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BORAX.

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INTRODUCTION.

Very marked changes occurred in the borax industry in the United States in 1907, resulting in the virtual closing down of most of the former producers in California, the only State in the Union producing this substance in commercial quantities. While the total yield in 1907 was only 5,323 tons less than in 1906, and the decrease in value only \$60,890, yet the sudden drop in market value was such that by the end of 1907 only the largest properties continued to carry on mining operations. In fact, most of the producers say it does not pay to mine borax properties under present circumstances and will not start up again until there are more promising conditions, and some of the companies which were working on low-grade properties do not expect to resume operations and have removed their plants from the mines. The consumption of borax has not materially increased, and in some branches of industry it has actually decreased. At the same time new mines opened within the year are prepared to meet even extraordinary demands as to output. New uses for borax are constantly being looked for by the producers in order that they may enlarge the market.

PRODUCTION.

California continues to be the only State which makes a commercial production of borax annually, the few small marsh deposits in Nevada being no longer productive. In 1907 the entire output was derived from the counties of San Bernardino, Inyo, and Ventura, Cal. The output of crude borax for 1907 was 52,850 short tons, valued at \$1,121,520, as compared with 58,173 short tons, valued at \$1,182,410 in 1906. Until 1903 the annual statistics were based on quantity and value of the refined or manufactured product, but since then the crude material has been taken as the basis of quantity, and the percentage of boric acid contained taken as the basis of value. The colemanite, or borate of lime mined, varies in richness of boric acid at different properties, and these percentages being ascertained, the values are fixed accordingly. This is explained in detail in the chapter on this subject in the report for 1905.

The statistics of production of borax in California from 1895 to 1907, inclusive, are given in the following table, the values for the

years 1903 to 1907, inclusive, being based on the boric-acid content of the corresponding number of crude tons of colemanite or borate of lime:

Production of borax in California, 1895-1907.

1895...short tons..	5,959	\$595,900	1902...short tons..	^a 20,004	\$2,538,614
1896.....do.....	6,754	675,400	1903.....do.....	^b 34,430	661,400
1897.....do.....	8,000	1,108,000	1904.....do.....	^b 45,647	698,810
1898.....do.....	8,000	1,120,000	1905.....do.....	^b 46,334	1,019,154
1899.....do.....	20,357	1,139,882	1906.....do.....	^b 58,173	1,182,410
1900.....do.....	25,837	1,013,251	1907.....do.....	^b 52,850	1,121,520
1901.....do.....	23,231	1,012,118			

IMPORTS.

The following table shows the imports of borax and borates into the United States from 1902 to 1907, inclusive:

Imports of borax and borates into the United States, 1902-1907, in pounds.

Year.	Borax.		Borates, calcium, and sodium (crude) and refined sodium borate.		Boric acid.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
1902.....	684,537	\$20,795	166,807	\$12,002	822,907	\$30,439
1903.....	68,978	5,727	146,654	13,280	693,619	28,011
1904.....	153,962	10,569	89,447	6,630	708,815	27,658
1905.....	166,960	8,802	20,395	1,626	676,105	22,872
1906.....	791,425	27,343	57,711	2,436	966,021	33,200
1907.....	2,268,065	77,258	2,959	175	534,524	23,647

REVIEW OF THE BORAX INDUSTRY IN 1907.

CALIFORNIA.

The main feature of the borax industry since about the middle of 1907 has been the steady reduction in price, which fell from 6½ to 7 cents per pound at New York early in the year to 4½ and 5½ cents per pound during the latter part of the year. This fall in price is considered as having been inaugurated by the Pacific Coast Borax Company, the leading producer, partly because of the lower cost of production which would follow the completion of the Tonopah and Tidewater Railroad to the Lila C. mine of that company in Inyo County, Cal., which was opened for production in May, 1908; partly in view of competitive conditions regarding both production and markets, and partly with a view to stimulate consumption.

It was this reduction in price which caused the closing of most of the other productive mines in California. Some of them had virtually exhausted the ore of a profitable grade in their properties; others were suffering from the expenses of transportation and were making but small profit, which was entirely wiped out when the price fell.

The cost of the crude substance mined differs quite materially with the different producers, owing to local conditions, longer or shorter

^a Refined product, including 2,600 short tons of crude, valued at \$91,000. ^b Crude product.

haul to railroads, methods of mining, etc. Some of it is concentrated or semirefined before shipment, being subsequently fully refined at places distant from the source of production. Some producers bring their product to a higher percentage of boric acid than others before shipping to the refineries at New York, Chicago, San Francisco, New Jersey, or Pennsylvania.

The company which is the leading producer of borax in its commercial forms states that in that portion of the United States served from its Chicago headquarters, comprising 23 States and a population of 40,000,000, with 427 cities and towns each exceeding 5,000 in population, about one-half of the prepared borax sold is used for household purposes. Of this company's entire output in the United States, about one-third finds household use. Among the industrial uses of this company's borax in the territory named that by meat packers has undergone a striking change through the operation of the pure-food laws. Before the passage of those laws, 40 per cent of the company's sales in this territory were to meat packers; in 1907 the proportion was only about 3 per cent. In the industrial uses that year in the territory referred to, that by metal-ware enamellers amounted to 49 per cent of the sales; large chemical dealers took 23 per cent, meat packers 3 per cent, manufacturers of plumbing supplies 3 per cent, tanners 2 per cent, and various trades and dealers the remainder.

The leading producers of boracic acid and prepared borax have recently been making strong efforts to stimulate the consumption of borax along all possible lines. The forms of the product designed for household use are becoming more varied, and are more widely and persistently advertised. The use of borax in tanning has been considerably increased.

One of the California companies has offered a prize of \$500 for a commercially successful electric process for the making of ferroboron, which compound has been found to increase so greatly the tensile strength of steel when used as an alloy to the extent of one-tenth of 1 per cent to 1 per cent that the company foresees a possible large increase in consumption of boron compounds.

In 1907 there were 5 producing mines in California, 1 in Inyo, 2 in San Bernardino, and 2 in Ventura counties. With one exception these properties had ceased production by the end of that year, though some of the operators have since commenced operations at other and more favorable places.

Inyo County.—In Inyo County is situated the Lila C. mine of the Pacific Coast Borax Company, which began to be productive in the latter part of 1907, and has since been yielding by far the largest part of the entire output of the State. The mine lies 12 miles west of the main line of the Tonopah and Tidewater Railroad, owned by the principal owners of the mine, and is connected by a short line with the main railroad. The colemanite vein in the mine is from 6 to 18 feet wide, and carries a boric acid content of about 40 per cent. The property has been under development for several years and is fully opened. It was the intention of the company to abandon, when the new railroad was completed, its old mines at Daggett, San Bernardino County, and draw its entire supply of ore from this Lila C. mine, Inyo County, where the ore is rich and plentiful. For this reason

development was commenced some years before it was practicable to utilize the output. Indeed, for a number of years the company has had prospectors out looking for borates, and it now owns virtually all the mounds and foothills of Furnace Creek "wash" in the Death Valley region of Inyo County. The mine is in the hills on the western edge of the Amargosa Desert. In the Amargosa Canyon are old abandoned borax claims still owned by this same company. The crude ore from the Lila C. mine is to be shipped direct to the refinery at Bayonne, N. J., without being concentrated or semirefined in any way. The Pacific Coast Borax Company is enabled to obtain its entire supply from this single mine.

The Western Borax Works in this same county made a small output in 1907, which was shipped to San Francisco; but the company ceased operations when prices fell in the latter part of the year.

San Bernardino County.—From this county both the Pacific Coast Borax Company and the American Borax Company obtained a production in 1907 from their deposits near Daggett. Neither the Western Mineral Company nor the Palm Borate Company produced. The Pacific Coast Borax Company has abandoned its mines at Daggett entirely, and its plant and machinery have been removed. The American Borax Company has given up its mine also and removed all its material. The Western Mineral Company has closed down its mine and will not resume operations until prices are bettered.

A new company known as the Borax Properties, Limited, has been organized in England, and has taken over the properties of the Palm Borate Company near Daggett, as well as other groups of borax claims in Belleville district. Capital has been supplied to put up the necessary plant for mining and for crystallizing the product. The Palm Borate Company was organized as far back as 1902, and has since been developing its mine by tunnel and shafts. Large quantities of borate of lime are exposed above the tunnel levels. After preliminary treatment of the crude ore, the solution of boric acid will be carried by pipe line to the Salt Lake Railroad station and there be crystallized in tanks.

The Los Angeles stockholders of the Palm Borate Company still retain an interest in these properties, and the management continues to be local. During 1908 contracts have been let for machinery, plant, etc., and by the end of the year the properties are expected to become productive. This will then be the only producing borax property in San Bernardino County, which has always heretofore been the county of the State making the largest output of borax.

Ventura County.—In this county the Frazier Borate Company, controlled by the Stauffer Chemical Company, of San Francisco, and the Columbus Borax Company, managed by M. Calm & Bros., of New York, both were producers in 1907. In April of that year the Frazier Company closed down its mine, and in October the Columbus Company did the same. The long haul to the railroad would not permit the continuance of operations with the prices for borax as they were at that time.

Notwithstanding the closing down of these long-worked properties, a new organization called the Russell Borate Mining Company has acquired some 600 acres of ground in the Frazier region, between the properties of the Frazier and the Columbus companies. The owners

claim that the material to be mined is of higher grade than that mined by the old companies. They have therefore, in 1908, formed a corporation to exploit this new ground, which has not heretofore been worked.

Los Angeles County.—Until November, 1907, no borax deposits were known to exist in Los Angeles County, but in that month colemanite was discovered by a prospector in Tick Canyon, a branch of Soledad Canyon, 40 miles north of the city of Los Angeles, and 5 miles from Lang Station, on the Southern Pacific Railroad. This mine is the nearest of its kind in the State to a shipping station and to tidewater. Some 20 claims were located, and have since been purchased by the Sterling Borax Company, which has its headquarters in Los Angeles. The vein is of colemanite and, if the claims of the owners are valid, it is one of the best bodies of that ore yet discovered in California. Cheap transportation is an important factor in working such properties, and this the mine possesses. Comparatively cheap labor may also be obtained in that locality, whereas in the desert region not only labor but supplies are more expensive than they are near the coast and close to railroad lines and large cities. During 1908 the new mine has been developed, and some ore has been shipped to San Francisco, Chicago, and New Brighton, Pa. The company will ship crude ore to refineries at the above-named places, and will erect no refinery or concentrating works at the mine. It is understood that the Stauffer Chemical Company, of San Francisco, which formerly operated the Frazier Borate Company in Ventura County, has a controlling interest in this company, and the owners of the New Brighton, Pa., refinery are also interested, as are manufacturers of sanitary plumbing ware, agate utensils, etc., in Chicago. During the latter part of 1908 this deposit is being actively worked and is in a position to make a large output of high-grade material.

The Sterling Borax Company is virtually a combination which includes not only the deposits mentioned, but the Ventura mines of the Frazier Borate Company or Stauffer Chemical Company, the Lang and the Death Valley mines of the American Borax Company, and the refining companies at Chicago, San Francisco, and New Brighton.

The uses to which borax is put are given in detail in the chapter on this subject in the report of 1905.