1937

Whaling in southeastern Massachusetts;

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Boston University

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Boston University
THESIS
WHALING IN SOUTHEASTERN MASSACHUSETTS;
ITS PLACE IN THE ECONOMIC LIFE.

by
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(A. B., Boston University, 1930)

submitted in partial fulfilment of the
requirements for the degree of
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1937
PREFACE

"Whaling was once a great industry in the United States. Whole communities were dependent on its success. When voyages were successful there was prosperity and plenty. When voyages failed there was hardship and hunger. Fortunes were made and lost. The foundation of many a stately old mansion in New England rests on 'oil and bone.' But whaling was not a passing boom, not a thing apart from all other interests, not local in nature and local in effect. Its influence as a social and economic factor was widespread. Whaling was a unit in a great whole—a part of the vast industrial interests of a growing country. It is so no longer. Whaling is practically dead. The almost complete cycle of whaling activity is a good lesson in economics—the lesson of a flourishing enterprise quickly wiped out by changing economic conditions. The history of whaling forms an important chapter in the commercial history of the United States."


University of Pennsylvania
"Neither the perseverance of Holland, nor the activity of France, nor the dexterous and firm sagacity of the English enterprise, ever carried this most perilous mode of hardy industry to the extent to which it has been pushed by this recent People; a People who are still, as it were, but in the gristle, and not yet hardened into the bone, of manhood."

From a speech by Edmund Burke before Parliament in 1775.
## WHALING IN SOUTHEASTERN MASSACHUSETTS: ITS PLACE IN THE ECONOMIC LIFE

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I THE WHALE-HIMSELF

The order of Cetacea comprises of whales, porpoises, and the porpoise-dolphins. There are two sub-orders; Mystacoceti, the whalebone whales, including the fin-, blue-, humpback and right whales; and Odontoceti, the toothed whales, including porpoises, dolphins, killer and sperm whales.

Like mammals, they bring forth the young alive and perfectly formed and nourish them as land mammals do.

Whales are distributed throughout the globe. All species except the "right" whales are thought to migrate from the northern to the southern hemisphere. Annually many migrate equatorialward to mate and bring forth young. Right whales never cross the equator. Whales seem to have a family or community range and may become extinct in a region.

The period of gestation is about one year and a calf is born every year or so. The age to which whales live is not known but some whales have been observed for a period of twenty years.

Whales are the largest animals that have inhabited the globe. The sulphur-bottom or blue whale may be one hundred feet in length and one hundred tons in weight. The average length of the blue whale is seventy-nine feet. The biggest sperm whales are eighty-four feet long, thirty-five to thirty-six feet in girth at the thickest part, and the neck and body
are deeper than broad at all points to the "small", where it is round. The forehead of the sperm whale is eleven feet high, and nine or ten feet in width. If the head of a sperm whale were above water and lying along the surface, it would be as high as a one-story house. If the head were standing out of water, it would be thirty feet high or as high as a three-story house. The flukes are from six to eight feet in length and from twelve to fifteen feet in breadth.

The whale calves are twenty feet or more at birth. They are sixty feet in length by the end of the first year and still nursing. Sexual maturity is reached during the second year.

The whale, being a mammal, breathes air and must come to the surface for it. Whales may come to the surface at intervals of five to ten minutes but can stay submerged for an hour. The sperm whale will "blow" sixty or seventy times at a rising requiring twelve minutes. The intake of air requires hardly any time. The bow-head whale spouts six to nine times and stays down fifteen or twenty minutes. The nostrils are located high on the head and close together. This allows the animal to breathe without exposing much of the head. In all whales except the sperm the nostrils are separate. In the sperm they are united in a single S shaped opening. This
accounts for the difference of the spout in the two types of whales. The right whale and similar whales have the double nostrils located back on the head over the angle of the jaws. They blow straight up, a finner whale as high as twenty or thirty feet; a large blue whale to a height of forty feet. The sperm whale has his single opening nostril located forward on his head and blows forward to a height of two or three feet. The spout is not water but moisture from the highly heated breath which condenses in the cool atmosphere. The aerated blood goes into a cellular reservoir (arterial plexus) where it is stored. Whales do not inhale air when sleeping.

Whales have a cruising speed of six or seven knots an hour. In sudden rushes their speed is greater. It cannot be kept up long and is difficult to estimate. Large fin-back whales are reported to travel at twelve miles an hour. A whale may sink quickly, drop like a mass of lead. This is called sounding.

The whalebone whales eat small red shrimp (Euphasia inermis) the so-called "brit" which are about three-quarters of an inch long. The whale cruises along the surface of the water with open jaws and the shrimp are caught and retained by the sieves of whalebone. The throat of the right whale is eight inches in diameter. The sperm whale feeds on fish,
The silver lining of the sperm whale's mouth attracts the squid. His throat is the size of a man's waist.

All whales except the sperm fear their relative, the killer whale, which tears out the whale's tongue.

The whale's eyes are very small giving a restricted range of vision, probably not more than thirty degrees. Located as these are on opposite sides of the head, they probably present two distinct fields of vision. The ears are very small. The external opening is hardly big enough to insert a quill. The right whale has no external opening. The brain of the whale is small for its size and bulk. The cavity containing the brain is ten inches by ten inches and is in the rear of the skull.

The question has often been asked if whales can communicate. This cannot be answered satisfactorily. If one whale is harpooned, others in the vicinity will know it and sound even if the harpooned whale creates no disturbance. Undisturbed schools of whales spread over several miles will all disappear at the same instant. Another moot question is whether whales sing. Many a seaman's tale tells of the whales singing, but scientists are incredulous because whales have no vocal chords.
Whales are gregarious, appearing in schools often as many as five to six hundred in a school. Sperm whales appear in schools of females and young accompanied by a few (one to three) stalwart males. Often schools of young males travel together. Whalers report finding one or two old bulls battle-scarred and solitary. The theory is that they have accompanied and protected a school of females and young until their position is wrested from them in battle by a younger and more vigorous bull. Thereafter they are solitary outcasts except for a similar outcast companion. Female whales show sympathy. A female sperm whale shows motherly instinct and will often rush to the aid of an injured calf and often thereby to her own death. This feeling is not shown by the males.

Many are the curious facts and characteristics of whales. Whales may raise their heads perpendicularly out of water and "look" around. They "stand up like a beaver," so to speak, and slowly revolve, scanning the horizon with their wide-set eyes. The whale's flukes are horizontal and not vertical as are those of a fish. There is not a trace of legs in a whale, not even the most rudimentary, although there are traces of arms in the pectoral region. It is reported that the whales of the northwest coast can relax the blubber of the back and prevent the harpoon from entering. There is one point on
a whale's head which, if touched, will result in his refusal to proceed, no matter how fast he may have been moving. The sperm whale if alarmed emits an oil, called the glip or wake, on the surface of the water. If the whale-boat enters this, the whale gives chase.

Notes on species of whales  

(Deartment of Commerce)

Blue Whale, sulphur-bottom finner, (Balaenoptera musculus), Largest whale, average length 72', maximum 100', weight 100 ton. Color--mottled gray. Habitat--cosmopolitan.


North Atlantic right whale, black whale, (Eubaena glacialis). Greatest length 54'. Color--black. Habitat--temperate water both hemispheres.
Bowhead, Greenland right whale, (Balaena mysticetus). Greatest length 65'. Color--black. Habitat--Arctic waters only.

California gray whale, devilfish, (Rhachianectes glaucus).
Average length 40', maximum 49'. Color--black or dark slate. Habitat--North Pacific only.

Sperm Whale, cachalot, (Physeter macrocephalus). Greatest length 30-84'. Head 1/3 total length. Female slenderer and 1/5, 1/3, or 1/4 as large as male. Color--slate gray. Habitat--cosmopolitan. Period of gestation supposed to be 10 months. Number of cubs rarely two, never more.

Killer Whale, orca, grampus, thresher, (Orcinus orca). Greatest length 30'. Color--black. Habitat--cosmopolitan. Enemy of tuna; preys on white whale, recognized by high back fin.

Narwhal, (Monodon monoceros) 10-14'. Tusk grows from left side of upper jaw to length of 8-10 feet, other teeth lost. Feeds on fish, north side of Alaska and other Northern latitudes.

White Whale, beluga, morsequin, blanc, (Delphinapterus leucas).
Average length 11', greatest 15'. Color--white. Habitat--North Atlantic, North Pacific, and Arctic. Food: cod,
haddock, salmon, squid, prawns, bottom fish. Furnishes "porpoise-jaw" oil, and leather for Canadian mail bags.

Blackfish, pilot whale, caling, or grindval, (Globicephalus melas). Average length 15', greatest 30'. Color--black. Habitat--North Atlantic, North and South Pacific.


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1Material on Whales from Department of Commerce, Bureau of Fisheries, Volume I, No. 52, July 30, 1930.
II HISTORY OF WHALING

The first people in history known to make a regular business of whaling were the Basques of northern Spain. As these people were preceded in their whaling by the aborigines of Europe, so were the earliest white men in New England preceded as whalers by the Indians.

To consider the weapons used by Indian whalers fills one with awe at the undertaking of such a task by Indians. Stone-headed arrows and stone-headed spears were used. These were similar to the weapons used by the Indians to hunt game on land. The Indian, in order to secure the whales, went afloat on the ocean in winter in a canoe. The frame of it was composed of sinew, the planking of bark and the cracks were calked with fat of animals mixed with spruce gum.

The Indians hunted especially the blackfish and the right whale. When a whale was sighted from shore the Indians would swarm around the mammal in their numerous canoes and get in as many thrusts as possible. Thus, only the strongest whales could withstand the onslaught. The Indians used a barbed harpoon and a float in connection with it. A float of logs or light wood was attached to the harpoon by a short line in order to impede the whale's flight.

When the white men first organized crews for whaling, many a red man was included in the crew.

Whales seemed to attract the attention of the first explorers and settlers along the Atlantic Coast. On the Mayflower some were skilled in fishing and whaling. After whales had been observed near Provincetown this argument was used by some of the settlers for choosing that site. However they had no whaling equipment with them.

The early settlers needed more fats than they could produce. Whales cast upon the shore were cut up and used. There seemed to be little catching of live whales. In 1635 John Winthrop speaks of crossing Cape Cod bay to get three or four whales which had been cast upon the shore.

Questions of property rights in these drift whales sprang up. The General Courts of Plymouth and Massachusetts adopted regulations. Many towns did likewise. In 1652 Yarmouth appointed an officer to receive the oil of the county. Sandwich appointed six men to supervise and regulate the cutting and distribution. The Massachusetts Bay Colony provided for a division of the oil from drift whales, one-third to the crown, one-third to the town, one-third to the finder.

There are three stages in the growth of whaling. The first is the finding and use of drift whales as mentioned above. The second is the pursuing of whales by means of small boats put off from shore. This method developed early.

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on Long Island and Nantucket. The latter island provided early in its history for watch towers to be placed at intervals on the southern shore to report whales seen off shore. These whales were then pursued by small boats. The third stage came with the equipping of ships for long voyages. This stage was reached when the need became great, there was a profitable export, and long trips had to be undertaken to furnish this demand.

Southampton, Long Island, seems to be the first place to have adopted searching for whales as a calling. Records of 1647 give detailed and business-like regulations. A few years later, regular expeditions were undertaken from shore. Many of the eastern towns of Long Island took up the industry.

It is to the history of Nantucket, that one turns for "An interesting portrayal of the conditions in a community dependent on a single industry--and that industry as full of ups and downs as was the whale fishery. No where else in the literature is there a more vivid account of the way in which a people's environment literally forced them to a particular industry, and how that industry shaped and modified social and economic conditions." *


From J. B. Macy--History of Nantucket. (1907)
The very early records give very little information about whaling. In 1690 the inhabitants of the island sent for a man to instruct them in whaling. Ichabod Paddock came from Salem to do this. It was he who divided the south shore of the island into four districts; each one three and a half miles long. In the center of each a hut was built and six men were assigned to the district. A tall spar with a crow's nest was erected and constantly manned to sight whales. When a whale or a school of whales was sighted, the cry was given, the crew put out in a boat, captured a whale, brought it to shore and there tried out the blubber in try-works erected on the shore. The scheme was communistic, all the men sharing equally in the profits. In some cases where Indians were used, they were paid in clothes and necessities. In the same year (1690), while the people of Nantucket were gathered on a hill watching the sea, one man is reported to have pointed to a school of whales seen off shore and to have said, "There is a pasture where our children's grand-children will go for bread." * In 1712 the first sperm whale was found. Records of 1726 show that eighty-six whales were saved by twenty-eight boats in

---History of the American Whale-Fishery page 17 is wholly unsubstantiated.

1 A. Starbuck--History of the American whale fishery, page 17.
this "off-shore" whaling.

In 1698 the sloop Mary, twenty-five tons, built in Boston in 1694, was sold to the Nantucket men. This was the first boat larger than a rowboat to be used in whaling from Nantucket. By 1712, the island owned five sloops, weight fifteen to forty tons. These engaged in voyages of five to seven weeks duration. By 1714 there were nine sloops engaged in whaling, six of them in the deep-water fishery. Six hundred barrels of oil and eleven thousand pounds of bone sold for eleven hundred £ in 1715. In 1720 the first oil was sent directly from Nantucket to London to get a better price than in American ports. The year 1730 saw twenty-five whalers bring in products valued at £3200 and also the first boat of 118 tons engaged in the industry. By 1732 ships had gone to Greenland and crossed the equator to Brazil and the Falkland Island to hunt whales.

The wars between France and England (1740-1762) caused the whaling ships to be bothered by cruisers and privateers.

Of 78 whalers clearing American ports in 1762 more than one half were from Nantucket. In 1766, 118 vessels of an average of seventy-five tons each, cleared Nantucket and brought home 11,969 barrels of oil valued at $129,983. In 1770, 125 ships, average 92 tons, brought in 14,331 barrels of

oil valued at £359,200. In 1767, 50 New England whalers went
to far southern waters. During this period, Nantucket had as
many whaling ships as all other American ports, combined.

New Bedford, situated as she is at the head of Buzzards
Bay, did not engage in the drift whale or off-shore fishery. In 1765
the four sloops, the Nancy, Polly, Greyhound, and Hannah, owned
by Joseph Russell, Caleb Russell, and William Tallman composed
her whaling fleet. New Bedford's growth comes at a later
period.

During this period the towns of Cape Cod; Provincetown,
Truro, Eastham, Wellfleet, Falmouth, Woods Hole, and Edgartown
on Martha's Vineyard were going through steps similar to those
in Nantucket, in the whale fishery. These towns were, how-
ever, less important and less dependent on whaling alone.

Of all the colonial industries the whale-fisheries was
almost the first to be affected by the hostility of the colo-
nies toward the mother country. The British ministry interfered with whaling as a means of punishment. In February 1775,
a bill was passed by Parliament restricting the Commerce of
Massachusetts with England and the West Indies. This bill
prohibited fishing of any kind. The merchants and traders of
London petitioned Parliament, protesting against this law.

This active minority which were affected worked against the

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1A. Starbuck,—History of the American whale-fishery, page 43.
2A. Starbuck,—History of the American whale-fishery, 58-66.
law. Burke espoused their cause. Before April 16, 1775 whaling had been suspended.

During the war itself many whale-ships were destroyed by the British. Some sailed despite the dangers and many were captured. Nantucket, especially, suffered at this time. Dependent as she was on whaling, her economic life came to a virtual standstill when her ships could no longer sail. The exposed location of the island invited British attack. In 1781 Admiral Digby sailed into Nantucket harbor and ruined many ships and much property. For a time during the Revolution it seemed that Nantucket might be lost to the union. Many of the population were Quakers and there was much sympathy for alliance with England. At least, many so argued, England could afford the island protection and the United States was unable to do that. By 1785, the fleet had been shattered. 134 ships had been destroyed or captured during the war.

The period after the Revolution saw the rebirth and further growth of the whale-fishery. Greater fleets than ever before were built and sailed. In 1785, the Massachusetts legislature passed a law giving a bounty on whale oil brought into Massachusetts by vessels owned and manned wholly by inhabitants of the state. The bounty stimulated the trade in Massachusetts and so concentrated it that it led to the market

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2W. S. Tower—History of American whale-fishery, 104-105.
William Roche of Nantucket wished to transfer a large portion of Nantucket's whaling business to Europe when the Massachusetts market became over-stocked. Europe offered a better oil market. He negotiated with the British government but failed to reach an agreement due to the British refusal to pay the costs of moving the industry. His negotiations with the French government proved successful and accordingly he, his family and some friends moved to Dunkirk taking their business with them. For several years they were successful but when trouble broke out between France and England the profits vanished. In 1794 he returned to Nantucket and the following year moved to New Bedford. At that time New Bedford begins her spectacular rise in the industry.

The revival after the Revolution was accompanied by an increasing world consumption of sperm and right whale oil. Fleets had to go further in search of oil. Ships had to be larger. Brigs, barks, and full-rigged ships were used. More men had to be employed, and more distant places were drawn on for the increased labor demand.

The war of 1812 put the whaling business in jeopardy. Few people believed that the war would really come, so ships had not been hindered from sailing. Neither were they recalled.

when the war broke out. As a result many ships were captured or destroyed. The year 1815 saw Nantucket again in deplorable straits. However, her recovery was quick. In 1812 Nantucket had a fleet of 46 whalers; in 1815, 83 whalers; in 1820, 72 whalers.

Between the War of 1812 and the Civil War, whaling reaches its height. The increasing slaughter of all countries sends ships to seek new cruising grounds. After 1819 the Pacific becomes the most valuable whale-fishing region. Especially is the sperm whale hunted. The growth of the industry may be gathered from the accompanying table of sailings from the principal ports. The growth of New Bedford whaling and the decline of Nantucket whaling should be noted.

<table>
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<tr>
<th>Place</th>
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<tr>
<td>Cape Cod</td>
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<td>8</td>
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<td>23</td>
<td>27</td>
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<td>20</td>
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<td>1</td>
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<td>5</td>
<td>10</td>
<td>24</td>
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Nantucket figures include Edgartown.
New Bedford figures include Fairhaven.

(From F. Hart--New England Whale Fisheries.)

1W. S. Tower--History of American whale-fishery, 49.
When the most valuable cruising grounds changed from the Atlantic to the Pacific, voyages became longer and ships of necessity had to be larger. The double trip around the Horn, the numerous supplies necessary, the large catches to make the venture pay, the three-year or more voyage, all caused this increase in size. A sand bar across Nantucket’s harbor entrance permitted ships to enter which drew no more than 6 to 10 feet of water. The larger whale ships drew 15 or 16 feet. To keep their industry and meet these newer requirements, Nantucket men devised a novel invention. A type of floating drydock called “Barker’s Camel” was constructed. * Two separate flat-bottom hulls each 135 feet long, 18 feet deep and of 29 foot beam were constructed. Each was propelled by a four horsepower engine. The same engine was used for working windlasses and the powerful steam pumps. The inner side of the hulls were curved to fit the form of a ship. The two were held together by heavy chains on which the keel of the ship rested. When empty “The Camel” drew three feet of water. Within the hull, there were two levels, a lower hold and a "between decks". In the lower hold were several chambers with individual water gates. When these were opened, the water

* An interesting model of this may be seen in the Whaling Museum at Nantucket—information following taken from Whaling Museum at Nantucket.
rushed in, the hulls sank and the chains were below the level of the ship's keel. The ship was floated in, made fast, the water gates were closed, and the pumps started to pump the water out until the ship was raised to draw only seven feet of water. Then steamboats toed it over the bar. The first ship to be so conducted was the Constitution in 1842 on her outbound voyage. In the next three years 76 ships were taken over the bar by this method. "The Camel" was used until 1854 and then broken up. In this way did Nantucket hold on to a little of her declining industry for a few years more.

New Bedford with her better harbor, her larger population, her more fertile and more populous hinterland to draw on for men and supplies surpassed Nantucket in the 1820's and assumed the leadership in the industry, which she held until the passing of the industry.

Much has been written about whale-ships engaging in slave smuggling in the period before the Civil War. Some did go into the slave trade. Five whale-ships of a total fleet of 2000 are known to have been so engaged. More probably did go into the trade unknown to us. A whaler was well fitted for slaving. They cruised the same region whether on whaling or slaving. This was an advantage at a time when England was suppressing the trade. The large pots of the try-works could be used to

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cook food for the slaves. Water could be carried in the barrels in the hold. And the gains from such an enterprise, when successfully completed, were great.

The Civil War caught the whaling industry wholly unprepared for a war. Many ships were out on long voyages. Those in the Pacific were thought to be quite safe. There were many encounters between privateers especially equipped to prey on the northern ships. Some whalers escaped harm by flying the Hawaiian flag.

The Shenandoah, a steamer, under Lieutenant James Izard Waddell, was sent out to prey on the whalers. Lieutenant John M. Brooke of the Confederate Navy had been with the U. S. Navy in the North Pacific and knew the whalers. At Ascension Island three ships were destroyed. Leaving that island on April 13, 1865, between May 27 and the end of June, she captured twenty-four whalers. On June 22, five whalers were destroyed. The captain was told that the war was over, but since this could not be proved, the Shenandoah did not turn back. On June 23rd, one whaler was destroyed; on the 25th, one; on the 26th, six. The trader, Susan Abigail, left San Francisco on April 19th carrying newspapers telling of Lee's surrender. Since the papers carried no formal proclamation, the Susan Abigail was burned. On June 28th eleven ships were captured. Two were
released to carry home the crews of all eleven. On August 2nd, from the English Bark, Sarraconata, the captain heard of the overthrow of the Confederacy. The Shenandoah then surrendered to the British and was later turned over to the United States, having captured about forty whalers and destroyed most of them.

The Alabama, built and outfitted in England, is famous for her havoc to American shipping during the war. She did great destruction to whalers also. An account, that of Starbuck,* says the Alabama, capturing the Ocean Rover of Nantucket, set her on fire at nightfall in order to lure other whale-ships to her assistance. Eight whalers, four from New Bedford and four from the Cape and Connecticut, fell into the trap and were captured. Semmes** tells of the capture of each boat separately. Each crew was permitted to leave in its own boat. This act has often been quoted against the Alabama rather than in her favor. In Semme's account no boat was burned at night but one was burned in the late afternoon. No other whaler came to her assistance.

* From Starbuck, A.—History of the Whale-Fishery, from its earliest mention to 1876, quoted in Spears, J. R.—The Story of the New England Whalers, Page 373.

** Quoted in Spears, ibid.
A great blow to whaling was given by the United States government although it was not recognized as such at the time. The federal government bought forty-five vessels. Twenty-four of these were old whalers. From $3150 to $2500 was paid for each. The gear was sold and the ship was fitted for convenient scuttling. Captain Rodney French was elected commander while seventeen of the twenty-four lay in lower New Bedford harbor awaiting orders to sail. December 10-20, this fleet appeared in the channel of Charleston harbor. They were stripped of sails and rigging, and their masts were cut away. The plugs were pulled and they sank, blocking the entrance to the harbor as the skeleton crews left in their small boats to be picked up by federal warships outside the harbor. This "Stone Fleet", as it was called, was the most famous of the means the federal government used to make the blockade of southern ports more effective. The name was due to the stone and sand that was used as ballast. Many owners found it profitable to dispose of whalers to the federal government at a good price instead of continuing to operate them, and many never replaced the vessels so sold.

The whaling industry never recovered from the blow given it by the Civil War. The causes for the decline are several. Injury to the whaling fleet at the hands of the Confederates.

+C. E. Haines--Whaling, 229.
contributed, although Great Britain did pay for some of the damage in the so-called "Alabama Claims." The ships bought by the federal government and sunk were well paid for and never replaced. The substitution of petroleum as an illuminant and a lubricant ruined the whale oil market. The development of the cotton seed oil industry further injured the market. It was the whalebone, (or more correctly baleen,) that kept the industry alive after the Civil War. Capital was diverted ashore steadily after the war. In 1860 the whaling fleet comprised 508 vessels; in 1865, 236 vessels; and in 1866, 190 vessels.

Spears* advances the theory that the decline of the industry was due to the failure of the supply of Americans for the forecastles, hence for the cabins, and hence for the counting rooms. Americans of this period went west, raised cattle or searched for gold. The same was true with the merchant marine after the Civil War. One must have sailors before one has a merchant marine. One must have whalermen if one would have a whale fleet.

In 1871, forty-one whalers were fishing in the Arctic. The whales came later than other years and while the catches were running at their best, the weather turned cold. Several

* Spears, Sr., p. 335.

J. E. Spears--The Story of the New Bedford Whaler, 335.
ships left. The rest optimistically remained. The winter did set in sooner than usual and thirty-four vessels were frozen in the ice. At first there was hope of a thaw and the possibility of getting out. But on September 14th, all hope being gone, the ships were abandoned. 1219 people, men, women and children, put out from the whalers in their small boats.

Sixty hours later after a treacherous trip of eighty miles under conditions of acute suffering from the premature Arctic winter, all the people succeeded in reaching the seven whalers which were in open water and had stood by to pick up the survivors. Conditions were extremely crowded, but all were taken to places of safety on the west coast. This disaster was another blow to the industry. The capital thus destroyed was never replaced. In 1876, twelve ships were caught in the ice and lost.

The growing use of petroleum and the poorer yield per cargo discouraged any further development of the North Pacific. The largest yield, 373,000 barrels for one season, is recorded in 1852. Three years prior to the Civil War there were about 170 ships in the North Pacific. 100,000 barrels was the average catch for those years. In 1876, eight ships brought in 5,250 barrels from the same region. The whaling days were indeed over. Whalebone kept the industry alive for a time but

1W. J. Williams--The destruction of the whaling fleet.
the large yields, the large profits, and the great fleets were gone.

The first steam whaler was built by Captain William Lewis of New Bedford in 1879. It was called the Mary and Helen. Some of these appeared in the industry in its decline.

San Francisco comes to the fore as a whaling port in the later period, taking the leadership from New Bedford. The first whaler to be owned and equipped in San Francisco was the Pauwennett in 1880. For the next thirty years no more than eight whalers are recorded from the home port of San Francisco in any one year. These were engaged principally in coastal whaling. After the destruction of the whaling fleet, steam whalers began to come into use. This made San Francisco.

Owners would not start a steam whaler on the Atlantic Coast and send her half way around the world to reach the whaling grounds when it could be equipped at San Francisco and return its cargo there. In 1883 works for the manufacture and sale of whale and sperm oil were erected there. In the same year the whaling fleet numbered 125 whale-ships. Nineteen of these came from San Francisco.

Sperm and southern right whaling were given up about 1880 because of increased working expenses, small catches and fall in the price of oil. Greenland whaling was practically given

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1M. B. Maury--Whalers and whaling, page 61.
2J. R. Spears--The story of the New England whalers, 416.
In 1912 on account of the exhaustion of the Bowhead and Right Whales and the fall in price of oil and whalebone.

In 1908, of the forty American whalers, eighteen came from San Francisco. Of these, twelve were steamers and six ships of sail.

The Charles W. Morgan illustrates well this trend to San Francisco. Built in New Bedford in 1841, she was owned and sailed from that port for a number of years. Her first dozen voyages she returned home with the catch. After that the voyages were made from San Francisco for twenty years. For a while she was owned in San Francisco also. Later she returned to New Bedford and was practically abandoned there at the time of her purchase and restoration. In 1884, 113 whalers sailed from New Bedford. In 1904, five sailed. American whaling today is not dead because it is extinct, but because it can never recover.

Modern whaling is in the hands of the Norwegians. It is pursued from barren British possessions. The British regard it as a speculation; the Norwegians, as an industry. In 1886, Captain Svend Foyn of Torsberg, Norway, invented a plan for

* The Charles W. Morgan is the whaler bought by the late Col. E. H. Green and enshrined at Round Hill, Dartmouth, Mass. Equipment, etc., restored. Open to public.

1W. G. B. Murdock—Modern whaling and bear hunting, 312.
capturing finner whales. They were numerous but were not hunted due to the fact that they were too strong and too heavy to kill from the old-style row-boat. His process was to mount a small cannon on the bow of a small steamer, and with the cannon to fire a heavy harpoon, one and a half to two hundredweights, attached to a four and a half hawser. This steamer and line were sufficiently buoyant and strong to play the whale and to haul its body up from the depths when it sank dead. Greenland right whales and sperm whales both floated when they died. Fortunes were made from finner whale hunting off the Norwegian coast.

Today's whaler is a veritable floating factory. Large steamers of up to seven thousand tons burden are used. Three or four small steamers set out from the floating ship usually anchored in a sheltered bay. They harpoon whales within a radius of 80 or 90 miles. Sometimes these steamers operate from a shore factory. Often the dead whale is inflated with air to keep it afloat and to make towing to the base easier. At the steamer the whale is attached to a hawser and drawn up a chute on board where all the cutting is done. All parts of the whale are utilized. The carcass is used for fertilizer. Thus has the chase, the harpooning, the stove boat, the cutting in, the frying out, with their attendant risks, all given way to

W. C. B. Murdock—Modern whaling and bear hunting, page 312.

Material following about whale whaling drawn from the same source.
to a scientific slaughter house. Thus has New England given way to Norway.
III. METHODS AND EQUIPMENT

The "whale-ship" was a boat adapted for its trade and differed from other boats according to the demands put upon it. The largest were 125 feet long. They were of greater width than ordinary sailing ships. The bows often carried old figure heads.** The sterns were cut square. The sides and bottoms were sheathed with copper. Broad, strong and stoutly, a "whale-ship" did not present as attractive a picture as other sailing ships of the time. One observer stated that he believed that whale-ships were made by the yard and cut off at intervals.*** Speed was not an object. Large carrying space in the hold for water and supplies on the outward voyage, and for barrels of oil and for bone on the return voyage was necessary. The bulky appearance of the whaler was added to by the whale-boats hung on davits on the outside of the ship. Usually there were three on the left and one or two on the right, with space for "cutting-in" left amid-ship.

* The term "whale-ship" means the large boat. The "whale-boat", the small, rowed or sloop rigged boat used for the actual whale chase.

** Many of these are in the Old Dartmouth Historical Society's Museum in New Bedford.

*** Old saying not attributed to any author.
If desired, the measurements of the Charles IV. Morgan may be taken as a typical whale-ship. It was built of live oak and copper fastened. Originally, it was 351 tons gross, laver 314 tons gross and 298 tons net. It measured: length, 100 feet 8 inches; beam, 27 feet 7 inches; depth, 17 feet 3 inches. It was first rigged as a ship. Later in 1867, its rigging was changed to that of a bark. The crew numbered 32 to 33 men. Built for the whale-fishery, it has never been used for anything else.

The crew consisted of about thirty men. The captain was a man of experience and ability. He needed a knowledge of whaling, medicine, business and had to be an expert disciplinarian. The mates were three or four in number. Their experience was similar to that of the captain, but in an emergency each must be able to take charge. Since a mate must command a whale boat and lance or kill the whale, he needed courage and skill in this. The next in rank were the boat-steerers. They were the harpooners, although to call one by that name rather than a boat-steerer makes one as the last uninitiated of "land-lubbers". The boat-steerers ranked above the sailors and ate at second mess after the captain and the mates. Their "lay" was considerably more than that of the sailors. A good boat-steerer must be fearless, be an accurate judge of distance.

\[ G. W. Hirsheon--The Whale-ship Charles IV. Morgan. \]
and air, and must be strong, calm and level-headed. Others were the steward, the cook, and the cooper. The cooper was, as his name implies, in charge of the cooperage but also he had other jobs or any other job to do. He might pull an oar in the whale-boat or he might tend ship with the cook, when the whale-boats were out. He was the ship's carpenter. The sailors were of three grades:--seamen, ordinary seamen and greenhands.

The crews' quarters were in the bow of the boat reached by the forward hatchway. Because of the great space needed for carrying, the crews' quarters were as cramped and small as possible. They were dark and smelly without ventilation or light except an occasional candle. These were the living quarters of 25 to 30 men for three years or more at a time. The officers' quarters were aft.

The usual method of paying the crew and officers was by means of the "lay". The lay was a percentage of the oil and bone taken. The captain might get one barrel in every fourteen taken, the first mate, one in every twenty-four, the second mate, one in every thirty, and so on down to the last greenhand who might get one barrel in 175 or one in 250. The oil was never given to a man, merely the money represented by his lay. The lay never amounted to much. Often it was very small for it was to the advantage of the captain or shipowner.
to keep the crews' participation as small as possible. The captain usually managed to have a man charged as much as his lay. His outfit provided by a special outfitter, paid for by the owners, and charged against his lay. Needless to say, the owner paid little and charged much. The outfit was purposely poor and likely to wear out quickly. On the voyage all supplies came from the captain's "clap-chest". A lost hat could be replaced at times as four times its original cost. Also the men were sent out unprepared for cold weather, necessitating the purchase of warm clothes from the captain's supply. Tobacco, whiskey, knives, paper, etc., all came from the same source.

It was not unusual to have a seaman return from a three years' voyage to find that he was in debt to the owners. He would then sign for the next voyage, get an advance for board until then, and quickly waste it all in useless extravagances and dissipation. Even if he had money, it vanished quickly in the glamour of the town and the first freedom in three years. This made it certain that the seaman would ship again.

Whaling bred a hardy race of men. There was constant danger of capture by enemy ships in the early days. In 1755-1756 Nantucket lost six ships which were captured by the French. In 1771 Dartmouth had three ships taken by the Spanish. More than one whaler fell into the hands of pirates. The men were

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1 C. B. Hawes—Whaling, 82-85.
stirred by adventure. They were strong, alert, and ready for sea or war. Many a whaler did not fall prey to privateers because of the daring, quick action and strategy of the captain and the men.

Hope of big profits spurred the men on to work.

The commanders were men of daring and high intelligence. Especially was this shown when the ships began to go on the long voyages. By the keen perception and accurate reports of whaling captains such knowledge of ocean currents became known. Many islands of the Pacific were first discovered by whaling ships. In the far North also they contributed much to exploration and discovery. An inspection of the records of about 1820 shows that the vessels were commanded almost without exception by men of American colonial names who descended from the earliest settlers. Year by year, the crews were more and more made up of dark-skinned Western Islanders who later became mates and masters. In the latter days of whaling it was carried on almost entirely by them.*

The outfitting for a whaling voyage was very elaborate.

There were some 500 or more separate types of utensils which

* See Appendix I. Decline of the industry
must be aboard for the after-times three-jay trip." Then the whaleboat ship is supplied all the run upon, but one of rolling is set. To get the crew aboard after was difficult, requiring tactics similar to kidnapping. When the crew was assembled, the ship boarded from the harbor was packed by the owners, friends, and well-wishers who, with numerous good wishes, left the ship outside the harbor. Left alone, the ship started her trip.

The captain, to impress disciplinary rules, usually addressed the crew, the watches were chosen, and the goods were stowed away.

The whale-boats were next equipped. The whale-boats were clinker-built and "double-ender", approximately 30 feet long and 6 feet beam. Each was sloop-rigged with a collapsible mast, and supplied with both rudder and steering oar, the latter being 23 feet in length. The rudder was used when under sail, the steering oar when rowing. The first oar pulled by the boat-steerer was 14 feet long; the bow oar, 12 feet long; the midship oar, 13 feet long; the tub oar, 10 feet long; and finally the after-oar, 11 feet long. The boat-steerer's midship oar and after oar were dipped off the starboard side; the

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* See more detailed description of the outfitting on page 61 and following.

To see the outfitted whale-boats at either the Nantucket or the New Bedford whaling museums does more than any amount of reading.
bow and tub rows, off the port side. In the bow was a cleat with a rounded log brace for the harpooner. On the starboard side the harpoons were ash in racks ready for use. Also a hatchet and a knife for cutting the whale-line if it became entangled. The tubs of whale rope, two and one-half inches usual, were carried in the whale-boat. The waist tub contained more than the stern tub which was used as an artillery. Together the two contained 320 fathoms of line. After a whale took out all this, and another boat would stand by with its line. Lances; willows to plant in a deal stake; lot of drinking water; bucket for bailing the boat; old whaling line; and lead bag containing salt-lard, brand, tobacco, etc., were included in the equipment. At the stern was the leg-rod around which the line was thrown to order to snub it. Thus it may be said that the line went from the waist to the stern, around the leg-rod, and hence through the center of the boat and over the bow in a groove so prepared for it.

Each whale-boat was put in order by its crew under the direction of its harpooner. The crew, as has already been disclosed, consisted of four oarsmen, a boat-steerer (or harpooner) under the command of one of the mates. On the outward trip the harpooner pulls the forward oar. At the command of the mate, he stands, gets fast into the whale boat,
harpoon, then a second, if possible. This finished, the mate, who until now has been steering from the stern, changes places with the boat-steerer. He for hours, in his name implying, the "boat-steerer." The lute at the bow takes a lance and gives the death thrust to the whale. The captain may direct a whale-boat* but usually he "keeps" ship with the cooper, cook, cabin boy, and mast-head watch, and directs operations by means of prearranged signals with flags from the "mast-head."

With boats in readiness, the ship enters the cruising grounds. The mast-head lookout is set. In the early boats one or two men were placed, to survey the sea for whales. In the early whale-ships the cable mast project - few exceptions, but later a platform was built to prevent the frequent accidents, which resulted when the lookout either fell asleep or became weary at that dizzy height. To this platform was added a hoop, which came under the arms of the man on duty. In Arctic whaling the lookout was protected from the wind by an enclosed hoop and platform.

* It will be recalled that in Herman Melville's book (fictitious) Moby Dick, the captain had command of a boat.

Lo. W. Ashley—Plumber-Hunter has the most interesting account of the chase. An artist of distinction, Mr. Ashley's drawings and paintings, many of which are owned by the New Bedford Free Public Library, make incidents of whaling vivid. See his Whaling trip of New Bedford and The Manitoba Whaler. For other interesting pictures see Grant, Gordon-Greaves and Dow.
The cry, "Bl-o-owl!" or, "There she Bl-o-owl!" sent the ship into a frenzy of action. The men rushed to their boats to seek the order, "Lower away!" When the position of the whales was ascertained, the order was given, and the chase was on. Usually a "prize" was given to the first boat to "take" the whale, and also for the first boat "to get fast".

If possible sails are used in the chase, usually; if not, the oars. Often four to six hours are consumed in keeping close on the whale or the school. During that time the whale has "sounded" several times and the four or five scattered whale-boats are informed of each new appearance by signals from the ship. Sometimes the boats lower only to lose the whale after many hours of work. Once the boat is within striking distance the hazards become great. The flukes*** may shatter the boat, sperm whales have been known to rush or attack a boat; or the whale may simply get away. Suddenly comes the order from the mate to the boat-steerer, "Stand by your iron." He leaps up ready for the next order, "Give it to him," when he hurls first one, then the second iron into the whale. Immediately comes

* Meaning "to sight".

** Meaning to get its "irons" (harpoons) into a whale.

*** Tail.
the aforementioned change of positions between the whale and the boat-steerer. Perhaps the whale has "sounded" or dropped like lead to the bottom, hence lowering the line out at a terrifying rate—so fast that if the whaler were not continually hit it, it would snap. This makes the four boatmen pull the line up, as again described, with the head. Through the whale goes the line out with its huge flukes still splashing the whale-boat. Forward board in order to stop the splashing and catch in the whale-boat again. This constitutes: "The reel at 81, 150 lbs". The line running out, the men either lower the hoop, being dependent on the situation now, by lowering the boat, keeling out the whale, and then, out of danger by the tremendous shock. The boat-steerer stands by the wheel, and throwing a turn of line around his lagger-head, now letting it off. Whatever the tactics of the whale, the line comes over its back, the line is painfully and laboriously drawn in and the boat gets near enough for the death thrust. The whale may again try sounding, rolling, or charging, and the work must be done again. When the death thrust is finally given by the mate's 6 feet of steel and ground into the vital organs of the whale. With a great spouting of blood, a wild churning in circles or a final wild charging, the whale seizes up and gives "fin up," just enough, if the catch is one of a school, the best way...
Black ted flap, cut it adrift and turn to stem. If not, the whale will pull back to the ship. The mates have one and join the line towing the whale. If not, then use a "wale-boat" to be carried as far off as is safe back of the ship and not picked up until the following day.

The whale is always allowed to the ship and "cut-in" on the starboard side, where the absence of davits and whale-boat amidships leaves room for the cutting stage. This is lowered from the ship's side and extends out some 15 feet over the dead whale. On this the mates stand, balancing themselves against the hand-rail and armed with long-handled, specially sharpened cutting-knives, cut the blubber free from the carcass.

A ship will always "cut-in" to windward so that the wind will balance the weight of the whale. If the sea is too rough, this may not be possible.

On the whale the blubber is about 12 by 18 inch thick, fatty, covering just under the skin-like coat called the blackskin. Of a fatty nature, very close textured and extremely

* Captain Jones, in old balloon "explaining things" to the visitors at the Old Dartmouth History Museum at New Bedford, Mass. (He is the blackskin or skill) of the skin-like still not all cut and says that it can be cut off with a "scalpel".
The cutting-tackle consisted of a cluster of gigantic blocks fastened to the main-mast. From this hang two falls, both well secured forward so that they swung directly over the whale-butch on the whale-room. From the two falls hung, on some ships two blubber hooks, on other ships one blubber hook and one toggle-pin which could be inserted in the whale. To fasten the first hook in the hole in the blubber made by the mate, just in back of the angle of the jaw, was difficult. Volunteers were called for and on board the ship, lowered by a rope around his waist, In constant danger of falling overboard, of being ground between the carcass and the chip, drowned, or being bitten by the ever present sharks which the mates kept off as best they could with their cutting knives, the falls, now hanging in mid-air, now covered by a wave, fastened the heavy hook into the blubber.

The windlass now creaked, and the large blanket-piece* rode high in the air. When a certain length was in suspension, another hole was made, the second hook or toggle pin inserted, and the first piece cut through. The second piece now rode high as the mates cut, the whale carcass rolled around and the

* Here given the strip of blubber.
blubber peeled off. The blanket-pieces were stored in the blubber-room where one watch continuously cut them into "horse-pieces" or similar pieces, and later cut them into "bible-leaves*" by approximation for later "trying-out". The "horse-pieces" were large lumps of blubber. The "bible-leaves" were like slices in a large loaf of bread that had not been rilled.

* Bible-leaves was [re] named by Captain Gardner in the Whaling Museum in Nantucket for them. I found them in a book, but on my authority of years of actual whaling experience, I have included the name. He had a true, home-made illustration of this. He had a dozen or more blocks of wood, 12 by 12 by 1. These were tacked on one side to a heavy piece of black rubber. The blocks of wood could be pushed together, or fall apart into as many pieces joined only on one side.
through the bow, which bulges more on the side in which the animal is found. There are pipes. They resemble bacon slices but still attached to the spine. This cutting was with a so-called casing knife similar to the hunting knife of the bush.

When the cutting of the breathing case the spout and other joint was cut, between the bone and the skin, and some was removed while the whale was still killed and some was still living. In the case of sperm whales the most valuable oil comes from here. If the whale was small enough, the whole head can be taken out. If too large and heavy for this, only the lower jaw, called the junk, is taken on deck. This is of no value except for the teeth and bone used by the men in making trinkets and scrimshaw.** The case

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* See discussion of ambergris in next chapter.

** Throughout the book, and also in the bulk of the whale tales, all whale oil, when sold or relating to oil sales, is referred to as ' sperm oil.'
was then hoisted to the level of the deck and securely fastened to the side. An opening was cut and the spermaceti was removed, half from its case. It was like a huge honeycomb shining with the sun. The mouth was split out and the rich spermaceti was half haled, half cut from its case. It was like a huge honeycomb trickling with its store. The spermaceti is tried out separately from the body oil since it is more valuable. If the whale is a right whale there is no spermaceti but there is whale bone in the mouth. The try-works are just forward of the main hatch. They are built on a platform of bricks over a shallow reservoir of water to prevent loss to the wooden deck. Two large pots are encased in the brick works. Wood is used to start the fires.

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The whalemen are just from old of the sea itself. They are built on a platform of bricks over a shallow reservoir of water to prevent loss to the wooden deck. Two large pots are encased in the brick works. Wood is used to start the fires.

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Wood is used to start the fires.
and after that the fires can be kept going with the tried-out scraps from the pots. The trying-out continues night and day until the job is done. The oil is bailed into a heavier cooler than bailed. Throughout the process a heavy, black smoke comes from the chimneys, darkening the rigging. The odor is the sickening smell of burning fat. A whale-ship trying-out seen on the horizon is reported to resemble an inferno. When the trying-out is finished and all the oil is in barrels and stored below, the decks which have been with oil are cleaned and the process of chase, catch, cutting-in and trying-out is repeated until the ship is full or has used up its provisions. Even then, ships on a Pacific voyage often sell some of their oil in Pacific ports and put out again or re-provisioned in island or Pacific ports for an extended voyage.

Whaling had hazards. True, no mission is hazard of alone work with the greatest of adventure stories. How a captain spend a life than in the industry without losing his health to his own. Perhaps he sailed a "lucky ship"* as he have been considered among the whaling ships. True, the choicest of luck and the good fortune of men, the sea have been a "lucky ship".
and in hard trouble, serious injury, mutiny, or loss of his ship. Captain Benjamin 7/orth is an example of the former. He was captain for thirty-nine years and had excellent luck. He was only six feet two inches and looked like a sailor, none of his ship was killed or lost a limb but by a whale. An example of the latter is Capt. in George Willard Jr. of Nantucket, who commanded the Essex whose story will be told later. His next command was the Two Brothers which was wrecked on a coral reef in the Pacific. All hands were saved but Sperm Whales, fighting whales, were saved.

Some of these adventures will be related here later.

The Awhashaka of New Bedford sailed in 1859. The Third mate's boat encountered fighting whales. It was about 12 miles off in the Gulf. The Ann Alexander of New Bedford sailed in 1859 and was lost. Fighting whales not only attacked her whale-boats but also attacked the ship.

* Fighting whales are always reported to be solitary bull sperm whales. Sperm whales are the only ones with teeth, hence the only whales capable of biting, etc.

J. R. Spear--The story of the New Bedford Whalers, 386.
J. R. Spear--The story of the New Bedford Whalers, 386.
The Edward Lee of Pembroke sailed in 1831. Captain Sparks lowered after a school of whales and killed one. The boat broke away from the main vessel and sank several days before being picked up. For a whale-boat to be lost all night was not unusual. 

Toward the Lee of New London sailed in 1831, Captain Sparks lowered after a school of whales and killed one. His boat became separated from the ship and was lost for six days before being picked up.

For a whale-boat to be lost all night was not unusual. A lowering might mean deaths, a "stove boat"—loss, or injury. In another case a boat lowered for whales had the misfortune to have a sperm whale bite off the bow of a whale-boat taking with it the boat-steerer. The boat-steerer's legs and hips were in the whale's mouth at the time he was last seen vanishing beneath the waves.

In 1832 the Rebecca Broke a whale. It smashed a boat, killed a whale, and saved the crew. A few days later the Hector made a double attack and succeeded in killing before it was killed, when the two were together.

J. R. Spears—The story of the New England whalers, 262.
J. R. Spears—The story of the New England whalers, 207.
J. R. Spears—The story of the New England whalers, 290.
they found the "irons" of the vessel before it was killed. Al bombs were shot into the whale. It yielded 115 barrels. In 1831 the bark "Jenins" of the Bedford was struck and sunk by a whale. Accounts of the disaster show the attack by the whale was premeditated. The "Pocahontas" of Holmes Hole was hit by a whale but was able to make Rio Janeiro. The "Eagle", whose captain has already been mentioned, sailed from Nantucket in 1819. On November twentieth in the Pacific the ship was struck by a sperm whale while the boats were lowered. The whale drew back, made another furious rush, and completely stove in the boat. The two whale-boats were recalled and a spare boat was launched. Provisions were put into the boats. The three boats set sail for South America carrying twenty men. Records were kept of the ship, her crew, and her fate. Sailors in these as well as on individual boats kept records of iron. In ships kept records of iron were lost, often they could be traced.

* All "irons" or harpoons carried besides

the ship, her crew, and her fate. Sailors as well as on individual boats kept records of iron. In ships kept records of iron were lost, often they could be traced.
On December twentieth, an island was sighted. Water was obtained between three and four, and it was concluded that they were still, like the inhabitants of Easter Island, on the island. Later, some men were rescued by a British vessel. The boat was left and seven hands remained, of whom two were left with a boat. On October, the island was taken to Wellington, and after being found on March eighteenth, it was brought to the same port.

Mutiny was another danger of the whaler. The ship left for the South in 1857. Five of the crew deserted on December ninth, killed all but one of the mates, and took charge of the ship. On their way to the coast of Australia, they killed all but two of the mates. Ten men put all the plunder into two whale-boats and left the ship. They were captured by the authorities and sent back to England to face trial. Through the able defense of Benjamin F. Butler and the clemency of President Buchanan, none were put to death but all served time in prison.
worthless and lazy. Under the influence of Comstock, a hoatsteerer, all the officers killed by Goristock, a hoatsteerer, and the ship was taken under the command of Comstock. The ship anchored at the harbor on February 14, 1824. Here a camp was set up and three days later three of the officers were killed. The next night six of the crew, who were not a party to the mutiny, cut the cable and sailed to Valparaiso where the ship was delivered to the American Consul. About two later trouble with the natives led to the death of all but two of those left on the island. In December, 1825 these two were taken away by the United States war schooner, Dolphin.
Economics of the Industry

Whaling was significant to her economic welfare and vital to the New England coast. Some historians say the Civil War delayed the development of cities and nations almost before whaling industry was ready for business expansion. That the importance of whaling as one of the important economic activities may be illustrated by the statement of Lieutenant William, *"Our whaling fleet can be said to have been born to slither the Pacific Coast with its consequences—the ramifications of the business spread to all branches of trade—and are spread through the whole Union."

Massachusetts was prominent in whaling. In 1774, the American sealing fleet numbered 320 vessels. 224 vessels were from Massachusetts. According to the Malbone's Shipping List and Merchants' Transcript of September 7, 1852,** there were 127 ships and 1 bank that New Bedford due to sail for Pacific ports during September and October. Also there were 4 ships and one bank from Fairhaven*** having leaves to the

* From his Narrative of the United States

Malbone, Evolition written in the early 19th Century. Published by Henry Lindsay of New Bedford. Published every Tuesday by Henry Lindsay of New Bedford. Pages quoted in Vol. X, No. 32.

** Pages published on Tuesday by Henry Lindsay of New Bedford. Pages quoted in Vol. X, No. 32.

*** This is quoted from Fairhaven, as the same
The capital invested in whaling was great. The American whaling fleet numbered 303 vessels in 1820, 355 in 1822, 355 in 1823, and 700 in 1832. The latter year was the first on which a large number of vessels were engaged in the whale fishery, and the capital invested was $21,000,000 or $23,000 for each vessel.

The largest vessel on the New Bedford whaling fleet was the Brant, a ship of 2,130 tons. The smallest, also of New Bedford, was the schooner Parma, weighing 49 tons.

In 1841 the following figures were taken:

- Number of vessels engaged in the whale fishery, 650;
- Tonnage, 193,000;
- Officers and crew, 13,000.

Almost every town along the coast of the Acushnet River was involved in the whale fishery. Records often give the figures of the two under New Bedford.
The value of these ships, as they sailed on May 10, 1800, was estimated at $20,170,000.

The returns on the capital also were great. Between 1771 and 1775 the average annual reduction was 45,000 barrels of sperm oil, 825 barrels of whale oil, and 75,000 pounds of bone. In 1776, the output of the whale oil industry for the first time reached 1,000,000.

In 1837, the catches were 6,385,995 gallons of whale oil and 5,319,138 gallons of sperm oil. In 1845 sperm oil brought a gallon. In 1840, a record catch of 11,593,183 gallons of whale oil sold for $.33 a gallon. In 1855, 5,796,472 gallons sold for $.73 a gallon. The highest catch for whalebone was 5,092,300 pounds in 1893. It sold at $.345 a pound, or about 20 cents a pound higher than the previous year. The year of the highest catch was 1894 with 10,500,000. 1897 was nearly

* Written in 1897, New York, N. Y.
Incoro for the last 10 years, sb-ry of $10,515.290.

The y^r^r 12 53 to 1257, inclusive.

Whaling a total of 50,52,59, or each ear 50, estimated in

This table gives the data on the foundation of the

<table>
<thead>
<tr>
<th>Number</th>
<th>Return</th>
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<tbody>
<tr>
<td>21</td>
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<tr>
<td>22</td>
<td>19, 19</td>
<td>1850</td>
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<td>23</td>
<td>19, 19</td>
<td>1854</td>
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<td>24</td>
<td>20, 20</td>
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<tr>
<td>25</td>
<td>20, 20</td>
<td>1862</td>
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</tbody>
</table>

**Note:**

1. All ships except for No. 282 are in the Whaling

2. Data from E. P. Holmman's "Collectors' Guide and

3. This table gives the data on the foundation of the

An excellent record was broken by the loss of $14,460.47. This would only amount to $2.20 profit.

After the Civil War, the whaler's place was taken by asphaltum because the asphaltum industry was already active in the production of asphaltum and rather soon all the asphaltum was taken up. The asphaltum in 1860 sold for $1.20 a barrel, in 1860 sold for $2.00 a barrel, in 1867 for $1,73, and in 1795 for $7.00. During that time, asphaltum was in great demand. In 1865 it sold for $7.77 a barrel, in 1870 for $1,10, in 1875 for $5.00, and in 1880 for $8.50. After the Civil War, asphaltum was the chief of many products which kept the industry alive as the growing use of petroleum and cotton seed oil decreased the demand for whale oil. Before the Civil War, the whaling industry was to some extent in a Skinner. During the thirty years given, the voyages increased from just under two years' duration to nearly five.

Capital was not allowed to remain idle. H. Sears——The Story of the New England Whale, 555.
Returns on voyages were looked upon. In 1824, the total
returns from whaling was $6,687,115. Zee was never a $3,820
for any ship. In 1824, the average per ship was $41,390. This
was in the so-called 'hey-day'. In 1825, the return was
$58,000. In 1826, the hit of the last of Long, the return
was $10,000.*

Some of the record catches were:
Sarah of Nantucket, Captain Frederick Arthure, sailing in the
Pacific, May 26, 1827--April 19, 1830, brought the largest
cargo of sperm oil up to that time to Nantucket 3,497
barrels, sold for $89,000.
William Hamilton of New Bedford, Captain William Swain, re-
turned 1838, record for all sperm voyages, total 1101
barrels (1000 barrels brought in, 121 barrels sent
home), sold for $109,269.
South America of Providence, Tupin Island. Captains R. N.
Smith, 26 months voyage, largest catch of whale oil
ever--5,300 barrels, 1,222 barrels spermaceti, 160,000

* While these figures are not as significant,
I raise the question, 'Will the end have
importance if the man living? Might they not become important if
thought over in isolation in this way?

"J. B. Speer, "Narrative of the New Bedford Whalers", 1858."
George Vasilion of Jew Bedford Curtain Edvirs, returnec in 1351, 7,000 lirels of wine, 75 barrels of s^jerin oil, besides 7,000 pounds of bone, sold for 151,000, cost of outfit $35,300. This is the record value for anp catch. Note the dates—too of high price due to war-time scarcity.

Hatched with the great profits came the great losses, many dangers assailed the whale-ships. The "prize and blank" theory of business caused new troubles. Seventy per cent of the profits went to the entrepreneurs, the shipowners; thirty per cent to the officers and men. Much has been written about the evils of the tem. Now let the whale be admired of both and alike.***

See also J. R. Spears—The story of the New England. Alena, 324,325.
CLii'i lubop shared the luck, as it were. Other writers concurred in the sentiment, too. The advance of credit for the outfit with interest, the "slop-chest account with interest," and the temptation to the owners. After the Civil War, native-born Americans, no longer entered this industry of harsh discipline, great dangers and little return. It was left for the dark-skinnedlander to man. Yankee initiative went West or sought greater profits on land. But in the period prior to the Civil War, owners and captains alike were men who had once been sailors. There was some marine insurance written for whalers. The Tri-Sailor was a popular and well known whaler of the late 1840s, covering the period 1845 to 1850. The first policy dated July 1, 1845, by J. A. B. Inglesby, was written by individual owners. In the early 1850s, Bostock and Co., with offices in New York, Boston, Philadelphia, New Orleans and New Orleans Marine Insurance Co. In the 1860s, insurance policies were written for $5,000. In two cases the premiums were $100; in the third, $200. The policies ran for 1, 2, 3, and 4 years, and were written by the owners. Both policies were still extant by 1870. The policies were:

- An insurance policy written by H. P. Tri-Sailor, 1845, for $5,000.
- Another insurance policy written by J. A. B. Inglesby, 1845, for $5,000.
The log records of the port will begin with the year 1815. The logs of the early years are not available. However, a list of the vessels sailing from 1815 to 1841, the information at present is public.

Note 1815 and 1841.

The first logs begin in 1815.
First record of ships sold in 1815.
Sailing vessels after 1815.
1840 and 1841. Few vessels sold in 1840 due to the industry being "The Great".
1815-1840船--a нгт.

Other years show there are more sailing vessels.
1850 marks the last year in which ships are noted.
1860 Terrific losses to the war.

Nantucket Records

taken from Port Records of Nantucket.

in Nantucket Whaling Museum.

<table>
<thead>
<tr>
<th>Ships</th>
<th>Year</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>31</td>
<td>1815</td>
<td>24 ships, 8 brigs, 3 sloop, 1 lost.</td>
</tr>
<tr>
<td>17</td>
<td>1816</td>
<td>7 new, 6 brigs.</td>
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<tr>
<td>27</td>
<td>1817</td>
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<td>39</td>
<td>1818</td>
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<td>31</td>
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<tr>
<td>32</td>
<td>1820</td>
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</tbody>
</table>
| 33    | 1821 | Ship Alexander captured at 3975 leagues. All crew lost, largest catch, after 33 new ships.
<table>
<thead>
<tr>
<th>Ship</th>
<th>Sailed</th>
<th>Year</th>
<th>Remarks</th>
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<td>1850</td>
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</table>

* See pages 18 and 19.

** To be continued.
<table>
<thead>
<tr>
<th>Year</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>1253</td>
<td>Sailed</td>
</tr>
</tbody>
</table>
| 1351 | Returned to America with 44,000 gallons of oil, largest catch ever, after four months in the Pacific; returned clean.
| 1356 | Sailed for California. |
| 1358 | Boats got smaller in size after this date. |
| 1361 | Sold to Talcahuano, Chile, best harbor on Pacific Coast of South America. |
| 1367 | Sold to Callao, principal port of Peru. |
The outfitting of a whaler was a task requiring thoroughness and conscientiousness. Always, it was an important business, Starbuck states in his History of the Whalefishery that in 1831, 210 vessels were fitted out in New Bedford or neighboring ports. This outfitting required 36,000 barrels of flour, 30,000 barrels of beef, 18,000 bolts of twine, 3,000 tons of hemp, 6,000,000 staves, and 2,000 tons of cordage. Also were required large quantities of iron for harpoons, lances, spades, blubber hooks, as well as smaller supplies such as molasses, tea, rice, coffee, sugar, etc.

Then voyages became longer, many whalers refitted in Honolulu, and some enterprising merchants from New Bedford moved further to follow the work involved in the refitting of a vessel will show the amount of business on shore resulting from this one industry and will show its economic importance not only to its principal ports but to their surrounding country.

First, the hull of the ship, is examined to see if it is sound. All timber and planking are examined, while the men are busy cutting and sawing it. Some in long files

*Figures given in connection with outfitting, whalemen taken from L. A. Littlefield—Fitting out a Whaler.
and heaving her down so that one side lay entirely out of the water. The carpenters and caulkers then worked from a floating stage. Caulkers made her seams tight with oakum. The hull was covered up to the water line with sheet copper or a metal, prepared especially for this purpose. If the vessel was intended for arctic whaling her bows were reinforced with oak and an iron shoe placed on her forefoot. While this was being done, many others were also repairing numerous articles. Sailmakers were busy in the great sloths, overhauling the rigging and sails of the ship. Every rope and bit of canvas was inspected to see if it would stand the strain of a tropic hurricane. Many coopers were busy making the huge casks for the oil. On the outward voyage many of these casks held stores, clothing, bread or water. Hard-cack was prepared in special bakeries to which the shipowners took the flour they bought. Shipwrights and joiners, working like demons, put new keel and sides in order, or made new keel and sides when these had been formed on the previous voyage. Built hatches had to be put in, spars, headsails, and the like. The following
and other articles as observed in the list.

One hundred and seventy pounds of beef, 210 of pork, 80 gallons of oil, 300 pounds of flour, 2 pounds of butter, and 100 pounds of codfish were in addition to a supply of rice, peas, beans, corn, etc. Other stores included tea, coffee, chocolate, salt, pepper, and perhaps a few live chickens for the officers' use.

The average cost of outfitting a whaler was $20,000, depending on the amount of repairs required.

1L. A. Littlefield--Fitting out a whaler, page 12, gives this figure. M. B. Maury--Whalers and whaling, page 30, gives $30,000 for a long voyage.
There are three principal products of the whale fishery. These are the whale oil or the oil coming from the trying-out of the fatty layer of blubber, sperm oil coming only from the fatty structure of the case of the sperm whale, and whalebone.

Whalebone, or more correctly baleen, comes from the mouth of the whalebone whales or Balaenoptera. It consists of several hundred horny, chitinous plates or plates which are attached by each side of the upper jaw. These are 200 to 300 plates on each side. The number as well as the length of these plates vary with the species and size of the baleen. When the whale's mouth is closed, the plates fold like a fan. When the whale's mouth is opened, the plates spring forward so as to fill entirely the space between the jaws. The lower edge of each slab has a fringe of hair which resembles the hair of a horse's mane or tail. The whalebone whales of the arctic seas give the choicest baleen, single very long slab may be 15 feet in length and 10 or 12 inches in width. The Pacific right whales give baleen of good quality. In finback whales the slabs are shorter, and in humpback whales the baleen is of very poor quality. It is more often of use than for anything else.

Baleen is not firmly secured to the jaw of the whale. About 12 inches of it is detached from the jaw. It is usually flaked, with one edge, deep.

Facts concerning whalebone taken from C. H. Stevenson.

Whalebone, 639.
The entire upper jaw is hinged at both ends and is suspended by the interval bar. The joint is then separated from the lower jaw by the cut off tackle, and when freed from the whalebone, cutters are detached, and the whalebone is then stored until a convenient season. The baleen is not liable to injury from dampness and is stored in the hold. Then the season is over, and the ship is on the pass to the whalebone is brought up on deck again and the slabs are carefully separated, each particle of bone scraped off, attached in salt water, and thoroughly dried. It is interesting to study the accompanying table and speculate on the relationship between price and supply.

* It is later (page 34) stated that the whalebone is a pound in 1832 caused a decrease in production.
# Statement of the Product of Mullein in the United States

During the period 1821-1848:

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<thead>
<tr>
<th>Year</th>
<th>Production</th>
<th>Total Value</th>
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<tr>
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<td>1820</td>
<td>$20,000</td>
</tr>
<tr>
<td>1822</td>
<td>2100</td>
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<td>2300</td>
<td>$40,000</td>
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<tr>
<td>1824</td>
<td>2800</td>
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<td>1825</td>
<td>3200</td>
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<td>3500</td>
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Figures from C. H. Stevenson, Fulham, 7.
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<th>Year</th>
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<th>Average value</th>
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<td>2,058,850</td>
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<td>2,571,200</td>
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<td>1859</td>
<td>1,923,850</td>
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<tr>
<td>1860</td>
<td>1,337,650</td>
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<td>1861</td>
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<td>1862</td>
<td>488,750</td>
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<td>1863</td>
<td>700,450</td>
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<tr>
<td>1870</td>
<td>600,655</td>
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From 1344 to the outbreak of the Civil War, the output averaged about 2,800,000 pounds annually, the greatest being 5,682,300 pounds in 1853, and the price gradually increased. Since 1860 there has been a large decrease in the yield of whalebone, which has been largely counterbalanced by an increase in the value per pound. The sudden rise in price from 66 cents in 1861 to 1.80 in 1864 was due to the Civil War, and again the sudden rises in 1872 and 1877 may be accounted for by the disasters to the whale fleet in the years preceding each rise. Tie loss in 1871, being by far the more serious of the two, brought a great drop in production. The economic value of whalebone is due to its combined qualities of lightness, elasticity or springiness, and flexibility even when split into very thin strips. It is also
69. retain any shape that is given to it when it is heated and cooled under compression.

Although various substitutes, such as steely cattle horns, and turkey juills, have been introduced, nothing rivals it.

The first operation of the whalebone is immediately to secure the state of splitting the whole into long slivers with a knife or pair of shears. This slivers are soaked in tepid water from one to two weeks and then subjected to steaming for 40 to 60 minutes. Each slab is then ready for cutting.

The first cutting, or the "front", is of the best quality and was formerly used in upholstery. Text, in order to make the material workable, the slabs are soaked in tepid water for one or two weeks and then subjected to steam for 40 to 60 minutes. Each slab is then ready for cutting. The first cutting, or the "front", is of the best quality and was formerly used for dresses etc. After the "front" bone comes the "whip" bone of less desirable quality but having the necessary flexibility for whips. The front bone is of two grades; shall bone being finer suitable for the muslin boning, whereas, shell bone is used for corsets or wherever it was slipped into casings instead of shells.
The fitter from the slitting and cutting into hrfstle sizes and used in the manufac-
act-ure of coarse stiff brushes. Shavings and scrappenings are used by uphol-
2etors. Formerly whalebone was used to make frames or ribs for umbrellas and parasols. It was used in houses, whalebone canes were once fashionable, the cutting of the blubber and the trying-out has been seen, the bailing out of the spermaceti and its trying-out has been noted.
The story of what happens to sperm oil on land follows.
Sperm oil comes from the whale in cases, from these it is purpured into tanks and heated to 150 degrees. After this it is put into tanks and chilled. The result is a semif-solid which is shoveled into bags and given its first pressing in a big hydraulic press, here it remains for four hours under pressure 2,500 pounds to the square inch. The resulting oil is called winter oil and has a cold test of 45 or 53 degrees. The winter oil is stored. The residue called sperm roots goes.

** The process for conversion is not well known. The story in some books is based on an account by W. H. Tripp, Curator.
The black cake, is heated to 72 degrees and ground to a fine meal. In this form, it is given a second pressing under pressure 2,000 pounds to the square inch. The result of this pressing is called spring oil. It is stored. Black cake is the name given to this oil. This will melt at 102 degrees.

The cakes are melted, washed and cleaned or refined with alkali. Next, the black cake is boiled off into small pans and hardened into cakes each weighing 20 pounds. It is now called refined black cake. It is stored. Before it is allowed to season, ten to twelve days. When it has seasoned, it is allowed to settle, and it is put into heavy bags of Egyptian yarn, and given a third or taffy pressing under pressure 3,000 pounds to the square inch. The resulting oil is called taffy pressed oil. The residue is made into cakes and is called unrefined spermaceti. These cakes are put into kettles and refined in alkali. This oil is pumped into a large kettle, heated and allowed to cook into cakes and is called refined spermaceti.
The base of all cold cream is refined acetic acid. It is used to make the hal'd candles familiar in churches. Inter-oil, which resulted from the first pressed, also has a refined roc-sa. From the storage, it goes to large 20,000 gallon bleaching tanks where it is heated to 130 degrees and agitated with alkali (caustic soda). The process reduces the fatty acid and removes the brown color. The residue is cocked into sperm oil, which is used for making silver plating compound. Watch case compounds are made of this sperm oil. Soap for washing watch cases. The oil next goes to the Sun vat room, where in large shallow vats it bleaches in the sun four to seven days. Pumped from filtered presses into storage tanks, it is ready for shipment. Winter oil, thus refined, is used compounded with lard or mineral oil. It is used as a fine lubricating oil. Spring oil is compounded with the winter oil.

Among the main products of the whale fishery are whale meat, guano, and ambergris. Whale meat is used as food in Japan. It is cheaper than beef. In winter, whale meat is fifteen cents a pound, when other times it is half that price. Whale blubber, heart, liver, tongue, and intestines are also sold. A chemical analysis of the flesh by Prof. Dr. M. A. Anderson. Whale hunting with gun and camera, 20.
analyses shows it to be richer in protein than lean beef. Whale meal may be made from fresh whale flesh and used for feeding cattle. This meal is 17.50% protein. Guano is made from the remaining flesh and about one third of the bone. This is 3.50% ammonia and 21.7% triboric phosphates. The whole of the dried bones and the meat may be made into one product, a rich guano, containing from 10 to 12% ammonia and 2 to 3% phosphates.

The above products are modern but ambergris has always been looked for in whaling. Ambergris cones from the intestine of diseased whales and probably is caused by indigestion. In the cutting-in of every whale, the carcass is cut and the intestines are searched for ambergris. It is rare and may be sold for as much as $300 a pound. A solid fatty substance of a marbled gray and black appearance generally contains the beaks of cuttle-fish. Then fresh ambergris has an intolerable smell, but the odor leaves it after exposure.

Ambergris is used in the making of perfumes, pastilles, incense, perfumed candlewax, powders, and in the tast for wines. It readily takes the scent of flowers and after that has departed gives its own pleasing scent.

1 Analysis by Prof. L. F. Jaffe, Professor of Chemistry, University of California.
2 Chemical of the whale intestine and ambergris, 1890. Z. A. B. H. 19.
Am'ber^ri?
lias lon^ been l:no''n. In silent tines it was considered a treasure. In 1691, it was described in a liharna-
tice. In 1672, an wrote of it as the
un
of a tree cast into the sou. Its origin was settled by its
ntuchet in the first quarter of the eighteenth century. Un-
til that time its origin was unknown. The ship of Kantucl^et hilled a 100 barrel sperm

While the crew was cutting in, the whale was noticed to be sinking. Cutting in to cut the carcass, the spade re-
ounded as if it had hit rubber. The carcass contained a lump of dark material an appear. Think, a belch. A large
looked like the skeleton and the rest of the whale. The spade on its sides. ..no such thing, said.

In 1882, a ship searched for sperm whales and found one.
and again. This red herring had been the clue. He called the ship and got a

After the whale was caught, the whale-boat got two irons into him. It took all day to kill the

That evening, with the whale secured along side, they left it sup-posedly until the next

Continued from preceding page--Although much has about ambergris, the two articles I. K. Sa3>^-
of the Sea and I. C. hur
-?1 o a t

Reading from source.
The captain set a large watch and waited for the moment. It was a hot day and heavy with the smell of tar and melted tar. The captain knew that the ambergris would be ready soon. He had been tracking the evidence of the whale's movements, and now he could see the signs of the crude substance that had been left behind.

The captain split the bale, and it was found to contain an enormous mass of lark substance in a solid state. This substance hardened in the air and broke to reveal a blob of ambergris.

This flooded the market and brought a fortune. With more skillful barbaining, more splits have been taken.

Llanp. — See AMBERGRIS. Tales are told of finding of ambergris.

Host objects thought to be ambergris are not.

In New Zealand a lump of it was used as a rock in a rod: garden for minnows before it was discovered. In Barbados a native girl on a ship had a fishbone that proved to be ambergris.
The day the woman was shopping in the market, she sat on a rock and her dress stuck. An apothecary learned of this incident and bought 1,400 ounces of ambergris.
V. CONCLUSION

At a time like the present when the elements are conducive to adjust itself, it is not to be truly expected that a satisfactory result will ever be achieved in the field of hunting the whale. The hunters have not fully realized that they are dealing with an animal that has been signs of the past and finally passed away. The opportunity is offered by the whaling industry.

Chapter one gives the very necessary introduction to the whale himself. This land mammal which can travel by life to the sea is peculiar and unparalleled in the world. Its big hulk, its adjustment to marine life, and its curious habits make the basis for a distinctive industry.

Chapter two gives the history of the Industry. Its origin and early growth; its critical period during the revolutionary period; its readjustment and its increasing importance, interrupted by the Civil War, its decline retarded by the shift of emphasis to a former by-product; and its present status; all these are included in the cycle.

Chapter three deals with the equipment, personnel and methods. In this field of the whaling men, that in India. The ship, the whale-boats, the implements are all related to the whaling shore. The method of paying the men for work.

The
chase, as long as the harpoon alone was used, was spectacular
and thrilling. The hazards were many and disastrous. This
chapter deals with the romance and drudgery of the industry.

Chapter four becomes more prosaic and business-like. The
capital invested, returns on the capital, prices and record
catches, insurance, outfittings, and the products of whaling
are discussed to show the industry's place in the economic
life of Southeastern Massachusetts.
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