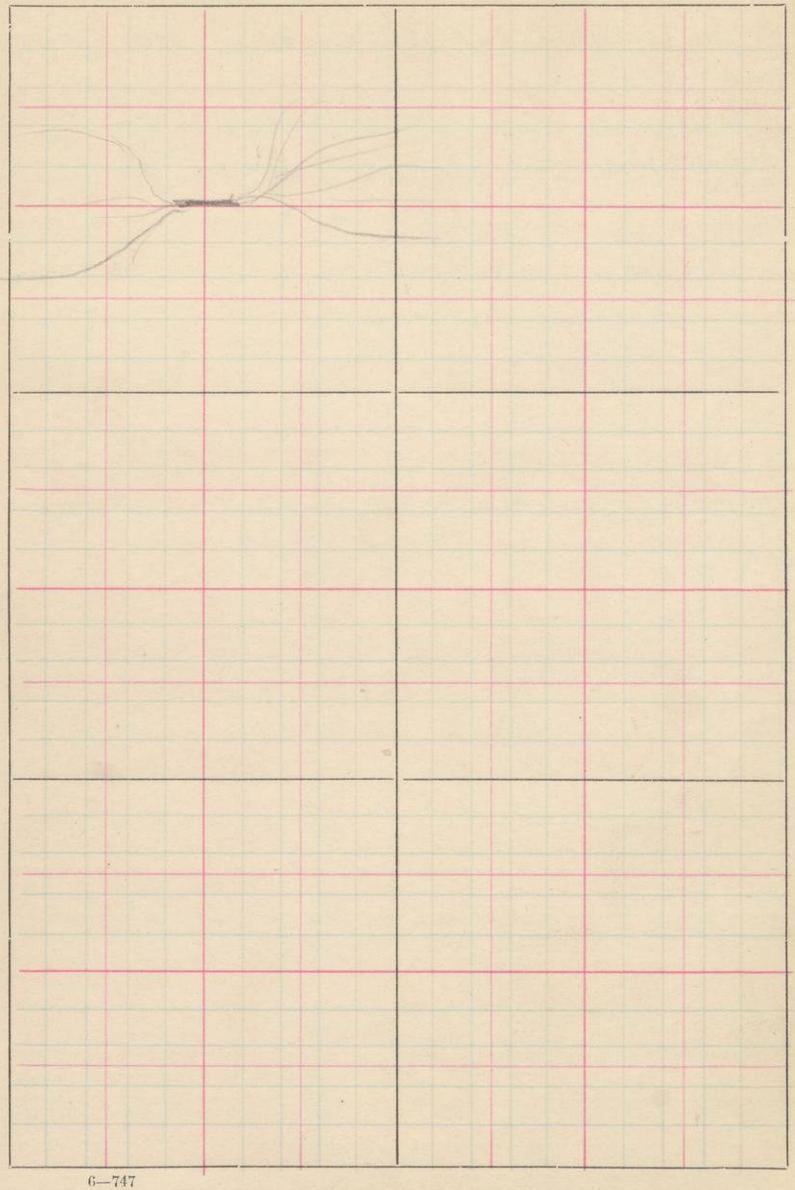
S. T. R.



Sarita

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Sechart

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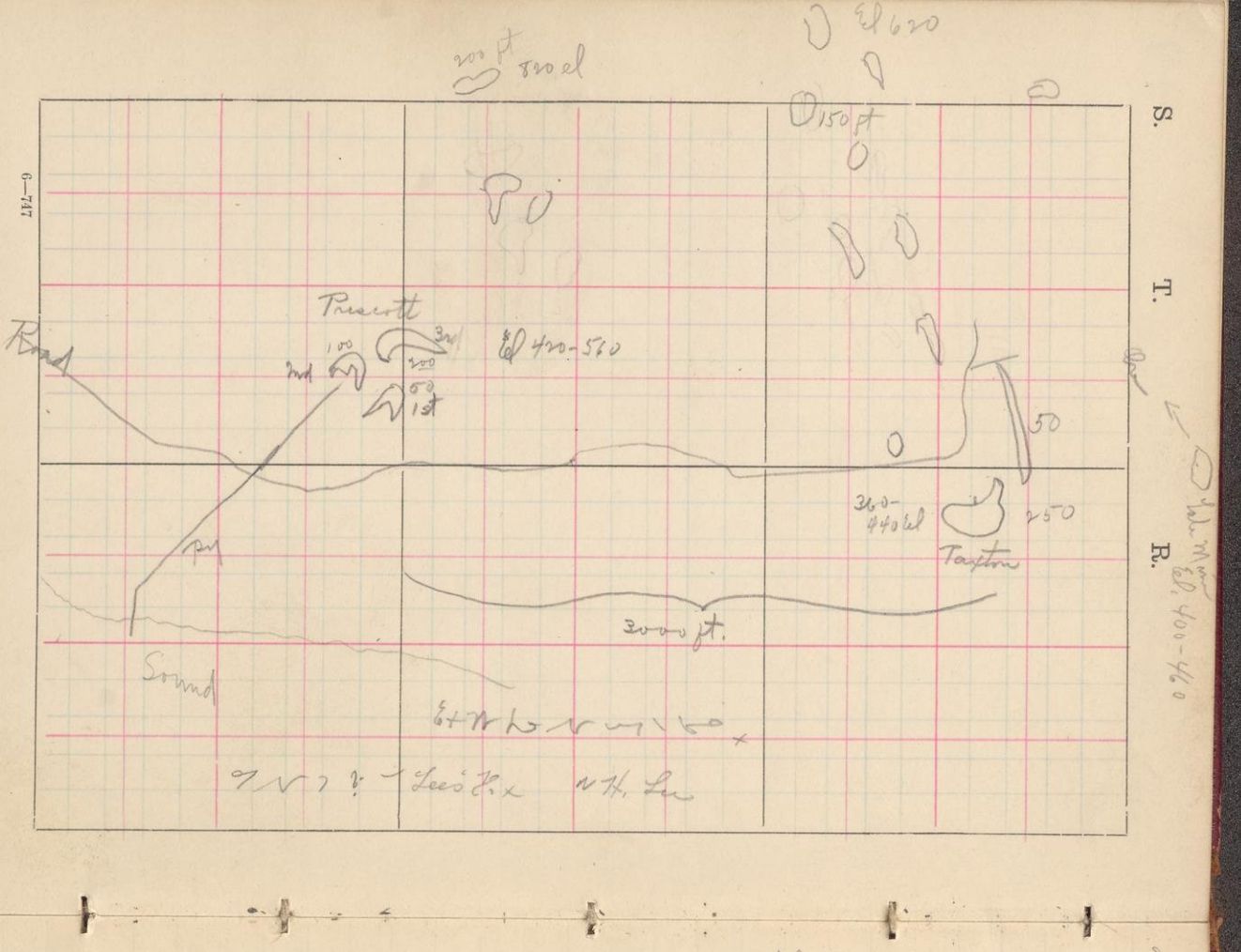
S.
T.
R.
6—747
Prescott
Road
2nd
1st
Sound
Taxpton
300 ft.
150 ft
El 620
El 430-560
360-440 el
250

Tejada

K-96-7

[illegible]


150
W
E
ORE
with altered granite
lime-stone
Granite

3

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46172 ﾆｭｰﾖｰｸﾀｲﾑｽﾞ

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46174 ﾉｰﾄﾙﾀﾞﾑﾆﾃｨﾆｽ

46175 ﾊｰﾄﾌｫｰﾄﾞﾓｰﾀｰｽﾞ

46176 ﾊﾟﾌﾞﾘｯｸｻｰﾋﾞｽｱﾅｳﾝｽ

46177 ﾊﾟｰｿﾅﾙｺﾝﾋﾟｭｰﾀｰ

46178 ﾊﾟｰｿﾅﾙｺﾝﾋﾟｭｰﾀｰﾌｫｰﾗﾌﾞﾙﾌﾞｯｸｽ

46179 ﾊﾟｰｿﾅﾙｺﾝﾋﾟｭｰﾀｰ

46180 ﾊﾟｰｿﾅﾙｺﾝﾋﾟｭｰﾀｰ

46181 ﾌｨﾗﾃﾞﾙﾌｨｱﾝﾎﾞｰﾙﾄﾞ

46182 ﾌﾞﾚｰｸｽﾙｰ

46153 From east of Valley, northeastern Washington. Martite ore between limestone. Contains green amphibole, biotite and limonite.

46158 From Copper Island mine, Barclay sound, Vancover island. Garnitiferous, epidotic and pyritiferous magnetite. Contains too much sulphur to be of value without roasting. Chloritic slickensides are abundant, showing that the rock has been broken and deformed. Magnetite with abundant lime garnet, calcite, brokwn biotite, epidote ?

46159 Wall rock. Matrix of chert containing chlorite, epidote ?

46160 Country rock short distance from ore. Matrix of chert contains biotite and chlorite.

46161 From Sureta Mine, Magnetite. Contains abundant calcite, chlorite, biotite, epidote, zoisite.

46162a Magnetite from same place. Magnetite contains calcite, pyrite, talc or kaolin.

46163 Sureta Mine. Ore intricately mixed with limestone. Good slide to study replacement of calcite by ore and recrystallization of calcite. Same green substance.

46164 Lime garnet showing minute alteration.

46165. Amphibole close to ore. Shows sharp contact not in accord with magmatic differentiation. Feldspar and quartz matrix. Feldspar is cloudy alteration. An abundance of green hornblende.

Near one edge becomes finer-grained and here hornblende is more abundant. Is this contact a ..... with limestone.

46167 Ore carrying an abundance of garnet, calcite, chert. Garnet altering along cracks to ..... (Looks like serpentine).

46168 Contact of ore with a rock consisting of chert and amphibole. This seems to be a contact of iron with igneous rock. Is amphibole characteristic of this contact? Look up relations of amphibole to garnet. Note its composition in relation to that of acid igneous rocks and iron. Also see to what extent it can be secondary to garnet.

46169 Texada Island. Andesite forming one of the walls for ore. Feldspar and quartz. Feldspar characteristically zonal. Largely altered to kaolin. Abundance of secondary green amphibole. Important.

46170 Texada Island. Few inches nearer the ore. Garnet showing alteration to .....(Serpentineous looking material) Also small amount of amphibole or epidote zoisite.

46171 Within a few inches of ore. Garnet showing clearly alteration to green amphibole. Green amphibole in minute ramifying stringers through the garnet. Small particles of magnetite associated principally with the secondary amphibole ?. One broken mass of magnetite shows amphibole within the cracks, suggesting amphibole secondary to magnetite.

46173 Andesite from lower tunnel at Texada mine. Quartz and feldspar, latter partly altered. Abundant secondary amphibole, some biotite. Specks of magnetite commonly associated with

secondary amphibole or with altered parts of feldspars.

46174 Ore, calcite, and quartz. Note coarse recrystallization of calcite near ore and within it. Also stringers of calcite penetrating ore.

46175 Rock mixed with the ore in mine. Under the microscope: Garnet containing secondary calcite. Magnetite in one case is associated with this secondary calcite.

46176 Darker colored igneous rock in sharp contact with andesite in tunnel. Under the microscope: Seen to be probably the same thing more altered and with more secondary hornblende. Also conspicuous fact that magnetite is abundantly associated with secondary hornblende. Compare this specimen with fresher igneous rocks of this locality.

46177 Ore containing iron sulphide in sheet-like forms. Under the microscope: apparently secondary to amphibole and infilitrated along irregular sheet-like openings. Same seems to be true of calcite which contains actinolite needles.

46178 Ore with rock representing about average sample of Texada mine. Rock as usual is garnet showing cloudy alteration, beautiful zonal structure. Alteration product, amphibole ? secondary calcite.

46179 Ore with copper and iron sulphides. Contains abundant garnet and usual cloudy alteration probably to amphibole. Some secondary green amphibole clearly present. Calcite. Quartz.

46181 Andesite from lower level, Texada mine. Shows beginning alteration of feldspar, secondary growth of feldspars, development of secondary amphibole where the feldspars are most altered.

46182 Garnet and calcite with secondary magnetite. Magnetite probably introduced with calcite and amphibole during alteration of garnet. Seems to be shown also in hand specimen.

46184 Contact of iron and limestone, third level Texada mine. Coarse recrystallization of limestone. Garnet in sharp contact with its own outlines. Magnetite later than both for it has outlines both in calcite and in garnet. Farther from contact secondary green amphibole. Here the iron again in abundance. Magnetite associated with amphibole usually lacks crystal outlines. Amphibole at least in part secondary to the magnetite.

46185 Same contact. Coarse recrystallization of calcite. Secondary green and brown amphibole next to calcite and then zone of garnet. Magnetite again clearly associated with amphibole rather than with garnet. Grain of calcite becomes finer in leaving contact.

46187 From Kamloops mine, British Columbia. Ore with apatite showing secondary alteration to calcite.

46188 Country rock, largely secondary amphibole with magnetite. Magnetite conspicuously associated with coarser phases of amphibole.

46189 Ore, calcite and quartz with secondary amphibole. Amphibole clearly secondary to ore found in crevices penetrating it.

46190 Average country rock. Quartz and feldspar, principally feldspar. Feldspar badly altered. Secondary amphibole developed. As usual, associated with magnetite. Magnetite lacking in relatively fresh parts of specimen.

46183 [illegible]

46184 [illegible] 3rd [illegible]

46185 [illegible] 3rd [illegible]

46186 [illegible]

[illegible]

K 29 1904

Glew inn

CTR.

Kambrium

"grauer"

46187

46185

46189

46190

46191-216 See MB. 399.

46217-227 Cuyuna Range, Minn. See Notebook 399

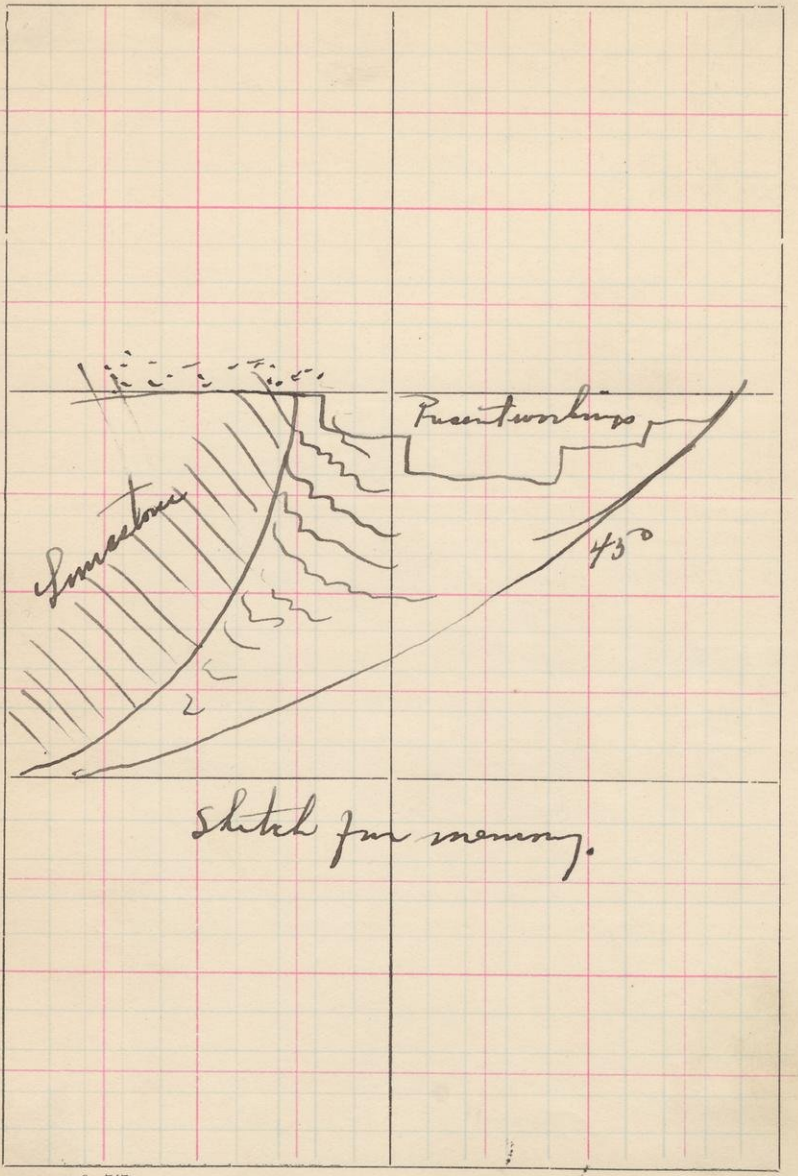
46228-9 Kiaw Pt. "

230 Mesabi "

231 Animikie "

232-7 Schultz Norman Rice "

S. T. R.



Sketch for memory.

46238
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46242 Anunakie range. See Notebook 399.

Vacant Nos. for T.H. (1904)
42655-42999