that H.L. Williams in 1897 caused a wharf to be built, from which the first hole was drilled over the water.*

A photograph survives showing the Summerland beach a year after the first wharf was constructed. Two of the earliest structures are visible (Figure 31.4). These wharves were 300 to 500 ft. long and eventually accommodated six to 12 wells. As it became clear that the best oil production came from the extremities of the first wharves, more structures of longer length were built. By 1900 there were 11 wharves containing six to 20 wells each. The most impressive wharf was that constructed by J.B. Treadwell, who contemplated its eventual use as a steamer landing. This structure was built on three rows of pilings. It was 30 ft. wide and stretched 1,230 ft. out into the water, the last 120 ft. being widened to 40 ft. and protected with fenders. It was the pride of Summerland. A photograph of the beach in 1902, when the field was at its peak, shows the Treadwell wharf in the middle (Figure 31.5).

Drillers for oil in the early days were innovators, and their equipment was primitive (14). Every field was a new challenge and usually demanded the origination on the spot of new drilling methods. So it was when drilling commenced in the water. At Summerland the ocean floor sloped gently away from the beach, so that a really long wharf might stand in 30 ft. of water. Pilings supporting the wharf were driven about 25 ft. into the sand. Over the well site, a wooden derrick some 20 ft. high was constructed. A casing larger than required for the well bore was lowered through the water to the ocean floor and then driven through the sand to blue clay. This conductor, as it was named by the drillers, excluded the ocean water and permitted drilling to proceed in much the same way as on land. Wells over the water were deeper on the average than wells on land. They sometimes produced from as deep as 600 ft., whereas land wells averaged 200 to 250 feet.

Summerland wells were small producers. A new well would flow 3 to 5 bbls. a day. There were exceptions, such as the legendary "Blue Goose," but even these were limited to 60 to 75 bbls. daily.† When an average well was put on the pump, it could be counted on for 2 bbls. a day. It was customary in those days to pump with central power to avoid the expense of an engine at each well. The central power was connected by shackle lines to jacks at six or eight wells along the wharves. The Santa Barbara Oil and Mining Company operated a large power plant, pumping not only 12 wells of its own, but also those of other operators. Power was furnished by three gasoline engines totaling 58 horsepower. The demand for prime movers among the operators was met when the Darling brothers' machine and blacksmith shop secured manufacturing rights to the Atlas gasoline engine. The Darlings also produced a combination engine, sand pump and tubing puller designed specifically for local field problems.

*This probability rests on the invaluable record of the Summerland oil industry contained in the *Advance-Courier* Souvenir Edition of February, 1900, the document closest to the event (4). The date of the first submarine well is often given as 1896, but the evidence does not support this date.

†This may be compared to the variously estimated flow of from 84,000 to 100,000 bbl. a day from the Lucas gusher at Spindletop.

Figure 31.4 (left). The beach at Summerland, California, in 1898, showing two of the first wharves constructed for drilling in the ocean. (Courtesy of Seaside Oil Company.)

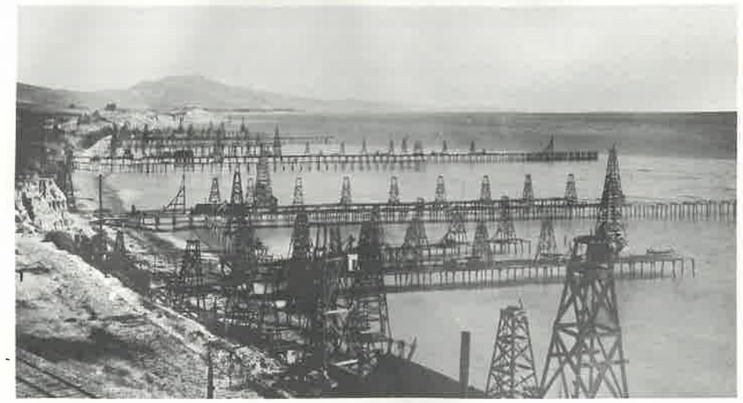

Figure 31.5 (below). The beach at Summerland in 1902 when the field was at its peak. (Courtesy of M.R. Campbell, U.S. Geological Survey.)

The cost of drilling at Summerland is suggested by this contemporary analysis:

> People outside of Summerland are continually inquiring: "What does it cost to sink an oil well?" As near as possible we will answer the question, taking the average depth of Summerland wells at 210 feet:

Cost of Derrick	$ 15.00
Drilling 210 feet at 80¢ per ft.	168.00
Casing (5-5/8) at $1.20 per ft.	252.00
Tubing at 27¢ per ft.	56.70
Sucker-rod at 4½¢ per ft.	9.45
Triangle, pumping bbl., valves	20.00
Cable, 50 feet, at 3¢ per ft.	1.50
Tank, 50-bbl.	15.00
Incidental expenses (say)	15.00
TOTAL	$552.65

The wells average two barrels daily although five, eight and ten barrel wells are common, and besides generally pump heavily the first three or four months, and have a life of five years, as far as we know. Putting the production at a minimum of two barrels daily, with oil at $1 a barrel, it will earn in 335 days, allowing 30 days for stoppages, a gross sum of $670 per annum. From this must be deducted $144 per year for pumping at $12 per month, and $67 for cost of handling of oil by one of the larger firms, who charge 10¢ a barrel for this service, leaving a net earning of $459 on the investment of $552.65 (6).

So it is not surprising that the author of this optimism insisted that a Summerland oil well "is almost as sure of a reasonable return on the money invested as United States Bonds . . . Within certain well defined limits a well sunk is an absolute certainty . . . (6)."

Such a bonanza could not last forever. After 1902 the field began to decline; by 1918 the Summerland beach was a forest of derricks (Figure 31.6), but the show was over. Even the wharves could not survive the storm of 1932 and tidal wave of 1942.

Still oil can be found not far from Summerland. Off Rincon Point to the southeast, Richfield Oil Company has built an entire artificial island connected to shore by a causeway 2,700 ft. long (Figure 31.7). From this modern counterpart of the Summerland wharf, 68 wells will draw oil from 1,175-acre reserve below the ocean floor.

At its peak the Summerland field—land and water—was scarcely over 100 acres. It produced in its life 3,180,000 bbls. of oil. It was never large and never rich, and it did not last very long, but because of that oil, men first drilled in the sea.

The Sacred Lake

The Indians of the Caddo Confederacy were farmers of a region which now comprises the northeastern part of Texas and the northwestern part of Louisiana. They lived in dome-shaped huts of grass and in their religious observances built mounds and guarded an eternal flame sacred to their people. In the midst of the Caddo domain was a lake also sacred to the Indians as the place where the tribe had been divinely saved from a great flood. Around that lake, two centuries after the Spaniards came, the flames of the white man's oil wells lighted the nighttime sky, unseen by the Caddos long since driven from their sacred lake.

It is not difficult to imagine Caddo Lake as a place of mystery to the Indians. From the depths of the lake, gas bubbled to the surface and, if

Figure 31.6. Summerland beach, 1918. (Courtesy of Seaside Oil Company.)

Figure 31.7. Rincon Island, 1961. (Courtesy of Richfield Oil Company.)

ignited, continued to burn. There were also oil and gas seepages on land around the lake shores. In 1870 a water well being drilled for an ice plant at Shreveport produced gas which was used for illumination. As a consequence of surface indications, the Caddo field proper was discovered in 1904 by a well which found oil but was abandoned because it would not flow (15).