Territory of Alaska
Department of Mines

P. O. Box 1391
Juneau, Alaska

T D M BULLETIN

Vol. III

January 1955

No. 1

MINING ACTIVITIES

FIRST DIVISION - Admiralty-Alaska Mining Company has purchased a Longyear Wolverine diamond drill with an electric drive and a gas-driven 20 KW generator to furnish the power. This is equipment for the next phase of their diamond drilling program on their nickel-copper ore body at Funter Bay. A diamond drill crew will probably soon be at work with this new equipment. The prospect drifting is continuing. Activities of this company also include the staking of additional claims as a result of the aerial magnetometer survey made over the area last summer.

THIRD DIVISION - The Alaska Copper Mines Company exploration project at Maclaren River was closed down for the winter. Although large quantities of copper ore of commercial value has not yet been found, they intend to resume work at the earliest possible date in the spring.

FOURTH DIVISION - A well-known Canadian mining group has reportedly taken an option from the DeCoursey Mountain Mining Company on their mercury holdings along the lower Kuskokwim River. They are planning an exploration program before putting the properties into production. The group's serious intentions are indicated by the fact that they are also reported to be picking up other mercury prospects in the Kuskokwim Valley. Former DeCoursey stockholders are receiving stock in the new enterprise, according to information released.

OIL NEWS

A news release early in December announced that Richfield Oil Company has entered the Alaskan leasing activities. They applied for leases on 90,520 acres of Kenai Peninsula land.

Shell Oil has also leased over 90,000 acres on the Kenai Peninsula lately. This is a significant move because Shell has had geological field parties working in that area most of the past field season.

Leases on another 65,000 acres of Kenai Peninsula land were applied for during December by nine independent Anchorage residents.

A new area in oil activity was that of Birchwood, 21 miles north of Anchorage. Two applications for leases of acreage there were filed by Alaska Natural Gas and Petroleum Company, of Anchorage, and one by three Birchwood residents.

On December 2, it was reported that the Phillips Petroleum Company's second hole, near Icy Bay, was down to 6550 feet. This hole is named Sullivan No. 1

PYRITE INFORMATION

It has been stated many times by the TDM that pyrite deposits were becoming more valuable with the advent of new metallurgical processes by which the iron as

well as the sulfur is saved. There is now a new reduction plant in operation at the Noranda Mines in Quebec which recovers sulfur, iron, and sulfur-dioxide gas from pyrite. It is a pilot operation only, at present, with a capacity of 370 tons of pyrite per day, but will no doubt be increased as they get the "bugs" worked out. Again, it should be emphasized that the Alaskan miner can hardly expect to mine and ship pyrite himself at a profit, but sulfur companies who can do it are interested in purchasing or leasing good pyrite prospects.

RADIOACTIVE INFORMATION

As a result of a flood of letters during the past two months asking for information on radioactives in Alaska, we have mimeographed an information circular on the subject. It is TDM Information Circular No. 4, "Alaska Uranium Information." It contains mostly the same information as published in the "Uranium" chapter of the November TDM Bulletin with a little additional information and a list of USGS Trace Elements circulars that may be obtained on their work in investigating radioactives in Alaska. These USGS circulars are general in nature, and usually do not go into extensive detail. The TDM circular is free upon request.

There has been an objection to our too-brief comparison of Geiger and scintillation counters in the above-mentioned Information Circular No. 4 and November TDM Bulletin in which we state that the scintillation counter is 50 or more times as sensitive as the Geiger counter. This statement is true for a good scintillation counter as against an ordinary Geiger counter with only one Geiger-Mueller tube, but is not true for <u>any</u> scintillation counter over <u>any</u> Geiger counter. Multiple tube Geiger counters are made that are as sensitive as comparatively priced portable scintillation outfits. It is reported further that they are even preferable to the scintillation counters under some conditions, and that the scintillation counters are more fragile and prone to disruption of service, which of course would entail more lost time and repairs. We hope this will clarify the situation and appropriate corrections will be made when a reprint of Information Circular No. 4 is necessary.

The USGS recently released a brief technical report on scintillation counters which may be of interest to persons purchasing or using them. It is Geological Survey Circular 353, "Portable Scintillation Counters for Geologic Use", and can be obtained free on application to the Geological Survey, Washington 25, D.C.

QUOTE BY SECRETARY MCKAY

In an address at a meeting of the Manufacturing Chemists' Association, New York City, November 23, 1954, Secretary of the Interior Douglas McKay said the following which is very true and particularly appropriate when considered in the light of Alaska's problem:

> "We would be in error if we regarded the resource challenge of the future as only a scientific puzzle. While many of the answers to our resource problems, it is true, come from the research laboratory, history has shown that even the most promising ideas and discoveries will come to naught if the economic and political climate in which they can grow and come to fruition is lacking."

SUGGESTIONS FROM READERS

The TDM has received several letters from our readers containing suggestions for pumps and pipe, etc., that might be used to an advantage with our idea of prospecting by groundsluicing as presented last month. We appreciate these letters and suggestions. There will be a report on the matter in a future issue.

ITEMS FROM THE WESTERN MINER

Two items by the "Sourdough" in the December Western Miner and Oil Review are worthy of repeating this month. The first item concerns a talk by Charlie Steen of Colorado Plateau uranium fame, and the second concerns prospectors' burros. In the Sourdough's own words:

"At this meeting he expressed an opinion I have always had; namely, that when it comes to the matter of discovering new mineral deposits, this industry must depend on the prospector. He went on to explain that there has been a great deal of talk about modern devices, such as airborne magnetometers, scintillometers, Geiger counters, fluorescent lamps, biogeochemical methods, etc., but that these devices should be kept in their proper perspective--they are aids to the prospector, valuable as they may be, but they do not and cannot replace the important work of the prospector. He expressed the opinion that this idea is becoming more generally accepted among the heads of large mining exploration companies in the United States. It is my opinion that the danger in losing sight of the importance of the individual type prospector is that it may cause a slackening of interest in prospecting among Canada's younger generation and be responsible for certain restrictive and unwise legislation affecting the prospecting for, staking and development of new mineral deposits.....

"Received a letter a few days ago from Miss Alma Diebolt of the Select Shopping Service, 615 West Pender St., Vancouver, telling of the small Mexican burros which she thought might be suitable for pack animals for use in prospecting and mining operations. These burros are approximately 37 inches high when full grown, are said to be gentle, easy to take care of, eat grass and hay, like carrots, oranges and tobacco! They are said to be very hardy, live a man's life span and live very well in any climate. Miss Diebolt advises these donkeys are used quite extensively in some parts of the country for packing supplies into mining properties that are inaccessible by other means. Her firm imports these donkeys and delivers them in Vancouver or nearby for $150. It is understood 14 of them are already in British Columbia and more are on order."

NICKEL

Nickel is one of the strategic metals in which the United States is critically deficient, especially in terms of domestic production. While we have consumed over 60 percent of the nickel production of the free world since 1940, more than 99 percent of this has come from foreign sources. During 1953, for instance, total consumption of nickel in the United States was 211,361,463 pounds, while domestic production amounted to only 1,203,000 pounds, largely recovered as a by-product of copper refining. Total Canadian production in 1954 is estimated at 320 million pounds of the metal, almost all of which comes from mines of two companies, International Nickel and Falconbridge. A considerable part of this Canadian production goes into U. S. stockpiles. International Nickel has a contract with the U. S. to supply 24 million pounds yearly in addition to what is already

going into the stockpiles, and Falconbridge has contracted to sell the U. S. 150 million pounds in a period of eight years, with options to sell an additional 125 million pounds. This gives an idea of the amount of U. S. money going into Canadian mineral resources. Another contract calls for the sale to U. S. General Services Administration of 4.5 million pounds of refined nickel by August, 1955.

The resistance of nickel to corrosion forms the principal basis for its many industrial applications. In many instances, however, nickel is the unseen metal, contributing vital properties to an alloy, but receiving little of the credit afforded the finished product. In addition to its corrosion-resistant properties, nickel controls to a degree the strength, ductility, toughness, hardness, electrical resistance, magnetic properties, thermal expansion, and machinability of its various alloys.

The price of nickel has fluctuated between a high of $3.50 per pound in 1873 down to 21 cents per pound in 1895. With consolidation of the large nickel interests the price has remained relatively constant, and unlike most metals nickel increased only a few cents per pound during the period 1914 to 1918 and actually dropped during the second World War. The current price is stabilized at near 64-1/2 cents per pound, after a recent raise from 60 cents.

Nickel has been reported as an essential constituent of 89 minerals and as an accessory in many others. It is found commonly as a sulfide, arsenide, or a hydrated silicate; never in the native state. Nickel alloyed with iron occurs in meteorites and in placer sands from various parts of the world. The principal minerals of nickel are: the sulfides, pentlandite ((Fe,Ni)S), polydymite (Ni_3S_4), and millerite (NiS); the arsenides, niccolite (NiAs), and chloanthite ($NiAs_2$); and the hydrated silicate of nickel and magnesium, garnierite. Pentlandite and garnierite are the most important ore minerals.

While nickel deposits have been found in many places throughout the world, most of them are too low grade to be handled profitably by the present known methods of processing. The largest known deposits are centered in Canada, Cuba, New Caledonia, Norway, and the U.S.S.R. In 1875 the lateritic nickel deposits of New Caledonia were opened and until 1905, when Canada emerged as the principal source of nickel, these deposits dominated the world market. The Sudbury deposits in Canada now account for about 90 percent of the free world production.

The nickel deposits of the world may be separated into two different types, based upon mode of origin and mineral composition. These are: (1) the primary ores, comprising the nickel-bearing sulfides, and occurring as magmatic segregations or deposited by rising solutions in veins; and (2) the secondary or lateritic ores which were concentrated by descending solutions and form residual cappings on ultramafic rocks that originally contained small percentages of nickel.

The important primary nickel sulfide ores, of which the rich deposits of Sudbury, Canada, are examples, are almost always associated with basic intrusive igneous rocks, such as gabbro and diorite. The principal ore minerals are pentlandite ((Ni,Fe)S) and chalcopyrite ($CuFeS_2$), which occur intimately associated with pyrrhotite (FeS). They are usually worked for both nickel and copper, and commonly contain minor amounts of cobalt, selenium, silver, tellurium, and platinum which may also be recovered.

The Sudbury deposits are localized along the periphery of a pre-Cambrian igneous body which has intruded older sedimentary rocks. This body, which crops out in a great ellipse 36 miles long and 20 miles wide, is presumed to be spoon shaped. Numerous faults offset the normal intrusive contact from a few feet to as much as 2-1/2 miles. The intrusive is in three distinct layers with norite, a basic igneous rock of the gabbro family, at the base. The ore bodies are confined to the zone of contact with the underlying rocks or, in some instances, along the offsets. The mineralization for both contact and offset deposits occurs in the disseminated form, as stringers in the host rocks, as veins along shears, as the matrix in breccia zones, and as lenses of clean sulfide ore. Other important deposits of this type are located in Canada, Union of South Africa, U.S.S.R., Norway, and in the United States.

Alaska has excellent nickel possibilities as typified by the well-known deposits at Funter Bay and Yakobi Island in Southeast Alaska and the Spirit Mountain deposit in the Copper River country. A promising belt of nickel prospects exists from Yakobi Island down the west coasts of Chichagof and Baranof Islands to Snipe Bay which the TDM has long advocated should be thoroughly prospected by private interests. Nickel prospects are also known in many other sections of the Territory.

The larger Alaskan deposits are of the primary origin. They mostly occur as parts of norite intrusions and are either sulfides disseminated through the norite mass or concentrated lenses or pods of nearly solid sulfides. The sulfides are usually pyrrhotite, pentlandite, and chalcopyrite. The material is usually quite magnetic, relative to the surrounding country rock, which allows a simple additional method of prospecting for it. It should be remembered that nickel is very likely to be associated with pyrrhotite, and in prospecting, any pyrrhotite mineralization should be checked. One nickel deposit was examined by a TDM engineer during the past season which has garnierite as the chief mineral. A classification of this deposit has not yet been made. Several USGS bulletins deal exclusively with Alaskan nickel deposits. Tests for nickel were given in a previous TDM Bulletin. Much of the information in this article on nickel deposits, other than Alaskan, was "lifted" from the November issue of the California Division of Mines Monthly Mineral Information Service.

METAL PRICES

The following metal prices are taken from the weekly E. and M. J. Metal Markets reports of dates as indicated to show current prices as well as trends:

	Dec. 30, 1954	Month Ago	Year Ago
Copper, per lb.	29.7¢	29.7¢	29.7¢
Lead, per lb.	15¢	15¢	13-1/2¢
Zinc, per lb.	11-1/2¢	11-1/2¢	10¢
Tin, per lb.	87-1/2¢	90-7/8¢	85-1/4¢
Quicksilver, per flask	$322-324	$318-322	$187-189
Silver, per oz.	85-1/4¢	85-1/4¢	85-1/4¢
Platinum, per oz.	$78-84	$77-84	$91-93
Nickel, per lb.	64-1/2¢	64-1/2¢	60¢
Molybdenum, per lb.	$3	$3	$3
Tungsten ore, per unit	$63	$63	$63