

small enough for use in quarter-pound cans were obtained, but during the last two years of the cannery's existence no sardines of size suitable for "quarter oils" could be had. This was the chief reason for closing the works.

*Sardine fishing and canning at San Pedro.*—In June 1 made a visit to a sardine cannery at San Pedro, in Los Angeles County, which had been established in December, 1893, and is now the only cannery of the kind on the west coast. Sardine-canning is a part of the business of the California Fish Company, of Los Angeles. Through the courtesy of the officers of the company I was enabled to inspect the factory, obtain full knowledge regarding the methods pursued, and gain much valuable information relating to the fishery carried on for supplying the raw material to the cannery.

Fishing for the San Pedro cannery is carried on by a vessel of 22 tons' burden, the motive power of which is furnished by gasoline. The engine has 24-horse power, which is produced by the hourly consumption of one dollar's worth of gasoline. The vessel is sloop-rigged, and when on the fishing-grounds jogs along under sail while looking for fish. Its value is \$5,000. Seven men constitute the crew, including a cook.

The vessel carries two purse seines, one of which is used for sardines, the other for mackerel; it is by this apparatus that all the fish are taken. A seine boat and a tender form a part of the equipment. The sardine seine is 120 fathoms long, 50 feet deep, and has a 1-inch (stretch) mesh; its value is about \$800.

The fishing-grounds resorted to by the vessel are San Pedro Bay, off Redondo Beach, and around the Catalina Islands. The last named are the best grounds, and fish are there often found in large quantities close inshore in sheltered places.

After the sardines are pursued up in the seine they are bailed into the vessel by means of a hand windlass. They are not dumped in the hold, but are retained on deck by means of a gunwale 12 to 16 inches high. Pending their discharge at the cannery a little salt is spread over them.

The lay on the vessel is as follows: The owners furnish provisions, fuel, apparatus, etc., and meet all running expenses, and pay 1 cent a pound for the fish delivered at the cannery. The captain and cook are paid salaries of \$20 and \$15 per month, respectively, and the value of the fish is divided among the entire crew. The vessel, however, draws half the share, so that the price actually paid for the fish is one-half cent a pound. In May, 1894, the crew shared about \$75 each.

In this region sardines are found throughout the year. They "show" at the surface at times, and thus permit the use of the purse seine. They sometimes go in immense schools. Single hauls of several tons are often made, and 10 tons have on several occasions been taken at a single set of the seine, such a catch being obtained about May 1, 1894. In December, 1893, several very large bodies of sardines were observed, and a haul of 10 tons of small-sized fish was taken. From January to June the fish appear to gradually increase in numbers. Some schools are made up of fish of uniform size, while in others they are mixed. The smallest fish caught are 4 inches long, the largest 12 inches, the average 7 inches.

The condition of the fish as regards fitness varies considerably with the season. Mr. J. H. Lapham, the president of the fish company operating the cannery, states that in December, 1893, when the canning began, the smaller fish were poor while the larger ones were fat. In January and February the conditions were about the same. In March the smaller fish began to improve, continued to grow fatter through April and May, and in June sardines in excellent condition suitable for "quarters oils" were taken. In May, 4 or 5 tons of large fish that were very poor were seined on one occa-