

THE
COMMERCE
AND
INDUSTRIES
OF THE
PACIFIC COAST
OF
NORTH AMERICA;

COMPRISING
THE RISE, PROGRESS, PRODUCTS, PRESENT CONDITION, AND PROSPECTS OF
THE USEFUL ARTS ON THE WESTERN SIDE OF OUR CONTINENT,
AND SOME ACCOUNT OF ITS RESOURCES,

WITH
ELABORATE TREATMENT OF MANUFACTURES; BRIEFER CONSIDERATION OF COMMERCE,
TRANSPORTATION, AGRICULTURE, AND MINING; AND MENTION OF LEADING
ESTABLISHMENTS AND PROMINENT MEN IN VARIOUS DEPARTMENTS
OF BUSINESS.

BY

JOHN S. HITTELL,

Author of "The Resources of California," "The History of San Francisco," "A Brief History of Culture," etc.

SAN FRANCISCO:
A. L. BANCROFT & CO., PUBLISHERS.
1882.

Linseed Oil.—Our coast consumes annually about 1,500,000 gallons of linseed oil, all of Pacific production. The raw material is obtained chiefly from fields of flax cultivated exclusively for the seed in California and Oregon, but the supply of the material from these sources being insufficient, the mills obtain cargoes occasionally from Hindostan. The seed yields from 20 to 25 per cent. of oil, and the cake left in the press is used for feeding cattle, being rich in fattening qualities. Most of the oil is taken by the painters, some of it by varnish manufacturers, and it is applied to a great variety of purposes. The wholesale price is from 55 to 60 cents a gallon.

THE PACIFIC OIL AND LEAD WORKS were opened in 1866 at San Francisco, and are the oldest establishment of the kind on the coast. Besides linseed-oil manufacture, quantities of oil are expressed from the castor bean, mustard, and coire at these works. The machinery used is perfect in every particular, and large numbers of employees are engaged in the different processes of oil manufacture.

A linseed-oil mill was built near Oregon City in 1868, but was closed in 1878; and now the only mill of the kind on the coast north of San Francisco is that of G. W. GRAY & SONS, at Salem. Upholstering tow is made from flax fiber at the same establishment. A linseed-oil mill was started in Utah in 1861, under the management of a prominent Mormon priest, but the local demand was insufficient to make a profitable market, and the enterprise was abandoned.

Paints.—As the people of our coast erect a great number of wooden buildings every year, and generally paint them externally as well as internally, we consume paints, paint-oils, and varnishes to the value of \$1,400,000 annually. This includes 3,500 tons of white lead, worth about \$600,000 at wholesale, and nearly as much of other pigments. The white lead, linseed oil, and most of the varnish, are made here; and here the colors are ground in oil; but we produce no pigment save white lead. Various deposits of umber, sienna, ochre, and other earthy paints have been found, but the factories erected to prepare them for the market have proved unprofitable, and have been abandoned. The processes used here in the manufacture of lead, oil, and varnish have no novel feature. The method of grinding with oil is the same with white lead as with other pigments, among which those most extensively used in house-painting are ochre, umber, venetian red, and lampblack. The painters add 4 gallons of oil to 100 pounds of ground white lead, and 8 gallons to the same weight of other pigments, to fit them for use. Putty is made by mixing whiting with linseed oil, the combination being one that becomes hard by long exposure to

the atmosphere. The consumption of putty on our coast amounts to 150 tons, worth \$9,000. One of the forms of paints most extensively used on our coast is the rubber-paint, of which 80,000 gallons are consumed annually. It contains some India rubber, and is considered an excellent protection for wood exposed to much moisture. Another kind of paint, mixed with soluble glass, is known as the Averill paint, and is also used extensively, the consumption sometimes running up to 500 tons a month.

The Pioneer White Lead and Color Works of WHITTIER, FULLER & Co., in San Francisco, the only establishment that makes white lead on the Pacific Coast, consist of 2 massive brick buildings connected by a bridge, and were erected in 1875. They cover an area of ground 275 by 137 feet, and extend from Fremont to Beale, between Howard and Folsom streets. That portion of the factory facing Beale Street is used for the manufacture of white and red lead. Piles of pig-lead are on hand awaiting the melting process. The metal must be pure, and especially free from iron and silver, the presence of which would tend to give the pigment a dingy and tawny hue. The melted lead runs from a furnace upon an endless band of iron molds. In these the lead assumes the form of thin disks, 6 inches in diameter and pierced with holes about one fourth of an inch in size. When cool, these disks are put into earthenware pots with strong acetic acid, but in such a position that the acid does not come in direct contact with the metal. These pots are imbedded in tanbark, in tiers, and each succeeding tier is covered with boards until a stack is built up 25 feet in height. The fermentation of the tan creates a double reaction, caused by the heat generated, and the acid becoming volatilized, changes the lead into an acetate. The acetate again undergoes a change by a combination with the carbonic acid gas evolved by the tan, and thus becomes a carbonate of lead. Three months elapse before the material is ready for further working, but, owing to the number of stacks, scarcely a day passes that one is not emptied. The carbonate, when ready, is passed over elevators to a crushing and grinding-mill, where it is mixed with water; a steam-pump conveys the fluid mass to the topmost floor of the factory, where it passes into tanks for the purpose of being precipitated; the residue from the last tank is conveyed to copper drying-pans heated by steam.

The pigment is pulverized in its dry condition, then ground 3 times over in different mills, to secure a complete and uniform mixture with the linseed oil into the best kind of ground white lead ready for the use of the painter. The works have a capacity to produce 20 tons of ground lead in 24 hours, and sometimes run day and night. Besides these extensive departments for the manufacture of the white lead and for grinding it in oil, there are others for making red lead and litharge in furnaces; for grinding colors gener-

ally in oil; for making rubber paint and putty, and for the manufacture of the acetic acid required in their business. They give employment to 150 men. Their establishment deserves credit for several improvements in the methods of manufacturing white lead, of a character designed to protect the health of the operatives.

A white lead factory, to make the pigment by a new process, was opened in Visitation Valley, 5 miles south of the business part of San Francisco, in 1872, but the process was a failure, and the enterprise was abandoned.

The Pacific Rubber-Paint-works, also the property of WHITTIER, FULLER & Co., are managed separately. The rubber, imported from Brazil, is mixed with the other materials under a patent process. The establishment produces a sufficient quantity of rubber-paint to supply the entire demand of the coast.

THE CALIFORNIA PAINT COMPANY makes all the Averill mixed paint consumed on the coast. The pigments are ground under a secret process, with oil and soluble glass, the latter giving a hard, glossy surface, considered excellent for resisting the effects of heat and rain. Besides making the Averill paint, this company grind about 250 tons of pigments in oil, and make 150 tons of putty. San Francisco has all the paint factories of our coast.

Varnish.—Of varnish which is made by melting or dissolving copal gum in hot linseed oil, our coast consumes about 80,000 gallons, worth \$150,000, annually; and makes 20,000, the remaining 20,000 gallons being mostly the finest qualities of coach and carriage varnish imported from England, and worth from \$4 to \$5 a gallon. More than half of the total amount consumed consists of furniture varnish. The only varnish factories on our coast are in San Francisco, and the principal establishments are those of HUETER BROTHERS & Co., the oldest in date, founded in 1857, producing 50,000 gallons of various qualities annually; N. C. WALTON, Sr., who makes 4,000 gallons of black varnish; W. H. WORDEN, who makes furniture varnish; and the recently opened California Varnish-works.

Turpentine, etc.—When the civil war broke out in 1861, the supplies of turpentine and resin, previously received on our coast, were suddenly cut off; and it was found that none were to be had from other sources so cheaply as from the yellow pine trees of the Sierra Nevada. The most accessible forest of yellow pine was in Butte County, which became the seat of an active production. The pitch, which gathered in cuts near the roots of the trees, was distilled, to separate its main constituents, the volatile turpentine, and the heavier resin. Both were made in large quantity, and of excellent quality.