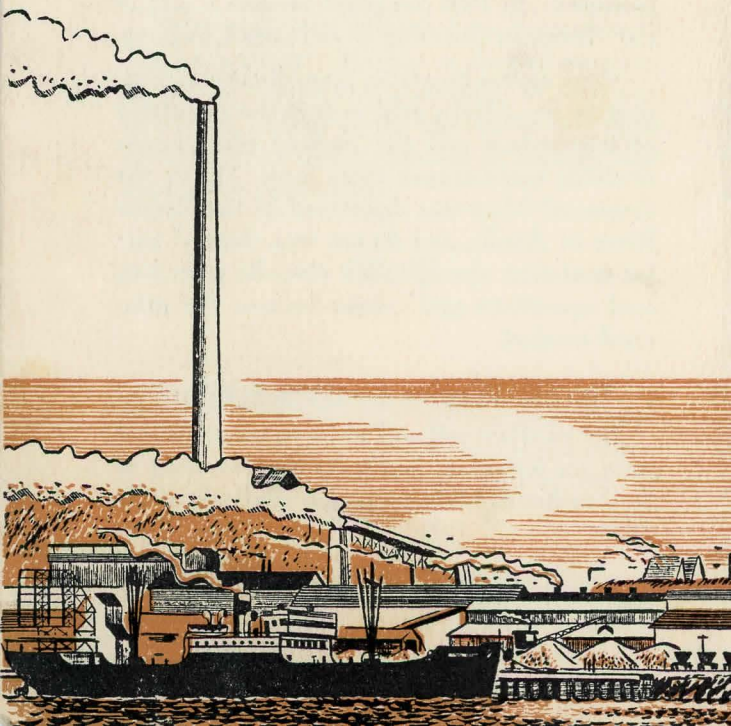


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**TACOMA**

No. 5 in a Series about the Business and Industries of Tacoma





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DEVELOPMENT of mining and transportation in the Northwest in the '80s led to the establishment of the Tacoma Smelter. Many mines producing lead, gold and silver ores had been discovered and were being worked; coking coal and limestone deposits were available nearby, and Tacoma had marine and rail transportation for shipping lead bullion to the east.

The combination of these circumstances induced a group of five Tacoma businessmen to organize a company in 1887 for the purpose of constructing a lead smelter of 200 tons daily capacity. The group secured the services of W. R. Rust to manage the enterprise, and in September of 1890 the first lead bullion was produced. In 1905 the plant became a part of the American Smelting & Refining Company.

Many copper properties were discovered incident to the Alaska gold rush at the beginning of the century and the Tacoma plant began smelting more copper than lead. When the Kennecott Mine was discovered on the Copper River in Alaska and its ore was shipped here for treatment, the company virtually ceased its lead operations and copper became the principal product.

#### **Tacoma Shipping Facilities Excellent**

The excellent rail and water connections that were an important factor in the founding of the Smelter continue to play a vital role in the

plant's present-day operation, and shipments come here from virtually all parts of the world. Alaska and British Columbia ores and concentrates still are sent here for processing, as are shipments from the continental United States and other parts of Canada, from the west coast of South America, Central America and Mexico, and from the Philippines.

#### **Valuable By-Products**

While copper is the principal product, there also are by-products including gold, silver, arsenic and nickel sulphate. Now under construction is a new million-dollar sulphuric-acid plant with a capacity of 100 tons of acid a day, which is scheduled to begin operation early in 1950. The process will involve capturing the sulphur dioxide from the smoke which rises in the huge stack, and its combination with water and oxygen to produce sulphuric acid. The decision to build the new plant was reached after a survey by the Chamber of Commerce disclosed a market for 500 tons of sulphuric acid daily in the Tacoma area.

Known in the industry as a customs plant, the Tacoma Smelter handles ores and concentrates produced and owned by other companies. These are purchased from them at a price determined by the content of gold, silver and copper. Weighing, sampling and assaying are conducted according to standard practices. The ores are crushed, and together with the concentrates which do not require crushing because of previous treatment, are then taken to storage.

#### **Five Steps in Production**

The production of copper at the Tacoma Smelter involves five steps. To reduce the

operations to the simplest terms possible and to list them in the order in which they occur, we find the first operation is that of **BEDDING**, which consists of mixing the proper proportion of the different types of concentrates and ores to produce a furnace charge that will smelt as easily as possible, and produce the desired matte and slag.

**ROASTING** is a process during which the mixed ores and concentrates are subjected to heat for the purpose of reducing the sulphur content and pre-heating for the actual smelting.

**SMEETING** of the charge takes place in the reverberatory furnace and is actually melting of the preheated charge to produce a copper-iron sulphide mixture called matte, and slag, the latter being wasted.

**CONVERTING** is a process in which the matte containing copper in combination with iron and sulphur and the precious metals is blown with air to eliminate the sulphur content and treated with fluxing ores to slag off the iron, leaving what is known as blister copper, which contains the copper together with the gold and silver, as the copper acts as a good collector for these precious metals.

The blister copper is further refined and cast into slabs called anodes for **ELECTROLYTIC REFINING**. This process is carried out in the tank-house or electrolytic refinery. There the copper is transferred by electric current from the anodes to pure copper sheets known as cathodes. These cathodes are then sheared into sizes for shipment or melted and cast into forms suitable to be rolled into wire or other shapes, which are best suited for individual demands. In the electrolytic tanks the gold and silver drop from the anodes to the bottom of

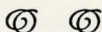
the tanks in the form of a black sludge which is smelted in a small furnace into gold and silver bars and shipped to another plant for subsequent separation of the gold and silver.

In the course of smelting and refining ores and concentrates, gold, silver and copper are recovered. There are certain impurity metals such as arsenic, antimony, nickel, selenium and others detrimental to the operations which must be eliminated at different stages of the process.

### **\$3,545,000 Annual Payroll**

Last year 383,129 tons of ore and concentrates were smelted and 106,870 tons of copper were refined at the Tacoma Smelter. Average employment was 1304 persons, of whom 195 have been with the plant for 20 years or longer. The payroll in 1947 was \$3,545,000. Nearly 400,000 barrels of fuel oil were consumed and 20,000 tons of limestone were used as well as approximately 9,000 horsepower of purchased electrical energy.

There you have a brief story of another of Tacoma's major industries—a story of men and metals, of vision and enterprise, of transport and trade, happily joined together to contribute to the progress and prosperity of Tacoma, and the Pacific Northwest.



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TACOMA MA 4520

Type — Text: EGMONT. Display: SPARTAN  
AND KAUFMANN BOLD. Stock: ANDORRA TEXT