

NOTES ON MINING IN SEWARD PENINSULA.

By PHILIP S. SMITH.

INTRODUCTION.

No party from the Geological Survey was detailed to carry on investigations in Seward Peninsula during 1911. On returning from the Alatna-Noatak region, however, the writer spent several days in Nome waiting for the steamer. During that time he obtained some notes on the mining industry, and these, supplemented by reports in the technical journals and local papers, and by official correspondence on file in this office, have furnished the basis for the following statements.

PRODUCTION.

The gold production of the peninsula during 1911 was approximately \$3,100,000, a decrease of about \$400,000 from that of 1910. This falling off is attributable to three main causes—first, a decrease in the amount of winter mining; second, a general decrease in the number of mining operations except dredging; and, third, the handling of low-grade material. All of these causes may be referred more or less directly to the exhaustion of the known rich bonanzas before enterprises capable of handling a large amount of low-grade material cheaply have been established. Practically all placer camps have had a similar history.

In the early years of the development of the ancient beaches at Nome winter mining was important, for labor was cheap, the physical condition of the ground was favorable, and there were many rich areas. Gradually the working out of the richer parts left material of too low a tenor to pay the cost of hoisting and subsequent sluicing in the summer; and consequently this form of mining has decreased. It is estimated that the winter production for 1909-10 was approximately \$1,000,000, but during the winter of 1910-11 it dropped to probably about \$200,000. That this decrease was more than the decrease in the total of the year was due to the increase in certain of the summer operations, namely, dredging.

In general summer mining work, with the exceptions already noted, fell off considerably, owing to the working out of the known productive areas and the absence of discoveries of new placers that could be mined cheaply by methods not requiring elaborate equipment. No important new strikes were recorded. An attempt to create interest in placers in the extreme eastern part of the peninsula, in the Koyuk basin, was made. Reports from that place, however, do not tend to modify the opinion previously formed—that this region is not particularly promising¹ for extensive placers, though “one-man camps” may be developed there. Dredging, however, became more firmly established and was perhaps the most important feature in the development of the region. Several new dredges were built during the summer, and some of those constructed late in the fall of 1910 first began active work in 1911. The fact that with a lessened production from the winter and other summer mining the total output of gold did not decrease more than \$400,000 from that of the previous year is entirely attributable to the increased number of dredges in operation.

The distribution of the gold production among the different Seward Peninsula camps was, in general, similar to that of former years. The Nome region still has the greatest annual output and is far ahead of its nearest competitors, Council and Solomon. Considerable activity in dredge building, however, has been shown by the latter camps, and their production is beginning to show an increase over that of a few years ago, when the bonanza days were past. Owing to a rather wet season, mining was done on several claims in the Kougarok and Fairhaven precincts that have been idle for the last few years. The production from these claims, however, was approximately the same as during previous years. Placer mining was in progress at several other places, but the gold production from these places was relatively small, and was won from previously known deposits that present no unusual features.

TIN DEPOSITS.

Although, as in the past, practically all the mineral production has been derived from gold placers, interest has been renewed in the tin deposits, and a production of nearly 100 tons of concentrates, worth about \$50,000, is reported from tin placers on Buck Creek. This output was obtained by the use of a dredge constructed last summer, so that only a short part of the season was available for mining. It is reported that the dredge commenced running on September 6 and closed by the middle of October. With a full season it should be possible at least to double the production stated above. A general

¹ Smith, P. S., and Eakin, H. M., A geologic reconnaissance in southeastern Seward Peninsula and the Norton Bay-Nulato Inlet region, Alaska: Bull. U. S. Geol. Survey No. 449, 1911, pp. 110, 113.

description of the dredge and a brief account of mining at this place has recently been published by H. G. Peake,¹ who states that 2.85 tons of tin concentrates are obtained each day.

Not only has dredging for placer tin been carried on, but certain lode tin mines near York have been reopened under the superintendence of a competent mining engineer. Although the production was practically negligible, the examination is reported to have shown promising deposits, so that the company proposes to continue development work energetically during next season. No important new features of these lodes are said to have been disclosed by the prospecting. It is understood that it is the company's intention to ship the tin concentrates to Seattle, where they will be smelted.

DREDGING.

As has already been noted, there has been a gradual increase in mining with dredges throughout Seward Peninsula, and a still further growth of this industry is expected. Many of the dredges have been used for prospecting instead of for mining and some have been mis-handled, so that nowhere near the theoretical efficiency has been obtained. Experience, however, is being gained and it is a hopeful sign that the big dredge-building firms are sending experienced engineers into the country to study the obstacles that must be overcome. One of the most promising features of this expert investigation was the refusal of a dredge-building company to put a machine on an unsuitable property. If this policy is continued one of the causes of past failures will be removed.

Several articles have recently been published on the dredging industry on Seward Peninsula. The most important of these are by T. M. Gibson² and Charles Janin.³ From these publications and from statements by W. E. Thorpe, a construction engineer of the Yuba Construction Co., and from personal familiarity with the region, the following table, giving certain statistics concerning the dredges in operation during 1911, have been compiled. A few minor discrepancies appear between reports received from different sources, but so far as possible these have been adjusted.

¹ Peake, H. G., Tin dredging in Alaska: Min. and Sci. Press, vol. 103, 1911, p. 652.

² Gibson, T. M., Gold dredging industry on Seward Peninsula: Min. and Sci. Press, vol. 104, pp. 45-48.

³ Janin, Charles, Gold dredging in Alaska and the Yukon: Min. Mag., vol. 6, pp. 45-48.

Dredges in operation on Seward Peninsula in 1911.

| Company. | Region. | Creek. | Built. | Type or builder. | Size of buckets (cu. ft.). | Bucket line. | Source of power. | Fuel used a day. | Remarks. |
|---------------------------------|------------------------------|-----------------|--------|----------------------------|----------------------------|--------------|------------------|------------------|--|
| Gold Beach Dredging Co.... | Nome..... | Osborn..... | 1905 | I. B. Hammond..... | 5 | Open | Crude oil.... | 18 bbls.... | Power generated from oil. |
| Nome Consolidated Dredging Co. | do..... | Bourbon..... | 1908 | E. L. Smith-Lidgerwood.... | 9 | Close | Electricity.. | (?)..... | |
| Do..... | do..... | Wonder..... | 1908 | do..... | 7 | do..... | do..... | (?)..... | Do. |
| Plein Mining & Dredging Co. | do..... | Otter..... | 1910 | Risdon..... | 3½ | Open | Crude oil.... | 13 bbls.... | |
| Saunders Dredging Co..... | do..... | Saunders..... | 1910 | (?)..... | 3½ | Close | Distillate.... | 200 galls.. | |
| Arctic Gold Dredging Co..... | do..... | do..... | 1910 | Union Iron Works..... | 2½ | Open | do..... | 160 galls.. | |
| Sionx-Alaska Mining Co..... | do..... | Moss..... | 1910 | do..... | 2½ | do..... | do..... | do..... | |
| Julien Dredging Co..... | do..... | Osborn..... | 1911 | Union Construction Co..... | 2½ | do..... | do..... | 190 galls.. | |
| Nome Consolidated Dredging Co. | do..... | Wonder..... | 1911 | do..... | 10 | do..... | Electricity.. | do..... | Still under construction. |
| Seward Dredging Co..... | Solomon..... | Solomon..... | 1905 | Bucyrus..... | 5 | Close | Coal..... | 12-15 tons. | Formerly the Three Friends. |
| Sievertsen..... | do..... | do..... | | (?)..... | (?) 1 | Open | Distillate.... | (?)..... | |
| Mulligan..... | do..... | West..... | | (?)..... | (?) 1 | do..... | do..... | (?)..... | Built before 1906. |
| Nome-Montana & New Mexico. | do..... | Solomon..... | 1908 | Risdon..... | 5 | Open | Coal..... | 5 tons.... | Built before 1906; runs on track. |
| Solomon Dredging Co..... | do..... | do..... | 1910 | Bucyrus..... | 3½ | Close | do..... | 7 tons.... | Previously at Hope, Alaska. |
| Flodin Mining & Dredging Co. | do..... | Big Hurrah..... | 1910 | Risdon..... | 2½ | Open | do..... | 3 tons.... | |
| Sievertsen & Johnson..... | do..... | Solomon..... | 1910 | do..... | 2½ | do..... | do..... | do..... | Similar to Kimball-Saupe dredge on Melsing Creek. |
| Kimball..... | do..... | Shovel..... | 1911 | Sluice-box type..... | 2½ | do..... | Distillate.... | 150 galls.. | |
| Blue Goose Mining Co..... | Council..... | Ophir..... | | I. B. Hammond..... | 5 | do..... | Wood..... | 12 cords.. | Built before 1905. |
| Alaska Gold Dredging Co..... | do..... | Warm..... | 1909 | Byron Jackson..... | 2½ | do..... | Distillate.... | 160 galls.. | |
| Do..... | do..... | Goldbottom..... | 1909 | do..... | 2½ | do..... | do..... | do..... | |
| Wild Goose Mining & Trading Co. | do..... | Ophir..... | 1910 | Yuba Construction Co..... | 3½ | Close | do..... | 300 galls.. | |
| Goose Creek dredge..... | do..... | Goose..... | 1910 | do..... | 2½ | Open | Distillate.... | 160 galls.. | Not in operation. |
| Alaska Gold Dredging Co..... | do..... | Willow..... | 1910 | Union Iron Works..... | 2½ | do..... | do..... | 150 galls.. | Sluice-box type. |
| Kimball & Saupe..... | do..... | Melsing..... | 1910 | Empire Iron Works..... | 2½ | do..... | do..... | do..... | |
| Lubbe..... | do..... | Mystery..... | 1911 | Union Iron Works..... | 2½ | do..... | do..... | do..... | |
| York Dredging Co..... | Port Clarence. | Buck..... | 1911 | Union Construction Co..... | 2½ | do..... | do..... | 190 galls.. | |
| Cripple River Dredging Co... | Southwest Seward Peninsular. | Cripple..... | | E. L. Smith-Lidgerwood.... | (?) 5 | (?)..... | do..... | (?)..... | Reported under construction. |
| Kelliher..... | Kougarok..... | Taylor..... | | Union Iron Works..... | 2½ | (?)..... | do..... | (?)..... | To be hauled to Taylor Creek during winter of 1911-12. |

It has not been possible to compute accurately the number of cubic yards of auriferous gravel handled by the dredges or the value of the production. Brooks has stated that in 1910 from 1,200,000 to 1,500,000 yards¹ of gravel were dredged, having an aggregate value of \$800,000, or an average value between 50 cents and 66 cents a cubic yard. Janin² estimated that the dredges in 1911 produced about \$1,400,000 in gold. If this estimate is correct and the value per yard remained the same as that given by Brooks for 1910, it follows that between 2,000,000 and 2,800,000 cubic yards were mined by dredges in 1911. To find approximately the number of yards mined, a computation based on the length of the working season and the size of the dredges may also be made. According to Janin most of the dredges started work on or before June 24 and closed about October 24, thus working during a season of 126 days. From the table given above it may be determined that the average size of bucket used on the 23 dredges that were in operation in 1911 was about 3½ cubic feet. On the authority of W. E. Thorpe it may be assumed that the average 3½-foot dredge will handle about 1,200 cubic yards of gravel a day. Using these various factors and allowing for time lost not only in operation, but at both ends of the working season, it follows that over 2,000,000 cubic yards were probably handled by dredges in 1911.

This is by no means the theoretical capacity of even the machines now on the ground, and new ones are being installed every season. There is no reason why a dredging season of 120 days should not be assumed, and many experienced dredge men predict that dredges can be operated through November, so that possibly a season of 150 or more days may be counted on for the larger dredges. When it is realized that even with the present dredge equipment over a quarter of a million cubic yards can be handled each 10 days, the importance of the length of the working season becomes evident.

During 1911 four new dredges, as is shown by the table, page 7, in as many different parts of the peninsula were built and operated. Three new dredges were in the region in various stages of completion and should be in running order by the middle of the open season of 1912. Of these new dredges perhaps the most important is to be installed on Wonder Creek, near Nome. The hull has already been built, and the digging ladder, spuds, and other parts "are being put together in the company's shops [at Nome] this winter, thus occupying the mechanical force which it is necessary to retain under yearly contracts and cheapening cost of construction, together with material freight reductions."³ This dredge will be equipped with 10-foot buckets, which are larger than any now used in Seward Peninsula. The motive power will be electricity, generated from oil.

¹ Brooks, A. H., *The mining industry in 1910*: Bull. U. S. Geol. Survey No. 480, 1911, p. 41.

² Janin, Charles, *Gold dredging in Alaska and the Yukon*: Min. Mag., vol. 6, pp. 45-48.

³ Perkins, W. T., unpublished letter.

LODE DEVELOPMENTS.

Little has been done during the year in developing lodes outside of the tin region. (See p. 341.) None of the prospects except the one on Manila Creek has been exploited, but that general interest in lodes seems to have increased is indicated by the fact that a two-stamp custom quartz mill has been erected near Nome with the object of giving opportunity for testing commercial samples of ore. The mill has been in operation too short a time to show its value, but it is believed that it will prove to be of great service, not only in indicating workable ores, but also in pointing out the leads that are not worth further exploitation. That there are valuable vein deposits in Seward Peninsula is not doubted, and their discovery and development may be greatly facilitated by a commercial test such as the new mill should afford.

The mine on Manila Creek, noted above, is the only one that is reported to have shipped ore during 1911. At this place the ore is mainly stibnite (the sulphide of antimony); carrying accessory values in gold. Specimens from this place have shown native gold in crystalline aggregates associated with the stibnite. Fifteen tons of this ore are said by the local newspapers to have been shipped to the Tacoma smelter and to have yielded \$125 a ton. This ore was probably hand sorted before shipping, so that the above returns do not represent the average run of the material. Nevertheless the presence of visible free gold in many of the specimens indicates a high gold tenor and a deposit worthy of full investigation.

Some graphite was sorted and sacked for shipment from near Imuruk Basin. It is understood, however, that the high transportation and treatment charges levied against former shipments have dissuaded the owners from sending out graphite at the present time.

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4. Copies of all Government publications are furnished to the principal public libraries throughout the United States, where they can be consulted by those interested.

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- Geology and coal fields of the lower Matanuska Valley, Alaska, by G. C. Martin and F. J. Katz; including detailed geologic and topographic maps. Bulletin 500, 1912, 98 pp.
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- A reconnaissance of the Willow Creek gold region, by F. J. Katz. In Bulletin 480, 1911, p. 152.

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- *Kenai Peninsula, northern portion; scale, 1:250,000; by E. G. Hamilton. Contained in Bulletin 277. Not published separately.
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- Fairbanks quadrangle; No. 642; scale, 1:250,000; by T. G. Gerdine, D. C. Witherspoon, and R. B. Oliver. Price 10 cents a copy or \$6 per hundred.
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- The Nome region, by F. H. Moffit. In Bulletin 314, 1907, pp. 126-145.
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- *Investigation of the mineral deposits of Seward Peninsula, by P. S. Smith. In Bulletin 345, 1908, pp. 206-250. 45 cents.
- *The Seward Peninsula tin deposits, by Adolph Knopf. In Bulletin 345, 1908, pp. 251-267. 45 cents.
- *Mineral deposits of the Lost River and Brooks Mountain regions, Seward Peninsula, by Adolph Knopf. In Bulletin 345, 1908, pp. 268-271. 45 cents.
- *Water supply of the Nome and Kougarok regions, Seward Peninsula, in 1906-7, by F. F. Henshaw. In Bulletin 345, 1908, pp. 272-285. 45 cents.
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Topographic maps.

The following maps are for sale at 5 cents a copy or \$3 per hundred:

- Casadepaga quadrangle, Seward Peninsula; No. 646C; scale, 1:62,500; by T. G. Gerdine.
- Grand Central quadrangle, Seward Peninsula; No. 646A; scale, 1:62,500; by T. G. Gerdine.
- Nome quadrangle, Seward Peninsula; No. 646B; scale, 1:62,500; by T. G. Gerdine.
- Solomon quadrangle, Seward Peninsula; No. 646D; scale, 1:62,500; by T. G. Gerdine.

The following maps are for sale at 25 cents a copy or \$15 per hundred:

- Seward Peninsula, northeastern portion of, topographic reconnaissance of; No. 655; scale, 1:250,000; by T. G. Gerdine.
- Seward Peninsula, northwestern portion of, topographic reconnaissance of; No. 657; scale, 1:250,000; by T. G. Gerdine.
- Seward Peninsula, southern portion of, topographic reconnaissance of; No. 656; scale, 1:250,000; by T. G. Gerdine.
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