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PROPERTY EXAMINATION REPORT

SELDOVIA MINING COMPANY & L. N. LYONS

104-17
104-18

CHROMITE PROSPECTS

FISH CREEK, RED MOUNTAIN AREA, SELDOVIA PRECINCT

SELDOVIA QUADRANGLE

KENAI PENINSULA, ALASKA

By

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931-15, RI 3885

SUMMARY

Exploration work on claims held by the Seldovia Mining Company and in the serpentine area by L. N. Lyons has uncovered numerous chromite occurrences during period of trenching and stripping with tractor equipment.

To date none of these showings, individually or collectively, are considered to contain substantial tonnages of chromite ore.

The chromite "pods" (or lenses) as now exposed vary in strike length from few feet up to 30 feet and vary in width from 2 to 60 inches. Their maximum extent in depth will probably not exceed their strike length. At several points bottom of the small pods were found within a few feet of surface by digging with a small pick; at several other points it was noted that trenches, five to eight feet in depth, had reached bottom of or entirely removed the lenses.

Occuring in an "en echelon" pattern and following the serpentine foliation in strike and dip, the lenses (in some sections closely spaced) have the same "scaly" appearance in most cases, and when broken off the lenses the pieces generally "break" along serpentinized "jointing" and "fracture" faces of lenticular shape.

It is estimated that there is 500 to 1000 tons of chromite of good grade which can be mined and shipped by judicious use of dozer equipped tractor.

Due to small size of the lenses costs will be probably high.

From work done to date chances of finding milling grade ore across 50 to 200 foot widths are considered to be poor.

INTRODUCTION

At request of L. N. (Bill) Lyons, Seldovia Mining Company, Seldovia, Alaska, an examination was made of the numerous chromite showings on claims held by the company and by Mr. Lyons. September 27th to September 30th, 1955, was spent on the properties.

During this period a Brunton and tape traverse was run to tie-in the chromite occurrences, during course of which the approximate claim locations were determined.* (See Map 1, attached).

LOCATION AND ACCESSIBILITY

The properties are located at approximate geographical coordinates Longitude $151^{\circ} 32'$ west and Latitude $59^{\circ} 23'$ north. The showings occur along the northwest margins of the dunite mass, which latter makes up the core of Red Mountain.

Located about 8 miles (airline distance) southeast of Seldovia, road construction into the area was reached a point about $8\frac{1}{2}$ miles from town, the last mile to mile and half of which is in the Fish creek valley. The first 5 to 6 miles followed an old road which had been put in good condition; the balance was cleared and graded last fall, but due to long period of wet weather had not been gravelled and was soft going. The remaining 4 miles to the temporary camp, near head of Fish Creek valley, was made by "jeep" following an old trail. Travel time for the 12 mile trip by "jeep" was about $1\frac{1}{2}$ hour.

From the camp site a temporary "Cat" trail, consisting of a series of steep switchbacks, has been built to level of the "hanging-valley" in which the chromite occurrences are located; from there on to the showings it has proved easy going for tractor equipment.

CLIMATE AND VEGETATION

The area is one of fairly heavy rainfall in summer months, and heavy snowfall during the winter. Strong winds prevail during good deal of the year, which results in snow drifts remaining in depressions until mid-summer (and later).

The dunite core of Red Mountain is characteristically devoid of vegetation. Spruce timber suitable for mining purposes is available in the lower end and along the mountain slopes of Fish creek.

TOPOGRAPHY

The area is one of rugged relief. The glaciated "U"-shaped valleys of the district have very steep and precipitous walls.

The chromite occurrences examined on the several claims are located in the northwest side of a "hanging valley" which extends about 1½ mile northeasterly from head of Fish creek valley.

Elevations above sea level on the claims range from 1725 feet at lower showing to 2542 feet at showing on ridge crest. Highest point is about one mile to east, at head of the glacial cirque, which is 3200 feet.

HISTORY AND OWNERSHIP

Ownership of the mineral claims shown on Map 1, attached, are as follows:-

Seldovia Mining Company -

Chrome Dome Mineral Claim
Maverick Mineral Claim
Margaret M. Mineral Claim
Billy L. Mineral Claim

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L. N. Lyons -

Son-of-a-Gun Mineral Claim
Once Over Mineral Claim
Ready Money Mineral Claim

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The four claims held by Seldovia Mining Company were located in 1953 by L. N. Lyons and Dallas Newell, and transferred to the company when it was formed.

The three claims listed above as being held by Mr. Lyons were located in 1955.

The "discovery" made resulting in location of the Maverick mineral claim is probably the same as that listed as No. 31 and plotted on Plate 26, U.S.G.S. Bulletin 931, by P. W. Guild. All other of the above listed claims were located upon "new discoveries" which have not as yet been plotted or described in geological publications.

The old mineral claims Rutledge No.s 3, 4, and 5 (abandoned), and the Juneau No. 2 (patented and now understood to be owned by the Union Carbide and Carbon Company) all lie to the east of the Seldovia Mining Company's and L. N. Lyons locations. The old claim locations are shown on Plate 27, U.S.G.S. Bulletin 931 by P. W. Guild.

Development Work

Work done on the claims examined has been limited to date by rather extensive stripping by tractor during short periods in 1954 and 1955. This work is shown on Map 1, attached.

A 10 ton shipment of highgrade chromite is reported to have been made from one of the showings a year and a half or two years ago.

GEOLOGY

The Red Mountain chromite deposits are associated with a layered mass of dunite and minor (?) pyroxenite. This igneous rock is intruded into the older graywacke, slate, argillite, cherts, limestone, and interbedded volcanics of the region. It is an elliptical mass whose areal extent is about 2 miles by $3\frac{1}{2}$ miles, the longer axis of which trends northwesterly-southeasterly.*

The dunite (and/or pyroxenite?) in some sections has been metamorphosed to serpentine, a development which appears to be most noticeable around the periphery of the intrusive.* Recent stripping on the properties examined has uncovered what appears to be the most extensive serpentine area on Red Mountain, and all their numerous chromite showings to date are found in it. This highly metamorphosed phase of the intrusive is located at its northwest limits.**

Major fault displacements have not been noted or mapped to date.

(The area as a whole has had excellent coverage by the U.S. Geological Survey, and for more detailed geological description of the district references to those publications are listed below).***

Mineralization

The chromite occurrences of the district (Red Mountain) are of the magmatic segregation type. Orebodies (referred to as masses, lenses or "pods") in the dunite vary from few inches in width up to 15 feet (as on the Star No. 4 mineral claim of the Kenai Chrome Company now being mined), and range up to 500 feet or more in length of nearly solid chromite. The reverse of normal vein type deposits, the chromite "fingers out" on the dip of the ore body.

* Refer to Map 2, attached.

** Refer to U.S.G.S. Bul. 931, Plate 26

*** Refer to U.S.G.S. Bul. 692-D, Page 267

Refer to U.S.G.S. Bul. 712-D, Pages 111 to 129

Refer to U.S.G.S. Bul. 742, Pages 30 to 41

Refer to U.S.G.S. Bul. 931, Pages 163 to 175

Chromite was observed disseminated throughout a good deal of the dunite area as sparsely distributed grains of less than 1%, up to masses or zones 15 feet or more in width and several hundred feet in length containing an estimated 10 to 30% or more chrome oxide; these occurrences have a more or less banded or layered structure.

The chromite showings examined on the Seldovia Mining Company's and Mr. Lyons claims occurs entirely in the serpentinite. Here the ore-bodies appear to be small "pods" ranging from 2 inches to 5 feet in width and up to 30 foot lengths. These small masses have a general "enechelon" pattern; they were all formed prior to the complete serpentinitization of the dunite or pyroxenite in which it was originally formed.

The numerous chromite showings (with notes as to length and width) were mapped and plotted on Map 1, attached. A brief description of each one beginning at northeast end and extending to southwest limits of the mapped area follows:-

1. Chrome Dome Mineral Claim.

In the 147 foot trench cut by tractor between traverse Stations 52 and 53, at northeast end of claim, in the first 47 feet there are a series of short irregular "pods" 6 to 10 inches in thickness. At Station 53 a "pod" 14 feet in length and 36 inches wide has been exposed. The chromite is in serpentinite, dips 60° to northwest with a garnetiferous pyroxenite showing for few feet on the hanging-wall side which is at contact of the sedimentary series of the area.*

At Station 56, near center of north sideline there is fairly abundant small chromite "float" in that relatively flat area, which has not been traced to its source.*

At Station 62 a few pieces of chromite "float" were observed.*

2. Margaret M. Mineral Claim.

At Station 58 there is a solid chromite boulder lying almost entirely upon the surface, which is 3' x 4' x 9' in size. Bedrock here is covered by a mantle of small sized sedimentary material (of local origin) which was deposited by a "local" mountain glacier. The 100 foot tractor trench excavated along east side of this boulder failed to find a possible source of the large chromite "slab"; however, the trench revealed depth through the overburden was 1 to 3 feet on this immediate area. It is apparent that the boulder was either "plucked" out of bedrock by the local mountain glacier or rolled down the steep slope from the west or south.

*Refer to Map 1, attached.

At Station 59 there is a 3' x 4' solid chromite slab exposed, but it has not been determined to what depth it extends into the probably shallow overburden.

At Station 60 a third piece of solid chromite "float" has an exposed surface of 1.5' x 2.5'. Four additional pieces of fairly coarse "float", up to a foot or so in diameter, were noted and mapped at 100 feet south of this traverse station.*

3. Maverick Mineral Claim.

The tractor road cut down on northside from ridge summit exposed a chromite pod or lense in the serpentine for length of 20 feet, and varies in width from 2 to 24 inches; 20 feet in length appears to be limit of this occurrence.*

Its dip is also 60° to northwest.

At Station 50, which is also the point of Discovery for this claim and lies at center of the rounded serpentine ridge crest, it was originally believed by the locator that strike of this occurrence was northwesterly. There was an abundance of small, thin ($\frac{1}{4}$ to $\frac{1}{2}$ inch) "shingly" float across the ridge summit; digging into it a 20 foot width of high grade chromite was reported found and sampled within a few inches of the surface. On October 28th, 1953, this showing was examined, and channel sample taken across 17 foot width a few feet from and paralleling the 20 foot sample taken by Mr. Lyons.

It was his belief that strike of this lense (or pod) was westerly due to coarse of "float" being found on ridge crest 350 feet N60W of this point; however, it was pointed out by undersigned at that time that its strike would probably be found to follow "foliation" of the serpentine (north-easterly-southwesterly), or related to an indicated fault in this vicinity of north-south strike.

Subsequent stripping and trenching on this chromite showing, for 60 feet to northwest, showed it to be lying parallel to ridge crest, and at point where trench was excavated 60 feet northwest from Station 50 it plunged vertically and was found to terminate at 8 to 10 foot depth. It was reported to have varied from few inches up to 4 feet in thickness (the latter for a very short distance). For the most part it was very thin, had a "strike" length of 20 to 40 feet, followed the serpentine foliation, and yielded a very small tonnage.*

Refer to Map 1, attached.

It is possible that in the 200 feet between Stations 65 and 50 (noted above) other small "pods" of chromite may occur.*

From point fifty feet southwest of Station 47 a "trail" of fine chromite "float" was followed 200 feet up the slope and a new discovery was made during period of last years examination. Digging into the slightly obscured outcrop at Station 49 (25 ft. NW of Station 48) an 48 inch width of solid chromite was uncovered and sampled, which may or may not be its full width. Its lateral extent was not determined. Striking N55E and dipping 70° northwest this occurrence has no relation to the one occurring at Station 50, but parallels it.*

Continuing southwesterly down the slope a series of tractor excavated trenches, near southwest endline of the Maverick claim, disclosed two more or less parallel chromite occurrences, within area of Stations 43-4-5-6. In trenches between Stations 44 and 45, chromite occurs in a series of very short "pods", 2 to 4 inches wide, for a distance of 60 feet; west of Station 44 there are two small (short) "pods", 20 feet apart, having 12 and 15 inch widths. At Station 46 there is a 30 foot more or less continuous "pod", varying from 6 to 14 inches wide, exposed in bottom of trench. Strike varies from N75E in the upper to N85W in the lower trenches. The dips average 60° northwest.*

The above four noted chromite occurrences on the Maverick claim indicates a parallelism of small "pods" having an "en echelon" pattern across a 200 feet width. They also suggest that additional small "pods" may occur across that width in this 600 foot southwesterly section.

4. Billy L. Mineral Claim.

In area of Stations 39-40-41, near northeast end of this claim, "Cat" trenches exposed two parallel chromite occurrences separated by 4 feet of serpentine.

The trench in which Station 41 is located shows a "pod" 16 inches in width and 20 to 25 feet in length, which has a strike of N50 to 55E and 60° northwest dip. The upper showing in trench at Station 40 has same strike and approximate dip, 12 inch width, and with some 6 to 8 inch pieces of "float" between these two stations, it is considered that there probably are several small pods between those points.

The trench in which Station 39 is located has exposed three points where chromite widths are 30 inches along a 25 foot section. They are considered to be individual small pods, as they do not show continuously in bottom of trench.

*Refer to Map 1, attached.

They are apparently along the same section as the lower chromite "pod", 36 inches wide and few feet long, exposed on east side of trench in which Station 40 is located. Strike along this section is N50 to 55E and dip 50° to 60° northwest.

Between Stations 35 and 36 there is some small "float" above and below the traverse line, which suggests one (or possibly two parallel) narrow chromite occurrence nearby.

5. Son-of-a-Gun Mineral Claim.

No chromite was observed in the 1350 foot section between last above noted occurrence and Station 29. At latter point several pieces of "float", up to 1' x 1' x 2' in size, was found in the shallow gulch. A few small pieces rest on left limit bank slope, a few feet below the overburden on bank edge, which suggests its source may be close by.

The coarser "float" may have come from the chromite "pod" outcropping at Station 27, located in right limit gulch bank 160 feet above. Here there is a well rounded natural exposure, 48 inches in width and 8 feet in length. No work had been done upon it, and while its strike and dip could not be determined until some trenching is done to expose its walls, it seems likely it will conform to those occurrences described to the northeast.*

Continuing southwesterly the next chromite showing is 10 foot south of Station 24, which is located on east bank of shallow ravine. Here there is a 15 to 18 inch chromite outcrop, visible for 3 or 4 feet along its strike. Its lateral extent had not been determined by trenching. The strike appears to be N50 to 60E and the dip 40° northwest.*

Trenching by dozer in section between Stations 17 to 21 has exposed numerous short, irregularly spaced, (residual ?) chromite "pods" along a 250 foot section, which have individual lengths up to 5 and 10 feet, and widths of 6 to 18 inches. The strike is N55E and dip 50° to 55° NE.

For distance of 200 feet between Stations 17 and 20, and 10 to 15 feet above the trench, there is a parallel section which shows some irregularly spaced (residual ?) chromite "pods" and/or "float".*

At Station 19 (located 50 feet southeast of Station 18) chromite "pods" have been exposed in a trench for distance of 110 feet. These are also short, irregularly but fairly closely spaced varying in length up to 20 feet and 6 to 18 inches in width.

*Refer to Map 1, attached.

The strike is N65E and dip around 65° to NW. Ten to 15 feet above this occurrence a trail of "float" indicates a parallel series of small pods.*

At several points along this area between Stations 17 and 21, shallow digging with a hand pick found bottom of small chromite lenses or masses.*

Between Stations 16 and 17 there is a number of small (residual) chromite lenses along a 100 foot section. Here their alignment gives a strike of N40E and an indicated 50° NW dip. This section is near southwest end of the claim.*

6. Once Over Mineral Claim.

There was only one chromite showing on this claim. Located at Station 10, 1000 feet south of Station 16, no chromite occurrences were noted or have been found in that wide serpentine section to date.*

At Station 10 there are two parallel occurrences 15 feet apart, having a N50 to 55E strike and 45° NW dip, located in right limit bank of creek. The upper showing has been stripped by tractor showing short irregular "pods" in 20 foot length 2 to 12 inches in width. The lower showing is similar, with fewer pods whose widths are 3 to 12 inches.*

At an estimated 600 feet southwest of Station 10 there are two small "pods" exposed in right limit bank where creek makes sharp bend to southwest. Three to 10 inches in width, they are visible for distance of 10 feet.

7. Ready Money Mineral Claim.

The showings on this claim are 1550 feet south of those on the Once Over. To date, no chromite has been discovered between these two points as bedrock is covered with mantle of glacial drift except where cut by creek.*

At Station 1, a short distance south of junction of two creeks a 20 foot length of solid chromite has been uncovered by tractor stripping in left limit bank of the creek. Width of this exposure is 48 inches.*

Terminated at the creek on its northeast end by a strong fault, its southwest limits is obscured by 4 to 5 feet of glacial drift. Its width increases to 60 inches at 2.5 feet on the dip. Striking N65E, the dip is 65° NW.*

*Refer to Map 1, attached.

At 32 feet from Station 0 and 168 feet from Station 1, stripping by tractor in the creek bed has exposed a chromite pod (lense or mass) for strike length of 25 feet, and having a 44 inch average width. Ten feet of its length stands three feet above the creek bed on the right side, with an additional 15 feet showing in creek bed. It may possibly continue further to the south, where its possible extension is obscured by 4 to 5 feet depth of the glacial drift. It appears to terminate at north end of the exposure. The strike here is N25E and dip 60° west.* Refer to Map 1, attached.

These two occurrences are considered to have the best chance for appreciable tonnages. The first described occurrence has an 2.62:1 chrome-iron ratio and the second an 2.92:1 ratio.** Refer to Sampling Results

At 54 to 64 feet along traverse line from Station 0 there is a 10 foot width of badly sheared serpentine which contains an estimated 50% of brecciated chromite in the creek bed, which is visible for strike S30W length of 15 feet where it disappears under glacial drift on south side creek bank. On north side of creek this showing does not appear to continue, doubtless being displaced by the fault striking N25E.*

Twenty feet south of Station 0 there is a second sheared serpentine zone, which contains short, small, scaly lenses of chromite across 4 to 5 foot width.*

Sampling

Samples taken were limited to the five occurrences having the greater widths, with one sample being taken at each of those exposures. Their locations are shown on Map 1, attached, and a description of them and results of analyses are as follows:-

No.	Width inches	Samples				Ratio Cr Fe	Description
		Cr2O3 %	Cr %	Fe %			
1-Seld	48	44.60	30.53	12.29	2.48:1	Full width of new discovery on Maverick claim.	
2-Seld	36	42.28	28.94	11.95	2.42:1	Full width of short pod exposed in Cat trench @ Sta. 40, on Billy L. claim.	
3-Seld	30	44.75	30.63	12.63	2.42:1	Full width of short pod 25 ft. from Sta. 39 in Cat trench, Billy L. claim.	
4-Seld	44	48.08	32.91	11.27	2.92:1	Full width exposed by Cat on right side of creek, 32 ft. east of Sta. 0, on Ready Money claim.	
5-Seld	40	44.60	30.53	11.61	2.62:1	Full width across top of showing exposed by Cat at Discovery on Ready Money claim. "pod" widens to 60 in. width at 2.5 ft. on dip, & has been exposed for 20' in length.	

Note:-

Silica content was not determined by assayer but estimated by him to be well below the 10% allowable maximum in all or above 5 samples.

Numerous samples have been submitted in the past from various points in this area by Mr. Lyons for determination of the chrome-iron ration, but without notes as to their individual widths and locations they will not be listed here.

The samples listed above show considerable variation in the five occurrences, with numbers 4- and 5-Seld having the highest chrome-iron ration.

Before undertaking a program of stripping and mining the narrower widths of other chromite exposures shown on the attached Map 1, they should be sampled thoroughly and only the pods showing the highest chrome-iron ratios and chrome percentage mined and shipped.

CONCLUSIONS

The numerous chromite occurrences examined, mapped, and discussed in some detail differ from those previously and currently being exploited in the Red Mountain area.

On the Star No. 4 and the Chrome Queen the "layered" deposits (lenses, "pods", or masses) occur in the dunite. On the former the main chromite occurrence is traceable "almost continuously for over 1100 feet, although only 1 foot thick for over half that distance..... The Star No. 4 main orebody is 625 feet long (*) with a maximum thickness found upon mining last year to be 15 feet. A number of other chromite occurrences have been observed in the dunite having continuous outcroppings up to several hundred feet in length and from few inches up to 30 feet or more in width; these, however, are either too narrow and/or too low grade to mine and ship without beneficiation.

The chromite occurrences on the Seldovia Mining Company's and L. K. Lyons mineral claims occur in a serpentine belt, which latter has a present known length of 7000 feet and up to 2000 feet in width. The serpentine has been derived from the dunite and pyroxenite of the area.

The numerous chromite showings here follow the foliation of the serpentine for the most part, and occur in an en echelon pattern. From work done upon them to date through trenching and stripping by tractor the "pods" (or lenses) appear to be small masses of short length (individually) along their strike and dip. Varying in width from few inches up to a maximum of 60 inches, these scattered occurrences show a parallelism across 200 feet on the Maverick claim and 50 to 100 feet across the Son-of-a-Gun and Ready Money claims.** However, to date there is no evidence suggesting presence of sufficient number of "pods" across those widths to make it worthwhile or give serious thought to mine and mill these sections.

*Refer to U.S.G.S. Bul. 931-G, Page 166.

**Refer to Map 1, attached.

It is estimated that there is possibly 500 to 1000 tons of chromite which may prove profitable to mine and ship direct as a "salvage" operation by a few hard working and experienced men. Costs per ton for such a program will possibly be double that of a normal mining operation and will require care in stripping the serpentine from footwall side of the chromite "pods" and pulling down the ore to floor of cut with a pick.

Attention should first be given to the wider lenses - that is to those of 2 feet or more in width. The showings on the mountain slopes covered by the Son-of-a-Gun, Billy L. and Maverick claims have all been subjected to crushing during period of deformation of the serpentine, resulting in serpentinization along joints and fractures and making the small lenses of chromite easy to remove by pick. The two solid chromite lenses on the Ready Money claim will have to be drilled and blasted.

The individual lenses (or pods) are generally of good grade, although those of the higher chrome-iron ratio should be given 1st attention.

Based upon results of prospecting the ground to date "chances" of finding individual chromite lenses having 500 to 1000 (or more) tons of shipping ore are considered remote.

It will possibly be found (as proposed "salvage" work progresses) that dip of the ore bodies (as well as foliation of the serpentine) will change from NW to SE within 20 to 40 feet depth, and that the present apparent dip to NW is due to "slump" or "creep" of the "scaly" serpentine down the fairly steep slope to the southeast.

RECOMMENDATIONS

For the owners proposed "salvage" operation this season the following suggestions are made:-

1. Each showing should be systematically sampled at 5 foot intervals across full width of exposures to determine the chrome-iron ratio's and Cr 2O₃ content. First attention in the mining program should be given to those occurrences having the highest chrome-iron ratio and chrome content, and the greatest widths.
2. Strip the newly discovered 48 inch width (1955) of solid chromite, located at Station 49 on the Maverick claim, to determine its lateral limits. Should it be found to have length of interest, prepare it for mining by stripping on the footwall side as deeply as practical.
3. The showings in the three trenches at northeast end of the Billy L. claim appeared to be short lenses when examined last fall.

However, it would be well to spend a few hours stripping along their strike to determine whether there is more continuity than was apparent in the 30 to 36 inch widths exposed.

4. The natural exposure in shallow draw at Station 27 on the Son-of-a-Gun claim, which is 48 inches wide and 8 feet in length, should be stripped along its strike to determine its extent. This occurrence did not appear to be as high a grade as other points (due to inclusion of altered wall rock at one end), but may be found to be of higher grade along its strike.

The other showings on this claim to southwest are narrower, but of better grade. However, they appear to be very short "pods", fairly closely spaced; prospects of appreciable tonnage here is not good.

5. The two showings of solid chromite at southeast end of the Ready Money claim appear to be the most promising lenses examined and sampled last fall. Their chrome-iron and percentage of chrome was the highest of those sampled. It is suggested that first attention should be given to them, with objective of determining lateral extent to northeast and southwest. The occurrence at Discovery on this claim is terminated at northeast end by a fault and disappears under the glacial drift at southwest end.

The bedrock in this area will require drilling and blasting to open up a "out" as it is too hard to remove with a dozer blade.

6. Due to apparent erratic nature of the occurrences and smallness of the lenses, exploration by diamond drilling is not recommended at this time. Results of the work planned for this season will determine whether (and where) a drilling program may be justified at a later date.

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July 11, 1956