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The Men all Singing : the Story of Menhaden Fishing

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The Men All Singing

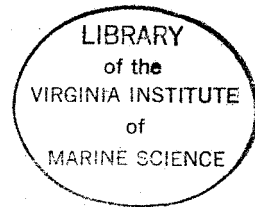
The Story of Menhaden Fishing

The Men All Singing

The Men All Singing

The Story of Menhaden Fishing

By John Frye



**DONNING
NORFOLK/VIRGINIA BEACH**

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351
M5F78

Design by Mike Brewer

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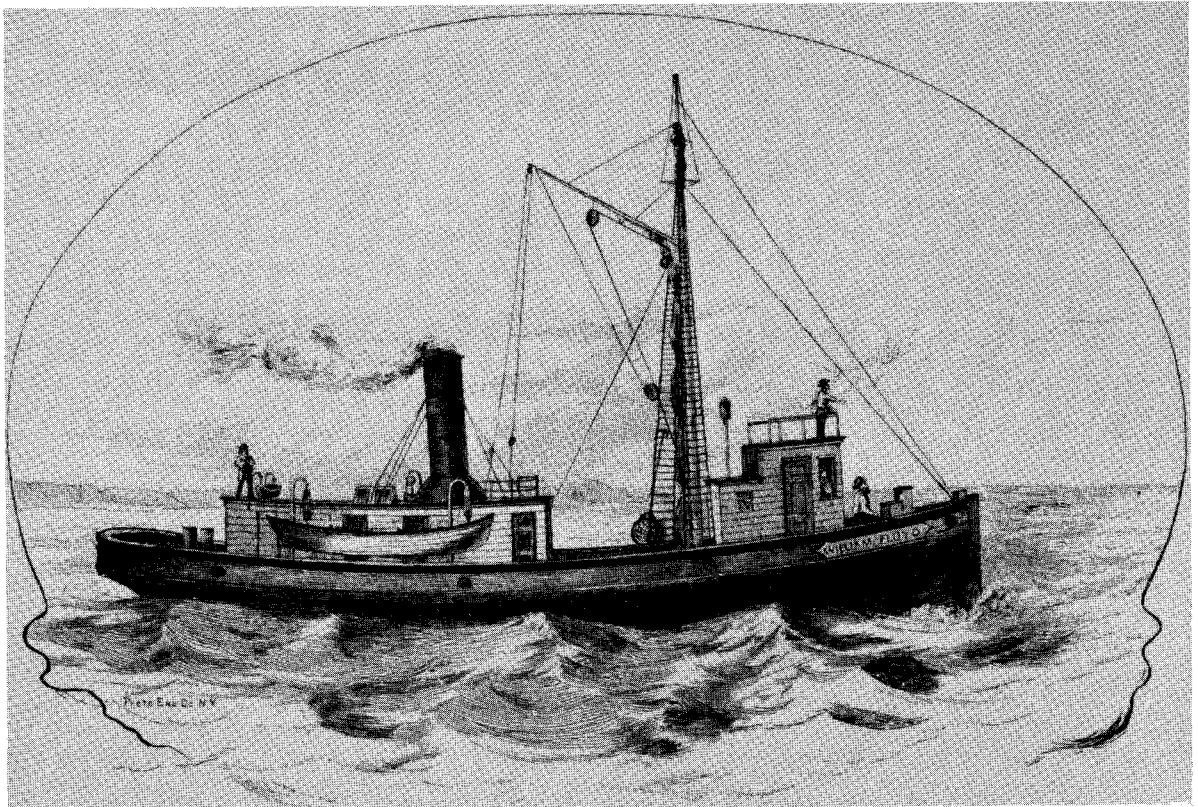
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The Men All Singing



A menhaden steamer cruises for fish. Drawing by Captain B. F. Conklin, from George Brown Goode's *The Menhaden*.

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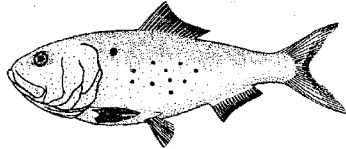
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The men all singing: The crews of four purse boats raise an exceptionally heavy set in Chesapeake Bay sometime in the 1930's—a situation which may have called the chanteyman to duty. He would start the verse that gave the men strength to pull again as they sang the refrain: "Hey, hey, honey!" or "He just walk away!" E. C. Ford collection.



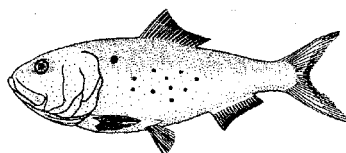


“Man, when we fished up near Atlantic City and coming in, the men all singing, and those yachts came out just to hear them. . . .”

—Sherman Curry

“When they got together good, they pulled about everything on earth.”

—Captain John B. Lowry



NOW . . . WHITHER THE BUNKER?

(Copyright 1998 by John Frye)

Our oldest and long our largest fishery--for menhaden--neared the end of the Twentieth Century amid questions of salt water ecology and coastal pollution. Among them . . . what eats what?

Some Atlantic Coast fish boat captains, noting in the last quarter of the century changes in fish size as well as in numbers in purse seine hauls, wondered if they saw only familiar up-down cycles or real changes in their world.

Controversies, new and old, grew. Ecological problems came under study. What about that "food web?" Does mass harvesting of one "inedible" fish deprive food fish of food? The pogy, fat-back, bug-mouth--the bunker--became seen as part, major but so far possibly beyond scientific measurement or governmental management, of a complex biological world. This non-food fish is a link in a food chain. How vital was under study, not always impartial.

With population, ours and the world's, growing,

especially along coasts, conservation became ever more vital--ever more difficult to practice, even to measure, ever more controversial. It can be made to seem irrelevant that menhaden have long been a resource for industries like stock and poultry feeds, steel, and paint. Now, with Food and Drug Administration approval at last, refined menhaden oil can be used in our food. In Europe fish oil, including ours exported there, has long been used as a food additive.

Yet many a Sunday or vacationing sport fisherman out to fill his charter boat or yacht ice chest with striped bass, or hook-and-liner hoping for a "mess of fish" for supper, is increasingly sure his fish have been driven to other waters--or starved! Friction with profitable pleasure activities--swimming and surfing, sunning on beaches, frothing about in over-powered craft, or seeing if the salesman was right that "anybody can sail and you have the right of way"--has grown almost to a point of asking if rivers, bays, sounds, oceans to the horizon, are only for fun.

Fun is a strong factor in our national economy. The thought of providing food to people, making a living too, can get lost in shouting.

+ + +

Some menhaden fishery "old timers" may have thought what they grew up with would last forever . . . summer dawn sights of dozens of fish boats racing out (at twelve knots) in coastal waters--first New England, New York, New Jersey, Delaware, and Chesapeake bays, Carolina and Georgia sounds,

now Gulf of Mexico waters from Florida to Texas. Captains and crews scanned horizons for "whipping" hundreds of thousands of bunkers. The fish boats might come in at sunset with full holds, the fish in earlier centuries to be sun-dried for fertilizer. Now they are "reduced" to protein-rich meal, oil, and solubles to help fatten hogs and chickens. Refined oil at last can be part of your oleo or salad dressing. A hundred other industries, steel to perfume, use it.

To bunkers, men in fish boats are only one hazard. The fish dodge striped bass, bluefish, weakfish, sharks, porpoises, whales, and others in the waters, herons and other wading birds in shallows, gulls, osprey, and pelicans from the air. To grow to be prey, larval bunkers must fill their own bellies with zooplankton drifting, and often scarce, in creeks and inlets no longer clean and rich.

Now, if bunkers or any fish have to search elsewhere for food, what becomes of fish living off them? Or of fishermen? Follow or starve? (Bunkers are a major food for striped bass--rock to watermen. A good year for rock, as in 1998, may suggest thousands of bunkers down their throats, to account for part of any light purse seine hauls.)

What if bunkers, for whatever reason, fail to reproduce in normal numbers even with adequate spawning stock? (National Marine Fisheries Service scientists have expressed concern over apparent decline in recruitment of young fish to

the coastal stock since about 1985. In 1997 nearly 30 percent of Chesapeake Bay menhaden were three years or older. Fewer young fish apparently were joining the schools, many not to survive spots of unfavorable environmental conditions, pollutants, disease, or predators.

Or if geological or climatological events drive fish, predator or prey, elsewhere? (What is the effect of often unstable Atlantic eddies between the Gulf Stream and the beaches? Do Atlantic or Gulf hurricanes, or Atlantic northeasters, have more than a temporary effect? What about the summer hot weather "dead zone"--low or no-oxygen spot often found in the Gulf in summer? What about the Pacific Ocean's El Niño's suspected effects, at times reported strong, on Atlantic weather?)

Or if an exotic aquatic plant or fish, pumped at night from a ship's ballast tanks, hinders or even destroys bunkers or any of our fish?

Or if shellfish become so scarce that the water is cleared of too few impurities--natural or man-made--washed off shores? Menhaden likewise provide filtering. One adult is estimated to pass four gallons of water a minute through its mouth and gills while grazing on algae. More important, bunkers and many other fish help control growth of algae, which can smother bottoms and kill other submerged aquatic vegetation.

Or, if "development" or cultivation--plowing and over-

fertilization and weed killers, whether of fields from the air or "manicured" water-front lawns--block or poison those inlets and creeks so that young bunkers and other fry have no place to hide while maturing? What about drainage from stock or poultry farms?

Or, if too many bunkers are pumped into fish-holds, as some watermen claim to be sure of? Over-fishing has been disastrous elsewhere; in our northern waters cod now are "commercially extinct," swordfish scarce. Some hard-pressed fish can be "farmed," but many most sought thrive best or only in the wild.

Or, if too many striped bass, weakfish, or blues go into those holds, as many sport fishermen claim to be sure of? (No bunker captain wants a thousand killer blues slashing through a school of bunkers, or caught and cutting up meshes in his costly purse seine with bloody teeth. One Chesapeake Bay company used to invite anyone aboard for a day to see how many, if any, food fish were pumped into the holds. The visitor was lucky to taste fish from the galley at lunch.)

These questions are more than the familiar, often over-passionate contentions of strict "environmentalists," or equally over-passionate contentions of critics who scorn them with "tree huggers."

It may be that little, even nothing, generally effective can be done to restore natural balances among all fish, or in any one species. Attempts at urgently needed multi-species

management may be like catching soap bubbles in the air. Fish know no state lines or "restricted fishing zones." They live and go where food and water are what they like.

And many a fisherman, sport or commercial, alone or in a crew, feels, "If I don't get it, somebody else will."

Even so, efforts--political, governmental state and national, and scientific--became intensified in late 1990s to try for answers, some questions historically thought beyond answer. Again, are wide swings in Atlantic menhaden landings --fish hauled to the "fish factories," the reduction plants--natural cycles of good years and bad? Or are the fishermen to blame? Or pollution, from rain-flooded farm stock "manure ponds" or whatever source? The anti-cigarette drive has made many tobacco raisers convert to hogs, with tons of manure to be stored in ponds, never big enough for a cloudburst.

Or seemingly "harmless development"--hundreds of "second" or retirement homes and shopping centers, with acres of oily parking lots, where trees, brush, grass, brambles, and reeds once protected rivers, creeks, inlets, and swamps from man?

Organizations, private and public, like the Chesapeake Bay Foundation, the Alliance for Chesapeake Bay, the Maryland Department of Natural Resources, and the Virginia Marine Resources Commission and the Virginia Institute of Marine Science join in research. Likewise active is the North

Carolina Division of Marine Fisheries. The Atlantic States Marine Fisheries Commission in June 1998 ordered its first review of the menhaden management program, to try to find out if the stock is dangerously low or only in a normal cycle.

Such work is complicated by competition among fishing interests. Bunker fish boats must share waters with sport fishermen, themselves the source of living for owners and crews of charter and head boats. Fish boats often also must share with another commercial activity such as bait boats--"snapper rigs." These, a development of the last quarter century, are smaller fish boats sending single purse boats to surround schools of bunkers with seines paid out astern from the fish boats themselves. The catches are sold for bait or chum to sport and other recreational fishermen, or crab potters. Some are shipped to New England to bait lobster pots.

The sport fishermen's demand for bunkers for bait or chum worries some menhaden people. Snapper rigs have been tried on the Gulf, but in the late 1990s gill nets of more than 500 square feet were banned within a mile of the Atlantic shores or three miles of the Gulf's. Prices for menhaden, sardines, and other bait fish soared; Florida sport fishermen had to depend on bait imports from the Atlantic coast.

Restrictions on menhaden fishing itself, laws keeping fish boats and their sets three or more miles offshore of

some states, have been more than a sport fishing or environmentalist promotion in some areas. Tourism, highly profitable to any state with attractive beaches, is another factor the menhaden fishery must "live with." Beach and boardwalk crowds often complain if "smelly, unsightly" fish boats make sets close in. And if, however rarely, a net rips and thousands of foul-smelling dead fish wash ashore, or a fish boat with full holds strands, no company clean-up squad or salvage crew can get there fast enough.

The industry often can only "go along" with restrictions. Jules Wheatly, president of Beaufort Fisheries, promised to cooperate with North Carolina's restrictions "to stay in business." His \$2 million enterprise exists along with \$230 million worth of tourism on the popular Outer Banks.

Again, pleasure only or harvest too?

+ + +

A growing problem of the 1990s has been appearance in some estuaries, especially in North Carolina, of a toxic dinoflagellate Pfiesteria piscicida, a micro-organism blamed in 1997 for large fish-kills, mostly of menhaden, in the state's Neuse and other estuaries, and lesser in Maryland. When cell counts become excessive on an afflicted fish, humans touching that fish, whether while swimming, wading, or in field scientific or laboratory research may be at risk.

(A similar but different toxic dinoflagellate, Gymnodinium breve, causes "red tide" in the Gulf of Mexico, especially off Florida, and lately off Texas. All Gulf fisheries were badly hurt in the late 1990s. Isolated instances have been reported in late summers in other waters, including Chesapeake Bay.)

Most other of these micro-organisms are non-toxic, harmless, some important links in food chains. About sixty, including Pfiesteria, of 1,200 known dinoflagellates may be toxic.

Pfiesteria has been found spottily from northeastern Florida to Delaware Bay. Menhaden in creeks flowing into rivers and sounds seemed most affected. The worst appearance to 1998 caused the large kills in North Carolina estuaries. In Chesapeake Bay Pfiesteria has been reported in creeks off Maryland's Choptank, Patuxent, Chicamacomico, Manokin rivers, and the Maryland-Virginia Pocomoke, and Virginia's Rappahannock and Great Wicomico. Pfiesteria was blamed in a massive kill in Delaware Bay's Indian River and Bay in June 1987.

Fishery scientists in North Carolina, Virginia, Maryland, and Delaware sought environmental or biological causes for the organism becoming toxic during any of its many life stages. The presence of fish seemed necessary to start the toxic stage, according to research at the Virginia Institute of Marine Science (VIMS) and fellow institutions in North Carolina and Maryland. The Virginia Marine Resources

Commission (VMRC) and Department of Health. The latter especially studied human impacts, such as reported sores, nervous afflictions, and brief memory loss and flu-like feeling. VIMS developed a laboratory designed to protect workers.

A research team of University of Maryland and Johns Hopkins Schools of Medicine neuro-medical scientists, in an "Early Report" in August 1998 in the British medical journal, The Lancet, confirmed this problem. They examined twenty-four watermen and others known to have had contact with afflicted fish in the Pocomoke on Chesapeake Bay's Eastern Shore. The subjects were reported showing "deficits in learning and selective and divided attention." The longer the exposure, the worse the problem seemed, the paper said. The subjects were described as having difficulty remembering words from lists, matching numbers and letters on a diagram, and placing pegs in a grooved board. Control groups, members picked by age, sex, and occupation, reacted normally.

The clinical syndrome was described as reversible rather than a permanent affliction. The report, written by neurologist Dr. Lynn M. Grattan, cautioned that the exact cause of the affliction was still to be determined, but all evidence pointed to Pfiesteria or Pfiesteria-like dinoflagellates.

Dr. Grattan concluded the report by expressing a

fundamental need to "explore the environmental basis for the emergence of this new pathogen (with its propensity for killing fish) in the Chesapeake Bay region, and its relation to toxic Pfiesteria-like dinoflagellates in other coastal areas."

While menhaden seemed to be the main fish victims, crabs, oysters, and clams also may be vulnerable. Dr. L. Donelson Wright, VIMS director, reported the toxins were "not believed to concentrate in the fish food chain," presumably creating no risk in food fish.

An immediate problem has been finding warning signs of an impending outbreak. What shows on menhaden especially before sores or kills develop? Will a waterman see the signs, or only a scientist in a laboratory? Coastal state agencies and the federal Environmental Protection Agency sent crews to check waterways for trouble signs, and also worked on rapid response plans for reported instances or actual outbreaks.

The White House pledged \$221 million to help North Carolina's work after a 1998 kill of 200,000 fish in the Neuse River. The money was to be distributed over ten to 15 years. An additional \$365,000 was promised to help the state find or prevent new outbreaks.

The federal Center for Disease Control in 1998 gave Virginia researchers \$700,000, and the state allocated \$7.7 million for studies during the rest of the Twentieth Century.

This last half of the Twentieth Century showed the menhaden fishery's continuing shift from the Atlantic's familiar Brevoortia tyrannus to its Gulf of Mexico cousin Brevoortia patronus. In 1955 Atlantic coastal fishing grounds from New England to Florida and especially in Delaware and Chesapeake bays, gave the many fish factories more than 640,000 metric tons to render, as reported to the menhaden population dynamics team at the Beaufort Laboratory. Gulf factories received fewer than 215,000.

Atlantic captains, from Delaware and Chesapeake bays especially, long had been attracted to the Gulf. Many took fall chills the signal to "cut out" and go south, first for North Carolina's brief year-end hunt for the great masses of bunkers heading to their own warmer winter waters offshore. Fish boats then went on to the Gulf. Delaware, Virginia, and North Carolina companies had their own factories in Mississippi, Louisiana, and Texas. Indeed, more than a few Virginians moved permanently to the Gulf. Omega Protein, the largest operator, had more than 50 expatriate Virginians on its lists in 1998.

(Omega, a 1998 spin-off from Zapata Corporation, is an independent company, with 60 percent of its stock still held by the Texas oil exploration company founded by a group including George Bush, later to be President Bush.)

In 1963, first of a series of declining years along the Atlantic, Gulf landings passed the Atlantic's--nearly 440,000 metric tons on the Gulf, fewer than 350,000 on the Atlantic.

Gulf landings have been greater ever since. A Gulf record of more than 980,000 was set in 1984, when Chesapeake Bay and North Carolina sounds and ocean fleets caught a little more than 325,000 metric tons. The Gulf's 1997 landings by 50-plus fish boats at its five factories, at Moss Point, Mississippi, and Empire, Intracoastal City, Morgan City, and Cameron, Louisiana, were more than 610,000. The five-year average was 533,000 metric tons. The Virginia-North Carolina landings for 1997, by 23 fish boats to the then two Reedville, Virginia, plants and one in Beaufort, were almost 260,000 metric tons, against a five-year average of 304,000.

+ + +

In 1998 the Reedville picture changed. Here, where Captain Elijah Reed "founded" the rich Chesapeake Bay bunker fishery with two schooners just after the Civil War, the Cockrell's Creek village and its neighbors, especially creek-mouth Fleeton and west-bank Fairport, suddenly had but one fleet, one factory. Indeed the fishery and industry now had only three companies in all, North Carolina's Beaufort Fisheries, and two, Omega Protein and Daybrook Fisheries, on the Gulf.

The Reedville area, once home to fish families with the highest per capita income in the country, already had seen some early captains' Victorian homes become bed-and-breakfasts. Instead of dozens of "steamers," now

diesel, fish boats heading in dawn to the Great Wicomico River and the Bay, residents and tourists saw moored yachts and an excursion boat, Captain Thomas, to take the tourists across the widest water of Chesapeake Bay to "quaint" Tangier Island for the day.

Zapata Protein, Inc., now Omega, had bought and closed its one Mid-Atlantic competitor, Ampro Fisheries, Inc., its plant and fleet on the west bank, across Cockrell's Creek from the big Zapata-Omega factory and docks. Close to 200 men and women became jobless in "a matter of the economics of scale."

History, always revered in Virginia, likewise was jolted. Omega so recently had been Zapata Haynie, keeping alive a pioneer name of Virginia's Northern Neck between the Potomac and Rappahannock rivers. In 1913 it had been founded as Reedville Oil and Guano Company, became Haynie Products in the 1970s, then Zapata Haynie.

Ampro for forty years had been Standard Products, Inc., founded in 1948 by Hanna R. Humphreys. In 1988 his son, H.R. "Peck" Humphreys, Jr., sold the plant and fleet but not the name to Ampro, a Georgia concern then with no experience in menhaden.

The 1998 move had been foreshadowed. Zapata had been expanding in the Gulf since 1984. Then it acquired plants of Seacoast Products, originally J. Howard Smith Company of Port Monmouth, New Jersey, in Moss Point, Mississippi, and Morgan

City, Intracoastal City, and Cameron, Louisiana. In 1991 Ampro operated its own Moss Point plant as a "joint venture" with Zapata, and sold it to Zapata in 1992.

+ + +

Other Gulf Coast menhaden operations have at times been as volatile as those of a half century or more on the Atlantic and Delaware and Chesapeake bays. In 1998 five factories and their 50-odd fish boats were active. In 1983 there were eleven. Seacoast, Standard Products, and Zapata then were in Moss Point, up the Pascagoula River from Mississippi Sound. In Louisiana, Empire Menhaden of the North Carolina Wallace origin and Petrou were in Empire, down the Mississippi from New Orleans. Zapata had plants in Dulac and in Cameron, almost to the Texas border. Also in Cameron were Wallace's Louisiana Menhaden and Seacoast. Seacoast also had plants in Morgan City and Intracoastal City.

One new plant was built at Morgan City, next to the now closed Seacoast plant, in 1989 by Gulf Protein, Inc. This, an enterprise of O.W. Burton of Burton Shipyards, made nine active Gulf plants, Eight years later Zapata bought it.

The 1990s started with nine plants, but Daybrook Fisheries took over the Petrou plant at Empire. The next year Wallace's Louisiana Menhaden plant at Cameron closed. In 1992 Zapata not only took over the Ampro property at Moss Point, but Daybrook and Empire Menhaden merged, leaving six active plants. In 1996 Zapata closed its Dulac plant, to leave five.

The 1998 Gulf line-up was Omega at Moss Point, Morgan City, Intracoastal City, and Cameron, and Daybrook at Empire.

+ + +

Among natural problems in the Gulf has been an annual summer hypoxic area or "dead zone" of low oxygen which kills many menhaden--and other fish--or drives surviving bunkers to near-shore waters, even as close as a yard--too shallow for purse seining--for oxygen. The size of the hypoxic zone varies, large in 1997, smaller but earlier in 1998. Windy weather then mixed the water column well.

Menhaden catches of the 1995 summer were reported "exceptionally low" off Louisiana west of the Mississippi passes, because of the low oxygen waters along the near-shore.

Steven J. VanderKooy, inter-jurisdictional coordinator for the Gulf States Marine Fisheries Commission, reported the dead zone closely related to varying nutrient loads from the Mississippi River. The river brings nutrients from as far as Minneapolis, plus the Missouri's Rocky Mountain springs and Pennsylvania to Tennessee coal fields, to spread east, south, and west. The Mississippi's nutrient loading, plus that of the Atchafalaya and other Gulf coastal river systems, contributes to increased algal or plankton blooms--eutrophication. When blooms die off, they settle to the bottom. Decomposition creates water of low or no oxygen content near the bottom.

Dr. Robert J. Diaz, a VIMS biologist, in a study of Gulf

and other dead zones, reported continuing expansion in many waters in the 1990s. The Gulf's dead zones, he reported, have been increasing since first measured in 1973, with the size doubling in years of Mississippi River system floods.

The record 1993 flood was cited by Dr. Nancy N. Rabalais and other Gulf oceanographers as exceptionally productive of oxygen-depleting nutrients, with "near anoxic conditions" prevailing during the peak.

Dr. Diaz speculated that further increases here and world-wide could be expected with population growth, competition of living standards and environmental needs, Third World development along with loss of yields elsewhere, increasing use of artificial fertilizers, and global warming. (The last is a matter of dispute among climatologists.)

+ + +

The Twenty-First Century outlook for the bunker fishery, Atlantic and Gulf, may well be shaped by world economic changes, including Asia's, as much as familiar guides and problems. That long awaited approval of refined fish oil in foods helped greatly in the waning Twentieth Century. Fishery and industry people wonder why the delay of so many years in the Food and Drug Administration. They may reflect that approval of a billion-dollar aphrodisiac had sex appeal, but action on something all Europe had long known to be good and safe could wait until "we get around to it."

Barney White of Omega, a spokesman for the National Fish Meal and Oil Association, commented only that the approval released the industry from dependence on sales of our fish oil in Europe--amid tariff disputes.

Introduction

Fish normally inspire limited "creative" writing. There are Hemingways who find eternal verities in the hunt and catch of big game fish, but most literary production on the subject runs to blood and thunder, plus technical talk on tackle, lures, and boats. In commercial fishing there have been even fewer Joseph C. Lincolns or Rudyard Kiplings or Norman Duncans to tell of cod and mackerel.

Oddly, the menhaden, the bunker, the porgy, the fish that has been an almost unknown part of our life from earliest days, has evoked excellent writing. Too little has been printed where it could be appreciated, no doubt because it's hard to get up general interest. Do we tell of the barefoot boy with hickory pole, grocery store string, bottle cork, and bent pin? Hardly. The toothless bunker bites on nothing. He wouldn't know how. Do we tell of the rugged woodsman, casting with rifle accuracy into a few square inches of a mountain stream or the surf fisherman dropping his lure into the breakers? Hardly. You could cast all day into a school of a half-a-million bunkers and reel in nothing unless you used a snag hook. Pure statistics might put one or two on the barbs. Then you wouldn't eat them unless you were just short of starvation. (Our generation isn't hungry enough. Menhaden have been praised by gourmets of other centuries.)

This book is partly an anthology of a scattering of the good writing, mostly of the eighteenth and nineteenth centuries, with a

bit from the mid-twentieth. Much of the writing was done or collected by George Brown Goode, curator of the United States National Museum and assistant secretary of the Smithsonian Institution from 1887 to his death in 1896, for his own book, *The Menhaden*, published in 1880 as part of the Fifth Annual Report of the Commissioner of Fisheries, and a later work, *The Menhaden Fishery*, done as editor with A. Howard Clark in an overall survey of the fisheries of the United States and published in 1887.

George Brown Goode was a noted ichthyologist who had studied under the great Louis Agassiz, longtime professor of zoology and geology at Harvard University, and a member of the Hall of Fame for Great Americans at New York University. In 1873, the year of Agassiz's death, Goode became at twenty-two an assistant in the United States Fish Commission, the next year the chief of the division of fisheries at the National Museum, and in 1887 assistant secretary of the Smithsonian, in charge of the National Museum. He held this position until his death, only forty-five years old but with a record of scholarship and scientific achievement hard to match even today.

Much of the writing in Goode's *The Menhaden* was by correspondents: factory owners, fishermen, lighthouse keepers, local officials, inspectors, and just people who replied to his questionnaires or who had written reports. Still others were scientists,

AMERICAN FISHERIES

A HISTORY

OF

THE MENHADEN

BY

G. BROWN GOODE

CURATOR U. S. NATIONAL MUSEUM; ASSISTANT, U. S. FISH COMMISSION; AUTHOR OF "THE GAME FISHES OF NORTH AMERICA;" SPECIAL CONTRIBUTOR TO AMERICAN AGRICULTURIST

WITH AN ACCOUNT OF THE

AGRICULTURAL USES OF FISH

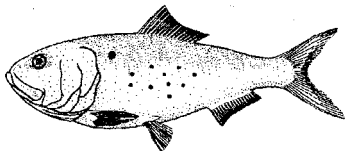
BY

W. O. ATWATER

PROFESSOR OF CHEMISTRY, WESLEYAN UNIVERSITY; SPECIAL CONTRIBUTOR TO AMERICAN AGRICULTURIST

AND AN INTRODUCTION, BRINGING THE SUBJECT DOWN TO DATE

THIRTY PLATES



Title page of George Brown Goode's menhaden history published nearly a century ago. Only a few copies are still to be found.

among them Benjamin Henry Latrobe, the engineer-ichthyologist who gave a first scientific description and sketch of the species in 1802.

All had taken the trouble to put down in simple, direct words what they saw in our coastal waters and estuaries. None had been exposed to schools of business administration or college of law courses in communications skills. None had been told that to make a point stand up in court, you had to wrap it so opaquely that only your associates, to please you, could pretend to understand it.

What many wrote and said was readable and intelligible even if you never had heard of a bunker. It was good of George Brown Goode to use so much of it verbatim in *The Menhaden*, including his own "in press" revisions covering the 1878 and 1879 seasons and the limited information in Washington on that remote Chesapeake Bay, one hundred miles away by geography, a century away in time.

Today there are few copies of *The Menhaden* or *The Menhaden Fishery* to be found, and they in fragile condition. The Smithsonian itself has none that it knows of. Captain and Mrs. H. Urban Haynie of Reedville, Virginia, have one of the former. Allen Haynie, chairman of the board of Zapata Haynie Corporation, has one of the plates of the later, and he had it rebound to save it. Both have generously allowed me to make copies of the illustrations.

Urban Haynie is a retired menhaden skipper, and his copy bears, in pencil on the flyleaf, the name of his father, J. H. Haynie, likewise a captain, who died in 1964 at ninety-six. The elder Captain Haynie's signature is on the last flyleaf inside the back cover. The Virginia State Library has a photocopy but not the original it once had. The Library of Congress has one. There are probably a few scattered in home and public libraries along the East Coast.

I have quoted from George Brown Goode's writing and gathering, partly to tell the early story of the fishery and industry, partly because they are the only extensive authoritative studies so far, and partly just to pass on the artistry of those men before it is lost. Not all his correspondents were gifted. Some were quite stodgy. Others replied in

obvious impatience to what they no doubt regarded as "another fool gummint form" that ran to sixty-eight pages. (What would they say today?)

For a sample of how such men talked and wrote a century ago, let us pick up what Captain Isaiah Spindel, manager of a fish pound on Buzzard's Bay, said in 1874 in testimony on the ravages of bluefish around Woods Hole, Massachusetts, as quoted by Goode from a government report:

A bluefish will destroy a thousand fish in a day. When they get into a school of menhaden you can see a stream of blood as far as you can see. They go into them and they will destroy the whole school before they let them go. They put up the guano factory here (at Woods Holl [sic]) on account of menhaden being so plenty then. Twenty-five or thirty years ago there were no bluefish, and menhaden were plenty. Only once in a while were there any bluefish there. Finally the bluefish got so plenty they drove all the menhaden out of the bay. There are plenty of menhaden up in the heads of the harbors; some bluefish will go up and drive them up as far as they can, but bluefish don't like to go up into fresh water. Squeteague [sea trout or weakfish] will swallow menhaden whole. I have seen bluefish and squeteague throw the food out of their stomachs when caught. I think the bluefish fill their stomachs and then empty them just for the fun of the thing, so as to catch more fish. I have seen them go into a school of menhaden and catch some and throw them up again, and then go in again. I could not swear they throw the stuff up, but I am positive that it is so. I have seen fish all chewed up and thrown out in the water. They often bite and swallow a part and leave the rest.

A purist grammarian could find himself disquieted, but a Hemingway would find the description dynamic. It told the story of blues and menhaden as fishermen today, commercial or sport, can see it almost any summer day on many of our waters, coastal or estuarine.

And here is Goode's own appraisal of "the place of menhaden in nature":

It is not hard to surmise the menhaden's place in nature; swarming our waters in countless myriads, swimming in closely-packed, unwieldy masses, helpless as flocks of sheep, close to the surface and at the mercy of any enemy, destitute of means of defense or offense, their mission is unmistakably to be eaten. In the economy of nature certain orders of terrestrial animals, feeding entirely on vegetable substances, seem intended for one purpose—to elaborate simpler materials into the nitrogenous substances necessary for the food of other animals which are wholly or in part carnivorous in their diet. So the menhaden, deriving its own substance from otherwise unutilized organic matter, is preeminently a meat-producing machine. Man takes from the water annually six or seven hundred millions of these fish, weighing from two hundred and fifty to three hundred thousand tons, but his indebtedness to the menhaden does not end there. When he brings upon his table bluefish, bonitos, weakfish, swordfish, bass, codfish, what is he eating? Usually nothing but menhaden!

To that now may be added, although not as "nothing but," chickens and pork, and only lately, catfish raised by aquaculture on fish farms. The sixty percent protein content of fish meal no longer goes into farm fields as a major ingredient of guano or fertilizer, but as a supplement for poultry and stock feed, competitive with other proteins such as soybeans. Executives of today's menhaden factories watch the Chicago Board of Trade for trends in soybeans and grains as closely as they watch their own and official reports on new "year classes" of menhaden appearing in tidal creeks every spring.

And again, nobody in the marine science laboratories has been able to tell much more about the seeming "one purpose"—to be eaten—for which the menhaden were created. And nobody has improved on Goode's description of a "food chain" or "food web."

There is much more, with fragments quoted in this book. The Smithsonian might consider looking on some long-forgotten shelf for George Brown Goode's works, handing

them to an ichthyological scholar to edit out obsolete and partial or conflicting information and tables and republishing them. After all, some menhaden captains today say, "We don't know much more than he did."

Only a few years after Goode's and Clark's 1887 book, the bunker even became inspiration for verse, a height it likely never will achieve again in a literary world that affects to scorn rhyme and rhythm (and reason, too, it often seems!). In 1894 Isaac McLellan, a nature and travel writer whose books had included *Poems of the Rod and Gun* and *Fall of the Indian*, introduced this in his *Haunts of Wild Game*, published by "Chas. Barker Bradford, 487 Broadway, New York":

MENHADEN

*O'er ocean waters, sound and bay
The twinkling June-time sunbeams
play;
And white with foam the billows
shine
Where the mossbunkers lash the
brine.
Above them flocks of seagulls swing;
Beneath the hungry bluefish spring.
And deadlier still the surfmen
strain
The oar, and run the meshing seine.*

*Where sweeps the broad and breezy
bay
Engirt by shores and woodlands
gay,
In shoals unnumberable as sands
That sparkle o'er the wrinkled
strands
The bunkers gather on the flood,
Roaming the ocean paths for food;
And here the fisher-boats invade,
Deep with the shining burden
weigh'd.*

*Off by the low New Jersey shore,
Off where Long Island's surges roar,
Off where the Narragansett Bay
Its tribute to the sea doth pay,
Off Massachusetts Bay profound,
Off Maine shores with their
pinewoods crown'd,
Off where the billows chafe and fret
O'er rocks along New Brunswick set,
These fish innumerable pass
O'er stormy seas, o'er seas of glass.*

On his title page McLellan quoted the well-known lines by Lord Byron: "There is a pleasure in the pathless woods,/There is a rapture on the lonely shore./There is society where none intrudes." His verse is short of Byronic, it misses mentioning the then-active Chesapeake Bay and North Carolina fishing, but on the whole it's a true picture. And the next page has a poem on bluefish. Who is to call it doggerel?

□ □ □

What does the menhaden look like? Just a fish. Nothing spectacular like a swordfish, nothing formidable like a shark, nothing beautiful like a tropical reef fish, nothing impressive like a sturgeon, nothing playful like a dolphin, nothing other-worldly like a sea horse.

To quote George Brown Goode, whose language has since been put into more scientific terms, but not bettered:

In length the menhaden is about the same as the common sea herring, but is deeper and more robust in appearance. Its weight, when full grown, is from two-thirds of a pound to 1 pound. A large specimen, of which a cast is preserved in the National Museum, measured 20 inches in length, while the average length is from 12 to 15 inches. At the menhaden factories, in estimating the number of fish in a certain bulk, 22 cubic inches are allowed to each fish.

The geographical range of this fish is along the Atlantic seaboard from Maine to Florida, the northern limit being the Bay of Fundy, while the southern limit is Mosquito Inlet, on the Florida coast. It is found in bays and rivers as far inland as brackish water extends, and it ranges oceanward as far as the Gulf Stream. Other species of menhaden occur in the Gulf of Mexico, along the South American coast, and on the West Coast of Africa, but none resembling it are found in the Pacific Ocean. The fishery

is limited to the Atlantic seaboard of the United States.

This geography now would be amended to include the Gulf of Mexico, where the largest catches, of a smaller species, have been made in recent years. There are two other minor species, fine-scale and yellow-fin, also caught in the Gulf, and two others are found off the Atlantic coast of Brazil and Argentina.

Having described the annual migration north, with the fish following the warming water in spring, Goode reported that:

Not enough is known of the movements or habits of these fish to determine the winter home of the great schools that summer along New England and most southern shores, but one of the most plausible theories at present advanced is that they remain in temperate strata of ocean waters known to exist under the Gulf Stream and between it and the American coast.

That's still a plausible theory. In the late fall and early winter the schools move southward, pour out of the Delaware and Chesapeake Bays, join in huge bodies off the North Carolina coast, and then disappear. The Chesapeake Bay fleets follow them as far as Georgetown, South Carolina, for a brief fall fishery, weather permitting as it often does not, then return to harbor for the winter.

There is a possibility, not given too much credence by our marine biologists, that the huge factory-oceanographic ships of the Soviet Union's distant water fishing fleet have found out where the bunkers go. Marine biologists and oceanographers are among the supercargo of these vessels, and until March 1, 1977, when our two-hundred-mile fisheries conservation zone limit went into effect, they spent much time in these waters. The Soviets were reported developing a purse seining fleet larger than our combined menhaden fleets, apparently with the intention of going after menhaden despite official denials, their own and our State Department's.

In the lore of the fishery, captains of freighters and cruise ships report passing through tremendous schools of menhaden in the winter, but nobody ever seems to get the coordinates.

"As the menhaden appear in early spring in Chesapeake Bay and farther north,"

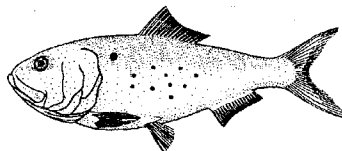
Goode continued,

they increase rapidly in abundance until in some places the water is almost alive with them. They prefer the shallow places along shore, and in some years crowd in great numbers into the brackish sounds and inlets and ascend some of the rivers for a long distance, until the water becomes too fresh for them. They are accustomed to swim in immense schools with their heads close to the surface, packed side by side, and often tier above tier, almost as closely as sardines in a box.

A few lines from the best book written yet about Chesapeake Bay may show an unusual view of menhaden, one that no menhaden fisherman himself has ever seen. In the late 1940's Gilbert Klingel, now a boat builder on Virginia's Gwynn's Island and then a devoted naturalist with a great curiosity for what happens below the Bay's waves, wrote *The Bay*. He had done helmet diving as a hobby for years and also designed and built a diving bell he called a "Bentharium" at Solomons, Maryland, on the Patuxent River, so he could see underwater life which was previously hidden from almost everybody. Today scuba divers can see what he saw, but so far they have been interested mostly in old wrecks. Following his underwater observations of menhaden schools, Klingel wrote:

To see one of these hordes of menhaden underwater is a never-to-be-forgotten sight. I have been completely surrounded by their massed golden-hued shapes. Packed in serried ranks, head to head, tail to tail, they have poured past my helmeted body in a deluge of finny forms. Nearly always they are in a state of high nervous tension. The slightest motion will cause them to break into terror-stricken flight; instantly the mechanisms of fear take hold of the entire school and the hysteria is communicated from one individual to another until the entire mass is transformed into a blurred deluge of

Part of a school of menhaden, as seen below the surface, swimming tightly packed with their mouths open for constant feeding on plankton. National Marine Fisheries Service photo by W. F. Hettler.





frenzied fish. Then, inexplicably, the terror passes and almost instantly they will cease their dashings and once again move slowly throughout the water. Frequently minor attacks of nervousness will occur and send waves of temporary panic through local areas of the school. . . .

In another passage of *The Bay* Klingel wrote: "Fishes which in the upper air are plain gray or silvery, when viewed in their own medium may become the colors of pearls, brilliant yellow, old rose, or iridescent green or blue. Thus menhaden, dull things of tarnished silver, become glittering objects of burnished coppery gold. . . .

Klingel echoes Captain Spindel's report of an attack by blues or other predators, including seagulls overhead, and he adds:

The crazed, terror-stricken menhaden, with no defense, can only flee. Their safety lies in their vast numbers; the schooling habit that causes them to become ready victims is their salvation. Theirs is a communism dictated by instinct; as in all communisms, the individual is sacrificed for the mass. Hundreds die in every attack but thousands escape only to become in their turn sacrificed. Few menhaden ever succumb to old age; they are born to die violently.

Klingel also gave a chapter to "The Top of the Bay," and described being becalmed in a sailboat in a tide rip and seeing many different forms of life, much of it planktonic, likewise held motionless by the opposing tides. Many creatures, jellyfish, crabs, and others, rose to feed, hunger bringing them to the surface.

"And in proof of this," he continued, "a wide school of menhaden swept by in perfect formation, their gaping mouths extended, scooping up the accumulated life. They were skimming the surface as close as possible and they wheeled back and forth following the line of the rip. In the distance I could see ripples caused by the dorsal fins of other feeding schools."

□ □ □

I knew none of this when I came to Chesapeake Bay in 1962 from Ohio, where fish means mostly Great Lakes fish. (George Brown

Goode had come from even deeper in the mid-west—New Albany, Indiana, across the Ohio River from Louisville, Kentucky.) I looked for things to write about and soon heard of menhaden, the fishery and industry. B. Brainerd Edmonds, Jr., sales manager for Standard Products Company, Incorporated, one of the larger companies, arranged for my wife and me to go out on a fish boat. His choice was right: the *Joseph F. Bellows*, *Big Joe* of a diesel fleet that still called its boats "steamers" even though no boilers had been fired for years. The captain was Wallace E. Lewis, one of the best and a veteran of thirty-five years of menhaden fishing. He had had the same crew for years, and they worked together almost as one living being. Every man knew what he was doing and what every other man was doing.

It was all instructive, and wearying. We went aboard before dawn at Fairport, Virginia. Captain Lewis had promised to telephone us in time to get there, but we didn't wait, and we drove the fifteen miles to the docks. Everybody was asleep aboard the fish boats, so we sat on the dock. Then we went back to our car, parked so we could see the docks, and fell asleep. Soon Captain Lewis came up looking for us. We should have depended on him.

Aboard and fishing, he bore with ignorance and explained everything, some of it, by necessity, several times.

I have been accumulating information, history, and photographs ever since, with the help of scores of menhaden people—fishermen, pilots, engineers, mates, captains, aerial spotters, managers, and association executives, active or retired. To name them all would be to compile a directory of the Chesapeake Bay menhaden fishery. If they regretted telling me anything, they restrained their indignation.

No doubt my output had gaps in understanding, if nothing worse. I am told that I created a financial crisis by quoting what a speaker said at a meeting about uncertainties. They were well understood in the industry, but bankers go into cataleptic trances at the word. At least they did then, before bank credit cards, Madison Avenue billboard nonsense, and "ethical" overdrafts.

A number of people ought to be thanked publicly for their help, some of it unwitting. Among them must be J. Steele Culbertson, late

executive director of the National Fish Meal and Oil Association. Steele could be depended on to hunt me down by telephone when some federal idiocy seemed likely to be executed to the detriment of the menhaden fishery—or all fisheries. At times I could sense his head wagging wearily over the latest reason given by our State Department for blocking any protection from the big foreign fleets, mostly Soviet, cruising our coasts and taking everything that might fall into their fine-mesh nets. The Soviets seemed periodically to test the vigilance of the Coast Guard and American fishermen by sending a satellite country's trawler (never their own) inside the twelve-mile limit to see what they could get away with. Some did and some didn't. The State Department showed interest only when the captain came before a "hanging judge" in Norfolk, Baltimore, New York, or Boston. Steele died in 1975 to confirm what Oliver Herford said in the nineteenth century whenever a death was posted on the Lambs Club bulletin board: "Always the wrong man." His successor, Thomas E. Reynolds, has been equally helpful in our still-short relationship.

I could go alphabetically through the company people: W. T. Beatley, Jr., Dalton Berry, Horst Brose, David Clarke, Earl J. Conrad, Jr., A. McNeal Covington, William Davis, John D. Deihl, Jake Dermer, H. L. Dickens, Sr., Ray Diemes, the Ammon G. Duntons (father and son), B. Brainerd Edmonds, Jr., E. C. Ford, Allen Haynie, Clem Haynie, A. A. Hudnall, H. R. Humphreys, Jr., Ben Humphreys, Joseph Jett, Miss Aleta McNeal, James Nelson, Stuart, Francis, Randolph, and John A. Palmer III, William P. Poluk, John and William Quinn, R. A. Rankin, Jr., Ray Richardson, Benson Riggan, Joseph Schollenberger, Harvey and Otis Smith, Ray Stevens, Jack T. Styron, George and Borden Wallace... and still not catch them all.

Captains must include Walter Biddlecomb and the late Alfred Biddlecomb, Kenneth Davis, Hudnall Haynie, Manuel Haynie, Urban Haynie, E. Vincent Haynie, the late Odell Lawson, Wallace E. Lewis, John B. Lowry and his brother Len Lowry, Meredith Robbins, Leland Robinson, and Lacey Rose.

Reedville people and others include Norris Haynie, one-time bookkeeper for the Davis Packing Company of whom I was told, "If

Norris doesn't know, nobody does." Another was Mrs. Miriam Haynie, author and historian of the Northern Neck of Virginia and widow of W. Harold Haynie, a nephew of Captain John A. Haynie, a founder of what is now Zapata Haynie Corporation. Mrs. Warren Slaughter and Reed Randolph, great-grandchildren of Elijah Reed, the founder of the Chesapeake Bay fishery, told much of their family.

Among marine and other scientists, including space, who have helped are Robert Chapoton, J.Y. Christmas, Jackson Davis, William J. Hargis, Jr., Andrew J. Kemmerer, John Merriner, D. R. Montgomery, William Nicholson, and Kent S. Price. If any of my information is out of phase scientifically, it's on me, not them. They did all they could to set me straight and save me from some of my own notions.

In the federal government, I must name Gerald D. Hill, Jr., public affairs officer for the National Marine Fisheries Service, and his whole staff for willing and fast response to my frequent "panic calls" for information. What they couldn't find for me, either in their own files or those of the old Bureau of Commercial Fisheries, probably was known to no one in Washington.

Sport fishermen interested in calming passions between their people and the menhaden fishermen and helpful in my effort included Gene Baker and T. D. Keatley.

Sea Grant personnel who hunted down information included Betty Edel, Sally Kuzenski, and Thomas M. Leahy. Marine museum scholars included Robert F. Burgess of the Mariners' Museum at Newport News, Virginia, Stuart M. Frank of Mystic Seaport, and Charles McNeill, Jane Wolff, and others of the staff of the Hampton Mariners' Museum at Beaufort, North Carolina. Maryland state officials included William Jabine II and Paul Wentzel. Among others elsewhere were Charles D. Briddell, David H. Hart, and William Lyman grover.

A word ought to be said for David R. Getchell and Steve Saft of *National Fisherman*, who must have wondered at times if anybody was covering Chesapeake Bay for them while I was off on some "literary" expedition. Their patience is appreciated. The 1978 *National Fisherman Yearbook* carried

an adaptation of my chapter on remote sensing of fish.

And I must return to the fishery itself—to thank the hundreds of fishermen who have told me what they thought was good and bad in the thirty to forty years they remembered. Some, like Sherman Curry, Charles E. Williams, and Willard Taylor, talked to me often and at length. Raymond Curry and Charles Winstead were most helpful in tracking down the story of chanteys. My daughter, Ellen, a professional musicologist, traced out origins in black work songs.

And there were many scores of others whose names I never learned. They answered a quick question during a set, or explained something else going on, and always willingly. Aboard a fish boat, the cook always saw to it that I got mine, and plentifully.

Preparation of a book always takes a

lot of non-creative labor, physical labor about in the same scale of human endeavor as ditch digging except that it hasn't been mechanized so far. My wife, Harriet, put up with much, and on the creative side, probably had more to do with this book than I know. Her artist's eye saw much that my reporter's eye missed. Much of whatever is good came out of her suggestions and observations.

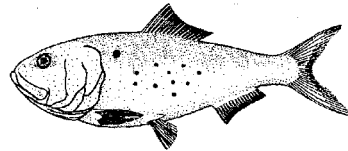
For services rendered, I owe much to H. R. Humphreys, Jr. Partly because he could be reached without a toll call, I badgered him often. To draw on his far-reaching knowledge of the industry, I had to take much time that he should have been giving to his company, Standard Products. Some of that time went into a final scanning of my manuscript to catch anything I wrote that simply was not so. Again, what he missed is on me, not him.

PART ONE

From Squanto
to Sabine Pass

I. The Squanto Story—If So

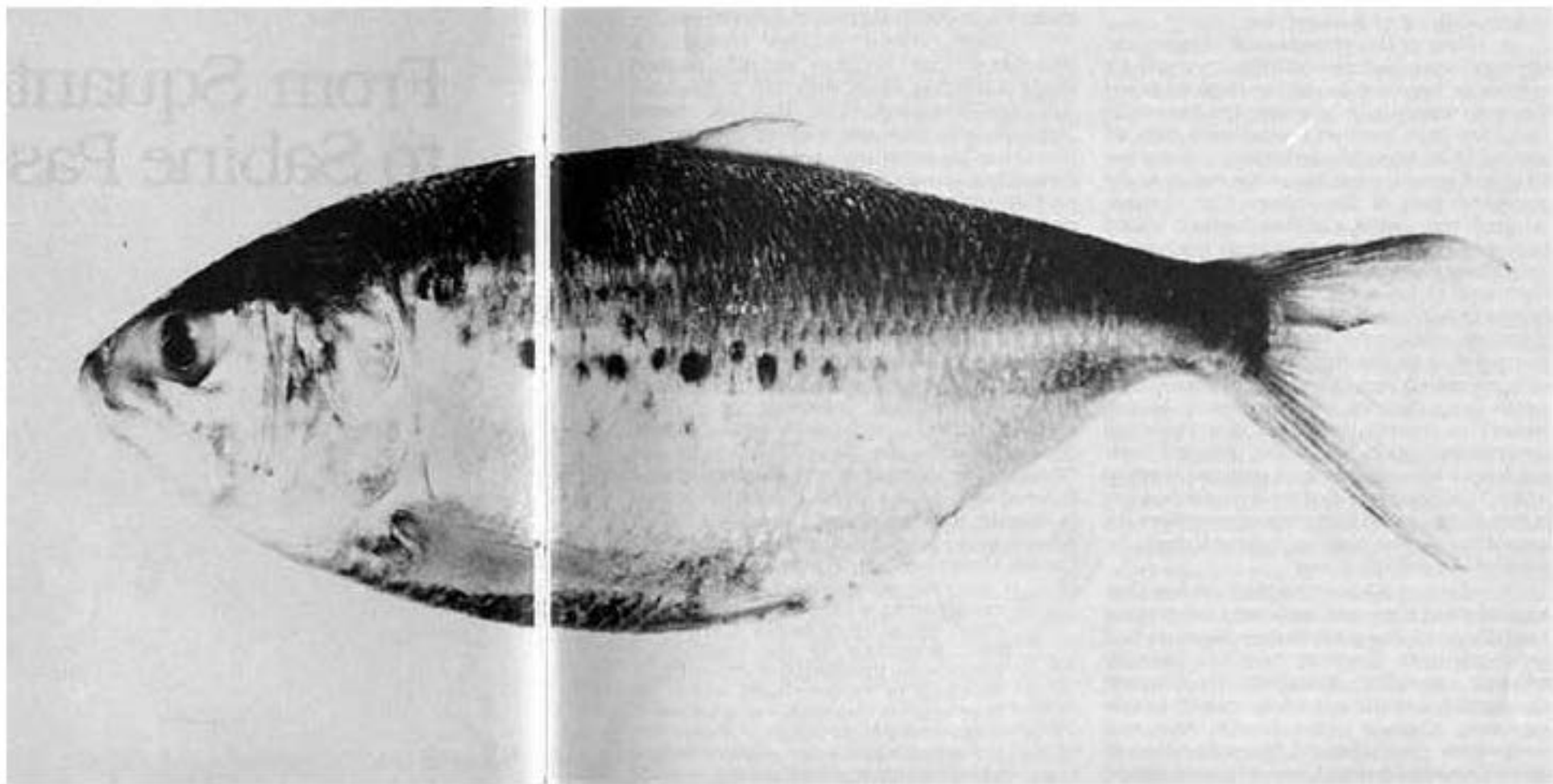
One happy day in April 1621, when the dreary winter of what was to become New England was becoming spring, an Indian named Tisquantum, so the legend goes, came to the hungry colony of Plimoth on the shores of Cape Cod Bay with sound agricultural advice of debatable origin. This may have saved the lives of the surviving Pilgrim Fathers, and of the mothers and children, for more winters, longer and drearier than even those of other Englishmen who settled in 1607 on the banks of the James River in Virginia but had to wait until 1619 to be thankful enough for our first Thanksgiving.



As Governor William Bradford described it in his *History of Plimoth Plantation*:

They (as many as were able) began to plant their corne, in which service Squanto (an Indian) stood them in great stead, showing them both y^e manner how to set it and after how to dress & tend it. Also he tould them, axcepte they got fish & set with it (in these ould grounds) it would come to nothing; and he showed them y^t in y^e middle of April, they should have store enough come up y^e brooke by which they began to build, and taught them how to take it.

Just what fish was running up the brook is not certain. Later accounts of the Plymouth Colony call it a herring "or rather a shad," and also an alewife. One Thomas Morton wrote in 1632 of Virginia, "There is a fish (by some called shadds, by some allizes)



that at the spring of the yeare passe up the rivers to spawn in the ponds, & are taken in such multitudes in every river that hath a pond at the end that the inhabitants doung their grounds with them."

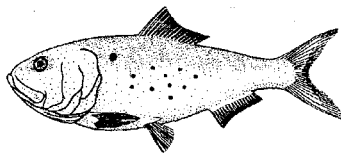
What Tisquantum or Squanto himself called them is unknown. More than a century ago Professor J. Hammer Trumbull, a Hartford, Connecticut, philologist, responded to an inquiry by George Brown Goode, who was gathering material for what was to become the first comprehensive study of fish in this country:

About all I can give you is my note to the new edition of Roger Williams' Key, ch. xix. Williams names, together, among spring fish, "Aumsûog and Munnawhatteaûg."

Under the former name are included several species of the herring tribe, *aum'su* (plural *aums'ûog*) meaning "small fish." *Munnawhatteaûg*, corrupted to *menhaden*, means, literally, "fertilizer" ("that which *manures*"). This name was applied to the herring and alewife as well as the "menhaden" proper—all these species being used by the Indians for manuring their cornfields.

In the northern and eastern parts of New England the *Brevoortia* [menhaden] is commonly called *Pauhagen*, and probably in some

The Atlantic menhaden, *Brevoortia tyrannus*. National Marine Fisheries Service photo, from Bureau of Commercial Fisheries files.



localities "poghaden" (as you write it and which is nearer the Indian original) though I have not heard it so pronounced by eastern fishermen. This name in the eastern dialects has precisely the same meaning as "menhaden" (or rather *munna-whatteaûg* in southern New England). The Abnaki (i.e., coast of Maine) name was *Pookhagan* as Rasles wrote it, and the verb from which it is derived he translated by "on engraisse la terre" [It manures the soil].

Dr. Trumbull then found that another term, "mossbunker," was classic, being mentioned in a 1661 poem "In Praise of New Netherlands," and in a 1679 journal of a voyage, varied as *marsbanckers*. He thought the Dutch settlers of New Amsterdam had brought this name from home for he could "make nothing of it as Indian."

Despite the etymological uncertainty, the menhaden fishery and industry traces its origins to Tisquantum, by the Pilgrims called Squanto, who was no ichthyologist. He may in fact have been more of a prankster than an agriculturist, no matter how grateful Governor Bradford was for what his advice meant to the surviving half of the colony. One modern student, semi-serious, of New England affairs suggests that Squanto really was having fun with these earnest Englishmen with their tall hats and pious ways. John Gould, the sly Maine countryman whose reverence for New England folklore is selective, thinks that putting fish in the hills of corne most likely only attracted every fish-eating animal within miles: bear, bobcat, mink, raccoon, skunk, weasel, or marten. He noted that Plymouth records add that "then they planted their gardens a second time and guarded them at night," and suspects that Squanto told many a merry story around Wampanoag campfires the rest of his life. Not many campfires, though, for he died the following year.

If it was a joke, it might have been his idea of justice for bad treatment from other Englishmen a few years earlier. Squanto had been taken to England in 1605, possibly willingly, possibly kidnaped, by Captain George Weymouth, one of the pre-Plymouth explorers. Captain John Smith, who was everywhere then, brought Squanto home in 1614. Captain Thomas Hunt, left in command

of the Massachusetts outpost, then lured Squanto and nineteen other Indians aboard his ship, took them to Málaga on Spain's Mediterranean coast, and sold them as slaves. With such treatment from Christians, Squanto resisted efforts to make him one, and escaped to London, smuggled aboard a ship of the Guy Colony of Newfoundland. In London he lived for two years with a rich merchant, John Slanie or Slany, who was treasurer of the Newfoundland Company. Squanto next was taken to a Newfoundland settlement, "The Cupids," to serve the governor, Captain Mason. Then he became pilot and guide for Captain Thomas Dermer and was taken home again. He arrived in Plymouth harbor six months before the *Mayflower* brought the Pilgrims. He found his family and friends had died in a plague. When the Pilgrims came, he made friends with them in his loneliness.

Lately comes another thought, a contention that Squanto actually learned about manuring fields with fish in England and Newfoundland. The Pilgrims, being "agriculturally illiterate," just didn't know the practice in their own country. And the Indians themselves always found it easier to move to new land or back to fallowed land than to try to restore exhausted fertility in "ould grounds," according to Dr. Lynn Ceci of the anthropology faculty of Queens College at the City University of New York. Dr. Ceci's suggestion in an April 1975 article in *Science*, the official publication of the American Association for the Advancement of Science, set off a scholarly uproar among New England traditionalists.

Joke or no, European or Indian, manuring fields with fish soon became general practice in New England. In his "Relation or Journal of the Beginning and Proceedings of the English Plantation settled at Plimoth, in New England, by certain English Adventurers both Merchants and others," George Mourt wrote in 1622:

We set the last spring some twenty acres of Indian corn, and sowed some six acres of barley and beans, and, according to the manner of Indians, we manured our ground with herrings, or rather shads, which we have in great abundance and take with great ease at our doors. Our corn did prove well, and God be praised, we had a good increase of Indian corn, and our

barley indifferent good.

In 1644 the town of Ipswich, Massachusetts, passed an ordinance requiring all "doggs...[to] have one legg tyed up... If a man refuse to tie up his dogg's legg, and hee bee found scrapeing up fish in a cornefield, the owner thereof shall pay twelve pence damages beside whatever damage the dogg doth...." Which seems to bear out John Gould's jest theory, in a domesticated way.

Thirty years later Edward Johnson's "Wonder working Providence of Sion's Saviour in New England, being a relation of the firste planting in New England in the yeere 1628," gave further witness:

But the Lord is pleased to provide for them [colonists] great store of fish in the spring-time, especially alewives, about the bigness of a herring. Many thousands of these they used to put under their Indian corne, which they plant in Hills five foot asunder; and assuredly when the Lord created this corne, hee had a speciall eye to supply these his peoples wants with it, for ordinarily five or six grains doth produce six hundred.

The practice came to scientific attention in 1792 in a paper by "the Hon. Ezra L'Hommedieu, of New York," in the *New York Agricultural Transactions*. The Long Island landowner reported that "Experiments made by using the fish called menhaden or mossbankers as a manure have succeeded beyond all expectations...." His conclusion was simply that the fish "enrich the land by their putrefaction." President Timothy Dwight of Yale College wrote similarly in 1804 of Eastern Long Island and Connecticut practices, and others of lesser renown but perhaps more practical knowledge added their testimony in the early nineteenth century. Later experience indicated that manuring with fish could be overdone, to make the soil oily, parched, and sterile.

Thus, what is today called, in our inflated language, "the image" of the menhaden or mossbunker became so established that even in the last half of the twentieth century a few old-timers in the industry, particularly in Virginia's southern portion of Chesapeake Bay, called menhaden "fertilizer fish." This despite the fact that by then menhaden had not been so used for many

years. The last company to include in its name "guano," the term long used for fertilizer made from dried fish scrap in a technological development following manuring with raw fish, dropped the name in 1968 "because no one knew what it was any more."

Part of the uncertainty over the exact fish used for manuring Pilgrim fields may grow out of—and today with—the many names the Atlantic menhaden was given by fishermen from Maine to Florida in the eighteenth and nineteenth centuries, some still to be heard. In New England, the Indian "poghaden" became "pogies," "porgies," and "poggies," also "alewives," "hardhead," "hardhead shad," "whitefish," "mossbunker," "bunker," and "bony-fish." Around New York Bay and Long Island Sound they were again "mossbunkers," and in Delaware Bay "old-wives," "old-wife chebogs," "ell-wives," and "bug-fish." They were, and still are to some watermen, "alewives" in upper Chesapeake Bay and the Potomac River, and also "bug-fish," "bug-heads," and "greentails" in lower Chesapeake Bay and the big Virginia tidewater rivers. In the Carolinas they became "fat-backs" and "yellow-tailed shad," and in Florida's St. Johns River, "fat-backs" again. There were no boundaries to names. Fishermen cruising the entire coast took local names with them and some names stayed after their visits.

The "bug-fish" and "bug-head" names came out of the southern states, where a small crab-like parasite often was found in the mouth of a menhaden, taking its share of plankton the host fish constantly drew through its always open lips.

And here too was the root of part of the scientific name given to menhaden. The bug or parasite was first described by the eighteenth and nineteenth century architect and engineer, Benjamin Henry Latrobe, whose other interest was the study of fish. The little crab may be up to two inches long, and Latrobe proposed a fine name, *Oniscus praegustator*, to the American Philosophical Society in Philadelphia in 1799. It was like the "foretaster," the *praegustator* who sampled meats and drinks to be sure they were not poisoned before serving them to a Roman Caesar. A biologist later found it to be in another genus and changed *Oniscus* to

Cymothoa, and another even later renamed it *Olencira*, but both had the good sense to keep *praegustator* for all time. (Actually the little isopod seems to do some damage, either eating or abrading the gill filaments and weakening and even killing its host.)

Latrobe almost incidentally gave the menhaden itself an early scientific description in this same paper to the American Philosophical Society, of which he was a fellow, and again his language survives in part. He proposed the name *Clupea tyrannus*, *Clupea* being the genus for the herring, *tyrannus* for the Caesar who could maintain such a minion as the *praegustator*.

More than sixty years later, Latrobe seemed forgotten and the fish became *Brevoortia tyrannus*, honoring the "Hon. J. Carson Brevoort of New York City." Brevoort was identified by Theodore Gill in an 1861 "original description of genus" as "the well-known ichthyologist of New York." Later he was described in a National Museum publication, with no memory for the writings of George Brown Goode, the museum's long-time curator, as "a gentleman long interested in the study of fishes."

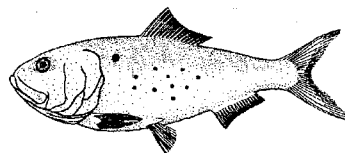
Latrobe died at fifty-six in 1820, and thus never knew of the reclassification of what might just as easily have been named "*Latrobia tyrannus*." He had gone on in his own career to become surveyor of public buildings in Washington and to supervise reconstruction of the Capitol after the British burned it in 1814. He also pursued his classical interest by helping introduce Greek forms into American architecture.

What George Brown Goode calls Latrobe's "quaint conceit" was continued in the slightly different species of menhaden in the Gulf of Mexico. This is now *Brevoortia patronus*, giving the *praegustator* also a patron to serve. Nomenclature and taxonomy must be "no nonsense" now, but in the eighteenth and early nineteenth centuries a scientist could indulge a "quaint conceit" with the literary and philosophical societies which were the all-embracing forerunners of today's infinitely specialized professional scientific associations and societies.

This etymological and taxonomic discussion out of what to us is distant past

may seem to add up only to uncertainty about a fish that few today know or care about. Yet that fish is the stock for North America's greatest fishery and its oldest.

Menhaden, poghaden now pogies, mossbunkers now bunkers, these are the fish that today are caught by the billions off the Atlantic and Gulf of Mexico coasts for nobody to eat. They have been eaten in the past, even promoted as "American sardines," but their oily, bony bodies now are far more valuable as ingredients for four to five hundred industrial products and processes, from lipstick to portland cement to steel making; protein supplements for stock and poultry and aquaculture feeds; dryers for paints; bases for perfumes and other cosmetics; an agent to separate iron ore from quartz; a medium for tempering oils; an ingredient in linoleum manufacture, pharmaceuticals, paper coatings, and many other uses.



Parasites of the menhaden, drawn by J. H. Emerton. From Goode's *The Menhaden*. Figure 13: head of fish showing the position of the crustacean parasite. Figure 14: *Cymothoa praegustator*. Figure 15: *Laemonema praegustator*.



Fig. 14



Fig. 15

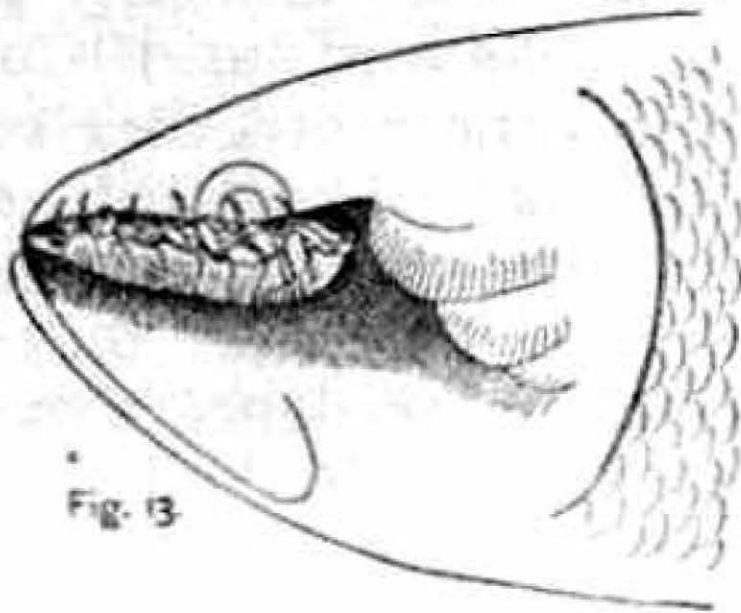


Fig. 13

II. They Purpled the Waters

As the Indians knew—or may have known—the *munnowhatteaûg* for centuries before the first sea-weary Pilgrim put a wobbly foot on Plymouth Rock (if indeed one ever did!), American fishermen have known and sought the fish under its many names ever since. They hauled them home by the wagon-loads from the beaches in the spring to manure the gardens and fields, caught them for bait for haddock, cod, mackerel, and other fish, and ate them. They also marveled at the size of the schools off their beaches and in their bays and creeks.

The fish were there, and in incredible volume. The Dutchmen of New Amsterdam wrote of “schools of innumerable fish, and a sort of herring, called there *marsbanckers*.” In the early nineteenth century Professor Samuel L. Mitchill reported to the Literary and Philosophical Society of New York, “They frequent the New York waters in prodigious numbers [“innumerable” and “prodigious” were not used casually then!]. From the high banks of Montock, I have seen acres of them purpling the waters of the Atlantic Ocean. The waters of Long Island Sound and its bay are often alive with schools of them.”

Samuel Latham Mitchill was no idle tourist gazing off Montauk’s bluffs. He was a naturalist who had also served in both houses of the Congress. Other members called him “the walking library.” Thomas Jefferson saw him as “the Congressional Dictionary.” Governor DeWitt Clinton of New York called

him “the Delphic Oracle” and a bishop, “a chaos of knowledge.” A bystander at Dr. Mitchill’s funeral asked who was being buried and was told, “a great character who knew all things on earth and in the waters of the deep.”

Through the nineteenth century, fishermen and scientists told of waters “blackened” by the schools. One aged Newport, Rhode Island, fisherman, Captain Nathanael Smith, told in 1871 of seeing a school “that was two miles wide and forty miles long” during an 1819 voyage to Portland, Maine. Others spoke of hauls of scores of wagon-loads of one thousand to twenty-five hundred fish each from the beaches. In 1865, Captain E. T. Deblois of Portsmouth, Rhode Island, reported bodies in Maine waters covering one hundred or more square miles.

On to the south they were noted in early writings, official and unofficial. A *Natural History of the Carolinas, Florida, and the Bahamas, 1731-1742*, by Mark Catesby, reported that a “small fish called a Fat-back” was among those “drove on shore by the Pursuit of Porperes and other voracious Fish, at the general Time of spawning.” These and herring similarly “drove on shore” made up:

the most extraordinary Inundation, of Fish... annually a little within the northern Cape of *Chesapick* Bay in Virginia [Cape Charles], where there are cast on Shore usually in *March* such incredible numbers of Fish, that the Shore is covered with them a considerable Depth, and three miles in

length along the Shore.

"At these times," Catesby wrote, with his nose twitching, "the Inhabitants from far within Land come down with their Carts and carry away what they want of the Fish; there remaining to rot on the Shore many Times more than sufficed them; From the Putrefaction that this causes the place has attained the Name of *Maggoty Bay*." It's Magothy Bay now, inside the barrier Smith and Mockhorn Islands of Virginia's lower Eastern Shore. Whether the Magothy River of Maryland, entering Chesapeake Bay between Baltimore and Annapolis and lined with fine homes, came by its name in a similar way is not volunteered by aristocrats there, but the Maryland rivers do suffer spring die-offs of young menhaden as water temperatures rise. There are frequent demands for somebody to do something about piles of dead fish at the ends of beautiful lawns.

Catesby also called the menhaden an "excellent Sweet Fish, and so excessive fat that Butter is never used in frying, or any other Preparation of them," and said they were "much esteemed by the Inhabitants for their Delicacy." William Byrd, the London sophisticate and a founder of the Byrd family of Virginia, joined Catesby in commending menhaden as food for a gourmet. In 1737, he included in his racy diary writings a non-racy catalog of fish in Virginia waters: "Fat back. This is a small but very good fish, as fat as butter. [It] affords a splendid fish when it is baked."

No one says that now, although in truth some retirees and second home families heading for the shores of Chesapeake Bay in the 1960's and 1970's have eaten them in innocence without complaint except for the bones. One or two menhaden may get into a private crab pot, and what "Come Heah" from the city is to throw out a good-looking fish? The more scholarly can document putting them in the pan by citing Catesby or Byrd, and even go back in time to the "Lost Colony," the settlement left by Sir Walter Raleigh on Roanoke Island between North Carolina's Albemarle and Pamlico Sounds in 1585. "Oldwives" were among the fish eaten, and John Lawson's 1714 *History of North Carolina* called fat-backs "excellent sweet food."

In South Carolina they were reported

in *The Shaftesbury Papers* before 1676 as being present in "multitudes," and in 1829 the *South Carolina State Gazette* of Charleston carried an advertisement: "30 barrels, menhaden fish. For sale low to close sale by May 4." Thirty barrels wouldn't have gone far in manuring fields, so it is quite probable that they were intended as food, maybe for slaves, maybe for freemen.

It is not necessary to go back so far. George Brown Goode's history of nearly six hundred pages included six describing their value as food in his time, only a century ago, with testimony here and there almost similar to Catesby's and Byrd's. He offered his own comment that "when perfectly fresh they are superior in flavor to most of the common shore-fishes" and said the Maine fisherman "finds his breakfast of fried pogies both substantial and palatable."

In New York and Boston they seem to have been eaten only by the poor or "in seasons of scarcity," but Goode quoted the Reverend A. W. Church, editor of the Middletown, Connecticut, *Constitution*, as finding "the mossbunker... a staple article of food among the people living on the sea-coast of New Jersey in the vicinity of Bricksburg, Somers Point, etc., and ten or fifteen miles inland." Mr. Church reported further that "every family makes a practice of salting down a barrel or two for winter use" and added, "they are preferred to any other fish which can be taken in that vicinity."

Goode also found them "in good demand on the shores of Chesapeake Bay" and said that in November and December of 1874 he "frequently saw twenty or thirty strings on the tables in the Washington fish market and they seemed to meet with a ready sale at 40 cents a string, a price nearly as high as that of striped bass, the favorite fish in Washington." Tastes have changed in Washington.

Salted menhaden were shipped by the thousands of barrels from New England to the West Indies and the Guianas during the eighteenth and nineteenth centuries "to serve as food upon the plantations." As might be expected for a slave economy, from which New Englanders as well as southerners took all profit possible, legal or not, "these fish were not carefully prepared, but are chiefly the surplusage of the bait supply remaining in the

hands of the outfitters of fishing vessels at the close of the season."

The practice apparently continued well into the nineteenth century despite a protest in 1768 from a Jamaica merchant to a Newport, Rhode Island, exporter.

"By no means," wrote the Jamaican, "any more menhaden as it will not answer at all at no price. I did not imagine I should get 12 shillings, 6 pence a barrel [about three cents a pound] for them. The menhaden would not fetch 12 shillings 6 pence and was obliged to dispatch the schooner with 50 barrels of menhaden to Black River where she sold at 20 shillings per barrel."

However, in the 1870s the American Sardine Company was active in Port Monmouth, New Jersey, still one of the country's major menhaden centers, trying to make bunkers as popular here as sardines in Europe. In a letter to Goode describing the packing, F. F. Beals reported discovery of a way of softening the bones without use of acids so "they can be eaten, like the flesh of the fish, without the slightest inconvenience." He said the company had sold thirty thousand dozen "whole cans or boxes" in 1873, was doubling its capacity, and had been given a medal of merit at Vienna that year and a silver medal at Bremen in 1874.

Goode's own judgment was that menhaden sardines, if prepared with olive oil instead of cottonseed, "would be fully equal to similar articles imported from abroad."

"It need only be said," he commented, "that they have been carefully tested by many unprejudiced judges in the city of Washington, and that the verdict has always been that they were almost equal to French sardines of the best brands."

Other efforts were described, among them preservation of menhaden in spices and vinegar, marketed by other Port Monmouth packers as "Shadine," "Ocean Trout," and "American Club-Fish." A *New York Times* story describing the operation of the "Ocean Trout" factory said the product was "quite a delectable food, and doubtless to-day the advance of civilization in the United States is shown in remote portions of the country by cairns made up entirely of empty tin boxes once filled with edible moss-bunker." There

are still piles of "tin boxes," most recently drained of beer!

Still another enterprise of the 1870s, in Saco, Maine, was preparation of an "extract of fish" developed by S. L. Goodale, secretary of the Maine Board of Agriculture. Goode said that he himself had found that "two tablespoonsful of the jelly dissolved in hot water yield a large dish of savory soup, most closely resembling the *potage consommé* of the French cooks." A New York hospital tried it and told Professor S. W. Johnson of Yale College that "the physicians consider it in no way inferior to Liebig's [a popular beef extract then]." He added that it "was not suspected by nurses or patients to be anything else."

And as late as 1942, Lewis Radcliffe, director of the Oyster Institute of North America, told the House Merchant Marine and Fisheries Committee, then considering wartime relaxation of state restrictions on menhaden fishing, "I have eaten canned menhaden which I consider very good food." He suggested that if the demand for proteins became acute enough, "we could undoubtedly draw heavily on the supply for human consumption."

Successful canning of menhaden, mainly for shipment to Soviet Russia but also to Great Britain under the name of "silver herring," resulted from a wartime invention by E. W. Copeland of Morehead City, North Carolina, to remove scales. (Herring scales shed almost like dog hair on upholstery, but Atlantic menhaden scales stick tightly. A different, fine-scaled menhaden, has been saved out by some Gulf of Mexico fishermen for food.) Copeland also became the only one in the country canning menhaden roe and reported for a time that he found it "utterly impossible" to fill all the orders. T. C. Slaughter of Reedville, Virginia, was also a wartime canner of menhaden, with three thousand cases in 1942, ten thousand in 1943, and twelve thousand in 1944. He also developed a "Virginia Fish Cake" made of ground menhaden, soy and corn meal, and "delicate seasoning." He used only menhaden taken in trap nets, which tended to be less oily.

Another wartime canning process, using steam for easy skinning, was tried by the Tilghman Packing Company on Tilghman Island along the Eastern Shore of Maryland.

Again, only trap net fish were used, Maryland having forbidden purse seining, and 1,200 cases were packed in 1943 and five thousand in 1944. Nicholas Harrison, manager there, said the skinning process eliminated much of the oil.

Serious talk of menhaden as a food fish continued. At a symposium of the 1973 meeting of the Gulf and Caribbean Fisheries Institute, Jack Styron of Wallace Menhaden Products, Incorporated, of New Orleans, responded to the question, "Is it not time for us to plan to use menhaden as the most important single food resource that we have?" He said, "It is ridiculous to take this high-quality protein and have to feed it to other animals to produce meat that can be consumed by humans." He noted the effort, technologically a success but practically a failure, to make a fish protein concentrate from hake, under the Madison Avenue name of "fish flour." This effort collapsed, partly because of general lack of interest, partly because of a fire destroying an experimental commercial plant. The menhaden industry had watched the experiment, thinking that the federal Food and Drug Administration might let menhaden be tried too. The F.D.A. did approve use of menhaden under restricted

conditions, apparently uninterested in the fact that menhaden oil has been used successfully and without harm for many years in production of margarine in Canada and Europe.

Dr. Gordon Gunter of the National Marine Fisheries Service's St. Petersburg, Florida, laboratory, responding to Styron's suggestion that "eventually menhaden will be used for human consumption," recalled the wartime enterprises, and said he had found menhaden delicious "when fried in their own oil," and no bonier than shad. He also commented that the canning operations were stopped after the war by "a peculiar little quirk of folk knowledge.... People who know menhaden very often equate it with fertilizer." And the F.D.A., he said, would allow its sale only as menhaden, not under the British name of silver herring.

Still, Dr. Gunter said, "I think that if you would really want to sell it, and can it and try it, you could make a very good product out of it."

Such canning as goes on now is for pet food; we seem not to be hungry enough yet. Also, the menhaden industry finds its capacity well taken up with production of meal, oil, and solubles.

III. The "Discovery" of Oil

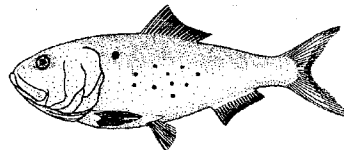
Sometime in the early years of the nineteenth century, part of the menhaden's present use and value began to be exploited by fishermen and manufacturers. This was before discovery of petroleum at Titusville, Pennsylvania, and the Aladdin's lamp it lit (or Pandora's box it opened!). The United States and much of the world depended on whale oil for lubrication and light. American ships ranged the seven oceans hunting the whale, and American businessmen, led by pious Quakers of New Bedford, Massachusetts, made whaling a worldwide enterprise and industry. It is easily forgotten now, when we find it convenient to denounce the "ruthless" Russian and Japanese determination to hunt the whale to the last one alive, that we

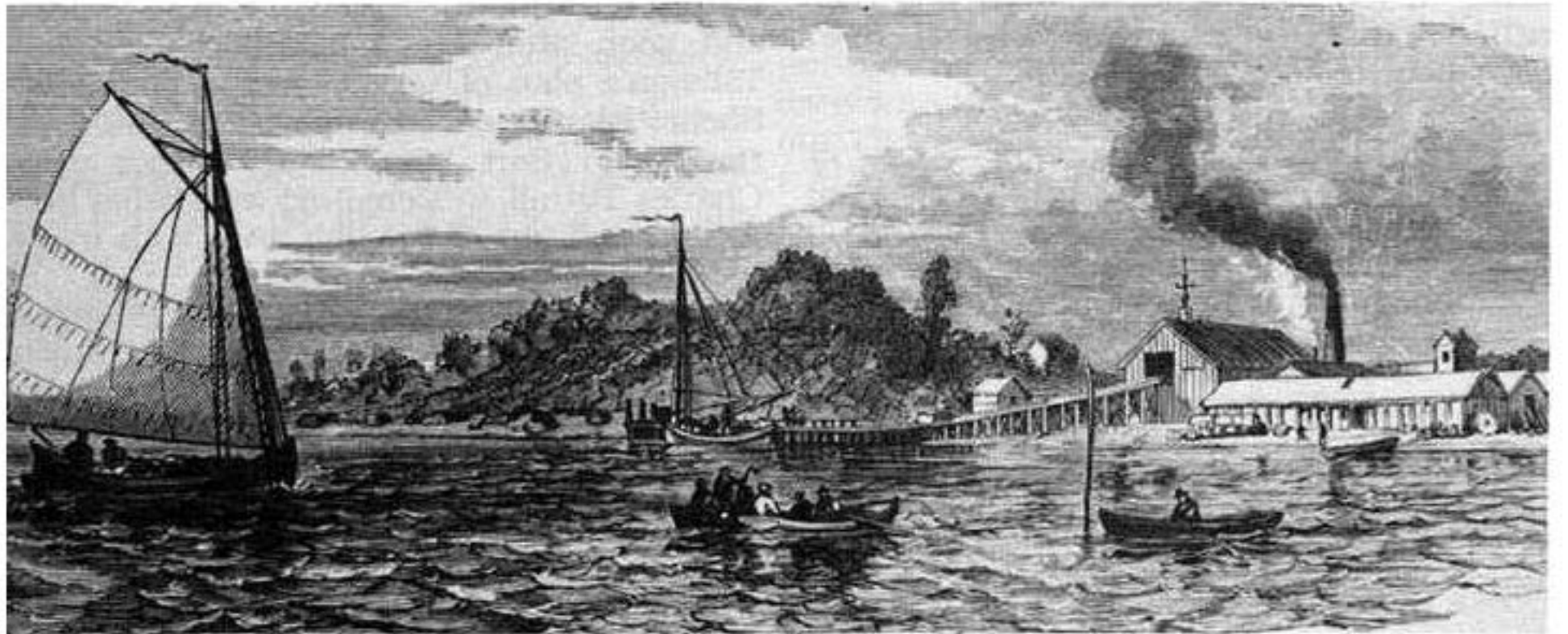
introduced industrial techniques to whaling, and the rest of the world merely continued and improved them after we found the fishery unprofitable. Petroleum was cheaper.

There were various uses for oil then—tanning and currying leather, and paints, rope- and soap-making among them—and the whale catch was always unpredictable. A whaler might go out for four years and return with a fortune in its casks, or with nothing aboard but a hungry crew and an insane, bankrupt captain.

The fish, the pogies, the bunkers were

Factory at Napeague, New York, shown in a cut from "American Agriculturist." From Goode's *The Menhaden*.





out there, just off the beaches or in the bays and sounds and rivers, and in uncountable millions, to be taken with no risk of a stove boat. How many were caught for manuring, bait, or food no one knows, for no record of the menhaden catch was started by the federal government until 1873.

Nor is it known beyond dispute just who first noticed that the oil, the fat which had caused early historians to comment that these fish could be fried without butter, could be recovered and put to use, even sold in competition with whale oil. Here, we were centuries late. In the third millenium B.C., Mesopotamians produced and exported fish oils for many purposes, including curing hides. In France, oil had long been made from a fish called merlan—*Gadus merlangus*—with the residue or scrap dried, ground, and packed in airtight casks for sale as manure. In the sixteenth and seventeenth centuries Basque, Breton, and English fishermen caught pilchards for oil, again with the scrap sold for fertilizer.

The first successful production of fish oil in our new country was probably in 1811 by a couple of Rhode Islanders, Christopher Barker and John Tallman, both among the early-day inventive minds that have turned up from time to time in the otherwise conservative fishing business. According to an article by Captain E. T. Deblois of Portsmouth, Rhode Island, another of George Brown Goode's correspondents, writing for his 1881 fisheries bulletin, Barker and Tallman set up two iron pots on the bank of the Sakonnet River, "a few rods south of what was then called the Black Point Wharf, near Portsmouth."

Captain Deblois wrote:

They boiled the fish in the pots or kettles and bailed the fish and contents into hogsheads, putting on top the fish in the hogsheads pieces of board with stones on top, to press the fish down so that the oil would come on top, and also in order that the oil could be skimmed off. A man by the name of John Hunt was the oil man who skimmed off the oil, and put it up in barrels for the market. It was sent to New York to market by a house or people that were doing business in Newport, R. I., by the name of Munroe,

who were in the West India trade.

Baker and Tallman added two more pots in 1814, and two other men named Munroe—possibly the same Munroes "in the West India trade"—started up close by. The two enterprises lasted through the War of 1812, only to be destroyed by "the notable September gales of 1815."

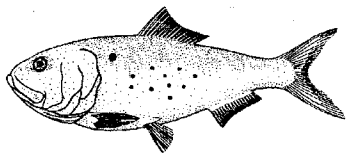
Captain Deblois reported that the business did not start up again until 1818, and in 1824 Barker "conceived the new idea of cooking fish." He built a portable box, five and one-half feet high and six feet wide and eight feet long, with a furnace at one end and a copper pipe running through the middle of the box from the furnace to conduct smoke and fire through. He put sixty pounds of fish in the box at a time, and covered them with water. All this was the "Bit Barker Fish Oil Factory."

"It was built on skids," Captain Deblois continued, "and was conveyed from place to place by his oxen, using it most of the time on his farm, which was a mile from the shore, drawing the fish from the shore with his oxen. By this method he saved the water, and put it on his land as well as the scrap, which made his farm produce very large crops."

John Tallman, Captain Deblois added, some years later built the first factory "to cook fish by steam in wooden tanks," then a second in 1841 "on M'Gay's Point, Portsmouth, R. I. It had eight wooden tanks, holding 60 barrels of fish, and a flue boiler. The boiler was fed by a force-pump worked by hand."

In 1842 Tallman and George Lambert of East Cambridge, Massachusetts, "built a factory at the mouth of Merrimac River, Mass., and soon after Mr. Daniel Wells got Mr. Tallman's plan of factory and built one on Shelter Island, near Greenport, N. Y." (More on the Wells effort later.) A Greenport man, Charles Tuthill, was credited with being first to press oil out of the fish and "with many other improvements."

In his own book earlier, George Brown Goode had told another story, later given much currency by an article around 1910 in *Popular Science Monthly*, that about 1850 "an elderly lady" named Mrs. John Bartlett of Blue Hill, near Mount Desert, Maine, was boiling a kettle of fish for her chickens and noticed a scum of oil on the water. She skimmed it off, bottled it, and took it to a leading Boston oil merchant, E.



Fish pens on the top floor of a nineteenth century factory; fish are led through a trough to the cooking-tanks. From a photo by T. W. Smillie, from Goode's *The Menhaden*.

B. Phillips. (Whether Phillips, who called himself a fish oil merchant, was actually dealing in whale oil or other fish oils is not clear. Stranded blackfish and porpoises were rendered for oil when available.)

"She told me that the fish were abundant all summer near the shore," Phillips wrote, "and I promised her \$11 a barrel for all she could produce. Her husband and sons made thirteen barrels the first year, and the following year one hundred barrels."

Phillips furnished the Bartletts with gill nets and large kettles. The Bartletts set the

kettles up on bricks to try out the fish. They noticed that much oil seemed to be thrown away with the residue, so they tried pressing it out. They made heavy covers for the kettles and used a long beam for a lever. The next advance was to put the scrap in barrels and tubs with perforated lids weighted down with heavy rocks.

Others began to see opportunity, as Tallman and Barker and the Munroes had thirty to forty years earlier, and Phillips found, or invented, a "screw and lever" press and fitted out fifty or more "parties on the coast of Maine." Smacks, both sloops and schooners, soon were going after the fish instead of depending on gill nets from skiffs or haul seines from the beaches.



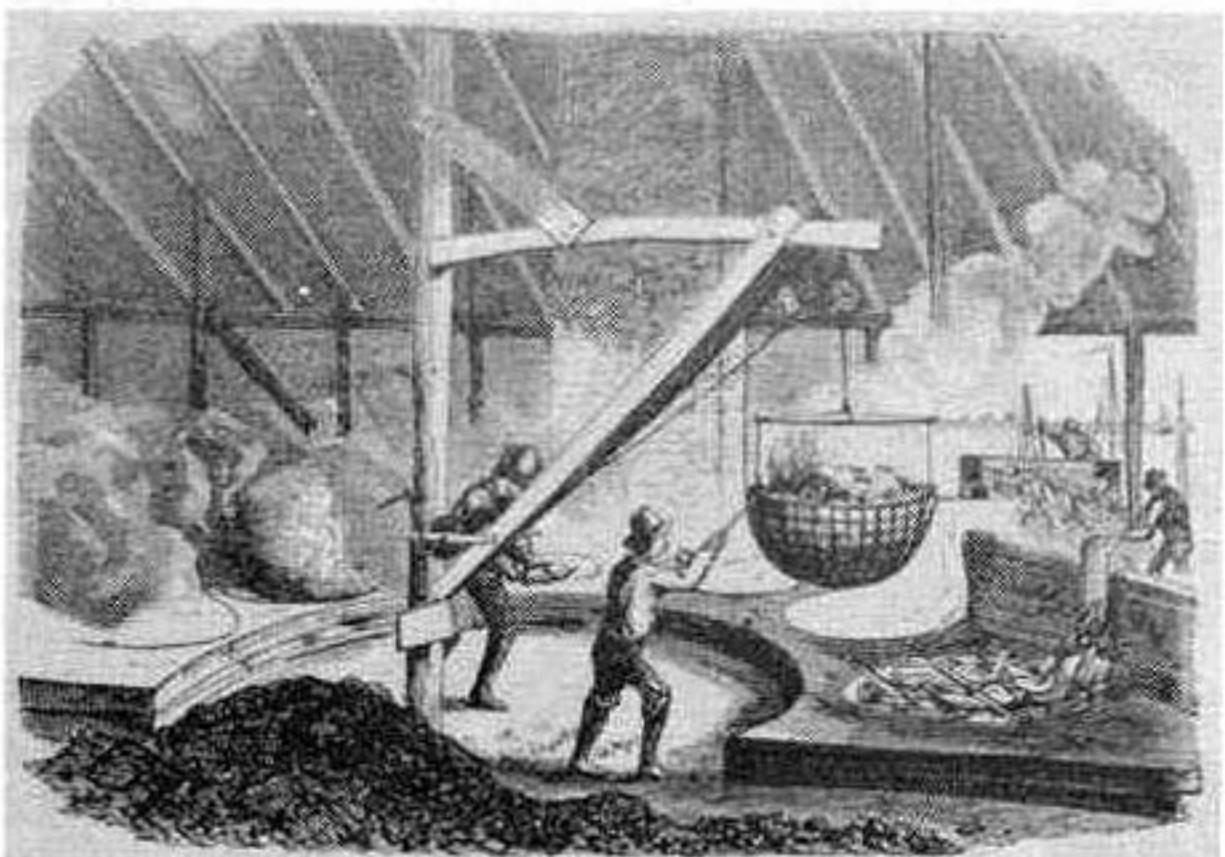
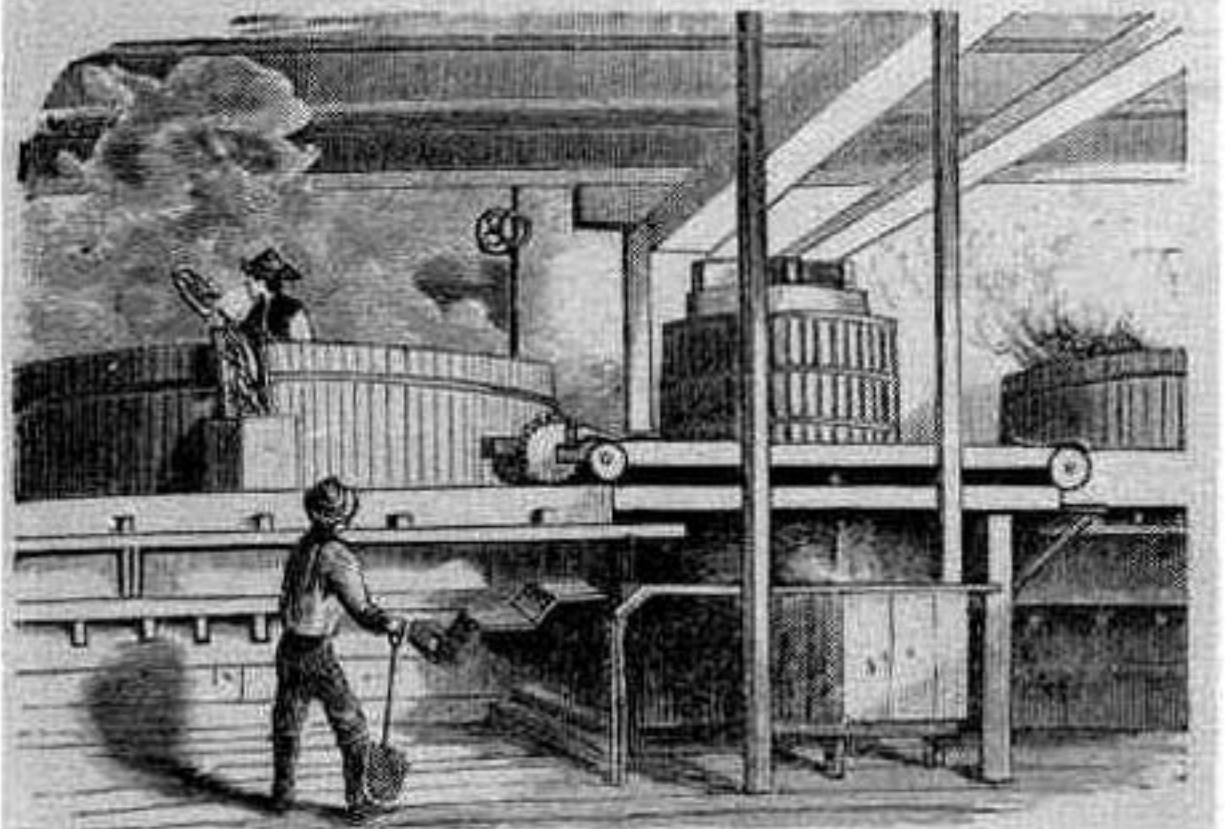
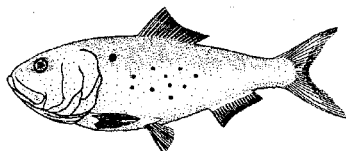


Fig. 45.





Interior views of a factory at Napeague, New York, in a cut loaned by the "American Agriculturist." From Goode's *The Menhaden*. Figure 45: interior of the pot-works. Figure 46: press-room.

The Bartletts may not even have been the first of their time. An "establishment for the manufacture of white-fish [menhaden] oil" was reported near Old Fort Hale, on New Haven harbor, about the same time. An Elisha Morgan of Poquannock Bridge, Connecticut, "made oil from bony fish previous to the year 1850," Goode was informed. Morgan caught fish, presumably menhaden, for manuring farm fields, and when he could not sell all his catch, he boiled them for oil. In 1850 on Shelter Island, near Greenport, Long Island, D. D. Wells and his son Henry started their steam factory from John Tallman's plans, to make oil and scrap. Apparently others there were making oil in whalemens' try-pots (the whaling port of Sag Harbor was just beyond Shelter Island),

but with little commercial success. D. D. Wells and Son's own first product was "very black, impure, full of fleshy matter, and had a very offensive smell." However, they developed machinery and in time had a market for a better product useful in painting, tanning, and rope manufacture—and also in "adulterating other oils."

Economics began to give the menhaden industry the swings it has suffered—or enjoyed—almost to today, now in production not only of oil but of fish meal and solubles, the dissolved proteins in the final liquor or "stick water" of processing. Other factories were set up around Greenport "and for a time the business was somewhat overdone," which caused some to abandon it altogether, others to consolidate. By Goode's time, there were ten factories left, "doing a fair business, giving employment to a large number of people and bringing up a hardy race of boatmen and sailors."

Despite the pioneering of the Bartletts and their neighbors in the early 1850's, their Maine did not see factories until 1864, after the Civil War had created more demand for oil. Captain Deblois, again writing for George Brown Goode's 1881 report, said he was the first with a factory at South Bristol on John's Bay, and another Rhode Island company built one at the Bartlett's Blue Hill, on Blue Hill Bay. Both seemed to prosper, but Captain Deblois felt at first that the John's Bay natives had told him more than was so. He may have started at a low point of one of those swings.

"The people of South Bristol told me that I would not have any trouble catching all the pogies that I should want in John's Bay," he wrote,

the shores and bays were full of them, and they plagued and bothered them, while they were fishing for mackerel, so much that they carried stones in their boats to stone or drive them away, but I did not find them so. The fish were very scarce in 1864. I got only 4,000 barrels. I cruised off-shore 20 miles and hailed vessels. They reported they had not seen any fish.

Another Rhode Islander, Captain Albert Grey of Tiverton, "started with four boats, and a full gang to fish in Maine." Captain Deblois added that Grey sailed to

Mount Desert, Maine, "but did not see a school of menhaden to set at, and returned without wetting a seine."

The next year started no better, but in August 1865 a large body of many schools appeared and seemed to fill the water in the ten miles between Damiscove and Monhegan Islands and extend for eight miles. A schooner captain, Washburn Clifford, further told him of seeing pogies "for a distance of one hundred miles. He said they made him think of a heavy shower of rain falling on the ocean; the ocean appeared to be alive with them. It may seem like a large story to tell, but knowing the captain and knowing that, where I was fishing, the fish were in one body of about ten miles square, I have every reason to believe Captain Clifford's statement."

In the next five years about a score of factories were built in Maine, with a third of them failing "from too sudden expansion of their business," just as on Long Island. Meanwhile, individuals like the Bartletts tried out oil in small lots, with fifty to seventy-five thousand gallons so produced in 1874.

In the mid-century period, the problem of disposing of what was left after the oil had all been boiled and pressed out of the fish led to development of "guano" as fertilizer, to replace the ancient practice of manuring fields with raw fish. The residue, called "scrap," "fish pomace," or "chum," at first was dumped overboard from docks or boats, but this drove away the mackerel and cod. Then it was given to farmers by wagon or scow load. The farmers of the Maine town of Brooklin—to figure fifteen years or so later in the founding of the menhaden fishery in Chesapeake Bay—were believed to be first to spread it on their fields. "Good effects" were seen on the sandy soil, and it could be composted with muck or fine loam and applied to potatoes and grass "with excellent results." Spread in hay fields after haying, it could cause rust and "a fishy flavor to the hay, not relished by cattle," if used too heavily. The farmers in time discovered how much to use. The oil factories also soon discovered they could sell scrap rather than give it away, and by 1864 it was bringing six dollars a ton.

The value of the scrap, in money to fishermen and factories and in productivity to

farmers, as well as of oil, soon had more factories being built, from Maine to South Carolina. Some prospered, some not.

Competition forced operators to find new ways to make menhaden yield their bounty. As early as 1852 or 1853, William D. Hall and his Quinnipiac Fertilizer Company, boiling bones and rendering tallow at Wallingford, Connecticut, experimented with a load of menhaden carted sixteen miles from Branford. After his workers had gone home for the night, Hall cleaned his tallow tanks and steamed the fish to recover the oil. D. D. Wells of Greenport, Long Island, claimed to have discovered this process earlier, but Hall got the patent, and also a patent on a process of drying fish scrap on platforms by sunlight. Hall turned salesman, calling on "pot works" to persuade their operators his was a better way. Drying scrap was an important advance. Pressed fish rotted quickly and if there were no immediate market, the scrap was lost. Then it was found that dried scrap or "chum" would keep a long time and could be shipped to distant markets. This and a companion discovery that treating scrap with sulphuric acid—"acidulating" it—also preserved it, were the start of the fish scrap or guano industry.

In 1866 George Brown Goode was able to list eleven steam factories in Maine, and ten years later the total was eighteen, representing an investment of more than a million dollars. By that time there was a Maine Oil and Guano Association with fourteen members, "all but two of them in good financial standing."

Massachusetts businessmen showed little interest, with only a couple of factories by 1877, and those mainly operated to get oil from stranded blackfish and porpoises. There was one fishing company at Woods Hole, or Holl as Goode spelled it, but it later discontinued its oil business. Rhode Island had thirteen factories, all with presses rather than steam, and Connecticut thirteen, including the pioneer Quinnipiac company on Pine Island, at the mouth of the Thames River, "running four gangs." Several others had been built but either burned or were abandoned for the usual reason: they didn't make money.

In Connecticut another pioneering effort was added to Quinnipiac's steam process: our first "floating factories," described thus by George Brown Goode:

They are usually built upon the hull of some old vessel and are towed from point to point, gathering the fish from the smacks and working them into oil and guano as they move. Some of them are fitted up with machinery for very extensive manufacture. Two important objects are attained by the owners of floating factories: the objection to their business arising from the offensive odor is to considerable extent removed; by following the movements of the fish time and expense are saved, for by bringing the factory to the fish they obviate the necessity of having a fleet of lighters to carry the fish to the factory, which might often require two or three days.

Luce Brothers of Niantic built one on the hull of an old railway ferry, the *Union*, and the George W. Miles Company of Milford put one on the *Alabama*, an old man-of-war. Miles operated it, with two presses, in Maine's John's Bay, and Goode reported that "in 1878 it is the intention of Mr. Miles to work it on the coast of New Jersey." The *Alabama* was described as more productive, of oil at least, than the company's shore factory.

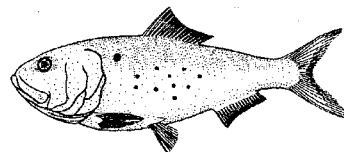
Two other floating factories, the *Falcon*, 2,500 tons, Captain George F. Tuthill, and the *Ranger*, 1,500 tons, Captain F. Frank Price, were among the thirty-odd factories established on Long Island, mostly at the eastern end around Greenport and Sag Harbor, also on Great South Bay and at Barren Island at the mouth of Jamaica Bay on the south shore. The *Ranger* presumably was the same boat that ventured to Chesapeake Bay annually for three years after the Civil War.

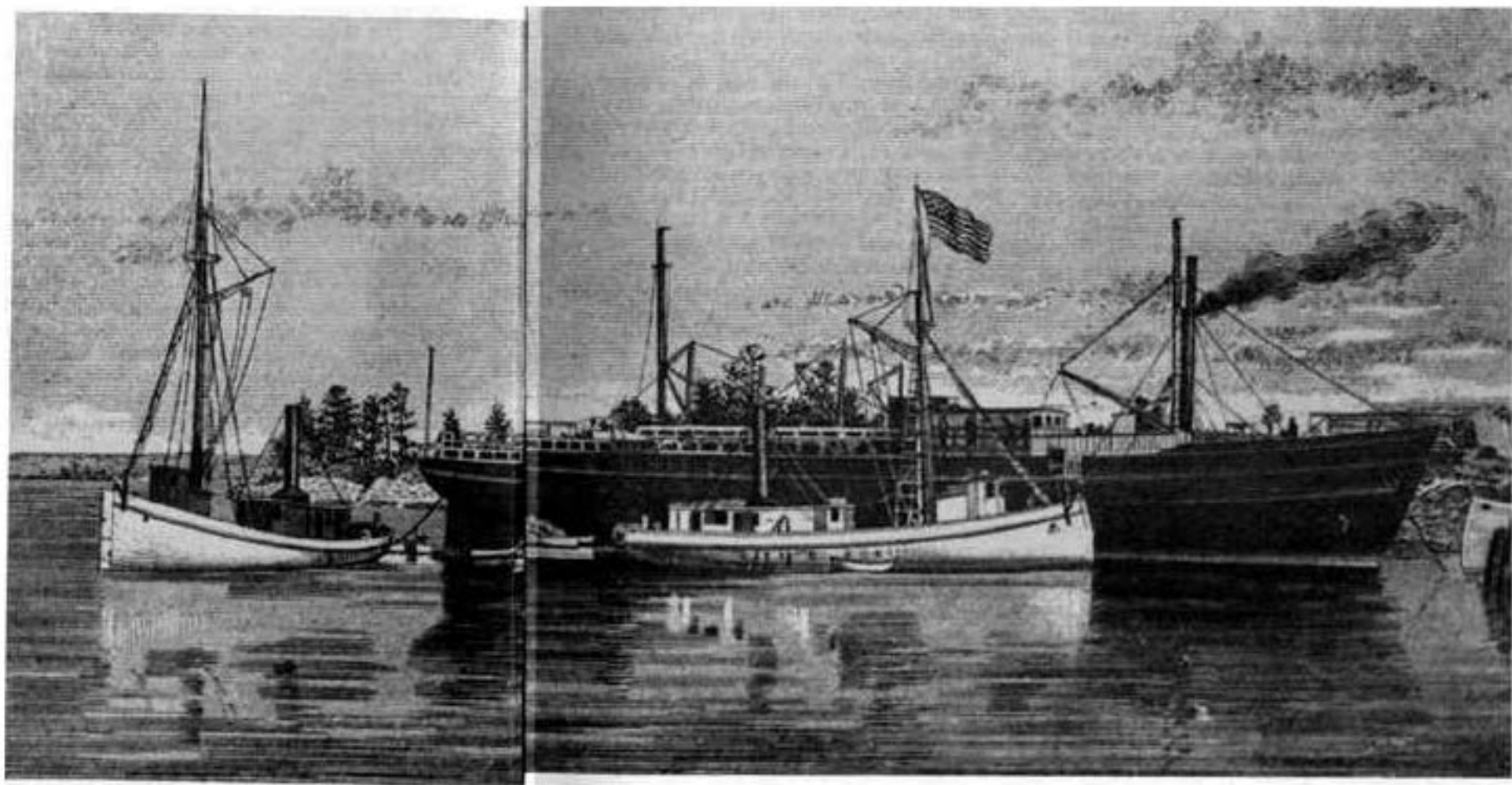
Goode commented that the floating factories were already going out of use in the late 1870's because of the introduction of steamers to the menhaden fishery, but their value was rediscovered after the Second World War, to the dismay of American fishermen, by the Soviet Union, Japan, and European fishing countries as particularly useful in fishing along our Atlantic and Pacific coasts. An American effort also to reintroduce the

practice with two big ships, *Seafreeze Atlantic* and *Seafreeze Pacific*, was a ten million dollar fiasco (half in public subsidies) in the late 1960s; American fishermen would not stay at sea four to six weeks.

Goode's tally of factories found four in New Jersey in 1877, one the Griffin and Vail enterprise at Port Monmouth, a town which in 1911 became headquarters for what for many years of the twentieth century was the largest menhaden company in the country, J. Howard Smith, Incorporated.

Goode found only four factories on Chesapeake Bay at that time, but after completion of his manuscript, he wrote in his introduction that he had learned from Colonel Marshall McDonald, Commissioner of

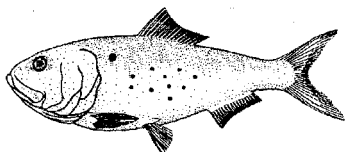




Fisheries for Virginia, of the existence of fifteen in 1878, including that of the founder of the Bay's menhaden fishery, Captain Elijah W. Reed of Brooklin, Maine. There were even two factories on the mid-Bay island of Tangier, owned by two of the many Crocketts there, Lewis and Henry. Colonel McDonald reported that in 1869 there were four vessels fishing, with twelve men employed afloat and nine more ashore, making three hundred tons of guano and two hundred barrels of oil from three million fish. In 1878, he said, there were seventy-eight vessels with 286 men aboard, 201 ashore, 118,309,200 fish taken, and 10,832 tons of guano and 234,168 gallons of oil produced. "This industry is yet in its infancy," he added, in words that he could not know would bespeak the day when the village

of Reedville, founded by Elijah Reed, would often record more landings than any other fishing port in the United States and two of the three largest companies would be located on its Cockrell's Creek.

Goode found no factories operating in North Carolina. There were four abandoned near Bodey's Island Lighthouse, and another at Beaufort. At Charleston, South Carolina, was "the works of the Pacific Guano Company, which consumes immense quantities of menhaden scrap." The scrap was not from local fish but "brought from the water by the vessels which carry on their return trip a supply of South Carolina phosphates for the other factory owned by the company at Woods Holl, Mass." However, a company had just been

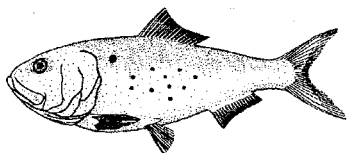


chartered there to fish for menhaden at the mouth of Charleston harbor.

The Pacific Guano Company was one of the first, if not first, to change the menhaden, on a large scale, from a mere manure fish to a source of guano, then to an ingredient in a much more sophisticated fertilizer. In the 1860's the company bought Howland's Island in the South Pacific for its rich deposit of natural guano from bird droppings, and shipload after shipload was sent to Boston to be dried in an abandoned salt works on Spectacle Island in the harbor, before being bagged for the market. The company then tried mixing in refuse fish to replace the ammonia lost by exposure to weather. This appeared profitable, and the company moved its works to Woods Hole to be closer to fishing grounds, with the oil to be extracted and the scrap or pumice or pomace mixed with the guano. The location proved unsuitable for the fishing venture, and in five years was abandoned; fish scrap was purchased from established oil works.

The Pacific Guano Company exhausted the guano on Howland's Island by 1866 and then brought phosphate lime from Swan Island in the Caribbean Sea. Finally it

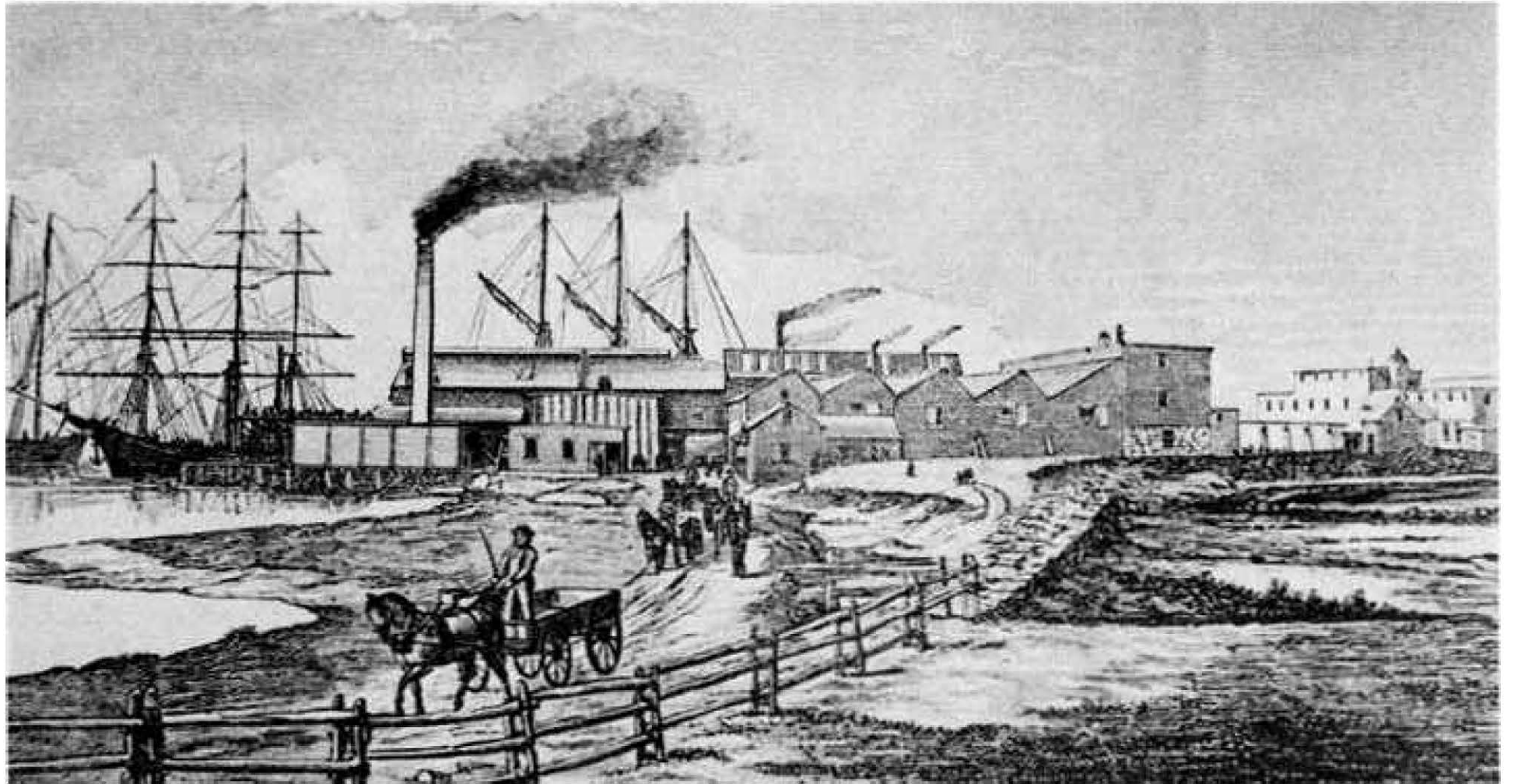
Pacific Guano Company at Woods Holl [Hole], Massachusetts, from a cut loaned by the company. From Goode's *The Menhaden*.



found a source for mineral phosphates in South Carolina after the Civil War, and in time abandoned the use of bird guano, even as a minor ingredient. The mineral phosphates and fish scrap became the manufactured product sold as guano, no longer bird droppings from distant islands, until well into the twentieth century. Then it was realized that there was even greater demand for scrap as a protein supplement for stock and poultry feeds.

In its first 250 years the menhaden industry grew from a simple business of providing fish to be spread directly on or dug in gardens and fields to one involving technological processes that continue into the twentieth century. It gave men work afloat and ashore, and it made some of them, operators and captains, wealthy as wealth went in those days. And it made others bankrupt, a pattern that likewise continued well into the twentieth century.

The Pilgrim Fathers, who must have noticed the oil squeezed out when they stepped on a fish, likely would have thought it sinful to exploit thus what the Lord had given them. Tisquantum or Squanto, wherever he got the idea of manuring fields with fish, probably would have thought it a pretty good thing. If John Gould's suspicion is right, that Indian knew a thing or two.



IV. Under Sail And Steam

Menhaden have been caught by most of the familiar ways in our nearly four centuries except by hook and line; their toothless mouths are always open for plankton, but they bite on nothing. Squanto may have shown the Pilgrims how to build a weir in the creek. Later, many, driven ashore by bluefish and scores of other predators, were shoveled into baskets and carts on the beaches. Later still, canoes and skiffs took out gill nets, or men worked haul seines from the beaches. A haul of one million to 1.3 million fish was reported in New Haven harbor, apparently in the 1840's or 1850's, with fish taken away in carts for three days and "finally a large part . . . allowed to escape." Today a fish boat captain bringing in a million fish thinks he has had a good day.

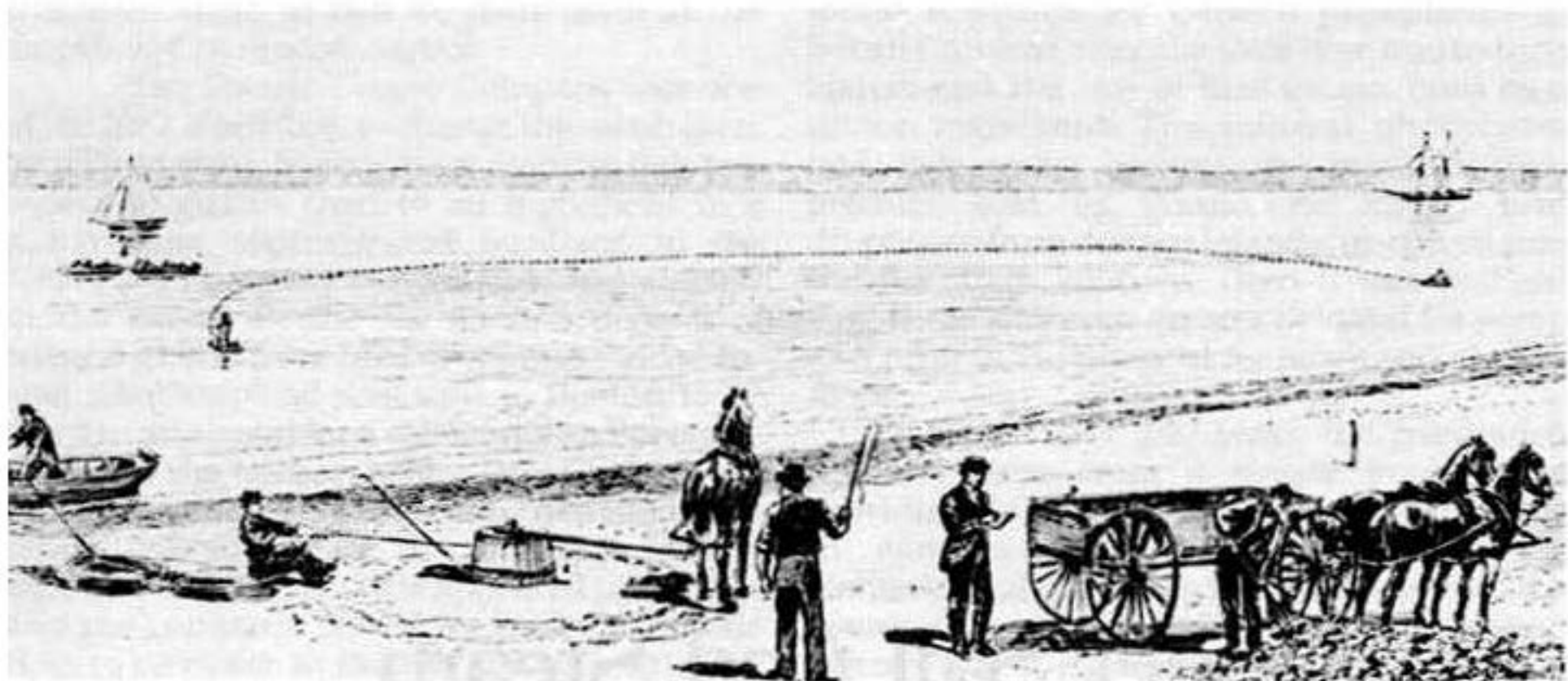
As our fishing fleets grew, sailing smacks went farther off and along shore, into bays and sounds and into the Atlantic Ocean itself. Schooners and Chesapeake Bay pungies (scaled-down Baltimore Clippers) replaced sloops, and steamers replaced schooners, only to be replaced themselves, when almost half the twentieth century had gone, by diesel boats. Until something more efficient comes along, diesel seems to be the peak. Yet there is always a possibility that declining oil supplies will force more change—a return to steam or even to sail, as improbable as either may seem.

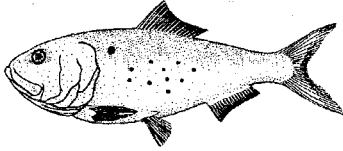
None of the changes was sudden and there was much overlap. For years steam fish boats worked amid schooners, and diesel craft

amid steam. Even into the late 1960's there were fish boats built for steam and converted to diesel. Through the 1970's modified wooden minesweepers and other small naval boats of the Second World War were competing successfully with refrigerated steel ships. Many of the latter likewise were converted military craft, but others were new ships designed and built just for catching menhaden, two million or more to a load.

With discovery in the nineteenth century of the diverse uses for menhaden oil—including mixing with whale oil so that only experts were able to detect adulteration—fishing techniques became more efficient. The greatest advance, still in use after more than a century and a half, with changes only in materials used and in size, came soon after the first oil factories had been set up. This was the purse seine, of which George Brown Goode wrote in a rare hyperbole: "By its use a school of almost any size may be secured without the loss of a single fish." (He later told how a whole net-full could be lost!)

John Tallman and Christopher Barker, the inventive Rhode Islanders who started the fish oil business, made the first purse seine as well, in 1826. In his first book, published in 1880, Goode had credited an unnamed Maine hand on a Gloucester fishing schooner with first coming in 1837 to the idea of surrounding a school of mackerel with a net instead of merely stretching one or letting one drift and hoping school would swim into it.





Haul-seine fishing at Long Island, 1790 to 1850: taking out the fish. From a sketch by Captain B. F. Conklin. From Goode's *The Menhaden*.

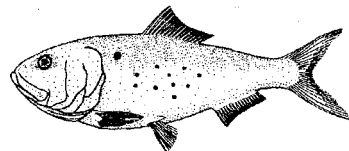
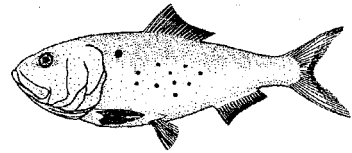
Menhaden sloops and steamers in Gardiner's Bay, Long Island, from a sketch by Captain B. F. Conklin. From Goode's *The Menhaden*.

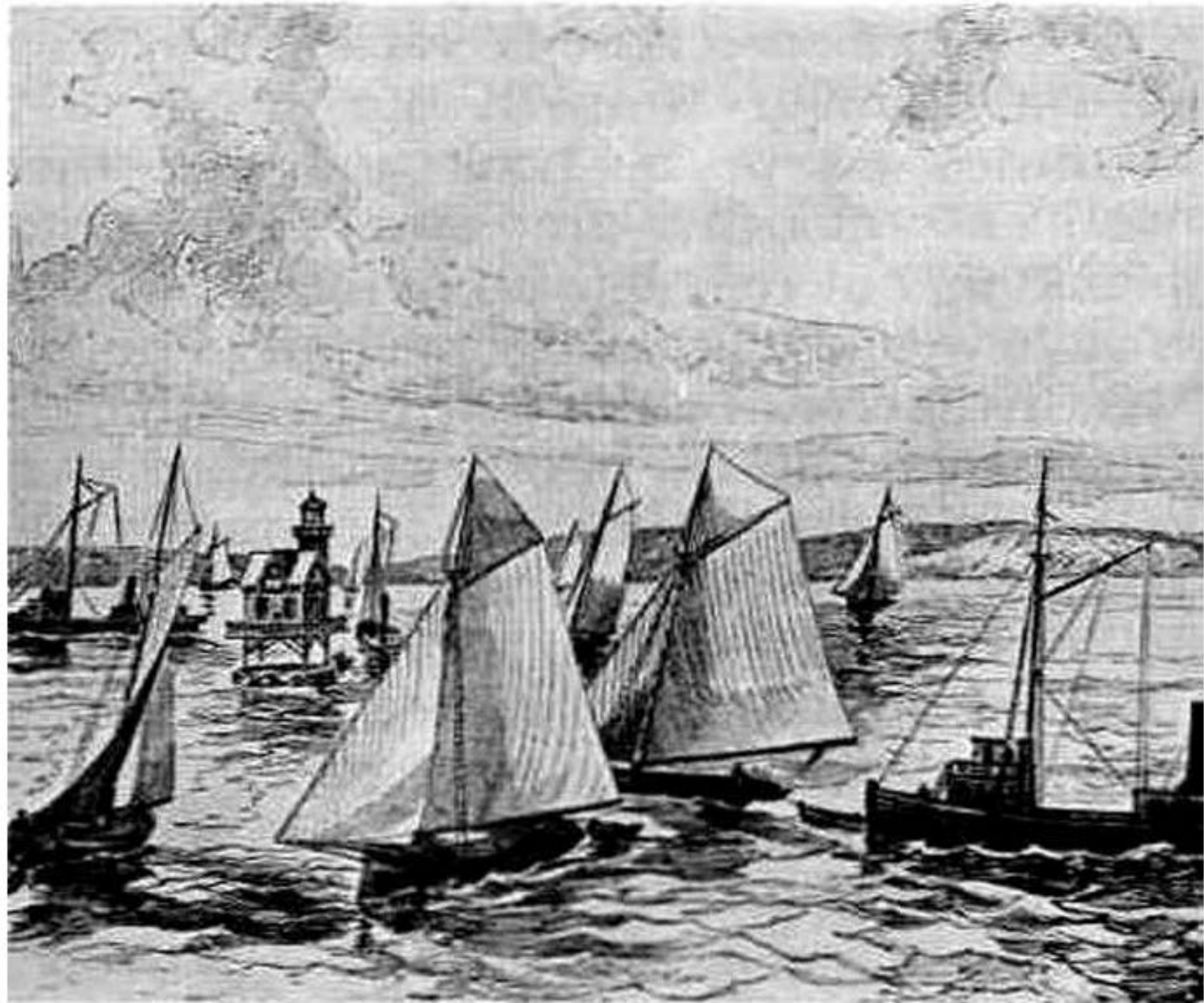
However, in 1881 Captain E. T. Deblois corrected this to tell of Tallman and Barker, joined by Jonathan Brownell, making one eleven year earlier. "It was 284 meshes deep and 65 fathoms long," Captain Deblois wrote Goode. "The purse weight was a 56-pound weight, and the blocks were common single blocks, and they had to reeve the end of the purse-line through the blocks, before they put the purse-weight overboard."

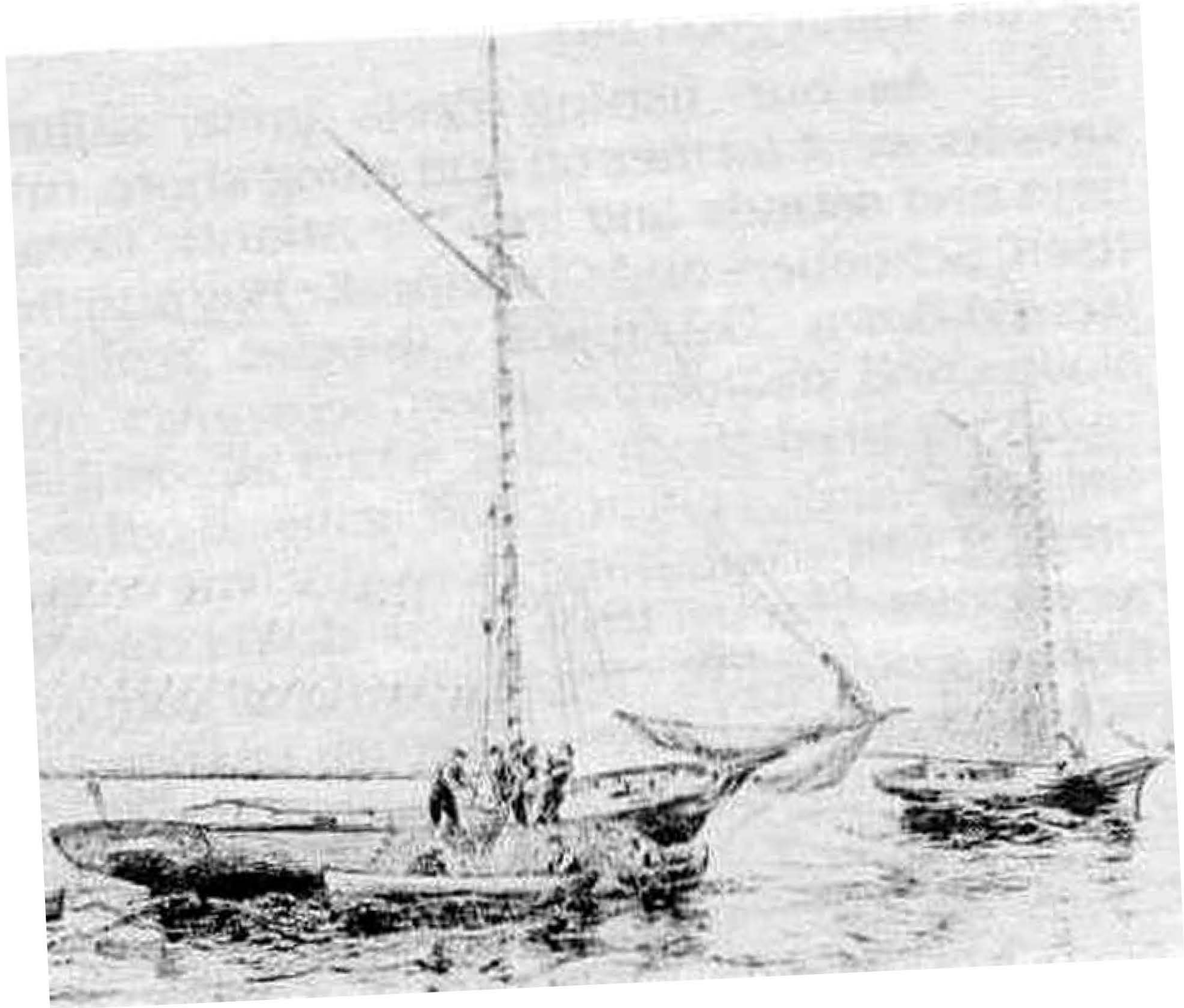
Setting it took some practice.

"The first time the seine was set," he recalled, there were fourteen men to help; they set around what they called a 500-barrel (150,000 fish) school of menhaden, and, while they were pursuing, the fish rushed against the twine so hard, that they twisted and snarled the twine around the purse line and weight to that extent, that the men could not gather the seine up, or get her into the boat again as they were, and after they had worked six hours, and quarreled over the matter, they de-

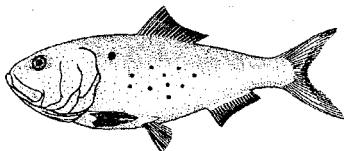
Carry-away sloops: bailing in the catch. From a sketch by Captain B. F. Conklin. From Goode's *The Menhaden*.











Haul-seine fishing at Long Island, 1790 to 1850: hauling the seine. From a sketch by Captain B. F. Conklin. From Goode's *The Menhaden*.

cided to tow or warp the seine ashore at high water, and, when the tide left the seine, they would be able to un-snarl it, which they did the next day. It was a number of days before they could muster courage to set her again, and, when they did, they set around a small school with better success.

Occasionally a modern captain gets into such a snarl, when the fish boat propeller fouls the net while coming alongside to pump fish, or when the seine catches on an old wreck or other debris on the bottom. The language then will peel paint.

The unnamed fisherman of 1837 could not persuade the conservative Gloucester fishermen, so he took his purse seine to Rhode Island, where it was tried successfully with menhaden by 1845. It was 1850 before two Gloucestermen, Captain Nathaniel Adams in the schooner *Splendid* and Captain Nathaniel Watson in the *Raphael*, tried them north of Cape Cod, off Chelsea Beach. Not until 1869 did purse seines come into general use among Gloucester fishermen.

The purse seine, or something like it, may indeed be far older. In his *Historia Animalium*, the Greek philosopher and natural scientist Aristotle wrote in the fourth century B.C. that "the watchmen in the tunny-

fishery often take advantage of the fish being asleep to envelop them in a circle of nets. . . ." He was arguing a theory that fish do sleep and gave no further description, but plainly the men of the Aegean Sea had invented something along the lines John Tallman and Christopher Barker and the unnamed Gloucester smack deckhand came to more than two millenia later.

With purse seines came purse boats to take them out. They started as conventional ships' yawls, then modified whaleboats were tried (lacking the sharp stern needed for quick backing from a wounded whale!). In time dory-like craft up to thirty-six feet long, or about the length of today's aluminum, diesel-powered purse boats, were used. The most popular seem to have been twenty-two to twenty-six feet long, "square-sterned, a smooth-bottomed, and batten-seamed." They were built for from 125 to 185 dollars each at New Bedford, New London, Greenport, and at Mystic River. "The New Bedford boats are preferred by many fishermen," said Goode.

The sailing vessels catching menhaden were of no specialized type. Sloops of five tons burden might be used in setting gill nets, and larger sloops and schooners in purse seining. Captain Elijah Reed brought menhaden fishing from Maine to Chesapeake Bay with two schooners, the description of which has not survived. This was only a decade before Goode began gathering information for his book, and while he included a number of

sketches of the sailing menhaden fleets, he told little about the boats themselves.

Fishing under sail was no easy way. The purse seine may have proved far more efficient than the haul seine or gill net, but Goode records a fishing crew making nineteen sets in a day without a single fish being caught—nineteen “stabs” and “haul-backs”! And it was hard work. Power, now provided almost entirely by diesel engines, hydraulic motors, mast hoists, and power blocks, was supplied then by hand, by the straining muscles of the boat crew of four to a dozen men. The strongest was the “tom man,” who heaved overboard the lead tom or weight that closed the net at the bottom to prevent the fish from sounding and escaping. Others, the bunt pullers, raised the net, clawing into the mesh with their fingers against the weight of the struggling fish.

Even with the strongest men, there was always a possibility of losing a seine full of fish. Fish held too long died and sank as dead weight. Then the fishermen, unable to hold it up, either cut the net open, a heart-breaking thing, or had to abandon it to settle to the bottom, even more heart-breaking.

Aboard the schooner itself, and on the pungies often used on Chesapeake Bay, human muscle again was the only power. None had donkey engines to raise the heavy gaffs of the sails or the bailing nets lifting the fish out of the purse seine and dumping them into the hold or the lighters or “carry boats.”

Goode gives this fine description of fishing under sail in his account of the first time he ever saw menhaden fishing, from the Rhode Island Fish Commission yacht *Cygnets* off Watch Hill in August 1874:

Several trim-built sloops are beating off and on, within a mile of the rocks. That they are “bony-fish catchers” is evident from the two long boats which are towed astern, carrying the purse-seine, which looks like a bale of brown hay stowed in the middle of each boat. A man stands at every mast-head watching for the well-known ripple. A school passes under the bows of our yacht and rises to the surface at a short distance, the bright sides of the fishes glistening in the sun and their tails flipping the surface noisily. The sharp eyes of the “lookout” of the

nearest vessel soon detects their presence. The sloop comes about and sails to the leeward of the school. As soon as they are near, three men jump into each boat. Two man the oars, a third stands in the stern and pays out the net, while the boats, rapidly diverging, are rowed around the fish, each describing a semicircular course. Now their courses converge and the men row faster. They come together and pass, thus closing the circle of network. The men all jump into one boat. The purse-weight, or “long Tom,” as they call it, is hooked to the two lead lines, and a splash of water announces that it has been thrown overboard to slide down the ropes and draw the lower ends of the net together. Now they begin hauling the net into a purse and the fish are secured. The “lighter,” or transporting boat, now sails up. The men on board heave a line to the seine-boats and they are brought alongside. A large dip-net, three feet in diameter, is now suspended by a block and tackle in the rigging of the lighter, and the fish are rapidly transferred from the seine to its hold. The silvery masses of fish are hoisted into the air and dropped into the vessel, settling in the bins with a flapping noise like the sound of distant thunder or the hand-clapping of a large audience.

In August, 1876, when on the steamer from Saybrook to Greenport, I saw a fleet of sixty vessels busily plying their nets in the [Long Island] sound near the mouth of the Connecticut. In the evening a gale sprang up from the southwest, and as the steamer entered Peconic Bay the little sloops were seen scudding to harbor under low-reefed sails. Every wave swept the decks, but they floated like sea-birds. Some them were loaded to the rail with fares of fish.

The menhaden fishery in Maine now was using both sail and steam, and Goode reported that a correspondent there described the sailing vessels as of about thirty tons burden, the steamers twenty-five to seventy. The fishermen lived aboard on a cruise, and tenders took the catch of steamers as well as schooners to the factories. The tenders carried about 250 barrels of fish at a load, but some

were being built for six hundred (one thousand fish made three and a third barrels).

When a steamer's purse boats were making a set, the cook managed the fish boat, and each purse boat carried a "seine setter" and two men rowing. As now, the captain was in charge of one purse boat, the mate of the other. As until late in the 1950's and even into the early 1960's, a "driver" or "striker"—sometimes two—tried to herd the fish into the seine and guide the purse boats in making the set.

"Four men to row, two to set the seines, and one (the cook) to manage the vessel, seven in all, are all that are really necessary for steamer or sail vessel," another of Goode's correspondents explained where more manpower was used, "the other functionaries being added as may be convenient." Again, half the seine, then 280 fathoms long and one hundred feet deep, was put in each purse boat. "The steamer cruises with men at the masthead looking for fish," he continued:

When they raise a school they put what are called striker-boats on them. Each steamer has two, with one man in each; they are men with sharp eyes, quick and active. They row close to the school of fish, observe its course, and by signs they direct the purse-crew how to set their seine to catch them. If the fish get scared, they drive them with white sea-pebbles which they carry in their boats. If the fish turn to run out of the seine, they throw the pebbles before them, and as they pass through the water before them the fish turn and swim in an opposite direction. After the fish are surrounded, the purse-crew and strikers all work together to get the seine around them. It is different from sail-gangs in this, that sail-gangs hoist the fish by hand, and have boats to take the fish from the fishing-grounds to market, while the purse-crew stay on the ground with a separate vessel. Steamers go on the ground, catch their fish, hoist them aboard by steam, and when the day is done take them to market, and the same men that catch them discharge them.

Brown noted that the steamer, when the operators finally appreciated its efficiency, thus saved the expense of a tender and could

get along with seven men instead of the ten needed on a sailing vessel "as sharesmen" in the proceeds of the catch. The steamer, "in consideration of coal and machinery, takes their three shares" and leaves the rest to the remaining men. He quoted a Boston *Daily Advertiser* story estimating that "persons chartering a steamer and sharing equally the profits with its owner easily make \$1,000 to \$3,000 in a season." That wasn't bad money then.

In New England a century ago there were in all sixty-odd steamers, described by Goode as ranging from sixty to 150 feet in length and costing from seven to forty thousand dollars each. The larger ones thus were not much different in size than some of today's but forty thousand dollars now would not buy an engine.

The steamers' average burden was given at about sixty tons. They were built of hard pine, with white oak frames and a watertight fish hold amidships. Goode reported that the fish hold was "said to make the vessels exceedingly safe, enabling them to float when their planking is badly injured." He described the loss of fifty feet of keel and eleven bottom planks by the steamer *Jemima Bloomer*, owned by Joseph Church and Company of Tiverton, Rhode Island, in a rough sea without sinking.

Church, incidentally, was credited with owning the first steamer in the menhaden fishery, the *Seven Brothers*. Goode gave no description, but said she was built for the fishery, not a conversion. Church's factory at Muscongus Point, Maine, was called the largest in the country in 1873.

The cost of operating a steamer then seems trifling today, but no doubt gave fishing company presidents anxieties when catches were light but expenses ran on. George Devoll of Fall River, Massachusetts, reported that his *Chance Shot*, of thirty-nine tons burden, sixty-eight-foot length, eighteen-foot beam, and five-foot depth of hold, and capacity of seven hundred barrels (195 pounds each) of fish, burned one ton of coal a day.

"The cost of running is about \$8 per day, including coal, oil, and the wages of the engineer," Goode said. "The crew are employed on shares, each man paying his own board and running his chance. The boat and seine draw

one-half of the profits, and the gang half—the gang paying provision-bills and cook's wages. There are seven men in the gang besides the cook and the engineer."

However, Goode's Boothbay, Maine, correspondents said that a steamer, costing from ten to sixteen thousand dollars and carrying eight hundred barrels of fish, had many advantages but did "not appear to be much more profitable" than sailing vessels.

The Boothbay correspondents give this more detailed picture of steamer fishing:

Let us now follow the process of catching fish as practiced by a steamer gang. We will begin at the sailing of the gang from the harbor, some clear morning in August. The engineer bestirs himself and has on steam early enough to reach the fishing-ground about as early as the fish can be seen. The fishing-ground is just where experience, and particularly the experience of the last few days, dictates. Commonly it is out to sea. As soon as it is light a sharp watch is kept on every side. Wherever menhaden are seen, thither the steamer's head is pointed. Sometimes it is close to home, and sometimes twenty or thirty miles are passed over before there is a single school to be seen. On approaching a playing school they always try to get on the outside of it, because the first movement of a school of pogies on finding themselves entrapped is invariably a rush seaward. The driver, in his swift rowboat, armed with a pile of stones, gets on the other side. Having divided the seine between them, one end and half the seine being on each, the two working boats approach the school within a short distance and endeavor to get in a favorable position. Sometimes a whole day will be spent in vain endeavors to get near swiftly moving or capricious schools. When the favorable moment comes, the boats separate and row around the school of fish, paying out the seine from each as they go. Meanwhile the driver, on the opposite side, throws stones at the timid fish and starts them in the direction of the boats. At last the boats have encircled the fish, and meet on the side opposite to their starting point; instantly the purse-lines are seized, and no man

stops to breathe until the bottom is pursed up. The crews exert themselves to complete the operation before the fish take the alarm, and many a time it happens that they pass out between the boats, just before they meet, or under the bottom of the seine before pursing is completed. The affrighted fish first, it is said, rush seaward. Finding themselves shut in on that side, they turn and rush landward; headed off there, they furiously follow the net around at the top of the water, some going this way and some that. Finding the circuit complete, they gradually subside, and finally settle to the bottom of the bag. The seine is now drawn aboard the working boats until only a small portion of it is left in the water, and the fish brought in a compact body to the surface. The steamer is now brought alongside, and with great tub holding two or three barrels, and worked by steam, the fish are rapidly taken on board. When everything works well, it takes about two hours to catch and take on board a school of 500 barrels; commonly it is longer than that.

Much of this would be recognized by a menhaden fisherman today.

The purse boat oars have been replaced by diesel engines and the cotton purse nets with nylon. The dip or bailing net, hoisted by hand on sailing vessels, or the two- or three-barrel buckets hoisted by steam on the steamers, has been replaced by a fourteen-inch hose through which fish are pumped, one hundred thousand every eight minutes, into the holds. A hydraulically powered gaff hoist aboard the fish boat raises the net against the side to compress the mass of fish in the seine for efficient pumping.

There is still manual labor—the clawing into the net from the purse boats while they hold the catch against the ship. And in most cases today's fish boats, like those first steamers, take the catch to the factory at the end of the day. There are exceptions, as when refrigerated Chesapeake Bay boats are sent up the Atlantic Coast—"up the beaches"—to New Jersey or to Long Island's "Promised Land," or New Jersey boats are sent south, or North Carolina boats venture down to the Georgia coast.

But the basic technique is the same. The fishermen still try to surround the fish with the purse seine, close it, hold the fish, and get them aboard the fish boat, to be hauled to the factory and made into fish meal, fish oil, and solubles. They are counted by the millions

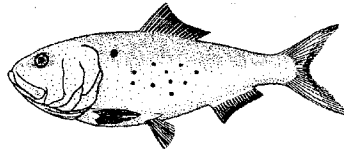
of fish or metric tons instead of by the barrel, and it takes millions of dollars annually for the whole operation, instead of the ten to sixteen thousand dollars investment that once would return perhaps three thousand profit in a season.

V. Catching Them Then

As today, many menhaden were caught in the nineteenth century for other purposes—mostly bait—by other means. On Chesapeake Bay today, pound nets set out in late winter for the spring run of herring catch many bunkers as well, and most go to crab pickers for bait, or to pet food makers. In New England in George Brown Goode's day those caught in weirs and gill nets went to bait haddock and cod lines, for "chum" for mackerel, or were sold or given away to be spread on fields—or were thrown away if they couldn't be disposed of.

One of Goode's most articulate correspondents was Colonel Theodore Lyman of Waquoit, Massachusetts, otherwise unidentified but apparently a state fishing commissioner. Colonel Lyman gave this "very graphic account" of weir fishing for menhaden in Vineyard Sound, written in one long paragraph in the style of the day but here broken into several for easier reading now:

The weir is hauled once a day, and always at slack water, because with a strong tide running east or west it is impossible to handle the bottom-lines. The men pull out in two parties, of which one in a large scow passes around the outside of the bowl, casting off the bottom-lines, while the other in a yawl-boat pushes inside the bowl, pulls up the sliding poles, and closes the entrances. The slackening of the bottom-lines allows the bowl-net to



Preparation of menhaden for bait, drawn by J. H. Emerton. From Goode's *The Menhaden*. Figure 35: slivering menhaden. Figure 36: bait-mill, perspective view. Figure 37: bait-mill, seen from above, showing knives, figure 38: roller of bait-mill. Figure 39: bait or churn box, which, when in use, is fixed in the rigging. Figure 40: bait-dipper.



Fig. 40



Fig. 38

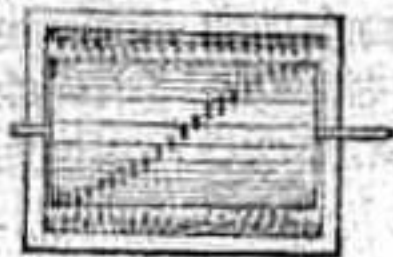


Fig. 37

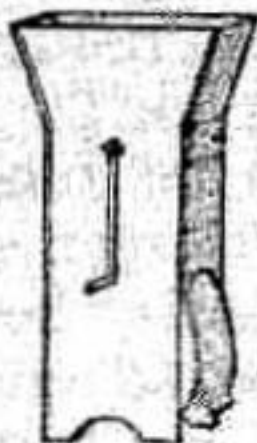


Fig. 36

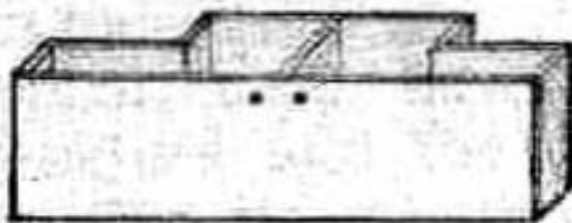


Fig. 39

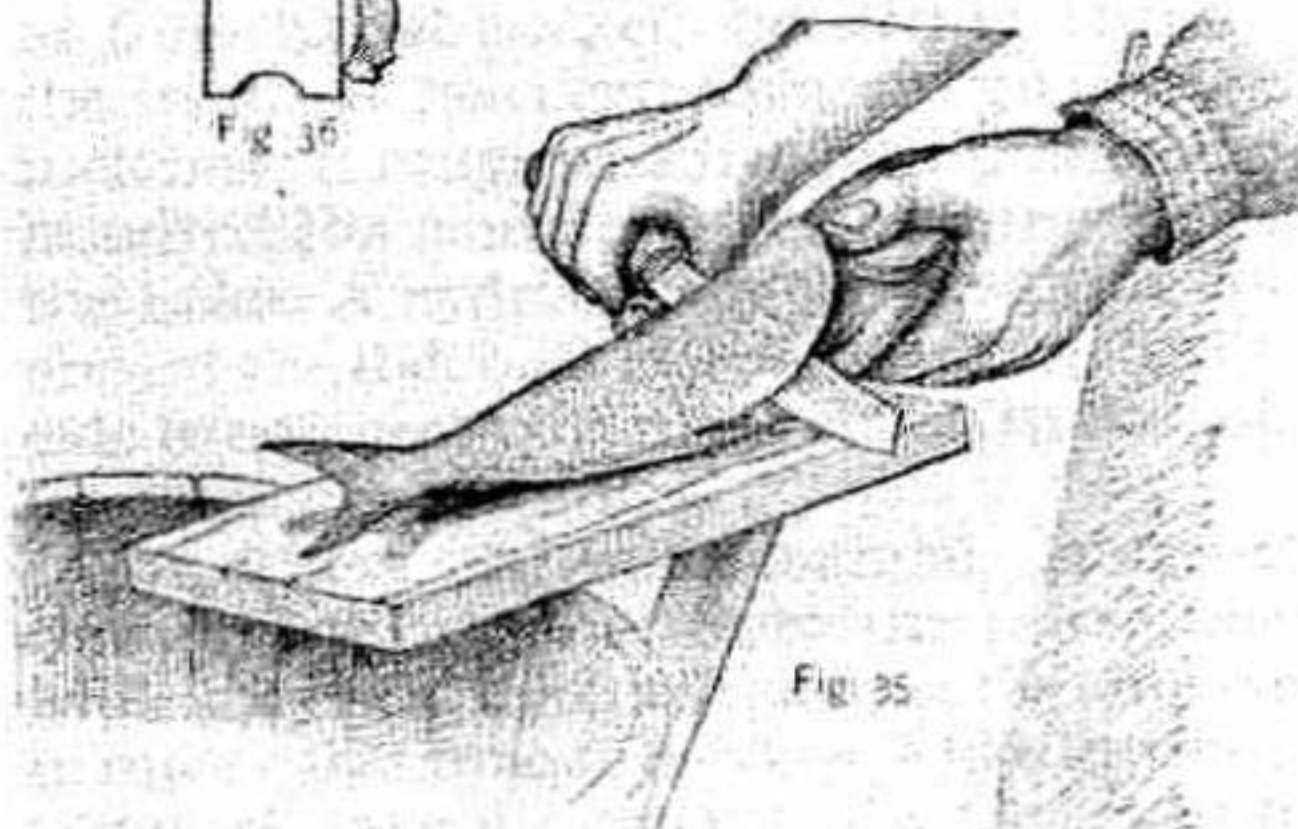


Fig. 35

hang free, and the crew inside begin to haul up the bottom of this net in such a way as to work the fish toward one corner, letting the net as it comes to the surface pass under the boat, which is thus slowly drawn across the bowl toward the corner where the capture is to take place, and where the scow is already waiting outside. [Except for details, a Chesapeake Bay pound net fisherman today would know every move.]

The scene now becomes an exciting one. The menhaden in thousands begin to show the sharp upper lobes of their tails above water; here and there darts a feverish mackerel like a blue and silver flash; great leathery skates, looking like pigs rolled out flat, raise their snouts in slow astonishment; here a shark suddenly works his way through the crowding mob; hundreds of goggle-eyed squid, smothered in the press, feebly ply their force-pumps; and there the murderous bluefish, undismayed by imminent death, glares fiercely and snaps his savage jaw to the last.

All these, with flat-fish, sea-robins, butter-fish, and many more, are taken and rolled in a fluttering mass iridescent with changing colors, and shower their silver scales high in air. It moves even the wear-men [sic] in their oil-skin clothes, with a slight excitement as they cull out from the menhaden the choice and the offal fishes.

There is Uncle Abishai smiting sharks with a spear, like so many Sauls, and he smiteth them not twice, and Captain Ed'ard endeavoring with a swift scoop-net to capture a dodging shad, because Mrs. Asa has boarders and needs a fish for dinner; and Captain Charles, with the air of one who gets a toy for a good child, diligently striving after some of them 'ere striped robins that the professor wanted. All this is strange and entertaining, even to a commissioner who, by the motion of a long swell and the evil piscatory odor, is somewhat afflicted by what the local satire terms "white ears."

And now the menhaden, bushels on bushels, are scooped all quivering into the great scow, for a

little outside lies a mackereler who has just let go her anchor with a rattle and a boat is pulling in with the skipper to buy bait.

"What you got," cries he, in an indifferent tone.

"Menhaden," retorts Captain Warren as if speaking of a new and rare fish. (A pause.)

"I don't know but I might take a few barrels if they was low," says the skipper. (No reply.) "What do you want for 'em?"

"Eighty-five cents," shouts Captain Warren, and then (*sotto voce*), "I don't believe he's got a scale."

At this answer, the man of mackerel pushes over the tiller and steers off indignantly; but presently pauses, "Give you sixty-five, for seventy barrels."

"Seventy-five is the lowest," replies Captain Warren. "Call it seventy cents for seventy-five barrels."

"Waal, waal!"

And by this time the scow is full, and the weir-men pull for the vessel, whose numerous crew is ready to hoist the bait on board and salt it down. They stand with knives, barrels, and chopping-blocks, and rapidly cut off the heads and tails of the fish, and the thin parts of the sides, then give a gash in the shoulder, and throw them into the barrel for salting. A mackereler will take as many as 120 barrels of such bait, which is minced fine in a hand-mill and thrown over to toll the fish.

For a seasick commissioner, no doubt making an official inspection, Colonel Lyman had a keen eye and ear for what passed between two canny Yankee fishermen on the price per barrel. Today's market analysts do no better on computerized arm's length bargaining.

His report on the haggling between Captain Warren and the mackereler was what had been going on for thirty or more years in New England waters. Salted menhaden had long been used as good bait for haddock, fair for cod, and in the 1830's and 1840's they were found equally enticing to mackerel if ground "into a mush and salted to be used as a 'toll bait,' and to be thrown over the side of the smack to attract the school to the surface and keep it alongside." One man threw the "mush,"

the rest worked their lines, or purse seines or drift nets if the smack was fishing that way.

This operation was called then, as now, "chumming up the fish," and the bait was called "chum," "stosh," or "toll bait." Today menhaden are still used as chum, but almost entirely by sport fishermen hoping to bring blues and striped bass to their hooks. The late J. D. Krentz, Sr., of Ophelia, Virginia, claimed to be a pioneer in rediscovering the technique in the mid-Chesapeake Bay region a century or so later.

Originally small or otherwise unsalable mackerel were ground up on the mackerel smacks, but menhaden were found soon to be even better and no depletion of the mackerel stock. Whether for haddock or cod lines or tolling or chumming for mackerel, the menhaden were first cut into "slivers"—pronounced "slyvers"—or crudely filleted.

"The head of the fish," said Goode, "is taken in the left hand of the workmen, and with a knife held in the right hand he cuts a slice, longitudinally, from each side of the body, leaving the head and vertebrae to be thrown away, or, occasionally, to be pressed for oil."

Mackerel fishermen from "the British provinces"—Canada—helped make up a large market for menhaden. Goode said they would pay six dollars a barrel "in preference to herring bait which costs only the labor of catching and the salt for preserving."

In fact, in 1868 an official "Special Report on the Distress among the Nova Scotia Fishermen" gave as one reason for failure of their fisheries the fact that "the pogies, the only real mackerel bait is not caught east of Portland." The report complained that importation of menhaden, with transportation costs and the American duty, placed the Nova Scotia fisherman "in the position that if he catches during the season, to his own share, forty barrels of mackerel in one vessel, he has not made as good a season by about \$100 gold, as if he had been in an American bottom."

As might be expected, fishermen seeking menhaden for bait soon found themselves, or so thought, competing with those serving or supplying the growing number of oil and manure and later guano

factories, even though most of the latter also sold "slivers" for bait.

"At first," a "History of the Towns of Bristol and Bremen, in the State of Maine," by Professor John Johnston, L.L.D., recounted,

the new branch of the industry, in which such immense quantities are consumed, was viewed by the old fishermen with no little suspicion. . . . Some riots were at least threatened, and one oil factory was actually destroyed, as was believed, by the old fishermen, or at their instigation. . . .

By 1873, the professor continued, "the opposition has ceased, and the general opinion seems to be that it is best to foster such an extensive branch of the business, giving profitable employment for a part of the season, as this does, to so many men, even though it may be attended by some disadvantages, which in the end may prove more imaginary than real."

In an ironic forerunner to disputes during the 1960's between the menhaden fishery and some sport fishing interests, and with other commercial fishermen, mostly crab and lobster potters, Maine line fishermen tried in 1877 and 1878 to obtain a law forbidding the use of purse seines near the shores. They contended that seining there "interfered with their legitimate privilege of catching menhaden for bait, and that their tendency was to drive away all other fishes as well, and to destroy the fisheries."

The manufacturers replied that menhaden were "practically inexhaustible" and that the seining on a large scale actually made bait more available to the line fishermen since they could buy it from the factories more cheaply than they could get it themselves.

"It seems unlikely," Goode commented, "that any legislature will at present interfere with so extensive an interest as that of the menhaden oil manufacturers."

Again with a touch of irony almost a century early, the industry told the legislature that the line fishermen's complaint of edible fish being driven from inshore waters was "too trivial to notice." Similar problems have come up frequently and are described in a later chapter.

“If the limited operations of seining inshore scare the fish out,” said the 1878 industry report by Mr. Maddocks of the Maine Oil and Guano Association, “much more should the far more extended operations

outside scare them in.” He added that association members did not catch more than two hundred barrels of shad a year, and never caught salmon.

VI. They Came, They Went

Some of today's fishermen, reading George Brown Goode's history, comment, "We don't know much more about bunkers now than they did then." The menhaden population and migrations seemed dependable enough then to be the foundation of a growing industry. Yet at times they just left one area or another and no one knew why.

While his history was going through the press, Goode had to write a hasty introduction to include late information on one of these unexplained regional swings—a complete failure of the fishery in the Gulf of Maine in 1879, echoing Captain Deblois' experience of 1865: "More than forty steamers went into the Gulf of Maine in July," Goode wrote, "to return in a few weeks without wetting their nets. The total catch for 1879 was one hundred barrels of fish, taken by one of the steamers in July, in Casco Bay."

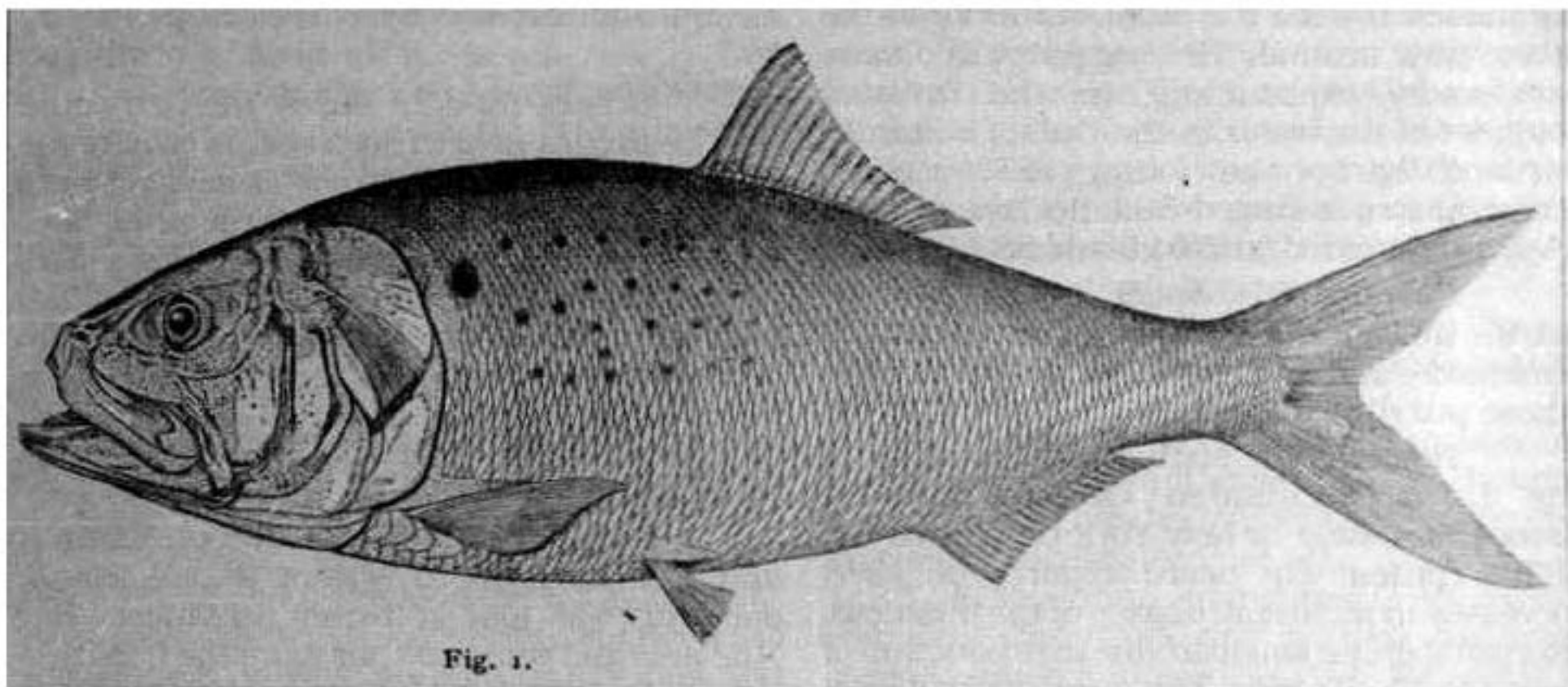
Goode quoted a detailed account by R. E. Earll of the Maine Oil and Guano Association describing "the general distress," which oddly did not extend south and west to the rest of New England or to Long Island Sound, the New Jersey coast, or Chesapeake Bay. Earll wrote:

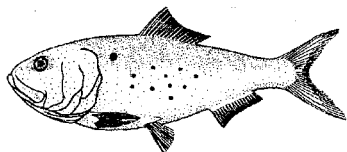
The total absence of porgies is causing no little loss to all interested. The shore fishermen have lost fully half of their time and over half of their usual catch from not being able to get any porgies to fish with, while the "Georgesmen" from Cape Ann have been driven far out of their way, going

even to Rhode Island and Connecticut to obtain their usual supply of porgy bait. Some have ventured to seek bait here, in the "hedges" and traps of the river fishermen, and have frequently taken river-pilots and gone far up the Kennebec, often waiting fully a week before getting their supply.

The oil and guano factories had gone to considerable expense in getting ready for the season's work, and their property is entirely idle. The factory hands and steamers' crews have been thrown entirely out of employment, and are perhaps less able than any of the other classes interested to bear such a loss. The general prosperity of the porgy fisheries, for some years past, has drawn to them a large class of workmen from other occupations. Some, in moving into this region, have built for themselves small houses, and have been depending on the summer's work for the means to pay for them or to complete them. Others have spent their entire means in getting their families located, and almost none have money laid up to carry them through the winter, and but little employment can be had from this time forward.

They were all on hand to begin work the first of June, and kept waiting, in the hope that the fish would "strike", until late in August. When they at last gave up the idea, it was too late to engage in any other





Brevoortia tyrannus, adult, 12 inches long, from Woods Holl [Hole], Massachusetts, drawn by H. I. Todd. From Goode's *The Menhaden*.

occupation. A few of them have gone out in small boats to "hook" for mackerel, but have met with indifferent success.

Eight companies "allowed their crews to take their steamers south" to other fishing grounds, and twenty-eight steamers left. Three others stayed in the Gulf of Maine seining mackerel, but landed only 550 barrels in all.

Goode ventured that the total 1879 catch would fall below 1878's except in southern New England because of the addition of the Maine steamers and hungry crews to the fleets already there.

Nor was fishing really easy elsewhere, despite the apparent abundance south of Cape Cod. Captain N. B. Church of Tiverton, Rhode Island, master of the steamer *G. W. Humphrey*, reported that the first fish were caught off Montauk Point May 6 and were plentiful for five weeks, but "sometimes they were at one place and again at another—were moving all the time." (As now, a fish boat captain tries to "be at the right place at the right time.") Captain Church also noted that his 1878 catch yielded an average of two and one-half gallons of oil to the barrel, but in 1879 only four quarts, even though he had caught sixty-thousand barrels, more than a third better than in 1878.

Another correspondent reported that a "heavy body was seen off Rhode Island for ten days, and then they disappeared, and have not been seen since." He added that the 1879 catch seemed little larger than in 1878 and complained, "Last season they were easy to catch; this season hard to catch. . . . The result has been less catch to a steamer, but there have been more steamers, and the result has been about the same." (Another comment to be heard down to our day.)

A Brooklyn, New York, correspondent, Louis C. d'Homergue, reported the fish scattering and spreading in late summer—"the fishermen called them 'wild'"—and scarce after September 1, with a rush in early October. The rush yielded well in oil, but November fish were so poor in oil they were called a failure.

Then a New Jersey factory operator, James E. Otis of Tuckerton, said the fish appeared April 25, "nearly two weeks earlier than usual," and continued to make the season the best in four years. "My vessels," he said, "have taken some 3,000,000 each, the largest single haul being 125,000." Goode also found that menhaden began to appear in the Washington fish markets February 25, well ahead of "branch-herring, shad, and glut-herring."

Seeking to account for the early arrival of the menhaden, George Brown Goode was not satisfied with theories related to bluefish movement, believing that the blues follow the

menhaden toward the coast, rather than the other way around. He suggested a "more satisfactory explanation" in the unusual coldness of the water in the Gulf of Maine. In Portland harbor he found 1879 surface temperatures averaged 56.1 degrees, bottom 54.6, as compared with 61.5 and 58.1 in 1878.

Despite this small early effort in marine biology and oceanography, much light remained—and still does—to be thrown on "these puzzling subjects."

However, the sixth annual meeting of the U. S. Menhaden Oil and Guano Association, held in New York on January 8, 1879, contentedly heard reports of 1878 increases in almost all phases of the business, excepting only a small decline in production of guano to 55,164 tons. The members had fifty-six factories in all, with 279 sailing fish boats, nine more than in 1878, and sixty-four steamers, one more. Manpower increased by 650 to 3,337, and the number of fish caught, the figure most important to the "sharesmen" aboard those sloops and schooners and steamers, rose by nearly 190 million to 776,779,250. The menhaden fishery was approaching a day when a billion fish could be caught in a season.

The growing catches, which had been developing over the years as more and more fishermen and shorebound entrepreneurs saw money to be made, had already been raising, in a small way, another of those "puzzling questions": Was the menhaden truly inexhaustible, or could it be overfished?

After a review of several possible factors, including wind and weather, especially thunderstorms and tides, Goode found little real long-time correlation, then cautioned, "Many of the remarks...are applicable only when they [menhaden] are left to enjoy their favorite haunts undisturbed." They were no longer undisturbed, and had not been since at least the Pilgrims' days.

The extent and effect of the disturbance was, as might be expected, in dispute. Inshore line fishermen seeking bait disputed with purse seiners. Goode also got testimony in Maine that menhaden were being driven out to sea, and the keeper of the Pemaquid Point Lighthouse reported that the inshore fishermen only got fish in their nets

for bait "on Sundays when the seines are laid by."

Others thought surely the fish could only be caught now in deep waters "where the seines cannot touch bottom." Others yet were "of the opinion that the use of the seine does not influence the movements of the fish." Still others blamed "the advent of the blue-fish twenty years earlier" driving menhaden to deeper water, but another faction thought the blues drove them into shoal water. "Both statements are doubtless at times true," Goode commented.

Daniel T. Church of Joseph Church and Company, the Tiverton, Rhode Island, operator, was just as firmly convinced that "the nets and seines do not scare the fish from the shore, for Narragansett Bay has been the theater of their greatest capture for forty years or more, and they have been more plenty than ever before known for the last ten years." He insisted that fish would "drive menhaden but man never does, except by use of powder." An axe or oar dropped on deck of a fish boat, "or the careless slat of a rung on the gunwale," he added, "has sent a school of fish off at top speed."

There was little reliable comparative data. The Dutch had told of huge schools of *marsbanckers* in New Netherlands; a New York professor had told of a haul of eighty-four wagon-loads, one thousand fish to the load, on some unnamed past date at Bridgehampton, at the eastern end of Long Island; and a New Jersey man wrote in 1857 of a haul of sixty wagon-loads at 2,500 fish to the load, from Raritan Bay. Whether any of these and many other incidents were one-time events or part of a continuing condition, no one could say.

Of the 1870s Goode found appraisals from Maine to the St. Johns River in northern Florida, with menhaden the most abundant fish. In many cases the correspondents reported them increasing to the point where big schools washed ashore in storms or driven ashore by bluefish seemed to make no hole in the abundance. A party of New London, Connecticut, manufacturers visited Chesapeake Bay in 1866, the year before Elijah Reed arrived, to find menhaden "so thick that for 25 miles along the shore there was a solid flip-flap of the northward-swimming fish."

One man jumped into the water with a dip-net and threw bushels on the beach.

Along the Delaware coast, where they were not sought, those caught with other fish were left on the beach "to rot or taken home to feed hogs, or...composted for fertilizer, for which they are only valuable," James H. Bell reported from the Mispillion River. "The quantity taken from the water never seems to affect the supply," he added.

A North Carolina correspondent said menhaden were "on the increase, and not even their wholesale destruction by the bluefish seems to affect their abundance."

Goode concluded that they were "by far the most abundant fish on the eastern coast," with "no evidence of any permanent decrease in numbers" despite annual fluctuations, and despite his own "very moderate" estimate that bluefish alone among the many predators destroyed "three thousand millions of millions of menhaden, old and young," annually. Again he cautioned that past comparative data were

lacking, nor was there any way to estimate the ratio of increase or decrease over the years.

"The same must be said," he added, "regarding the effects of the wholesale capture going on every year on certain parts of the coast, for the present perfection of fishing apparatus and the skill of the fisherman is likely to prevent any apparent diminution of the yearly returns of the fisheries, even though the species be gradually approaching extinction."

He thought no one could "reasonably predict a decrease in the future" and thought it hopeful that menhaden were never captured on their spawning beds at sea.

Fish boat captains, fishermen, company executives, and marine biologists agree to much of this today. And all agree that nobody yet knows enough about menhaden.

More is discovered, year by year, and in time the whole answer may be in hand, although nature rarely gives whole answers to anything.

VII. New England a Century Later

The center of gravity for the menhaden fishery and the fish meal and oil industry shifted from its New England origins in the nineteenth century, but in the late 1970s pogies were still caught and fish meal, oil, and solubles were being produced—not exclusively from menhaden.

Techniques were different, adapted to the smaller scale of industrial operations in fishing country where almost the entire effort is for food fish. The fishermen were still hampered by fogs. The draggers depended heavily on electronic fish finders to tell about schools of food fish deep in water, and fog to them was largely a navigational hazard. The menhaden fisherman is badly handicapped if he can't see fish whipping at the surface, or if his spotter plane pilot can't see the dark mass of the school, or can't even get off the ground. Visibility was a problem in the nineteenth century, but the pace was slower.

Much of the New England menhaden fishing now is done by one or another of the large companies. The fleet of Seacoast Products, Incorporated, successor to J. Howard Smith, Incorporated, whose refrigerated boats are based at Port Monmouth, New Jersey, is within a day's steaming of much of the New England ground, and particularly in and near Rhode Island's Narragansett Bay. Zapata Haynie Corporation of Reedville, Virginia, occasionally sends a boat that far north.

However, Lipman Marine Products,

Incorporated, of Gloucester, Massachusetts, maintains an active menhaden effort, buying the catch of four privately owned boats with capacities of 375 to four hundred thousand fish each. The fish are brought to a factory with a capacity of one thousand tons every twenty-four hours, and both menhaden and fish waste from food fish filleting houses in Boston, New Bedford, and Gloucester are processed.

The fleet serving Lipman, made up of family-owned draggers which turn to food fishing when menhaden head south in the fall, includes the *Ida and Joseph*, the *Rockaway*, the *Silver Lining*, and the *Natale III*. They cruise from Narragansett Bay to Rockland, Maine, making sets with only one purse boat aided by a modern outboard version of the striker or drive skiff that was a key factor in the fishery everywhere before air spotting became practical after the Second World War.

A typical fishing day with one of the fleet, the *Ida and Joseph*, owned by Joe D'Amico and Sandy Calomo since 1948, and crewed by a dozen men, mostly kinfolk, may take her into Boston Harbor, where good catches were made yesterday. That's two to three hours from home and the start is made long before dawn, with most of the crew sleeping in bunks in the wheelhouse and galley.

In Boston Harbor the *Ida and Joseph* will be conned carefully past lobster pot buoys and through or around harbor debris, trash,

and refuse, some dumped, some coming out of sewer outfalls—including bloody bandage plasters and other hospital wastes. When the boat nears the Peddocks Island site of yesterday's catch of a boat-load of 350 thousand in one set, the single purse boat is sent out to cruise slowly and look for another school. The men aboard the *Ida and Joseph* take up lookout posts, high or low.

If it's a good day, each pogy boat may have a spotter plane overhead, usually a rented plane with a member of the boat's family beside the pilot to locate schools and call observations and orders down by radio. On days when the weather makes the cost of the plane marginal, the fishermen are on their own, as years ago. As with spotters on other waters, the location of schools in closed areas—in the inner harbors and creeks—can be passed on to the boats, so the men can watch for fish to come out with the ebb tide. Information also comes by radio from the Lipman offices to tell the captains other areas, near or far, where fish have been seen.

Sometimes a school will start whipping close to the dragger when its purse boat is far off, and then it's a race for the purse boat, summoned by radio, to get back before the fish head off elsewhere, or before they sound because of some noise spooking them.

The set is made in much the same way as with two purse boats. The skiff is towed by the purse boat until the time to start around the school. Then its operator casts off, drawing the cork line and pulling the seine out of the purse boat.

Both boats pick up a little speed to make the circle with the 180-fathom net, then rush toward each other at the last, seemingly on collision courses. The purse boat reverses to stop, the end of the cork line is passed aboard from the skiff, two 300-pound toms are dropped to purse the bottom, and the set is made. The power block on the purse boat begins to take up the seine to bunch the fish, with crewmen tending the folds and flaking it down.

The skiff races back and forth to keep the fish from escaping before the cork line is finally winched completely aboard the purse boat. Then the operator heads to the opposite side of the seine to raise the floats and keep the

fish from overriding in one of their rushes from side to side.

These two duties were likewise part of the services of the old-time striker, who tried to drive a school into the seine by striking the water with his oars, or, as George Brown Goode told, throwing white pebbles. Then the striker too rushed to the far side of the net to hold up the corks and keep the fish from overriding.

All the time the men in the purse boat—and those in the dragger as well—watch to see the fish "hit" or start to flash and boil at the surface, and roll out the bunt under the corks, as the tightening net packs them more and more closely. Then the men can tell whether they have a good set, whether they are making money or putting in time.

From time to time, fishing in a harbor as heavily used—and dumped into—as Boston's, the seine will bring up beer cans, waterlogged timbers, even abandoned dories or other small craft long sunk and forgotten—all to be cleared before the net is damaged.

While the power block is raising the seine, the skiff operator makes fast to the purse boat again and starts mending any tears caused by all that jagged junk or by rocks on the bottom.

The *Ida and Joseph* then comes alongside to take the catch. It is bailed aboard with a dipnet holding up to 1,200 pounds of fish and winched up over the fish hold. A quick pull on a line opens the bottom to dump the fish.

Then the *Ida and Joseph* cruises or drifts again, everybody alert and watching for more whips, or listening to their spotter, or to the factory radio. The purse boat cruises and drifts, too. If the set was a small one, say only fifteen or twenty thousand fish, more will be needed to make a day's work before racing the other draggers to the state fish pier. If it was a real good one, a boat-load that seems to make freeboard disappear, head in now, and even call over another dragger to take any excess.

As Chesapeake Bay menhaden fishermen must move nimbly around crab pot floats (most do, although crabbers are quick with suspicion), the New England fisherman must be careful of lobster pot floats. If a pot is taken up in a set, it must be put back as closely as possible to its original location. Free

lobsters caught are thrown back. And since menhaden are liked by lobsters as well as crabs, the pogy boats often sell a bushel or so to a lobsterman for bait. It makes a profitable side business, and tends to keep lobstermen friends.

As with menhaden fishermen everywhere, fish boats here at times have a "haul-back," when the fish sound or otherwise escape before a set can be completed. It's part of the game, no matter how painful, how unjust, it seems at the time. Menhaden may have been made only for the welfare of the fishermen, but once in a while they forget.

Lipman Marine Products is, like many other menhaden company, a descendant of earlier enterprise. The company was formed by the Lipman family in 1966 to take over the plant and facilities of the Gloucester By-Products, Incorporated, which had processed menhaden and food fish waste for many years.

Bernard Lipman is president, Harold Lipman treasurer, Frank Lipman secretary and clerk. The general manager is Edward J. MacLeod, who is also a member of the New England Fisheries Management Council, formed to develop conservation and management plans under the two hundred-mile limit law which went into effect March 1, 1977.

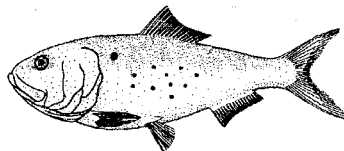
Another New England fish meal and oil producer is the Mearl Corporation, with a factory of forty tons an hour capacity at Eastport, Maine. It, however, depends on sea herring, caught mostly in the Bay of Fundy by Canadian fishermen. Its primary product is not the fish meal and oil but pearl essences, crystals, and pigments, made from herring scales. (Herring scales shed easily, but menhaden wear theirs almost intact into the factory cookers.) The company at one time had a small herring station at Harryhogan, Virginia, on the Yeocomico River, a Potomac River tributary. The products go into such things as cosmetics, including eye shadow, lipsticks, makeup, and nail enamels, and also into manufacture of simulated pearls, automobile finishes, buttons, vinyl and other plastics, and even a foam fire extinguishing agent known as Mearlfoam 5.

A predecessor company was formed in 1916 to pioneer in extraction of pearl essence from herring scales, and in 1933 Mearl Corporation was organized. Harry E. Mattin is board chairman and James W. Zarakas is president of the company, which has headquarters in Ossining, New York. Lauren C. Kingman, Jr., is manager of marine products and David B. Turner is manager of the Eastport plant.

VIII. Yankees in Virginia

In the late summer of 1867, Elijah Warren Reed was forty years old, already retired after twenty years at sea as a captain. He had turned to poggy fishing out of Herricks Bay from his hometown of Brooklin, Maine, but found the fishery crowded. More fish than whale oil was made in Maine, but the poggy catch was dropping off.

As master of the barque *Laura Campbell* and a three-masted schooner, Captain Reed had seen Chesapeake Bay as well as many foreign ports. On the Bay he had seen pogies by uncountable millions. Perhaps he also had heard the report from the New London men the year before of a Bay school twenty-five miles long. Like many a Maine Yankee, he knew when he saw opportunity. He loaded his kettles and presses on two small schooners, the *A. F. Powers* and the *Two Brothers*, and sailed for Virginia. He entered through the Virginia Capes, sailed the eighteen nautical miles west across the Bay, and "set up" on the beach of Back River, near Old Point Comfort, just above the entrance to Hampton Roads. (For years in the next century, the old Virginia Fishermen's Association, organized in 1896 by menhaden owners and captains, met annually in the Chamberlin Hotel at Old Point Comfort, as a sort of close-by memorial to the founder of their industry. There was nostalgic lamentation when the growth of the industry brought about creation of a successor National Fish Meal and Oil Association, with a



Captain Elijah Reed in later life, from a portrait hung in Reedville's Bethany United Methodist Church.





Washington lobbying headquarters and a practical inclination to meet in more efficient convention halls around Washington or at Williamsburg, Virginia, or a Florida resort.)

Captain Reed's Old Point Comfort site was exposed and also busy with shipping traffic into Hampton Roads. That winter he moved almost fifty miles north to Ketcham's Camp on the Bay shores just north of the Great Wicomico River. The Great Wicomico enters the Bay at the eastern end of Virginia's Northern Neck, the narrow peninsula between the Potomac and Rappahannock Rivers.

Ketcham's Camp likewise was exposed. He soon moved again to the nearest deep creek, Cockrell's Creek, a Great Wicomico tributary, "on Mrs. Mary Jane Towlson's point, known as Point Pleasant," as told a memoir by

his son, the late George N. Reed. With six kettles and one purse seine, and joined by Gordon Terry of Long Island and a native, G. T. Owens of nearby Fairport, Captain Reed cooked 2,750,000 menhaden in the first season. He got about three gallons of oil per thousand fish.

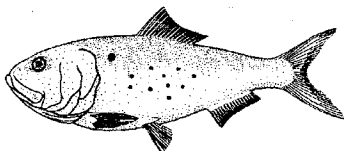
He operated there until his factory burned—a familiar disaster—in 1873. He moved a third time, but Point Pleasant continued in the menhaden scene, with another factory in a few years.

Captain Reed's new factory, built in 1874, was on thirty-three and one-third acres of Windmill Point, the eastern tip of what was to become the village of Reedville. The land, bought from Mr. and Mrs. A. J. Evans, cost one thousand dollars. In 1879, he built the Bay's first steam factory.

Yet Captain Reed was not the first to test the promise of Chesapeake Bay menhaden. George Brown Goode had gathered fragmentary reports, mentioned earlier, of efforts just after the end of the Civil War, some contradictory, all uncertain, but all probable or at least possible. No one had to keep detailed records then, and if a man went to the Bay and caught fish, he might well have kept it to himself, or if he failed, have forgotten about it. The Internal Revenue Service doesn't let you do that now.

And, while Goode was writing in Washington, at the fall line of one of Chesapeake Bay's biggest tributaries, the isolation of the Chesapeake Bay country and especially of the Northern Neck kept him from hearing much.

It does seem established that in 1865 one of the Greenport, Long Island, entrepreneurs, David G. Floyd, put oil works aboard a sailing vessel for a floating factory and sent it to the Bay, but apparently with little profit. In December 1866 Captain F. Frank Price brought the *Ranger*, one of the two factory boats already active at Greenport, to the Bay for eleven days, fished, processed, and hauled its oil home. A factory boat would have been the only practical way to fish so far from home. The fast rotting fish would be worthless hauled home on deck. The venture must have returned something, for the *Ranger* came back each of the next two years.



George Reed, son of Captain Elijah Reed, who gave his father's name to the village where the Reed factory finally was set up after burning at another location. George Reed, then postmaster at nearby Fairport, moved the post office to Reedville. Reed family collection.

An early New England company likewise was looking into Bay and North Carolina prospects. The Quinniapiac Fertilizer Company of New Haven, Connecticut, sent a "prospecting party" to North Carolina, only to be "driven away by the natives" of Roanoke Sound. The party retreated north to Cape Charles, the northern of the Virginia Capes at the entrance to Chesapeake Bay, and apparently was joined by two unnamed New London, Connecticut, companies.

"They found the fishery very good, although the fish produced little oil, and were adapted only for the manufacture of fertilizer," Goode reported. "The laws of Virginia do not encourage the inauguration of such enterprises by strangers, and the following year it was thought inadvisable to continue the business."

Added to this sketchy report was information that "since 1872 several stock companies have been organized under Virginia laws...and their success is well assured. Although the oil is not produced in great quantities, there is sufficient to pay the cost of manufacture, thus leaving a clear profit in the scraps."

Elsewhere Goode told that H. L. Dudley, secretary of the U. S. Oil and Guano Association, had informed him of four factories between Norfolk and Baltimore, but added, "I have not learned the names and locations of all...." There was, he said, a Virginia Oil and Guano Company at New Point Comfort, seventeen miles north of Old Point Comfort, and a second owned by William D. Hall, "formerly connected with the Quinniapiac Fertilizer Co.," now of "Willenbeck, Lancaster County." ("Willenbeck" will be Millenbeck, on the Corrotoman River, a tributary of the Rappahannock. William D. Hall must have been the man who in 1852 or 1853 invented a steam process for recovering oil at his Quinniapiac bone and tallow works at Wallingford, Connecticut.) A third was the Manokin Oil Works, "said to be on Pocomoke Sound," and owned in 1873 by Crockett and Company, and a fourth on Tangier Island, owned by Ford, Avery and Company. (Since Crockett has always been a leading family name on Tangier, Goode could have had these enterprises reversed.) And Goode related, "A

factory was operated near Norfolk in 1872 by Mr. Fitzgerald but this has since been destroyed by fire."

In his last minute introduction to his book bringing this information up to date, Goode apologized for having thought it not necessary to make a special survey of Chesapeake Bay, and cited data provided by Colonel Marshall McDonald, Virginia's commissioner of fisheries, in a "circular, without authentication, dated Northumberland County, Va., December, 1878." From it he calculated that the Virginia production, added to the northern manufacturers', would increase "the total catch for 1878 to nearly 900,000,000 of fish, the total yield of oil to over 4,000,000 barrels, and of guano to over 30,000 tons." He then listed fifteen companies, mostly in Northumberland County, some in Lancaster, two Crockett companies on Tangier Island (nothing further on Ford, Avery), and a scattering elsewhere, including one on the "Pecancatauck River" in Middlesex County. "Pecancatauck" undoubtedly was a phonetic variation of today's Piankatank, which flows into the Bay a few miles south of the Rappahannock. Captain John Smith heard it from the Algonkian Indians as "Pyankatank" or "Pyankantank," meaning "small and beautiful bay or water," which it is.

Goode found that "in the year 1869 more than usual attention was turned to this matter" and reported twelve men employed on four vessels, catching three million fish, with nine men ashore making three hundred tons of guano and two hundred barrels of oil, all probably for Elijah Reed. By 1878 he found 286 men sailing on seventy-eight vessels and catching nearly 120 million fish, with 201 men ashore making more than ten thousand tons of guano and 234,168 gallons of oil.

"This industry is yet in its infancy," Goode wrote,

and the best means of handling the product of the fisheries of the rivers and bays of the State may not yet be fully understood, but with ingenuity and energy of the fishermen and patronage of the farmers in the liberal use of the fertilizers made, and the protection of the Legislature, we have no doubt that ultimately the enterprise and capital employed in

this business will realize satisfactory results."

The comment about the legislature may have been made to temper the earlier remark that "the Laws of Virginia do not encourage the inauguration of such enterprises by strangers." Or to suggest to the Virginia General Assembly somewhat more favorable laws. Lobbying had been invented.

It is strange that Goode's and Colonel McDonald's comment, early or late, scarcely mentions Elijah Reed, and then only through inclusion of "E. W. Reed, Fairport," as the fourth of his list of fifteen companies. There was also a Reed and Woodhull listed on Little Bay, Lancaster County, but it is not clear whether this was an Elijah Reed company. George N. Reed's memoir of his father does not mention the company.

Whatever, Elijah Reed stayed, undiscouraged by any (if any) unfavorable laws, untouched by any (if any) opposition of "the natives," and too busy by 1880 to notice that he had been all but ignored.

He thus became father to an industry that in the first quarter of the twentieth century was to give the whole Reedville community the reputation of having the highest per capita wealth in the United States. In 1912, that most happy of years for the whole fishery, there were eight plants, capitalized at two million dollars, in and around Reedville, on Cockrell's Creek. They returned to stockholders dividends of as much as 125 percent. More than sixty fish boats steamed forth every weekday morning in the summers to cruise all Chesapeake Bay, some to venture into the Atlantic Ocean. They followed the schools wherever the bunkers went.

In Reedville every family owned its own home, some grand if not magnificent, with Victorian gingerbread to show a cosmopolitan air to any who chanced by in this remote corner of an almost forgotten corner of Virginia.

While farming and timbering still supported the people away from the water, the bunkers gave this Cockrell's Creek enclave a good living, with trap fishing, crabbing, and oystering rounding out the year. Ashore the factory operators prospered, afloat the captains and mates and engineers. Even the fishermen, most of them black men whose

parents, certainly their grandparents, knew slavery, benign though it was in this area, did well.

Robb Leon Greer's 1915 report on "The Menhaden Industry of the Atlantic Coast," the first substantial survey since Goode's, gave a wage scale that could not have been much different from that of 1912, especially since the United States was not yet in the First World War. He wrote:

The captain, who must be a practical fisherman in addition to having a knowledge of the coast, receives no stipulated salary but is paid a bonus of 12½ to 18½ cents for each 1,000 fish caught. The monthly pay received by the other members of the crew is as follows: Mate, \$100, or \$50 and a bonus of 4 cents per 1,000 fish, or \$25 and a bonus of 5 cents per 1,000 fish; pilot \$85 to \$90; engineer, \$90 to \$125; assistant engineer, \$60 to \$80; firemen, \$35 to \$45; striker, \$60, or \$35 to \$40 and a bonus of 1 or 1½ cents per 1,000 fish; cook \$60 to \$75; and \$35 to \$45 for the entire crew. In addition to this, the employers furnish subsistence for the entire crew.

These figures, for the Bay and the Atlantic coast to the north, sounded a little quaint in the 1970's, when captains got from seventy-five cents to a dollar a thousand and fishermen a guarantee and around twenty-five cents (no subsistence—they even pay for food afloat!), but at that time it was adequate. One captain, Isaac Milton Bussells, gained the reputation in the early 1920's of making more money than anyone else from fishing, and he got up to about twelve thousand dollars a season.

Although there were many lean years ahead that would turn prosperity into near-disaster, Reedville then was on the way to becoming what it is today, ranking annually among the nation's leading fishing ports, along with San Pedro, California; Cameron, Louisiana; Pascagoula and Moss Point, Mississippi; and Empire, Louisiana. Of these, all but San Pedro are menhaden ports! Reedville landings run close to a billion fish a year.

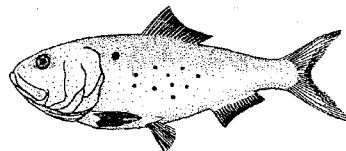
Actually, there is no menhaden industry at the village now, however many the menhaden people and their Victorian

houses—and newer ranch houses. Zapata Haynie Corporation, largest menhaden company in the United States, has its Atlantic Coast factory, likewise the largest, at Fleeton, a half mile down the east side of Cockrell's Creek. Standard Products Company, Incorporated, third largest, has its main factory at Fairpoint, across the creek. Possibly in some final reckoning it will be recognized that Fairport, a village no longer with its own post office, once had enough factories to be the actual center if not birthplace of the industry on Chesapeake Bay. But all the catch is tallied under Port of Reedville. Fairport had a post office long before its postmaster, Elijah Reed's son George, moved it upstream in 1888 to the village he named for his father, who had just died.

Whether Elijah Reed knew what he was starting no one could guess now. Nothing in his son's memoir so indicates. Likely all he felt was the familiar ambition to make a success and some money in a business he knew well. Yet what he did helped Tidewater Virginia and especially the Northern Neck recover from the Civil War and what southerners regard as little less disastrous, the Reconstruction and its swarm of carpet-baggers, most looking only to get rich at the expense of the defeated South.

The Northern Neck, seemingly touched lightly by the Civil War with no battles on its grounds—indeed almost no bloodshed since the War of 1812—nevertheless was on “hard times.” Its Colonial tobacco economy had long since died with exhaustion of the soil to meet the demands of London merchants, themselves likewise interested only in getting rich at the expense of the distant colony. It was too far north for cotton. And some of its many men who had gone to war did not return. The memorial statue in the court house square of the Northumberland County seat, Heathsville, depicts no general on a rearing stallion, but a woman with an anchor, for the wives and mothers who kept the Northern Neck's water-dependent life going.

Heathsville's Civil War monument: a woman with an anchor honors the wives and mothers who kept up the maritime economy of the Northern Neck of Virginia while the men were fighting.





There were unhappy memories, including those of Yankee gunboats patrolling the Potomac and Rappahannock Rivers and the seventeen-mile Bay shore and, by local legend, "shooting off Granddaddy's chimney just to be mean." The only building on Windmill Point, a store, when Elijah Reed built his second factory had been hit several times, and an unexploded shell was found in 1963 during dredging for a fish boat dock at Fleeton. Some of these memories were still alive in the second half of the twentieth century among older people who had heard the stories from their grandparents. The memories were fading reluctantly even amid an influx of latter day Yankees retiring, with money, to the shores of the scores of Northern Neck creeks and rivers.

When Elijah Reed sailed into Cockrell's Creek in 1868, the Northern Neck was almost as isolated from the rest of the country and the world as a distant island. Some called it "the lost colony." The Potomac, ten miles wide at the mouth, separated it from Maryland's shores, and they could disappear in a light haze. No one here, of course, could forget that on Maryland's southernmost point, Point Lookout, was a Union prison camp regarded in the South to be as infamous as the South's own Andersonville. Many an escaped Confederate was helped across the Potomac by Northern Neck watermen and welcomed in Northern Neck homes.

The Rappahannock River, two miles wide, was to be crossed only in good weather by ferries. Richmond, the state capital, was two to three days away by ferries and by horse. No railroad was ever built. Some thought the menhaden industry blocked it. Others pointed to ownership of the old Baltimore, Chesapeake and Atlantic Steamship Line by the Pennsylvania Railroad.

The Northern Neck knew Baltimore, from which the steamboats brought its daily needs, and to which steamboats, schooners, and pungies hauled its fish, timber, and produce. At Baltimore you could get on another steamship, or take a train, to Philadelphia and New York. But Washington was remote, a nest of carpetbaggers, to be visited only in urgency about some new federal injustice. Then you went either by horse or by steamboat up the Potomac.

The Northern Neck had history, with more years in it than the nation itself could count. Northumberland County was erected in 1648 from the Lord Fairfax grant that ran "west to where the sun sets." Lancaster County, along the lower Rappahannock, was carved from Northumberland three years later. From Northumberland sprang 120 counties westward over the Appalachians to what is now Kentucky. Within a score of miles of Reedville are such landmarks as Robert "King" Carter's Christ Church, completed in 1732, the year George Washington was born; Ditchley and Cobbs Hall, early homes of the Lees; Epping Forest, birthplace of Mary Ball, to be mother of George Washington; and Mantua, a great house overlooking the Potomac at the mouth of the Coan River, whose land an early speculator offered as a site for a new nation's capital. Within forty miles of Reedville are the birthplaces of George Washington and Robert E. Lee, in Westmoreland County, which with Richmond County (not city) forms the rest of the lower Northern Neck.

Thus Elijah Reed the Maine Yankee—and the score or more of similarly minded Yankees who followed him from Long Island and New England—sailed into a land of F.F.V.s, First Families of Virginia. The other Carters, the Harrisons, the Byrds, the Tylers, the Wards who settled along the James River, southernmost of Chesapeake Bay's big tributaries, were perhaps more select, at least among themselves, but here were not only the Washingtons and Lees but Mottoms, Turbevilles, Wellfords, Haynies, and more Carters, along with many another who had chosen the Potomac or Rappahannock shores between the Bay and the fall line for their plantations and great houses. In Colonial days English sailing ships were conned up the broad waters and shoals of the Potomac or the winding way of the Rappahannock to bring rich furniture and furnishings to these Colonial squires, and to haul their tobacco back to London, along with now and then a scion to be educated in England before succeeding to his father's thousands of acres and slaves. George Washington's great-grandfather John, a mate on a British ship, quarreled with his captain while anchored in the Potomac off Pope's Creek in 1649 or 1650. He went ashore in anger, fell in love, and

married Ann, daughter of Nathaniel Pope, to found the Washington family in Virginia on a one hundred-acre wedding gift from his new father-in-law. Thomas Lee, a judicial officer of Queen Anne and Virginia's first native-born Colonial governor, saw his home burned, possibly by someone who resented his justice, and then in 1725 built a fortress-like Stratford Hall, where Robert E. Lee was born in 1807. Not far away, near Coles Point on the Potomac, is one of the Lee burying grounds, with the graves of Richard Henry and Francis Lightfoot Lee, brothers who signed the Declaration of Independence. Their tombstones are engraved in Latin and Greek.

How was Elijah Reed, great-grandson of a Maine Revolutionary War captain, received? George Reed's memoir does not say. But he seemed to make his place quickly and to find the men he needed to boil his six kettles and turn his press to make oil and guano, and to sail his schooners. He stayed. Perhaps the answer is only that the people became aware, willingly or unwillingly, that Elijah Reed and those who followed were what they needed—"go getters," if the term had been coined then. They were a different breed from the plantation aristocracy that had lived, even to 1861, in Colonial splendor.

If the Northern Neck had little but its people and its fish, timber, and soil to live on, Reed created another economy, and one that became a source of hope and strength. It was the menhaden pioneers, the newcomers soon joined by natives, who helped the Northern Neck off its back, not politicians in Richmond or Washington or financiers in New York. Even if the menhaden men had in mind only getting rich themselves, the spin-off, in space age idiom, was economic salvation for many.

□ □ □

Here as in New England and on Long Island Sound, the new industry depended on the wind to take its fleets to the fish and to bring them home. Elijah Reed himself was first to bring steam to the fleet, but not until 1880,

and as late as 1909 there were only twenty steam fish boats on Chesapeake Bay.

Not too much has been recorded of sailing days. The *Richmond Times-Dispatch* of July 31, 1909, carried a story by G.W. Beale telling of the "slow sailing, cumbersome schooners...under full sail, proceeding like an old time fleet on the eve of battle." They offered, he said, "a picturesque and pleasing picture on the water."

Robert N. McKenney wrote in the *Northern Neck Historical Magazine* in 1960 of times toward the close of the nineteenth century when the schooners were still numerous enough to clog Cockrell's Creek. Boats upstream couldn't sail out to fish until those moored downstream had moved.

Captain Carroll Ripley of Susan, Virginia, who retired in 1960 after forty-nine years of fishing for menhaden, recalled his father, Wesley, fishing under sail for "a factory at New Point Comfort," apparently the Virginia Oil and Guano Company mentioned by George Brown Goode, with Captain Bob Morgan. "If they caught three million fish a year, they had had a big year," Captain Ripley said. Wesley Ripley died in the early 1950s at the age of eight-five, having become a Chesapeake Bay captain during the First World War. He had been born to sail, his father having rounded Cape Horn—blown back seven times before making it one voyage—and later retiring to become keeper of the old lighthouse at New Point Comfort.

James E. Mears, Eastern Shore historian, wrote in 1967 in the *Eastern Shore News* that the Marsh brothers of Harborton served the old Albro J. Morse plant, largest on the Eastern Shore in the early 1900's, with sailing craft adding to the catch of factory steamers. The Marsh boats, used for oystering in winter, were pungies to carry lookouts and fishing crews and schooners to bring the fish in. Captain Charles W. Marsh was drowned when he fell off his schooner *J. Calhoun Johnson* while awaiting a signal to come alongside a pungie to load fish.

By the 1970's there were few to tell of sailing days. Norris Haynie of Reedville was a boy helping his father, William Jackson Haynie, fish pound nets off the mouth of the Great Wicomico River in the late 1890's and

early 1900's. "I remember the sail boats," he recalled:

They were mostly pungies. We could see them sometimes from the pound, bailing fish from the purse net to the deck. They had the dip-net hooked to blocks and falls to the masthead. Someone of the crew would climb the mast, catch the end of the tackle and jump out. His weight would raise the dip-net full of fish. He did it over and over again until the set was all aboard.

Today the Occupational Safety and Health Administration would have something to say, sternly. It was a fishermen's life then.

Other glimpses into the menhaden fisherman's life under sail were given by Captain Walter Biddlecomb of Fairport, a retired captain for the Smith fleet, with stories his father, Alfred Biddlecomb, Sr., told before his death in 1937.

These family memories included men sleeping in the hold of a schooner if, as occasionally, they stayed out overnight. The day's catch would be on deck above their bunks, and water and fish juices would leak through. The production would have been copious; menhaden rot quickly without refrigeration.

The fish boat might anchor overnight in such coves as Cod Harbor at the southern end of Tangier Island. From there it could sail quickly the next morning, either into the Bay itself or into Tangier Sound, wherever fish were sighted.

"The cotton nets would rot if not dried, so they had to be hung to air every night," Walter Biddlecomb recalled. "Oars would be lashed to hang them on. If a thundersquall came up, the men had to rush to take them down and then get away. One man lost his boat because he couldn't get them down and get away quickly. She blew ashore."

Unloading at the factory was another tedious job. The men threw the fish off the deck on the inboard side, then had to trim the boat by moving the fish from the outboard side, then move them again to the dock. There

men with wheelbarrows hauled them to the raw box, the bin from which they started their way through the cooking and pressing processes.

The labor was further attested by another of the last men who had seen some of it, James Blackwell of Weems. He made his living in 1902 hauling fishermen to the docks in a wagon on Sunday nights, and home again on Saturday nights. He recalled seeing the two-masted schooners, topsail or staysail, and pungies sailing into the creek on any Saturday night, the men weary for their day of rest—as soon as the fish were unloaded.

The coming of steam provided at least donkey engines or winches to hoist the bailing net aboard, but the life of the Bay menhaden fishermen, as everywhere, continued one of dawn-to-dark labor. Perhaps it was slower paced than today—fewer sets when you sailed and rowed—but it was all hard work and only, as James Mears said, for "men with well developed physiques." The older Captain Biddlecomb's own verdict was that the "good old days" really were "too much work and not enough pay." He told his sons, Ralph, Walter, and Alfred, Jr., so, but all three nevertheless went fishing and in time became captains.

Elijah Reed started the changeover with his steamboat *Starry Banner* in 1880. He bought her in Rhode Island, where steam already was in use along with sailing boats. There is no description of her, but one relic is still in use, and the name now sails the Bay and the Intracoastal Waterway, with the hand of a descendant of Elijah Reed at the wheel and a descendant of the *Starry Banner's* captain, Cyrus S. Morrison, beside him.

When Reed Randolph, a great-grandson of Elijah, replaced his twenty-nine-year-old *Floran* with a trawler type yacht to become home for him and his wife Flora, he named the new boat *Starry Banner*. By the wheel, and often in Mrs. Randolph's hands, were the binoculars which her grandfather, Cyrus S. Morrison, had used from the wheelhouse of the first *Starry Banner* to sweep the Bay waters for fish.

IX. Virginia And Maryland

Elijah Reed, Gordon Terry, and G.T. Owens had colleagues also catching Chesapeake Bay bunkers for oil and guano. In the century to follow their small operations on Point Pleasant and Windmill Point of Cockrell's Creek, perhaps sixty plants were built along the banks. Most disappeared in fires (Reed's own Windmill Point plant burned in 1925), bankruptcies, and mergers. Others died with their owners, or with their owners' loss of fascination with the business. A characteristic of many Northern Neck people for generations has been a recurring thought of "doing something else for a while." They always lived independent lives, and if a man got tired of fishing, he could make a living with a little store, or by building houses, or by farming or cutting timber and ties to be shipped on sailing rams or rafted up the Bay to Baltimore.

Elsewhere on Chesapeake Bay shores and creeks were other menhaden enterprises, some mentioned, some not, some remembered now in old brick evaporator stacks rising out of honeysuckle and poison ivy-covered rubble, others gone, forgotten, no trace to be found.

G. Henry Seldon of Kinsale, on the Yeocomico River, a Virginia tributary of the Potomac fifteen miles up from the Bay, reported to George Brown Goode in 1878 that "seven vessels are employed in this vicinity having crews of 15 to 18 men, but the aggregate number of men at the factory and on board of the vessels is 45 or 50." He added,

curiously, since Elijah Reed had by then built his second factory on Cockrell's Creek only twenty miles away, that "the only factory in this neighborhood is the one at New Point Comfort, owned by Nickleson & Co. of Norfolk, Va."

Colonel Marshall McDonald's memorandum to Goode had mentioned an O. E. Maltby plant at New Point Comfort in 1878, but said nothing of the Nickleson plant. There was also the Virginia Oil and Guano Company plant there in the nineteenth century. Again, they came and went.

In the middle of Chesapeake Bay, just below the Maryland line, Tangier Islanders got into the fishery from time to time, and apparently in considerable volume for a while. Hance Lawson, collector of customs at nearby Crisfield, Maryland's southernmost Eastern Shore town, told Goode of one or two Tangier factories operated in the 1870's by Crockett and Company. He said the factories, which still used the primitive boiling technique, cost 2,500 dollars each, or about enough to furnish a low pecking order office of today's plants. Lawson's report, correcting Goode's earlier information, put the Crocketts on Tangier, where the family has been dominant since John Crockett first settled there in the seventeenth century.

Lawson's information was either incomplete or activity increased on Tangier soon. The *Peninsula Enterprise*, an Eastern Shore newspaper, reported in 1883 from the

island: "No place on the Eastern Shore is more fish manure manufactured than with us. There are six factories, giving employment to many persons, at lucrative prices."

There is little memory of this today on Tangier. A few of the older of the nine hundred-odd residents, the men almost all crabbers, point to Cod Harbor, the cove formed by a hooked spit at the southern end of the isolated island, as the site for one long-gone factory. For a number of years in the late 1960's and early 1970's an old menhaden boat was beached there by an off-island promoter who had an inspiration for a resort, with the boat as a restaurant or hotel. But the spit can be reached only by boat, Tangiermen never did welcome outside enterprise, and the project died. Tangier only now is learning to cope with outsiders, with excursion boats from Crisfield on the Eastern Shore and Fairport, Virginia, on the western spilling up to three hundred "touristers" a day on the water-laced island in summer.

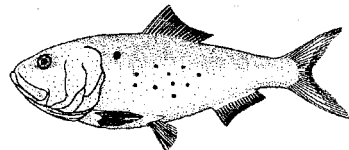
Not all Virginians were impressed by menhaden fishing in the nineteenth century. Henry Richardson, keeper of the Cape Henry Lighthouse on the south side of the entrance to Chesapeake Bay, near where preliminary prospecting had been done less than ten years earlier, reported no factories in 1874 and explained, "A factory for this purpose was in operation some two years ago, but it has since been consumed by fire." Again, like many another.

Isaac D. Robbins, keeper of the Hog Island Lighthouse on the seaside of the Eastern Shore, twenty-five miles north of Cape Charles, commented to Goode that "on the Chesapeake side of the Peninsula I have known large quantities of these fish caught, and a few years ago some gentlemen undertook to convert them into oil and manure, but to what extent they were successful I cannot say."

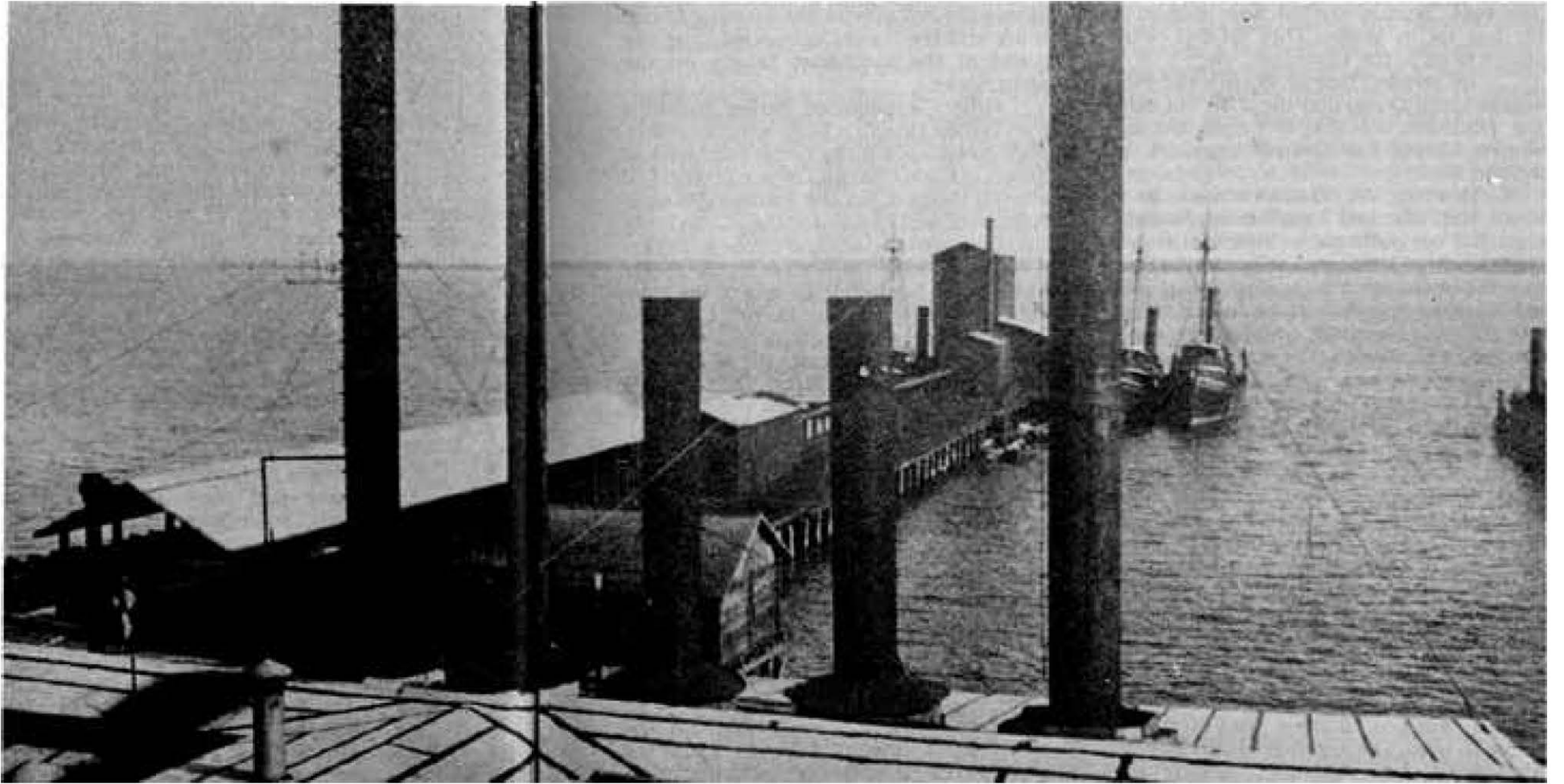
Keeper Robbins' casual appraisal might have been briefly valid in the late 1870's, but the Eastern Shore had had considerable

activity—and long before Elijah Reed came to Chesapeake Bay. By the end of the nineteenth century it was a busy center for the fishery that might have rivaled Reedville and Fairport on the Western Shore had things gone a little better.

In the 1850's a Captain John W. Bunting set up the first factory at Chincoteague, then a village on the protected side of one of the string of Atlantic barrier islands stretching from Cape Henlopen and Delaware Bay to Cape Charles and Chesapeake Bay, and now the southern gateway to Assateague National Seashore. James E. Mears, Eastern Shore historian, was unable to learn how extensive it was at the start, but found that the *Peninsula Enterprise* reported from Chincoteague in the spring of 1883 that



Seaboard Oil and Guano Company plant at Chincoteague, on Virginia's Eastern Shore, taken from the top of the main building sometime before 1923. The company failed in 1934. Photo by W. Harold Haynie.

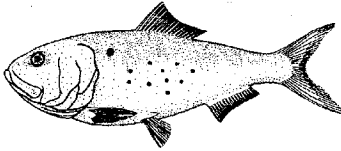


Captain Bunting, "one of our most energetic citizens," was adding three thousand dollars' worth of improvements to his factory, known as "the Kettle Factory." Captain Bunting, the story said, "is a progressive and wide-awake gentleman and much credit is due him for his zeal and exertion to promote and expand the prosperity of Chincoteague." The Bunting Kettle Factory operated until 1900, closed until 1920, then was reopened by Henry Williams and kept running for ten more years.

There were others around Chincoteague, with the *Enterprise* reporting in May 1883 that "great preparations for a lively fishing season here are being made by the proprietors of the different fish factories. Some of the steamers are now on their way."

Many years later, during the 1920's and early 1930's, the Seaboard Oil and Guano Company operated a large factory at Chincoteague, but "went broke" in 1934, and its fleet was sold at auction. One fish boat, the *Blundon*, drew only 1,800 dollars from a Reedville group, and some drew no bids. The *Blundon*, under Captain Wallace E. Lewis, fished successfully along the Delaware and New Jersey coasts for the next fourteen years.

Twenty miles south of Chincoteague, another pioneer now forgotten, Captain Edward J. Foote of New Jersey, came to Cedar Island, another of the Atlantic barrier islands, in 1881 or 1882 to open a factory. His steamers, including the *Clara Ellen* as the only one now remembered, brought in fish from the Atlantic.



What was to become the biggest Eastern Shore menhaden operation started in 1884 when Powell Brothers, merchants and sailing vessel owners, joined with Albro J. Morse of Connecticut to build a factory at Hoffman's Wharf on Pungoteague Creek, a Chesapeake Bay tributary. In time Morse bought the Powells out and formed the American Fish Guano Company, then A. J. Morse and Company.

Captain Clem Haynie of Reedville, who died at ninety-eight in 1969, had his own memories of the Morse operation. When he was twenty-one, he spent a season on one of the three Morse boats, the *Isaac N. Vezey*, a ninety-seven-foot steamer that caught only four hundred thousand fish, cruising as far as Maine.

"We went to Maine in August," Captain Clem said, "because the fish were poor on the Bay but fat in Maine. They yielded twenty gallons of oil to the thousand."

He recalled that of Morse's two other steamers, the *Daisy* and the *J. W. Hawkins*, "the *Hawkins* was sold to Cuban blockade runners during the Spanish-American War and was lost."

However, the *Hawkins* went to no heroic end. She had been libeled for debts when the company got in financial trouble in the panic of 1896, sold at auction in Baltimore to Cubans revolting against the Spanish, and taken to New York to be loaded heavily with rifles, ammunition, and coal. No one of her new crew noticed that a sea cock, above water when she was light, had been opened because of freezing weather. She filled and sank off Barnegat Light, New Jersey, and a passing four-masted schooner rescued all aboard. They included General Calixto Garcia Iniquez, the Cuban patriot of whom Elbert Hubbard wrote "A Message to Garcia," an inspirational essay of the time. The former engineer, J.C. Kelly of Harborton, had refused to go with the *Hawkins* because a previous gun runner had been captured by a Spanish naval vessel and all aboard had been executed by a firing squad.

Morse was quite a promoter and included in his non-fishing interests the Virginia Eastern Shore's first telephone service in 1894. The line linked Harborton, the new name for Hoffman's Wharf, with

Pungoteague and Keller.

He ran the fish business on an "extensive scale," James E. Mears wrote, but "the affluent living of the Morse family is said to have caused it to become bankrupt about 1900." The next year two more Connecticut men, James Lennon and Lewis Allyn, both experienced factory operators, reopened it, bought one large steamer and built two others, and ran the company successfully until 1917. Then the federal government bought up the fleet, as it did many others, for conversion to minesweepers for the First World War. The factory closed and later burned.

In 1937 Wallace M. Quinn, a venturesome native of Crisfield who was to have factories and fleets in North and South Carolina, Florida, Mississippi, and even Texas, opened another on the Morse site. The business did not survive the burning of one steamer and the Great Depression. That was the end of the menhaden fishery on the Eastern Shore.

Others established earlier included one on Sandy Island, a large sandbar, since washed away, a few miles north-northwest of the town of Cape Charles. Garner Brothers of Lewisetta, Virginia, on the Potomac River at the mouth of the Coan, closed their Coan River Guano Company factory and joined with Ben and William Colonna of Norfolk in the Sandy Island venture just after the end of the First World War. One steamer, the *Beatrice*, was lost with all hands in an Atlantic storm while returning from the Chincoteague area with a full hold and a deck-load. In time the company disappeared, and today all that remains is a shoal that bares at very low tides.

□ □ □

The Chesapeake Bay menhaden fishery has been popularly thought of only as Virginia's own, but there were at least two plants on the Eastern Shore of Maryland. The industry never thrived, and in 1931 the Maryland General Assembly prohibited purse

seining, the only way of catching enough menhaden to support factories. A fish scrap factory on Tilghman Island used offal from herring canneries for a number of years in the first half of this century, but apparently no menhaden, even from pound nets.

Hance Lawson at Crisfield told George Brown Goode about a factory operated in 1874 by Ford, Avery and Company at Manokin, probably on the Manokin River north of Crisfield, where "800 barrels of oil were made last year." This undoubtedly was the company Goode had thought to be on Virginia's Tangier Island. Later a factory was operated by L.E.P. Dennis on Jane's or Old Island, across the Little Annessex River from Crisfield. It is now a state marine park. The old stack still stands and is shown on nautical charts to arouse curiosity among today's yachtsmen and sport fishermen who bring their boats to the island for picnics.

Today's Virginia menhaden captains, waiting in Tangier Sound or the Bay itself just below the Maryland line for schools of bunkers to move south, often think that if the industry had caught on in Maryland, the lawmakers there might not have been so righteous in 1931 about purse seines. More think that Maryland did the industry a favor by setting up a sanctuary of one third of the Bay where young menhaden could grow undisturbed—except by Maryland pound netters and by bluefish and other predators.

They could document such a thought from testimony given to the House Merchant Marine and Fisheries committee April 23, 1942, only nine years after Maryland enacted the law. William S. Snow, president of the American Fisheries Association Cooperative, speaking against a bill to relax state menhaden restrictions as an emergency war measure, told the committee: "The fisheries in the lower end of Chesapeake Bay for menhaden have increased in recent years, and I think it is largely due to the situation in the state of Maryland in the upper part of the Bay where they have these protected areas."

The Maryland General Assembly had no such intention. It based its action on the idea, debated for generations before and since, that catching menhaden in large volume in purse seines deprived food fish of their forage and also that many food fish were taken in

purse seines. Only limited scientific support, noted in a later chapter on conflicts with sport fishermen, is given to either contention.

Whatever the philosophical thoughts among waiting captains, a good summer day may see half a dozen to a dozen Virginia fish boats drifting just south of the state line. Overhead spotter planes circle, the spotters telling the captains that one school or another is stationary, "cartwheeling," or "They're starting down!" In the distance, anchored close to a buoy marking the line, will be a white boat of the Maryland Marine Police, its officers making sure the fish boat captains remember just where the line is. Those who have strayed over because of fog or of a flooding tide pulling a set across, have seen the inside of Maryland jails.

An incident most remembered involved five fish boats in the late 1960's. They strayed in a fog near Smith Point, northernmost Virginia headland on the Western Shore, where Maryland's Potomac River enters the Bay, and were found north of the line.

Inspector Adrian Hansen of the Maryland Marine Police arrested the captains and took them to the St. Mary's County jail at Leonardtown. They were held for one thousand dollars bond each.

John D. Deihl, port captain for Haynie Products, Incorporated, at Reedville, was called by the captains. He told Maryland authorities he would bring a check for five thousand dollars at once. Paul Wentzel, a district supervisor for the Marine Police, insisted on cash.

The bank at Reedville was closed by that time, and Captain Deihl had to go up and down the village's Main Street asking friends and company officials for whatever cash they could lend. He carried hundreds of one-, five-, and ten-dollar bills to Leonardtown and counted it out for the Maryland court.

The captains were released for their day in court. One testified that he had just navigated by radar in heavy fog from the New Jersey coast, up Delaware Bay, through the Chesapeake and Delaware Canal, and down Chesapeake Bay, and was not sure of his position. Another said he was washing out his net and had been carried over the line by the tide. All were fined 250 dollars apiece.

X. Some Virginia Begats

Joining Elijah Reed on the Northern Neck's Cockrell's Creek, either in his lifetime or that of his son George, were such native names as the McNeals, Jetts, Edwards, Haynies, Hintons, Cockrells, Towlsons, Snows, Timbs, Fallins, Owens, McGills, Douglasses, Palmers, Eubanks, Hubbards... mostly still part of the fabric of the lower Northern Neck.

But of all the names, only that of Haynie continues in the menhaden industry, as part of the corporate title of the biggest company in the country, Zapata Haynie Corporation, now a subsidiary of Zapata Corporation of Houston, Texas.

And of all the plants, only those of Zapata Haynie at Fleeton, a half mile downstream from Reedville on the east bank of the creek, and of Standard Products Company, Incorporated, at Fairport, across on the west bank, survive. Standard Products is now the third largest, after Seacoast Products, Incorporated, of Port Monmouth, New Jersey, successor to J. Howard Smith, Incorporated.

As Zapata Haynie carries on the name of one pioneer and an ancient family as well, Standard Products traces its executive blood line if not its corporate life to a couple of young Long Islanders who followed Elijah Reed to the Northern Neck, and includes as well some of the corporate blood of Elijah Reed. In the mid-1960's Standard bought the McNeal, Edwards Company, the last to trace its origins to him. McNeal, Edwards was founded in 1901 by Herbert and Andrew McNeal, Elias Edwards,

and George N. Reed, son of Elijah. The original Reed company, becoming Reed and Cockrell, then Edwards and Reed, ended in the fire that destroyed its Point Pleasant plant in 1925.

McNeal, Edwards is likewise remembered for the only woman president in the industry, Miss Aleta D. McNeal of the fifth generation of McNeals on the Northern Neck. She is now retired and living in the home built by her father, George H. McNeal, at Fairport. Her porch looks out on the site of her father's factory and piers, and for years the old fish boat *George H. McNeal III* lay there to remind her of another day. Other McNeal companies—the McNeals seemed to enjoy competing with each other—also were in Fairport. They included McNeal, Dodson, organized in 1912, and the McNeal Company, both now part of Standard Products Company, the former since 1952, the latter since 1966.

The two young Long Islanders in the background of Standard Products were George P. Squires, a Civil War veteran from Gardiners Bay who came in 1880 at the age of thirty-six, and his brother-in-law and partner in a kettle factory on Dyer's Creek, ten miles south of Cockrell's. This was Joseph Foster Bellows, then twenty-one, who in time became father-in-law of the late H. R. Humphreys, Sr., who founded Standard Products in 1928, and thus maternal grandfather of today's Standard Products president, H. R. Humphreys, Jr.

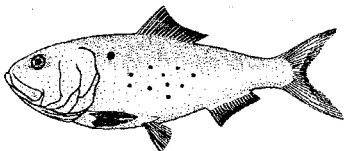
The senior Humphreys and Joseph F.

Catch of Fish for Week Ending _____

STEAMERS.

TUBS OF FISH

8	Morris Fisher Co. Inc.....	_____
2	Edwards & Reed Co.....	_____
2	Edwards Company.....	_____
3	McNeal Edwards Company.....	_____
1	McNeal Dodson Company.....	_____
2	Reedville Oil & Guano Company.....	_____
4	C. E. Davis Packing Company.....	_____
2	Douglas Company.....	_____
1	Coan River Guano Company.....	_____
5	Seaboard Oil & Guano Company.....	_____
2	Indian Creek Fertilizer Co.....	_____
3	Eubank Tankard Company.....	_____
1	Virginia Fisheries, Inc.....	_____
7	Bellows & Squires, Inc.....	_____
3	Taft Fish Company.....	_____
3	Menhaden Oil & Guano Company.....	_____
3	Dennis Fish & Oil Company.....	_____
1	Davis Palmer Company.....	_____



Tally sheet for Virginia menhaden companies, believed used in the early 1920's. Eighteen were listed, most located on Cockrell's Creek at Reedville, Fairport, or Fleeton. Of the companies shown here, only Reedville Oil and Guano, now

Zapata Haynie Corporation, is still in existence. Standard Products Company, Incorporated, was founded in 1928, and now includes the McNeal companies listed here.

JOS. C. JETT

BROKER
Norfolk, Virginia

CONTRACT

Organic and Chemical
Analyses
Fish Scrap & Specialty
Acid Phosphate, Potash

No. 2540

Phones 22889
22889

Sept. 5, 1925. 192

SELLER	Bellows and Squires Co. Inc.,	Coran, Va.
BUYER	Cook & Swan Company Inc.,	New York, N.Y.
MATERIAL	Crude Menhaden Fish Oil.	
QUALITY	Prime A Grade, not over five (5) per cent free fatty acid.	
QUANTITY	Two (2) tank car loads of about eight thousand (8000) gallons each.	
PRICE	Fifty one cents (51¢) per gallon fob buyers' tank cars, Baltimore-Md	
SHIPMENT	Prompt.	
WEIGHING AND SAMPLING	Oil to be gauged and samples drawn by Geo. A. Thompson of Baltimore promptly after loading cars in Baltimore.	
ANALYSIS	By Gascoyne and Co. Inc., Baltimore, Md. Test to be made for free fatty acid and Moisture and settlement to be fixed by this result.	
MOISTURE	Not to exceed one (1) per cent. Deduction to be made for any moisture in excess of one per cent.	
TERMS	Cash by sight draft with documents attached.	
CONTINGENCY	This contract is subject to fires, strikes, acts of God and/or other conditions and/or circumstances over which it is not possible for seller and/or buyer to exercise control.	

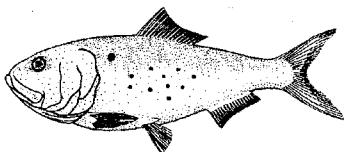
ACCEPTED

APPROVED

COOK & SWAN COMPANY, Inc.

By Geant Smith
Buyer

By [Signature]
Seller



A contract for the fish oil from Bellows and Squires. Note the signature of Gilbert P. Smith, a co-founder of J. Howard Smith, Incorporated.

Bellows had gone together in 1912 to buy a marine railway at Weems, on Carter's Creek, just in from the Rappahannock River. When Bellows died in 1923 (Squires had died fourteen years earlier), William L. Bellows, a son, ran Bellows and Squires, with Humphreys a stockholder, until it was sold to J. Howard Smith, Incorporated, in 1938.

Like other Yankees, Squires had seen Chesapeake Bay earlier, although his visit was as a private in the Union Army. He liked what he saw and returned, as a businessman and no carpetbagger. Before leaving Long Island he had married Margaret Bellows, and after the couple had settled in for life in Tidewater Virginia, her brother Joseph Foster Bellows came to visit. Joseph was seventeen years old, too young to have fought in the Civil War even though his family traced itself to men who fought in eastern Long Island skirmishes of the American Revolution.

Young Bellows also liked what he saw, and soon came to stay, as partner with Squires in his new fish business. Neither Captain Squires nor Bellows had been part of the active menhaden fishery of eastern Long Island, especially Greenport, but they made a good team. Captain Squires took charge of their small fleet of sailing fish boats and later added the catch of Chesapeake Bay's second steam fish boat, the *George H. Bradley III*, owned by Captain Ocran Humphreys (no relation to H. R. Humphreys). This boat, built in Maine in 1871, served the company until the First World War.

Bellows managed the business side—factory production, marketing, hiring men for the hard work of turning the hand presses and putting up the oil in barrels, spreading the fish scrap on platforms to dry under the sun, then bagging it to be loaded with the oil barrels on five-masted schooners or their own fish boats for shipment up the Bay to brokers in Baltimore.

Bellows also found time to finish his education at a school in nearby Kilmarnock, run by Harold Chase, a New Englander likewise attracted to the Northern Neck. And the young man fell in love with a girl here, Annie Elizabeth Toleman. They were married to extend the Bellows family tree from Long Island and New England to Virginia.

Bellows built the company office building over a well, and high enough so he could look out into Fleet's Bay and the Chesapeake for the returning fish boats. He built his and his bride's home, a mile inland, three stories high so he could watch from there, too. His elder daughter, Mrs. Nina Bellows Lowe, recalled in the 1970's that their best captain in the first quarter of this century was Jimmy George, who ranked with another legendary captain of the Reedville fleet, Isaac Milton Bussells, "Bud Bussells."

"Papa could go up on the third floor and tell the boats by their lights," Mrs. Lowe said. "He always said, 'When Jimmy comes I know we'll have fish.'"

When Jimmy George brought the steamer *Joseph F. Bellows* in with fish, young Nina Bellows and others of the family also knew things were going well by the sound of singing, the music of old hymns, rising out of the holds of the fish boats. The men sang as they shoveled fish into the elevator buckets to be hoisted to the conveyor to the raw box on the dock.

"Old Esau Ball was the loudest," Mrs. Lowe recalled. "They just sang whatever hymns came to mind as they worked. I always wondered how they could sing, a dozen men, naked to the waists, down in those hot holds. But they were wonderful men and they loved Papa."

Yet it was not always so peaceful out on the Bay. The captains of all the fleets—and in the first quarter of this century there were a dozen to a score, depending on how the fish were running—were competitive, intensely so.

"They used to cut each other's nets to spoil a set," she added. "When they saw a school they couldn't take themselves, they would run through it with the steamer. The fish would scatter, not to be caught by anyone that day."

When this country entered the First World War in 1917, the Navy took all but two of the Bellows and Squires fish boats for minesweepers, as it did many of the other fish companies on the Bay and elsewhere. In addition to the old *George H. Bradley, III*, they were the *Joseph F. Bellows*, *Margaret, Little Joe*, *David K. Phillips*, *Elizabeth Froelich*, and *George P. Squires*. Only the *Peter C. Struven* and the *H. R. Humphreys* were left. However

REPAIRS TO FISH VESSEL "AM-15 DOW" AND CREW,
 Baltimore & Squires Co.,
 Corning, Va.

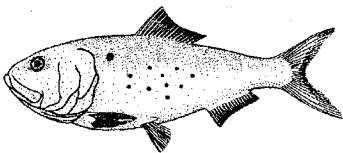
June 26th, 1930.

To Colonna's Shipyard, Incorporated, Dr.

SHEET A.

To: Cleaning and painting bottom, painting gaff, painting iron work, removing damage from fish hold, painting water line, painting canvas and lettering stern, electric welding seams on rudder, drilling band for masts, making electrical repairs and furnishing material to crew.

May 27,	Pump			5.00
	2 hrs.	Painters painting gaff	1.05	2.10
	22 "	Labor cleaning	.70	15.40
	1 1/2 "	" Foreman	1.45	2.18
28,	16 1/2 "	Carpenters removing damage from fish hold	1.15	18.58
	1 "	" Foreman	1.45	1.45
	5 1/2 "	Painters painting iron work	1.05	5.78
	36 "	Labor	.70	27.30
	5 "	" Foreman	1.45	4.38
	1 "	Mill	1.50	1.50
		302 ft. NO Pine	.08	16.16
		1/8 lbs. 1 1/2" Yellow Metal	.65	.65
		6 lbs. 3 Strand Marline	.60	3.60
		2 Gals. Plymouth White Zinc	4.20	8.40
		1 Pcs. Burlap	.35	.35
	1 1/2 hrs.	Electric Welding Plant and Operator welding seams on rudder	8.00	12.00
		By Wallace Smith:		
		1 1/2" x 3/8" Brass Bushing	.17	.17
		1 1/2" GIC Globe Valve	1.00	1.00
		1 3/8" Leak. Drain Cock	.00	.00
		Telephone Call to Baltimore Md.		2.00
29,	1 hrs.	Drill Press	.75	.75
	1 "	Machinist drilling band	1.15	1.15
	32 1/2 "	Painters painting bottom and water line	1.15	37.00
	2 "	" Foreman	1.45	2.90
	26 "	Labor	.70	18.30
	1 1/2 "	" Foreman	1.45	2.18
		14 Gals. Baltimore Copper Paint	2.95	41.30
		2 Gals. Roofing Cement	1.50	3.00
		To: Repairing one starting box		
		Furnishing 12 50 AMP General Fuse		
		" 100 30 " " "		
		2 Rolls Rubber Tape		
		4 " Friction Tape		
		2 Double Sockets		
		3 Key Sockets		
		4 Switches		
				38.95



The Bellows and Squires fish boat *Annie Dow* needed a haul-out and repairs at the Colonna Shipyard in Norfolk. The total bill in this Depression year of 1930 was \$308.77. At this time the

highest rate of pay was \$1.45 an hour to foremen; laborers got seventy cents an hour.



SHIP CHANDLERS

AGENTS FOR
RITCHIE LIQUID COMPASSES**CHAS. M. STRUVEN & Co.**
**STEAMSHIP,
FACTORY AND MACHINISTS' SUPPLIES,
WHOLESALE GROCERS**
BROKERS AND COMMISSION MERCHANTS FOR
MENHADEN FISH SCRAP, FISH OIL, FISH MEAL

116-118 E. FREDERICK ST.

BALTIMORE, Md. November 5, 1925.

Messrs. Bellows & Squires,
Ocrans, Va.

Gentlemen:-

Enclosed we are pleased to hand you accounts of sales, with certificates of analyses and gauge sheets attached for the following shipments of fish oil and fish meal made per Steamer Swanson.

Oct. 22	8284	gallons	fish oil	net proceeds	\$4222.50
Oct. 23	1224	bags	fish meal	net proceeds	3677.20
Oct. 30	8089	gallons	fish oil	net proceeds	4123.02
Oct. 30	8120	gallons	fish oil	net proceeds	4138.82

We have placed the above amounts to the credit of your account and we trust you will find the enclosed accounts of sales in order.

When your Mr. Humphreys was here on Tuesday we handed him our checks amounting to \$18000.00 which practically balanced the account to date.

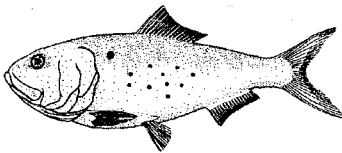
Awaiting your further favors, we are,

Very truly yours,

CLS

CHAS. M. STRUVEN & COMPANY

ENCL



Business in the mid-1920's. Most of the fish meal and oil was sold through Baltimore brokers, with Chas. M. Struven & Co. handling the Bellows and Squires business.

patriotic, it was a blow that shook the company.

"Papa never got over it," Mrs. Lowe said:

I'll never forget the day the man from the Navy came to get them. Papa went aboard one to go down to Norfolk with them. A lot of the factory men, a dozen or so, came to the dock and he leaned over the rail and called to them, "If I don't come back, be good." Of course, he didn't really mean that, but one of the men from way over on the Corrotoman said, "Lordy, don't say that!" And great big tears started down his face. They loved Papa, they loved him.

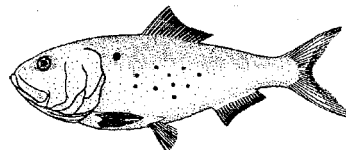
The boats sailed out down the creek in a line, all steamers except the *Margaret*. We didn't see them again. After the war, Papa didn't want to buy them back. He was afraid the engines would be too much damaged.

After the *Joseph F. Bellows*, with Jimmy George always bringing in fish, the *Margaret* was perhaps Bellows' favorite fish boat. She was named for the youngest of his seven daughters, Margaret herself being named after his sister, George P. Squires' wife. Young Margaret, twelve years younger than Mrs. Lowe, was her father's joy in his later years. Their mother died when Margaret was only eleven, and she took over running the Bellows household. In the late 1970's, Margaret, now Margaret Bellows Somervell, lived at White Stone, a few miles from her family home and birthplace.

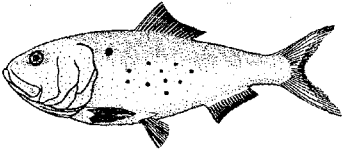
To keep his company fishing, Bellows built another fleet at the marine railway he and H. R. Humphreys had taken over in 1912. It included the *Richmond*, *Swanson*, *Martin*, and *Lancaster*, later the *Annie Dow*, named for his wife and his father, Lorenzo Dow Bellows.

After the war the Navy put the now-surplus fish boats up for auction, and Bellows did not bid. The *Margaret*, which had been

The *Margaret*, named for Joseph F. Bellows' favorite daughter, when she was still fishing for Reedville Oil and Guano Company in the early 1960's. Reedville Oil had acquired her when it took over The Douglas Company, which had bought her at the Navy auction after her service in the First World War. She was one of the first fish boats converted from steam to diesel. National Marine Fisheries Service photo, from old Bureau of Commercial Fisheries files.







converted to diesel power before the war in one of the first such moves in the fishery, went first to the Douglas Company, then to Reedville Oil and Guano Company, to be fished successfully for many years. In the late 1920's, a storm caught her returning from the Atlantic with a full hold, and she was swamped near Thimble Shoals light in lower Chesapeake Bay. Captain R. P. Waller, who had been trying to make harbor at Norfolk, got all thirty-eight men into the purse boats and they rowed to safety. She was raised, repaired, and put back to her job of catching bunkers.

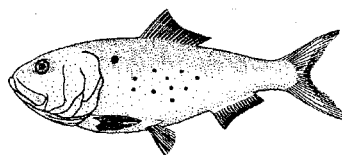
The *Joseph F. Bellows*, Captain Jimmy George's prize boat, went to McNeal, Dodson but finally returned "to the family" when Humphreys' Standard Products acquired that company in 1962.

Of all this, all that remains is the hulk of the *Joseph F. Bellows*, "*Big Joe*," laid up and likely never to move again at a dock in the nearby Corrotoman River, another Rappahannock tributary. Standard Products, with Captain Wallace E. Lewis her skipper, fished her until the late 1960s, when she broke her shaft. She was sold to a Bahamian for an inter-island freight boat, but he disappeared without taking her.

The old Bellows and Squires property, sold to J. Howard Smith, Incorporated, in 1938, was regained by Joseph F. Bellows' grandson, H. R. Humphreys, Jr., when Seacoast Products, Incorporated, successor to J. Howard Smith, sold its two Northern Neck factory properties, the other being the Taft Fish Company, a few miles away on the Rappahannock River near White Stone, in 1973.

For years the remains of the factory and equipment—the old high office building from which Joseph F. Bellows watched for the fish boats in the Bay—and the brick evaporators and other structures now only rubble, stood on the bank of Dyer's Creek. Mrs. Lowe often went to the site, just to look at it and remember the days of her childhood, the lights of the fish boats coming up the creek, the sound of the men singing hymns in the holds, and the smoke of the line of steamers heading out on their delivery to the Navy.

"It's all in crops now," she said. "Some of the bricks are in a nice patio of a nephew in

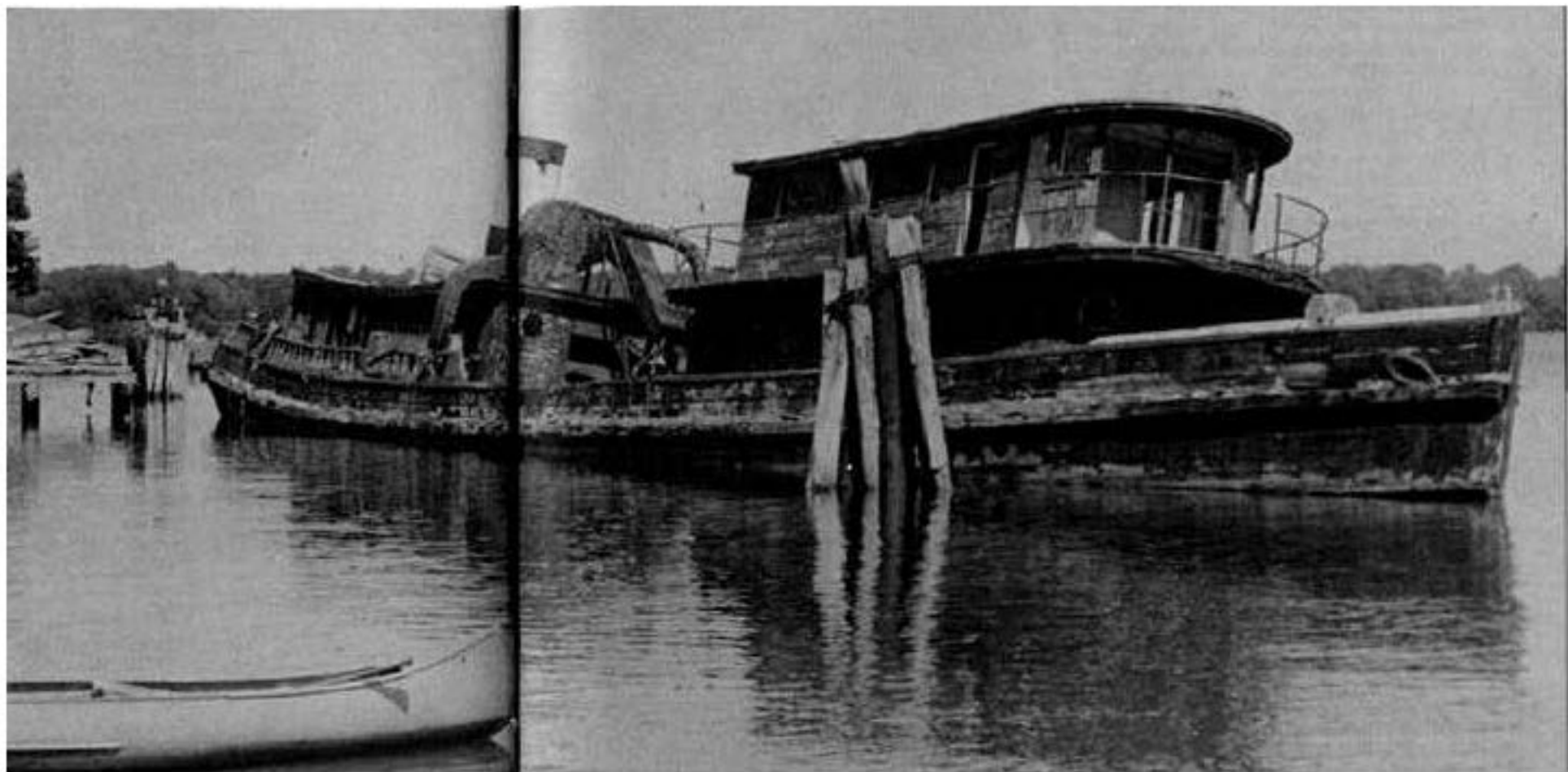


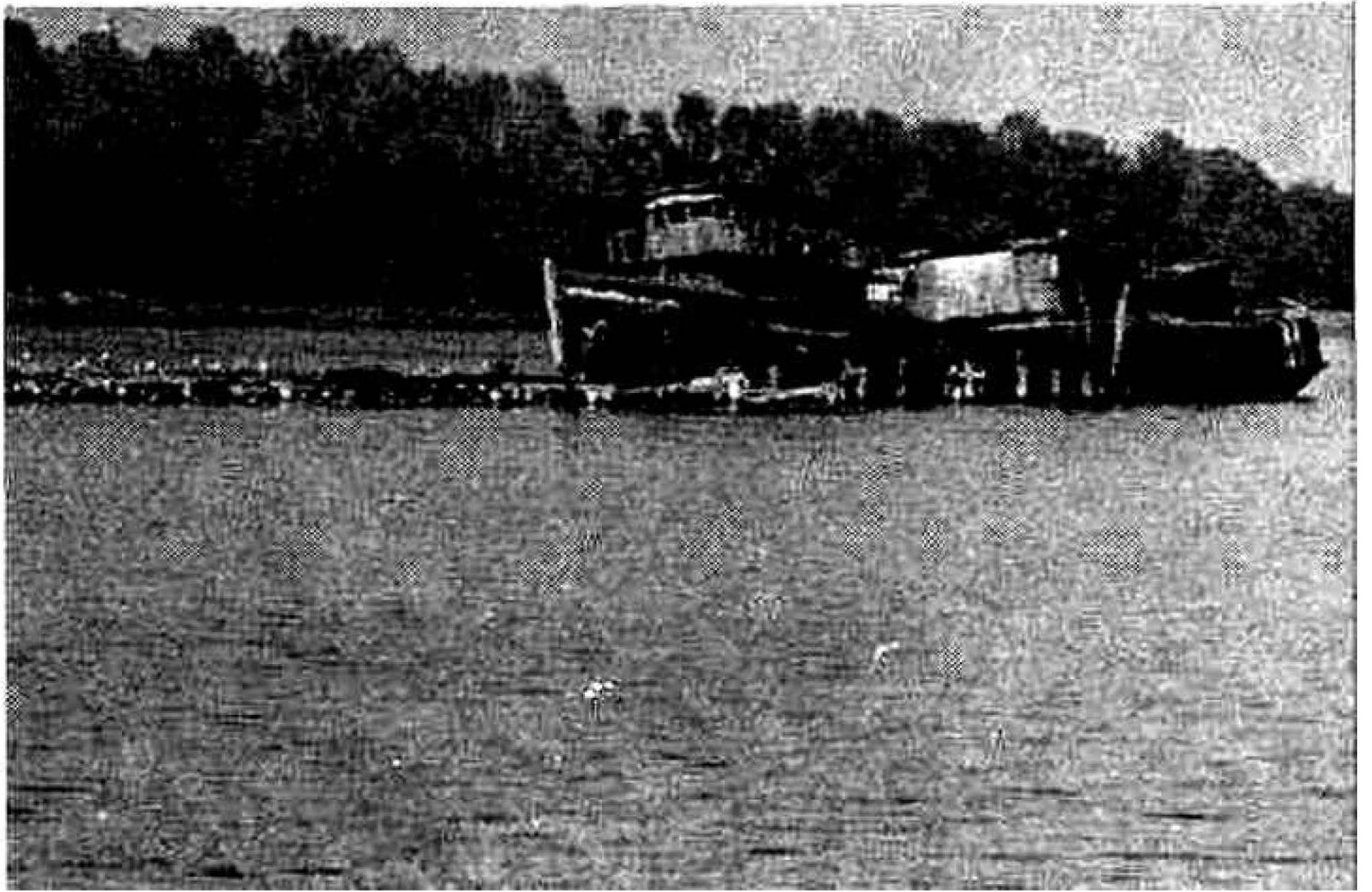
Rockville, Maryland, but everything else is gone.

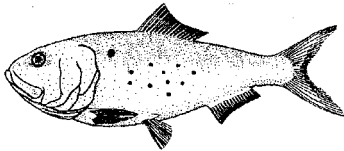
Before the sale of the property to Humphreys, Seacoast had bulldozed everything away but Nina Bellows Lowe's memories.

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Another incoming founder was Albert Morris, co-owner with James C. Fisher—both New Jersey Yankees—of what was for a time





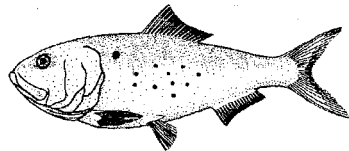


The *Joseph F. Bellows*, laid up in the Corrotoman River, a Rappahannock tributary, probably not to move again.

the largest menhaden company on Chesapeake Bay. They had one of the early steam factories, with a steam dryer perfected by Morris, and a fleet of eight boats.

Albert Morris had his own menhaden company at Somers Point, New Jersey, the Somers Point Oil Works, with, as George Brown Goode recorded it, "a gang of nine men and three vessels." Morris found "the fish

A hulk of a long-forgotten fish boat lies at the remains of a long-forgotten wharf in Cockrell's Creek in a 1973 photo. From 50 to 60 fish factories have operated on Cockrell's Creek and others on Virginia's Northern Neck during the past century.



played out" there in the late 1880s. Word of the Chesapeake Bay fishery had come up, along with information that labor was cheaper. He closed up in New Jersey and came to Reedville.

He had married Annie Steelman, and James C. Fisher had married her sister Emily. Thus Fisher, a former sea captain, became interested and a few years later joined Morris. The company flourished into the 1920s, when Captain Fisher, as surviving partner and holder of most of the stock, sold to a new company of Reedville and Baltimore people. In 1939 J. Howard Smith, Incorporated, acquired the property for a shipyard and net works.

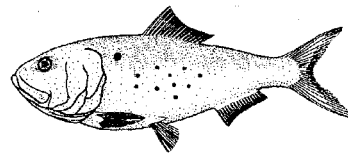
Albert Morris is remembered. Like Elijah Reed, he took a deep interest in the isolated country and village he had come to. He worked and spent much of his wealth for Reedville. He provided the land for the village cemetery in 1903, and later for the first Reedville High School. He gave time and effort to see that the school was built and put similar energy to building the Reedville Bethany United Methodist Church as a member of the building committee. The cemetery, now Roseland Cemetery, has near its gate a life-size statue of Albert Morris, described simply as "Benefactor." The details of his death are not known. He was drowned at the age of fifty-six in the autumn of 1907 at Atlantic City, possibly in a fall from his yacht.

Memories of Captain Fisher are perhaps more colorful. Norris Haynie of Reedville remembers him as "strong willed and with a bad temper. He had run-ins with my father," Haynie recalled. "He couldn't forget that he had been a sea captain who could order people around."

Norris Haynie remembered Captain Fisher striding Reedville's Main Street wearing a "tortoise shell hat." "It was shaped like a bread tray, like those tropical pith helmets. He had some breathing problem and was always snorting. You'd hear him every few steps."

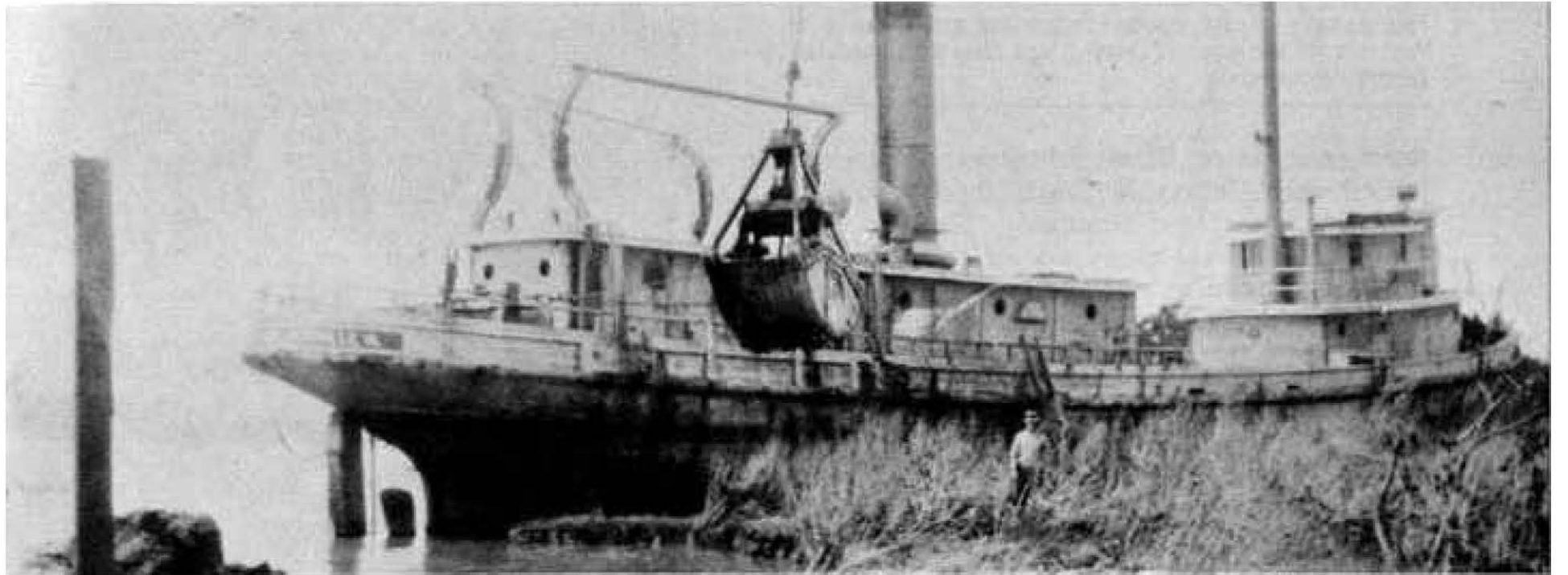
It was John A. Haynie who, with his brother Thomas W. Haynie, founded in 1878 what has become Zapata Haynie Corporation, now the only company still in existence from the nineteenth century, to be described in a later chapter.

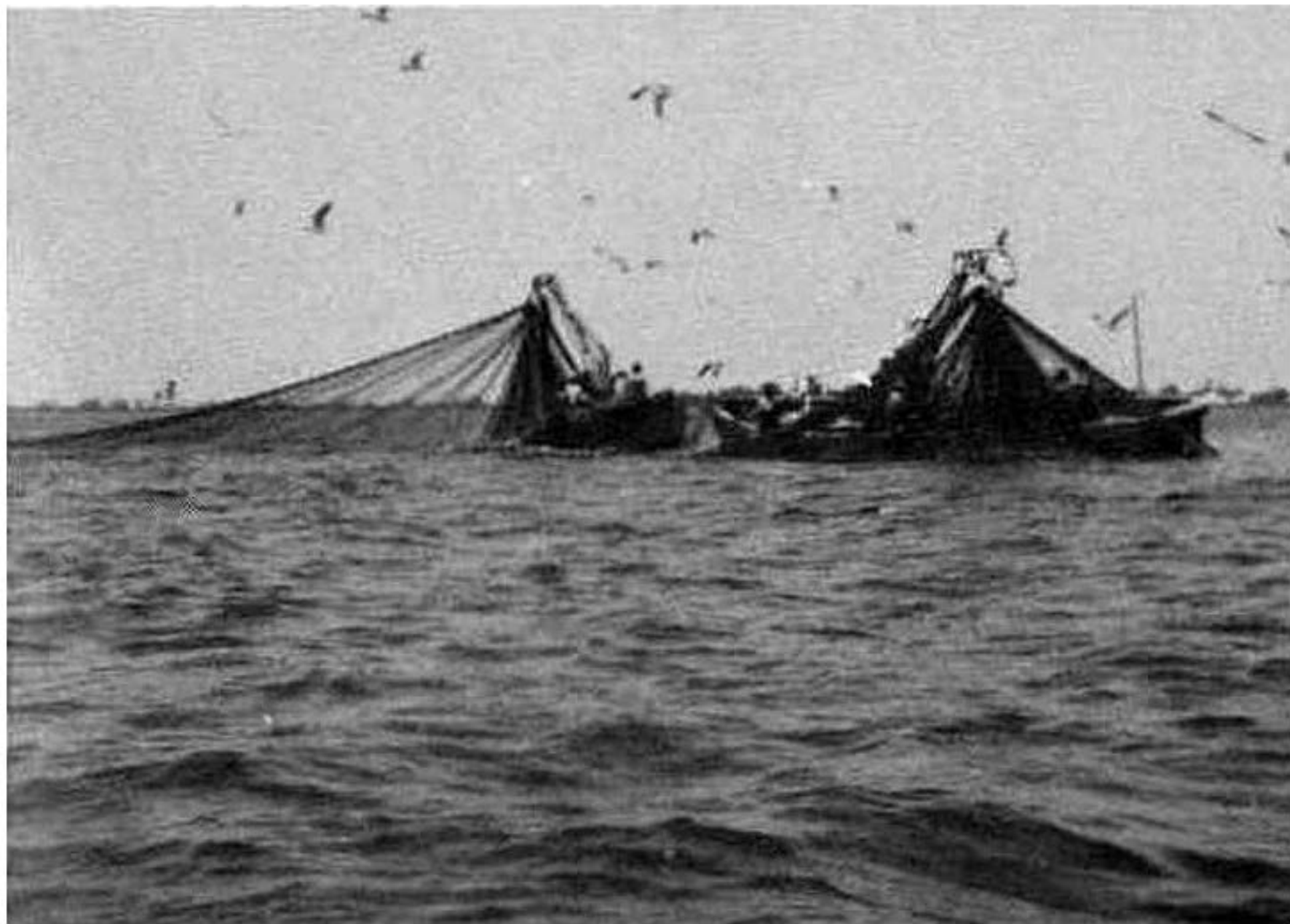
The now-giant Zapata Haynie Corporation started small, and such a scale

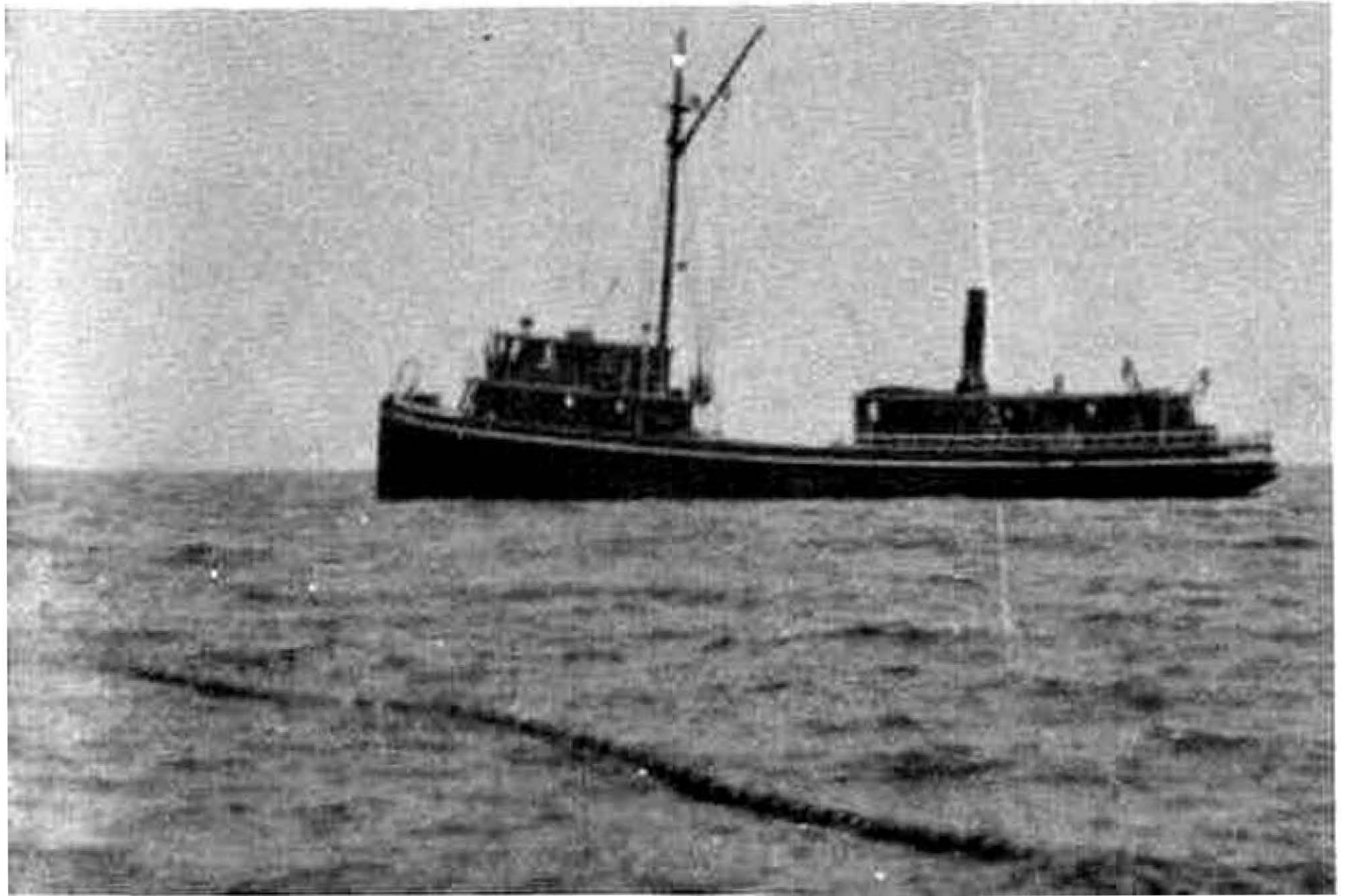


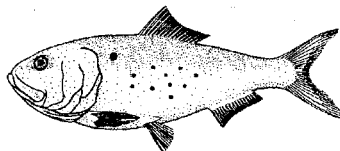
The Albert Morris statue in Roseville Cemetery at Reedville, honoring the founder of the Morris, Fisher Company.



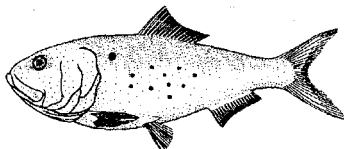








On August 23, 1933, a hurricane swept through Chesapeake Bay to put the McNeal, Dodson Company steamer *Charles J. Colonna* ashore near the mouth of Ball's Creek, a few miles south of Reedville, Virginia, with about five men aboard. Here a dragline with clamshell bucket digs her out of the marshy shore. She returned to freight service as soon as she was freed and repaired, hauling coal and other supplies to the McNeal, Dodson factory on Cockrell's Creek. Lucy Waring photo.

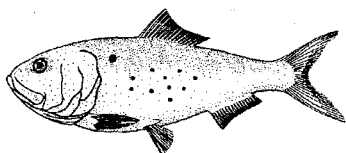


A Chesapeake Bay set off Tangier Island. The gulls think it is all for them. Vernon Bradshaw photo.

was the rule of the fishery on Chesapeake Bay. Some companies grew, some held steady, some fell behind in a cycle of light catches or just in inability to keep up with normal competition.

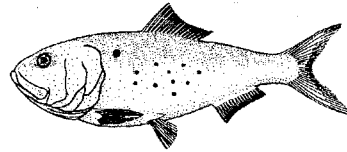
The end of the first decade of the twentieth century, when the industry was doing well, found the Edwards family starting its own venture. Wallace W. Edwards and his son Wilbur A. Edwards started fishing with a small fleet and plant that in the next twenty-eight years zigzagged through good years and bad. By 1938, when it was sold to J. Howard Smith, Incorporated, the Edwards plant was the biggest on the Bay, busy with the catches of five fish boats.

The family became involved with other menhaden ventures as well. Wilbur A. Edwards had been associated with George H. McNeal in forming the McNeal, Edwards Company at about the same time as the Edwards Company



The *Brook Taylor*, a fish boat of the long-forgotten Virginia Fisheries plant on Dividing Creek of Virginia's Northern Neck. Palmer family collection.

This painting of old wooden fish boats at the docks of Reedville Oil and Guano Company was done for a calendar. Zapata Haynie photo.

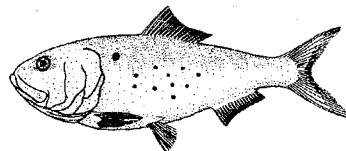
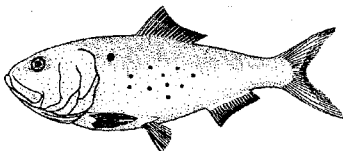


itself, and later Elias Edwards, a brother, joined with George N. Reed, Elijah's son, in Edwards and Reed Company. The fire that destroyed the company ended the name of Reed in the menhaden fishery, and today there are no Reeds by last name in Reedville.

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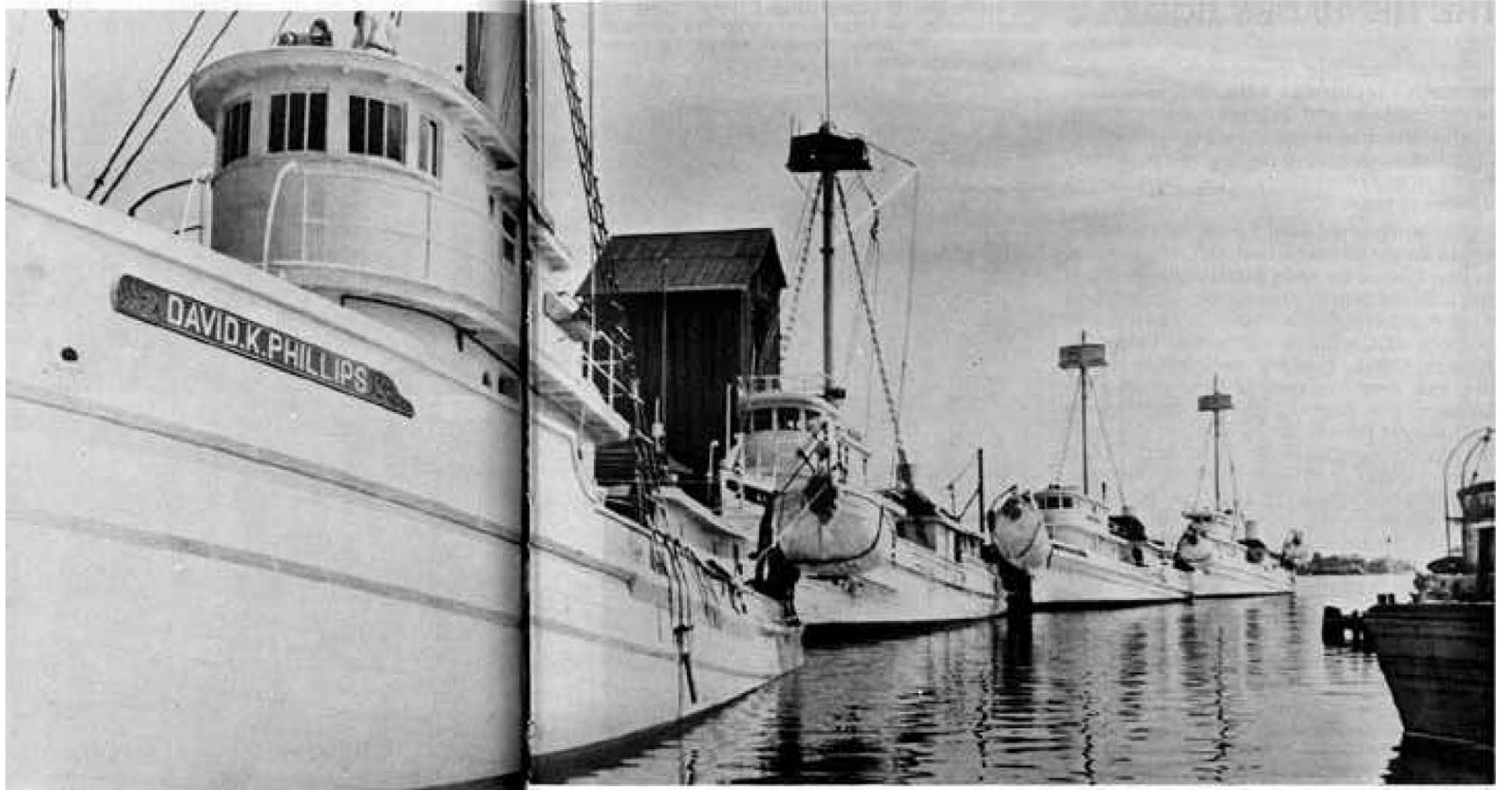
Over the years other names, native and "foreign," came to the Northern Neck. Many are still invoked by watermen with long memories: Blundon...Brown...Brusstar...Chilton...Covington...Cralle...Croswell...Dunton...Gresham...Gunby...Hornsbury...Hubbard...James...Lewis...Lunsford...Marsh...Mercer...Messick...Pasquith...Rice...Rowe...Slaughter...Struven...Treakle...Whacker...Whaley...

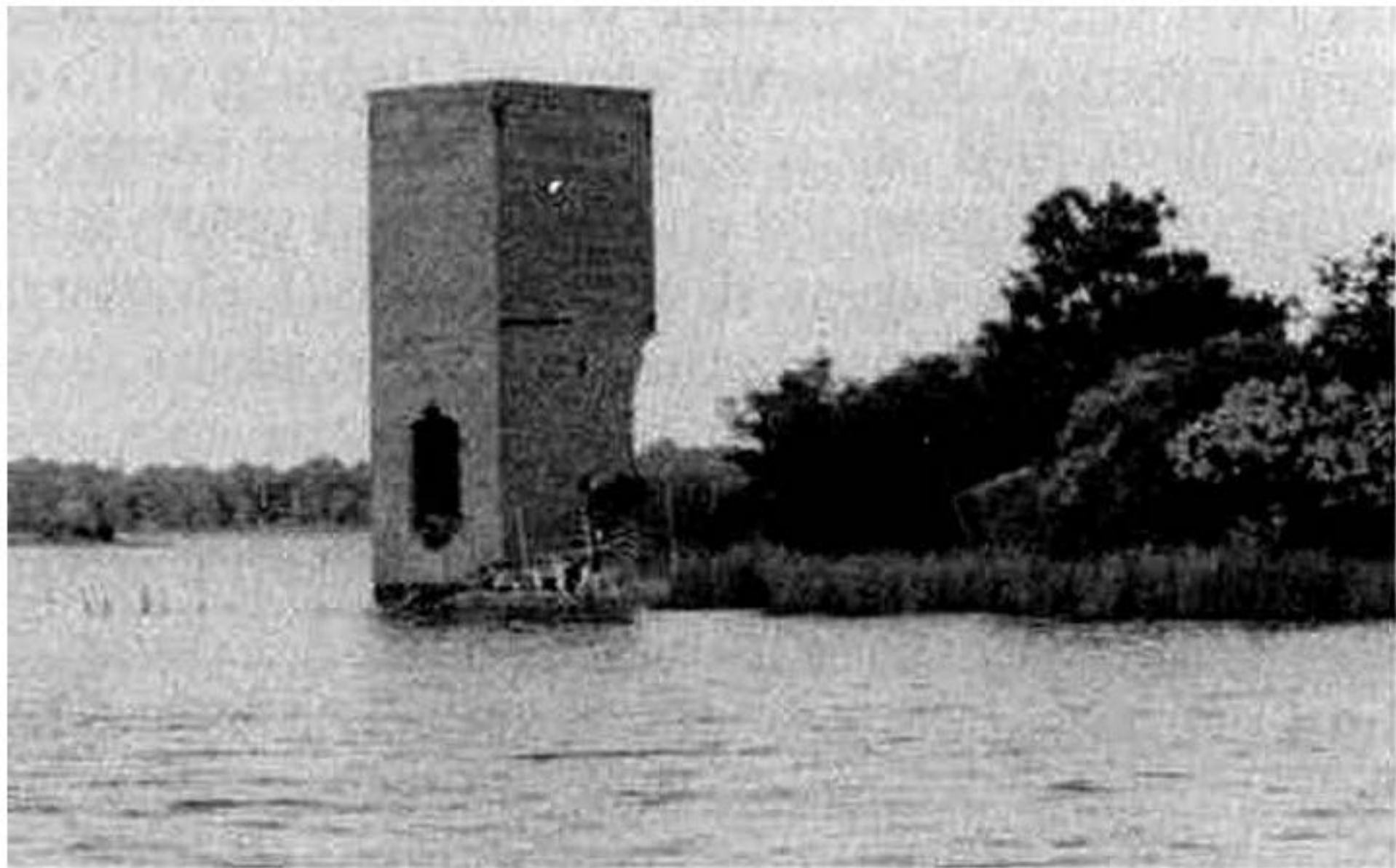
The list, and many could be added, may sound like the Biblical "begats," but they stir memories still around Reedville, Fairport, and Fleeton on Cockrell's Creek, Kilmarnock on Indian Creek, Ocran on Dymers Creek, White Stone on the Rappahannock, and Lewisetta on the Potomac.

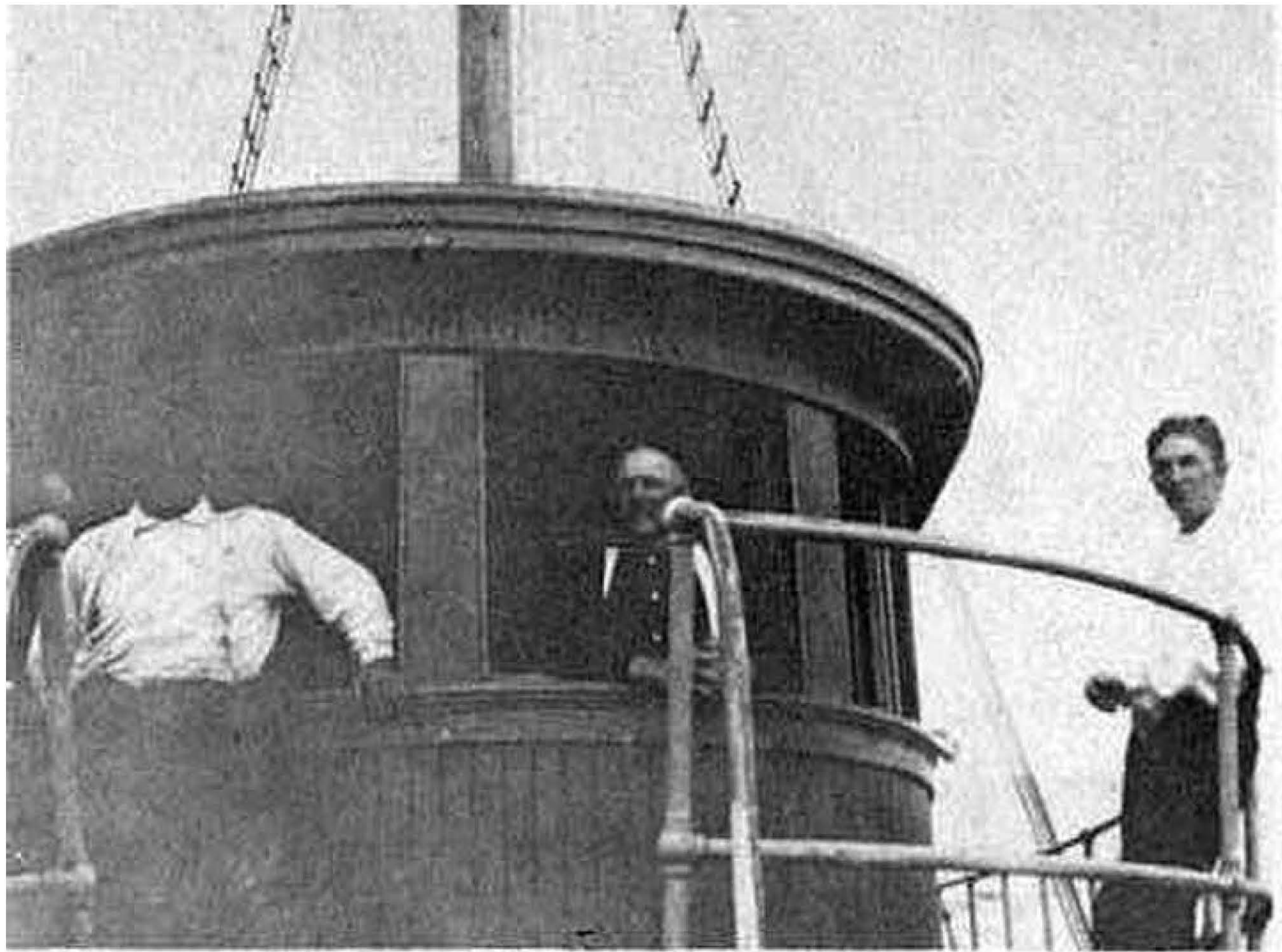


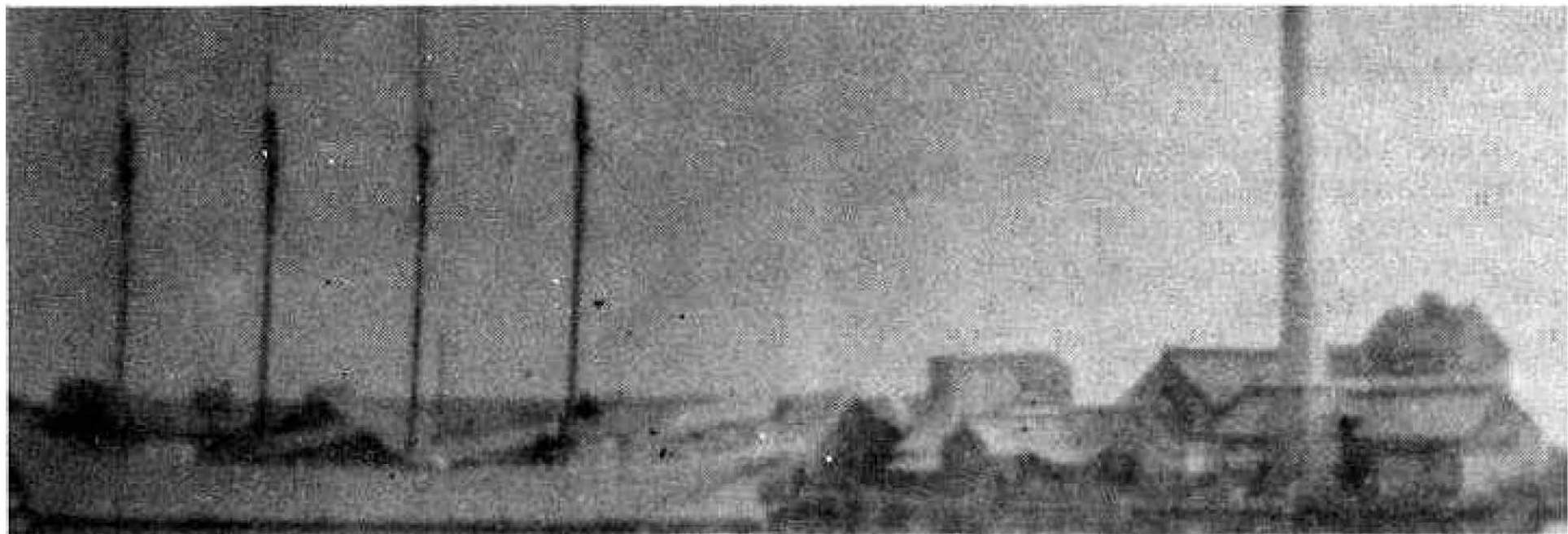
All that remains of the menhaden industry on Dividing Creek's southern branch, Prentice Creek. Fire destroyed the plant many years ago, and Mrs. Alfred I. DuPont, the former Jessie Ball of nearby Ball's Neck, bought the property to ensure that no fish factory would be set up there again.

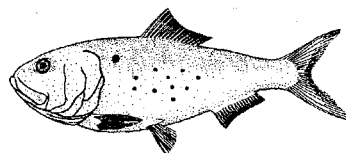
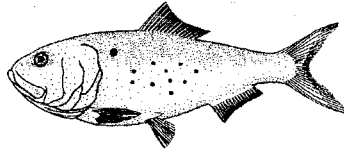
This snapshot from the Norris J. Haynie collection, marked "Str. Squires," shows the pilot house and three officers.











The Morris, Fisher plant at Reedville, Virginia, about 1910. A four-masted schooner is loading fish scrap for the Baltimore brokers. Norris Haynie collection.

THE MENHADEN HOMES

In the late nineteenth and early twentieth centuries, Virginia menhaden factory owners and captains made money much of the time, to give the village of Reedville a reputation of having the highest per capita wealth of any community in the country for a number of years.

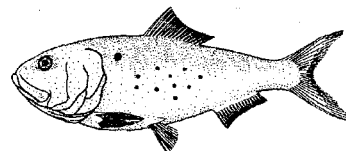
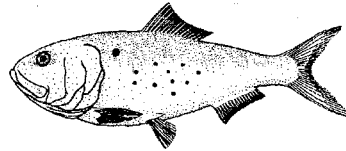
Much of the wealth went into homes—homes for the men who built the industry and fishery, homes for sons and daughters when they married. Possibly because of the isolation of the Northern Neck's Reedville, Fleeton, and Fairport on Cockrell's Creek and Ocran on Dymmer's Creek, possibly because so many founders were Yankees or descended from Yankees, the homes followed no Virginia traditions of the plantation owners along the Potomac, Rappahannock, York, and James Rivers. Instead, they tended toward Victorian, with touches reflecting personal tastes, or memories of nineteenth century New England. And they created, at Reedville, a community unique among menhaden centers on the Atlantic and Gulf Coasts.

Unlike the plantation mansions, which became known as "great houses," many with names in the colonial tradition, such as Berkeley, Shirley, Bacon's Castle, Mantua, Stratford, Wakefield, Gunston Hall, and Mount Vernon, the menhaden homes were known largely by the names of their first owners: the Reed House, the Morris House, the Haynie House, the Jett House, the Bellows House. Who lived there was important.

Some were built around nautical mementos. The Fisher House, almost at the end of Reedville's Main Street, includes a mast erected through its third and fourth floors. The Bellows house on the Ocran Road in Lancaster County has a room paneled from a schooner that once fished.

Here are recent photographs of a few menhaden homes on the Northern Neck. In Reedville, almost all were waterfront, the village being on a narrow peninsula between two branches of Cockrell's Creek, with Main Street down the middle. Elsewhere they were on the water or not, according to their first owners' preferences.

The Gables, built by Captain James C. Fisher, former sea captain who became Albert Morris' partner in a nineteenth century menhaden factory at Reedville. A sailing ship's mast runs up through the third and fourth floors.

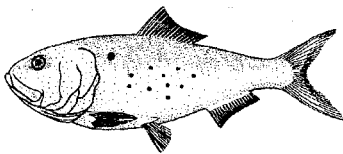
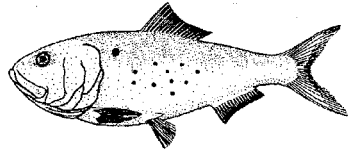


The Raymond Lee Haynie, Sr., home, built by his father, John A. Haynie, for a wedding gift.

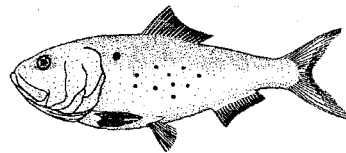




The Albert Morris home, across Main Street of Reedville from his partner's The Gables.



The Reedville home of Captain Thomas Haynie.



The T. Howard Jett home, still in the Jett family.

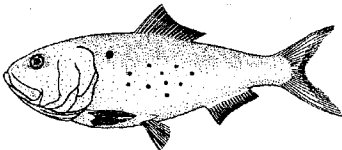
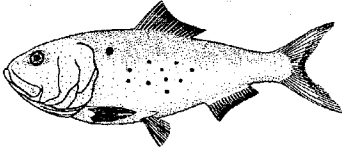




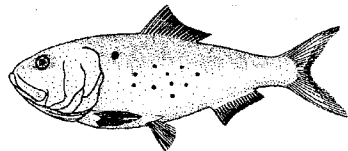


From these upper windows of his home on the road to Ocran, Lancaster County, Joseph Foster Bellows watched the Bellows and Squires fish boats come up Dyer's Creek. His

office, with a desk from an old whaling ship, was on the first floor just in from the porch.



George N. Reed built this home in the late 1890's. He was the son of Elijah W. Reed, founder of the Chesapeake Bay menhaden industry. Elijah Reed's great-granddaughter, Lillian Slaughter, and her husband, Warren T. Slaughter, live there now.



The William T. Covington home, a joint project of the Covington and McNeal families when William Covington and Mortimer Idelle McNeal were married.

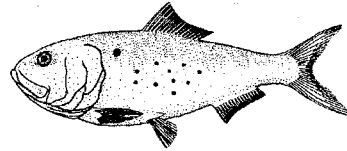
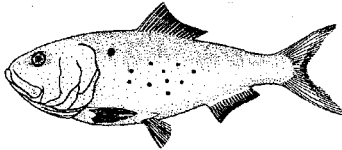






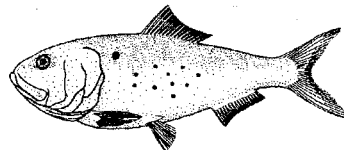
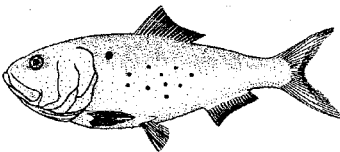
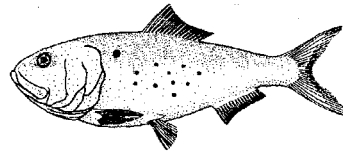
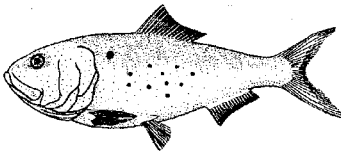
The home Joseph Foster Bellows built for his daughter Ida when she and H. R. Humphreys were married in 1904, and birthplace of H. R. Humphreys, Jr., now president of Standard Products.

These diamond designs in the slate roofs were a mark of the homes Joseph Foster Bellows built for his family of seven daughters.



The Fleeton home of Isaac Milton Bussells.

Another Bellows home on the road to Ocran.



The home in Fairport of Miss Aleta McNeal, who served in the 1960's as the only woman president of a menhaden company. Her father, George H. McNeal, built the house close to his factory on Cockrell's Creek.

Captain Ocran Humphreys, owner of the *George H. Bradley III*, the second steam fish boat on Chesapeake Bay, built this house on Dyer's Creek, near the village of Ocran. He fished for Bellows and Squires when the company was emerging from the sail era in the late nineteenth century.













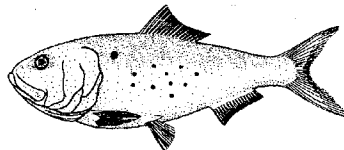
XI. The Carolinas South

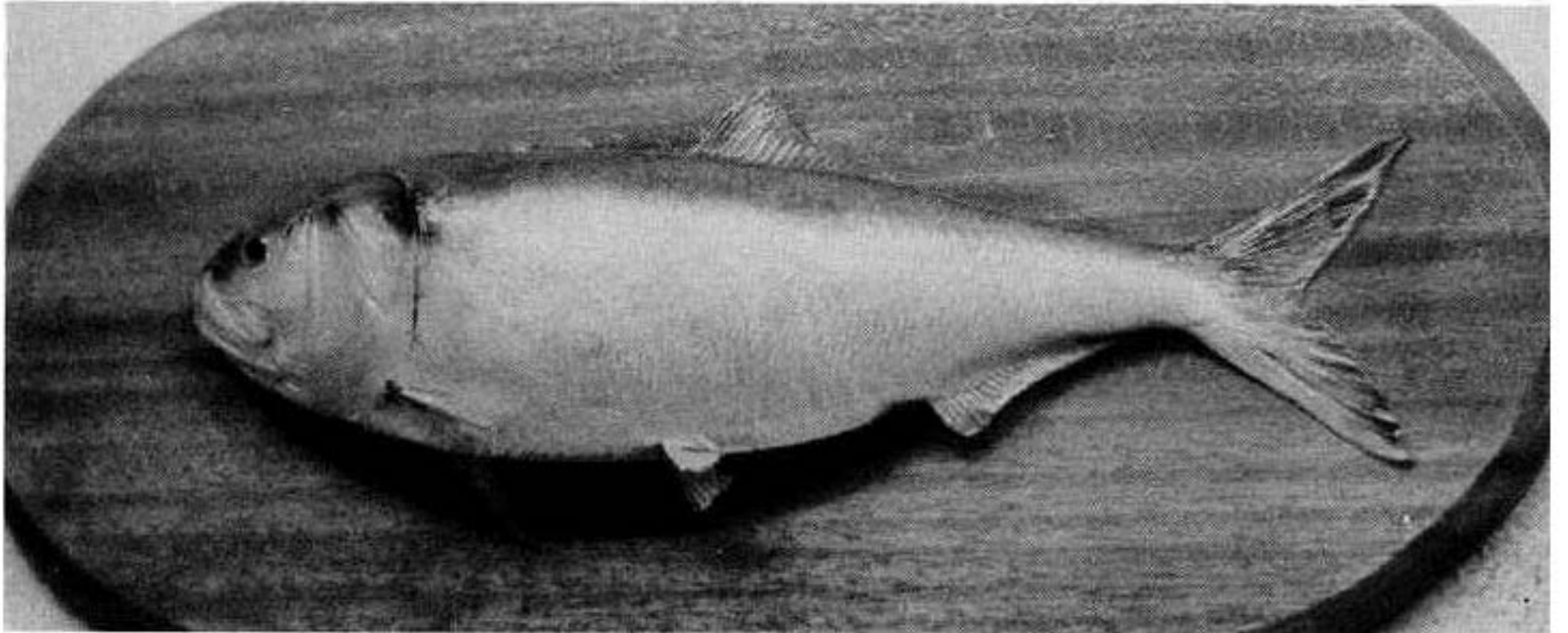
The North Carolina seacoast and sounds, fishing country since Colonial days with the rest of the Atlantic seaboard, like Chesapeake Bay "discovered" menhaden after the Civil War. The fishermen had long known "fat-backs" and indeed some unremembered few from the early days may have boiled them for oil, but more likely manured their fields and gardens. More certainly, recalling John Lawson's 1709 judgment of fat-backs as "excellent sweet food," they ate them.

One story of the "discovery" was that a railroad engineer from Crisfield, Maryland, C. P. Dey, who was running a troop train carrying the Seventh Rhode Island Regiment to New Bern on the Neuse River, saw such a fishery as more likely to make him rich than opening and

closing a locomotive throttle. After the war he became a leading producer with a factory near Beaufort. Other pioneers included Charles S. Wallace, a member of the North Carolina legislature, who started one of several factories along Core Sound, northeast of Beaufort. In 1911 he established one at nearby Morehead City, just in from Cape Lookout, with a company that now fishes entirely on the Gulf of Mexico, its headquarters in New Orleans. Its story is in a later chapter. Still another pioneer was R. W. Taylor, Sr., also active on Core Sound just after the war.

The North Carolina "fat-back"... "mammy shad"... bunker ... menhaden, as mounted at the Hampton Mariners Museum at Beaufort.





Yankees as well got into the business, as on Chesapeake Bay. Union soldiers stationed along the coast saw the schools in the ocean and in the inlets, sounds, and estuaries. They wrote home, or took back enthusiastic, perhaps expansive, reports after demobilization. Although some listeners may have wished later that they had never heard of the fish, a few men with menhaden experience in New England and Long Island came to North Carolina to see for themselves. They found the stories mostly true, or so thought, and began to set up oil and guano works, first on Harper's, now Harker's, Island, just off the mainland in the lower end of Core Sound near Beaufort, in 1865, and in 1866 another on Roanoke Sound and a third on Portsmouth Island on the Outer Banks.

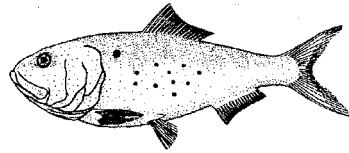
R. Edward Earll described in 1887 the Harper's Island venture as depending on gill nets. The catch was processed in kettles and hand presses at first, then with a steam boiler. Later purse and haul seines were used. The enterprise continued, apparently with little if any profit, until 1873. Then the operators moved a few miles to Cape Lookout. Once

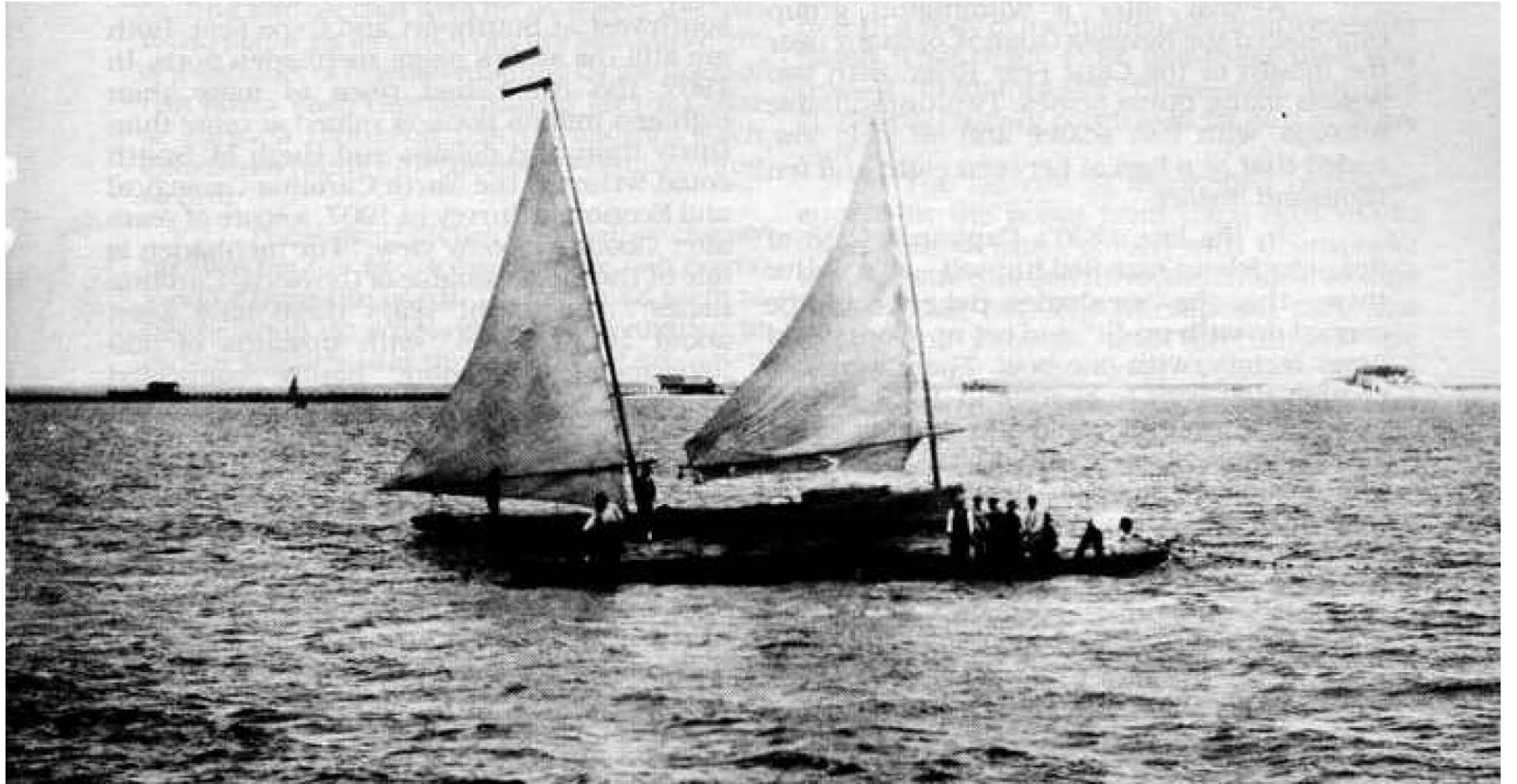
there, they seemed to have thought better. They never reassembled the plant and closed up with losses totaling three thousand dollars, Earll reported.

The venture by the Quinnipiac Fertilizer Company of New Haven, Connecticut, mentioned earlier, lasted only through the winter of 1866, then moved north to Cape Charles, Virginia, after the Roanoke Sound fishermen destroyed its weirs.

That same year a Rhode Island stock company, Excelsior Oil and Guano Company, put fifty thousand dollars into a venture on Portsmouth Island, the Outer Banks strip lying about halfway between Capes Hatteras and Lookout, with Ocracoke Inlet at the northeastern end giving passage from the ocean to Pamlico Sound. Earll told its unhappy experience despite importation of skilled purse seine fishermen from the north and modern equipment to cook and press the fish.

Menhaden fishing on North Carolina sounds in the nineteenth century. The purse boats have just made a set, with the seine about to be drawn in by hand. North Carolina Museum of Natural History, loaned by Hampton Mariners Museum, Beaufort.





In three years seventy-five thousand dollars had been lost and the venture ended. Among causes was scarcity of fish, with schools averaging fewer than twenty-five barrels each. Fish now are measured by the thousand. Then three and one-third barrels were figured to equal one thousand. Rapid rotting in the summer heat also limited the fleet's range to twenty-five miles from the factory. Further, the boats could not fish in the ocean because of the shallowness of Ocracoke and other inlets at low tide and also because of sudden storms. Finally fish in the sounds yielded only two quarts of oil to the barrel.

The business manager told Earll, "It would be impossible to make the menhaden fisheries profitable along this coast." That should have deterred, but did not, the experienced Joseph Church and Company of Rhode Island from trying again about 1870, this time at Oregon Inlet, between Bodie and Hatteras Islands to the north. The attempt lasted two seasons, with the steamer *Seven Brothers* used the first year to buck the strong currents in Oregon Inlet (now traversed daily by scores of sport fishing boats seeking big game offshore), then smaller sailing vessels.

A year later a Wilmington group established the Nevassa Guano Company near the mouth of the Cape Fear River, with two vessels using purse seines. Two unprofitable seasons, with fish scarce and oil yield low, ended that at a loss of between eight and ten thousand dollars.

In the late 1870's Captain I. Cain of Roanoke Island satisfied himself—as a native there—that the "menhaden fishery could be carried on with profit" and set up a kettle and press factory, with one boat. There were not enough fish even to operate in 1879, but he announced that he would add a steam boiler and hydraulic presses. He probably did, at a total cost of two thousand dollars, but may not have operated them either. George Brown Goode and A. Howard Clark reported in 1887 in their massive *The Fish and Fishery Industries of the United States* that no menhaden fishing was done in North Carolina in 1880.

Goode and Clark gave a pessimistic appraisal to the North Carolina fishery, noting that no one had yet made it pay:

It is therefore an open question whether this fishery can be prosecuted in the State. The currents are so strong at the inlets that sail vessels are often unable to enter them when the tide is unfavorable, and they are thus frequently delayed so long that the fish spoil before they reach the factory. Menhaden are quite abundant in the inner sounds, but the water is usually so shoal as to interfere seriously with the use of purse-seines, and the fish are so scattered that only a few barrels can be taken at a haul.

This was one of George Brown Goode's few wrong guesses. Even by 1887, the year of publication of the menhaden section of their survey, a fishery had been established out of Beaufort, near the original Harper's Island sites. That year a catch of nearly fifteen million pounds was recorded, and two years later there were seven factories in the Beaufort-Morehead City neighborhood. Not big ones—total investment in buildings, equipment, fish boats, and seines being estimated at one hundred thousand dollars—and one closed the next year.

By 1900 the fishery had two centers, one around Beaufort, the other to the southwest at Southport and Cape Fear. Both are still the state's major menhaden ports. In 1902 the catch had risen to more than eighteen million pounds valued at more than thirty thousand dollars, and Hugh M. Smith could write for the North Carolina Geological and Economic Survey in 1907, a score of years after Goode's gloomy view: "The menhaden is one of the most valuable of the North Carolina fishes.... In recent years there have been about 10 [factories], with upwards of 500 fishermen and shore hands connected therewith."

In 1908 the catch rose to more than fifty-seven million pounds, and in 1918, the last year of the First World War, to nearly 180 million, a record to stand until 1929, when nearly 182 million pounds were taken. The record year later was 1959, with nearly 180 million pounds.

In the early years of the twentieth century, Robb Leon Greer noted in 1915, everybody on the North Carolina fish boats was "on shares," as in New England in the nineteenth. The whole crew was given seventy-

five to eighty-five cents a thousand fish, the captain taking fifteen cents, the others five cents each. The captain "usually" gave the mate two and one-half cents extra, the cook one cent, and the engineer one to two cents. All had to "find their own food."

The North Carolina fishery in some ways has been unique. Menhaden usually are abundant at least ten months of the year, but late fall brings spectacular activity. Then fish boats from New Jersey to Chesapeake Bay "cut out" and move to the hundred-mile bight of the ocean from Cape Lookout south and west to Cape Fear. They are following the schools of big fish migrating from the mid-Atlantic, from Long Island Sound, and from the New England coast, heading for wherever the fish go for the winter.

Schools of one hundred thousand join to form bodies that may hold millions, all normally high in oil content. From the air they are dense, dark blobs that may extend as far as a spotter pilot can see, greater than any one fish boat can enclose in its purse seine. These are survivors of a summer of predation—endless slashing by bluefish, by striped bass, by sharks, by seals, by whales, by almost any marine animal that lives on whatever live fish it can get in its mouth. They are also survivors of a summer of intensive fishing by the fleets of fish boats, each captain hungry for the dollar or so each thousand fish brings him, each fisherman hungry for the twenty cents coming to him.

These great bodies would all seem easy picking for the two score or more fish boats, local or from the north. Theirs would seem to be the *coup de grâce*, with few menhaden to escape the nets and the continuing predation by carnivores following them, few to find their way to shelter of tropic or sub-tropic waters with fifty- to seventy-degree temperatures.

As Sportin' Life sings in *Porgy and Bess*, "'Tain't necessarily so!" Cape Lookout and Cape Fear may not be so exposed as Hatteras with its many storms. They may be well south of the snows and occasional freezes of Chesapeake Bay. But they have fall and winter gales, and more than one fish boat has been overwhelmed, either to be towed in by a sister ship, or to roll to the bottom. The waters may be shoal to super-tankers, but they are

deep enough for a fish boat to be almost beyond salvage.

On December 7, 1968, the J. Howard Smith *Fenwick Island*, caught with fourteen others by a freak southwest squall off Cape Lookout, rolled over and sank in near hurricane winds and freezing temperatures. The W. T. James, Jr., of Haynie Products' Chesapeake Bay fleet, rescued seven men but seven others were lost.

Captain Ernest Delano of the *James*, a large converted military transport, saw the *Fenwick Island's* lights go out from about two and one-half miles and rushed to the scene, pulled the survivors from the thirty-five-degree water and heavy seas, and brought them ashore wrapped in blankets.

Any such accidents are rare, fortunately. Most storms are forecast well enough that the fish boats stay at their docks near Beaufort or Southport. In a really stormy December, the boats can be idle enough for the crews to owe the boats money for their meals. The crews, by long custom to the north as well as here, pay for their food.

The capes themselves offer shelter for a ship in a northeaster. But a fish boat at the dock or anchored in the lee of a cape makes no hole in a body of menhaden heading for winter haven. That many more fish make their way free—if predators let them—and nature's statistical balance continues. Or so it appears now.

The fall run of menhaden begins to appear in the ocean from Cape Hatteras to Cape Fear in mid-October, with Chesapeake Bay fish starting down. North Carolina sounds fish moving out. The Chesapeake fish, also called "holy jumpers" and "forerunners," are ten to twelve inches long. A month later a second wave, the "Delaware fish" or "mammy shad," up to sixteen inches long, begin arriving, to stay for two or three weeks. Toward the end of November "Boston Bay" and "Amagansett fish," sixteen to twenty inches long, begin the biggest run of all, and the northern fish boats begin to appear, to stay through most of December. Finally in December or January there is a fourth wave, but of fish two to ten inches long, that moves off almost untouched.

The schedule is not rigid. Mild winters to the north can delay migration, and indeed

Chesapeake Bay companies got the statutory season there extended to Christmas when it seemed that a long cycle of warm winters might go on forever, a thought shattered by the winter of 1976-77, the coldest since 1917-18. The date later was set back a little to the third Friday in December. Outguessing fish and weather is what makes menhaden fishing, like almost any, as much a terribly earnest sport as business.

The return of the fish makes a spring fishery. The northbound fish, called "Georgetown flats fish" because they arrive first near Georgetown, South Carolina, are caught in Core and Bogue Sounds from May, some years from April, through August, and also outside from Cape Lookout to Cape Hatteras. They are six to eight inches long when they first show. An extremely hot summer, like that of 1977, may drive the fish north. Seventy-degree surface temperatures seem to be about their upper limit.

As it should be, one of North Carolina's two menhaden centers is one of its oldest fishing centers. Beaufort, founded in 1719 and one of the oldest cities in North Carolina, was first known as "Fishtown" because so many of its early colonists turned to Pamlico, Core, and Bogue Sounds and to the Atlantic Ocean for their living and food. The shallow sounds behind the barrier islands of the Outer Banks produced many species of estuarine and anadromous fish, and the ocean migratory fish in their seasons.

Thus, when the Yankees began appearing, talking of the riches to be made from bunkers or pogies, fishermen of Beaufort, and of its younger but now bigger sister, Morehead City, on the west side of the Newport River, knew they were talking about fat-backs and that there were plenty about, offshore and in the sounds.

Among the seven factories of the late nineteenth century was one to be the start of a company still fishing for menhaden, now in the Gulf of Mexico far from North Carolina, and with the longest corporate history of any save that of the Haynies of Reedville, Virginia.

In 1898, when Morehead City was a leading seafood port, second only to Gloucester, Massachusetts, on the Atlantic Coast, Charles S. Wallace built a menhaden

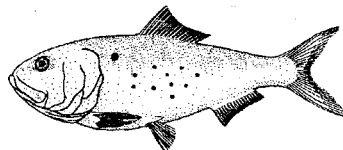
plant at Crab Point, across Calico Creek from Morehead City.

He had to close the Calico Creek plant after a year because fish boats could not sail to it easily, nor could the fish scrap and oil be gotten out easily to Morehead City for shipping by rail. In 1900 he tried again with a plant on Jarrett's Bay of lower Core Sound, near Smyrna. This plant succeeded and operated for thirty-one years.

Meanwhile, in 1911, Charles S. Wallace, his wife's brother William M. Webb, and a banker, E. A. Council, formed Wallace Fisheries Company, with starting capital of fifty thousand dollars, and built another hand factory just west of Morehead City on Bogue Sound. This plant too was successful.

In 1916 Charles Wallace started a new company, Portsmouth Fisheries Company, with a plant on Casey's Island, on the Pamlico Sound side of the Outer Banks' Portsmouth Island, his birthplace. The plant was close to fishing grounds but far from a shipping point and lasted only one season. Portsmouth Fisheries moved to Southport, where it operated until 1933. Then, with Depression problems, it went into receivership and was reorganized as the Brunswick Navigation Company, with Wallace a partial owner. Eventually it was sold to Standard Products Company, Incorporated, of Virginia, and is still operated with that company's Beaufort plant.

Two other major operations in the Beaufort-Morehead City area were Harvey W. Smith and Wallace M. Quinn, whose stories,



Fish scrap drying in the sun at a North Carolina fish factory, late nineteenth century. North Carolina Museum of Natural History, loaned by Hampton Mariners Museum, Beaufort.

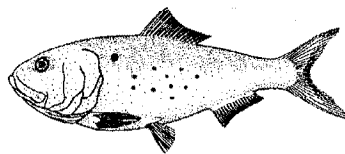
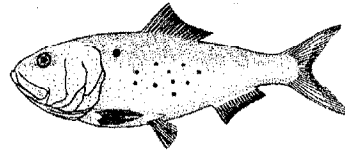


The Carolinas South

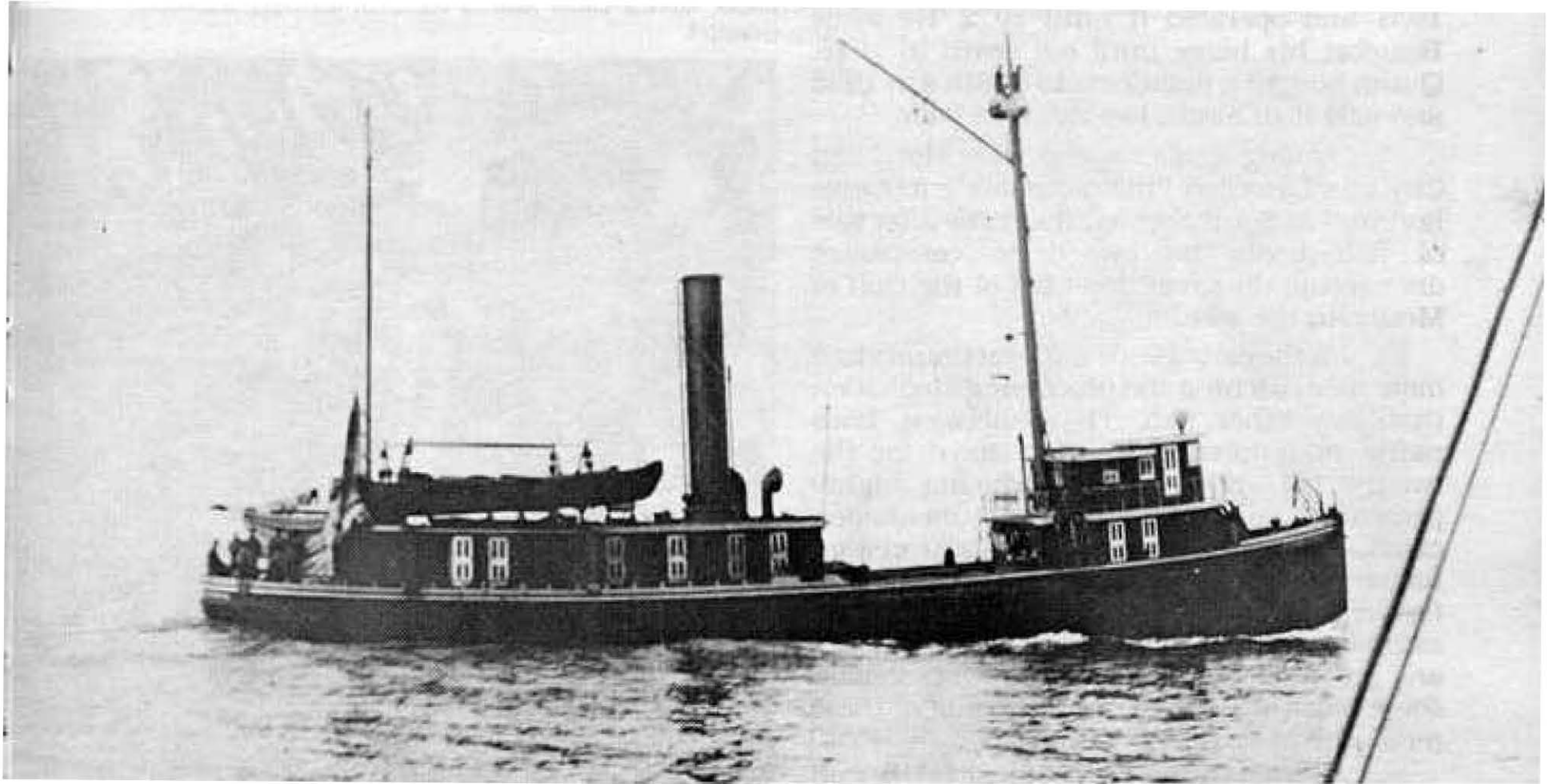
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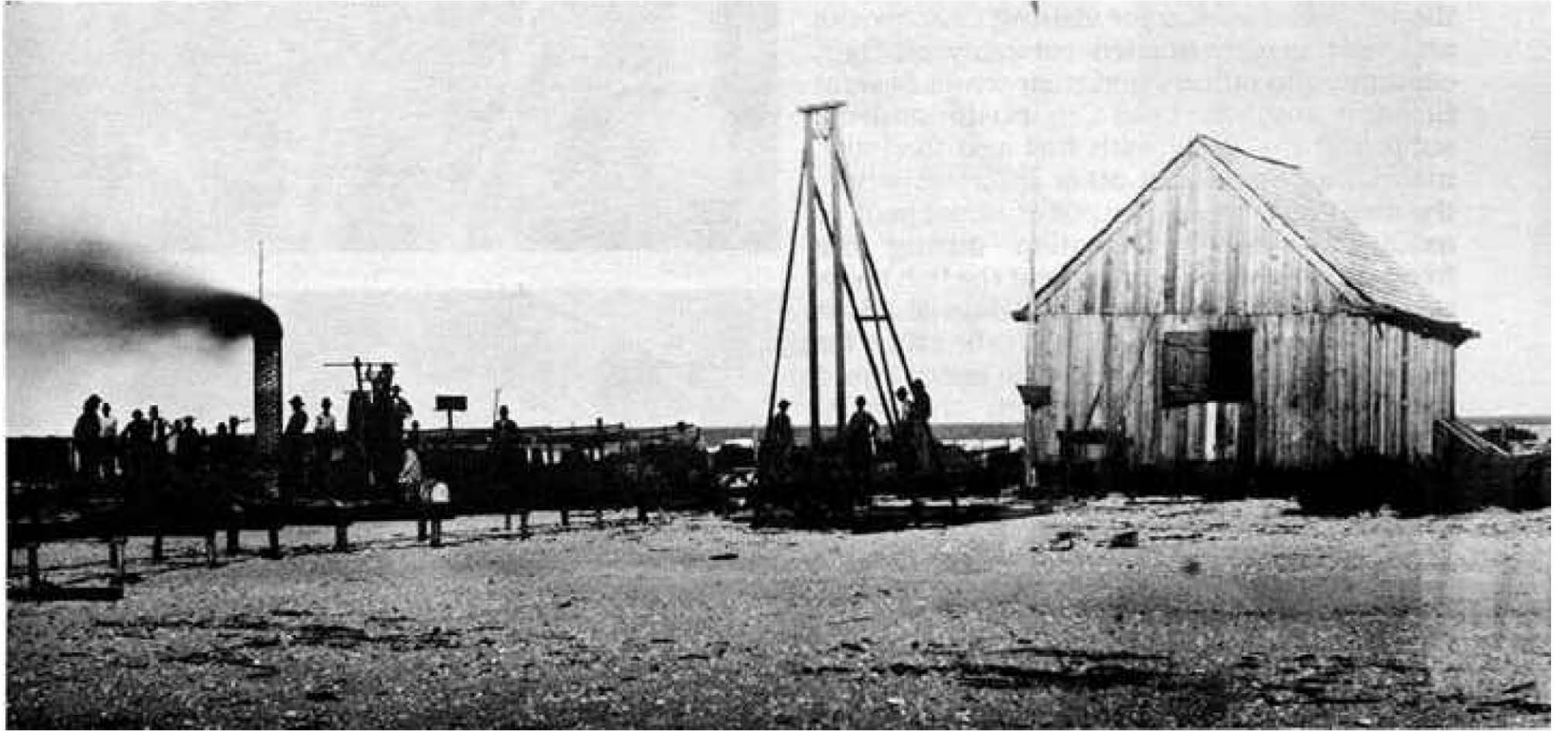
A menhaden steamer of the early twentieth century in North Carolina waters. Note men in crow's nest looking for fish. North

Carolina Museum of Natural History, loaned by Hampton Mariners Museum, Beaufort.



A North Carolina menhaden factory dock in the late nineteenth or early twentieth century. North Carolina Museum of Natural History, loaned by Hampton Mariners Museum, Beaufort.





like Wallace's, are told in detail in other chapters. Smith built a plant at Beaufort in 1931 and operated it until 1972. He made Beaufort his home until his death in 1976. Quinn bought a plant next to Smith's in 1935 and sold it to Smith twenty years later.

Among smaller operators at Morehead City was Llewellyn Phillips, whose enterprise here and at Southport left the scene after sale of fish boats he owned to companies discovering the great potential of the Gulf of Mexico in the 1940's.

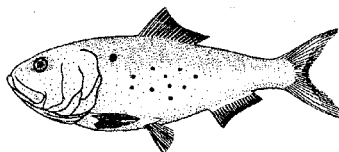
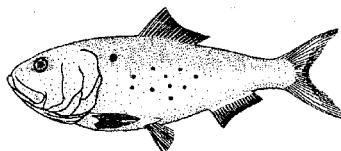
In the early 1960s Carteret County had more men catching and processing menhaden than any other fish. The fishermen, both native and northern coming down for the twenty fall days, were producing eighty percent of North Carolina's total menhaden catch. That total, amounting to 230 million fish in 1961, was ten percent of the whole fishery. Eastern North Carolina had an estimated seventy thousand men catching and processing all fish, some only seasonally, some most of the year, and the bulk of these men were in Carteret County.

During these days of great activity off North Carolina, the fall fishing season was also the fall social season for visiting Chesapeake and northern menhaden company officials, captains, and officers and their wives. Several Beaufort and Morehead City business firms supplying the fleets with fuel and food also maintained halls and other quarters where the men could meet, play poker, shoot pool, or indulge in other recreation during the frequent days when storms kept the fish boats tied to the docks. A series of bad days could set off non-stop poker games, with the chips far out of the penny ante scale. The crews found their own entertainment with the usual ingenuity of men away from home, and the forecables and mess tables of the fish boats could echo with the click of dice and the fall of cards.

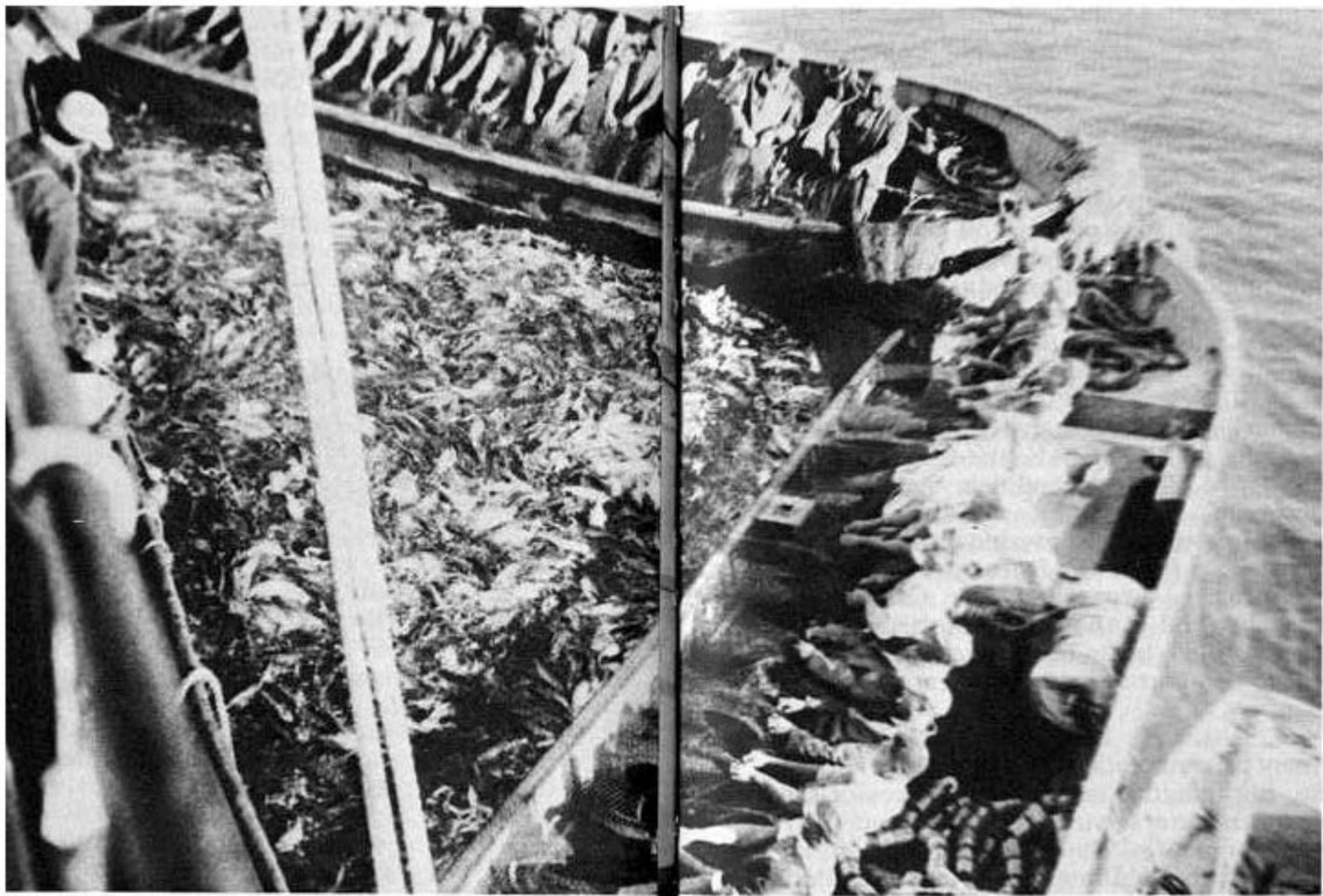
A good season meant money for all. Any kind of a season might mean a good time, socially at least.

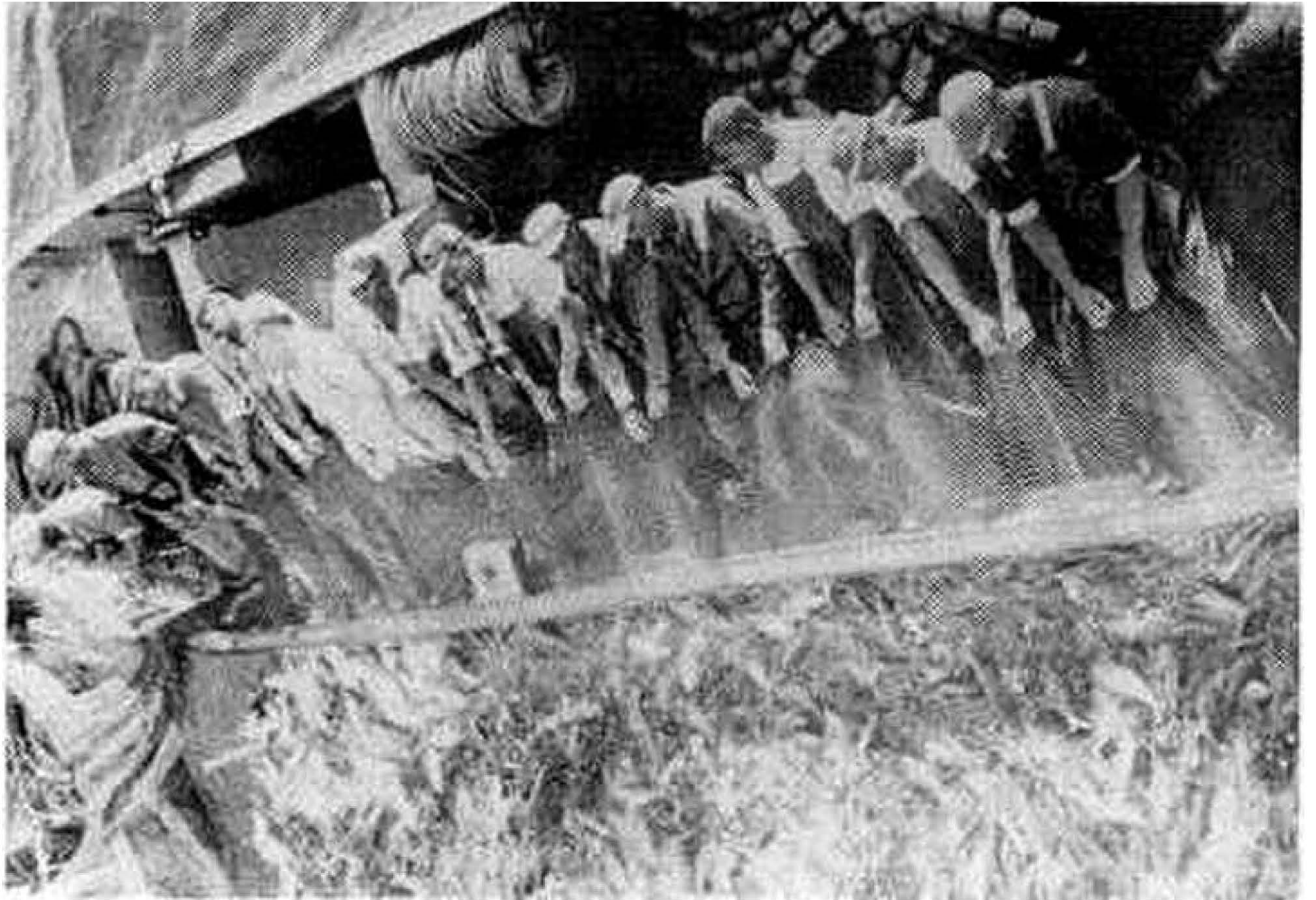
In the late 1970's there were two menhaden factories in operation near Beaufort. One was Beaufort Fisheries, Incorporated, a locally owned company that, like many others in the nearly two centuries of

The straining fishermen, helped by a chantey perhaps, raise the seine against the side of the fish boat. Jerry Schumacher photo, Martha Loftin loan to Hampton Mariners Museum, Beaufort.

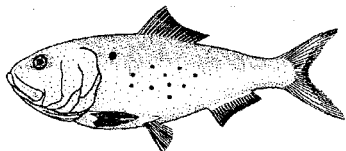
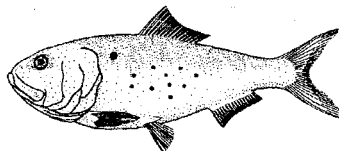


The fish come higher as load after load is bailed into the fish hold. Jerry Schumacher photo, Martha Loftin loan to Hampton Mariners Museum, Beaufort.

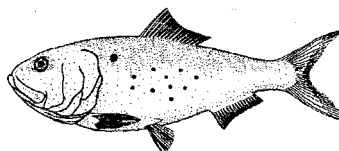




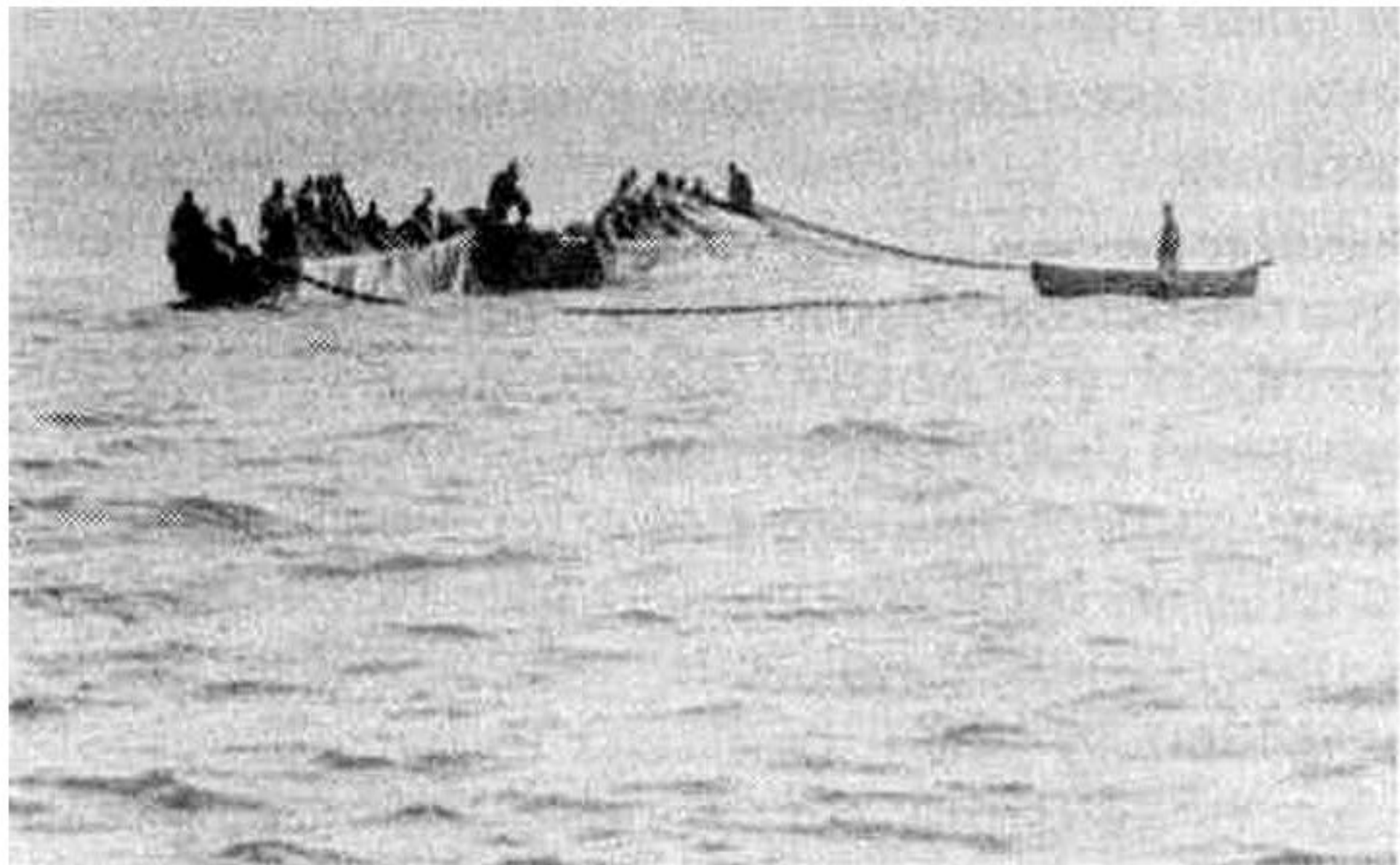
North Carolina fishing in the Harvey W. Smith fleet in the 1930's: the captain, mate, and striker locate a school from the crow's nest. Jerry Schumacher photo, Martha Loftin loan to Hampton Mariners Museum, Beaufort.

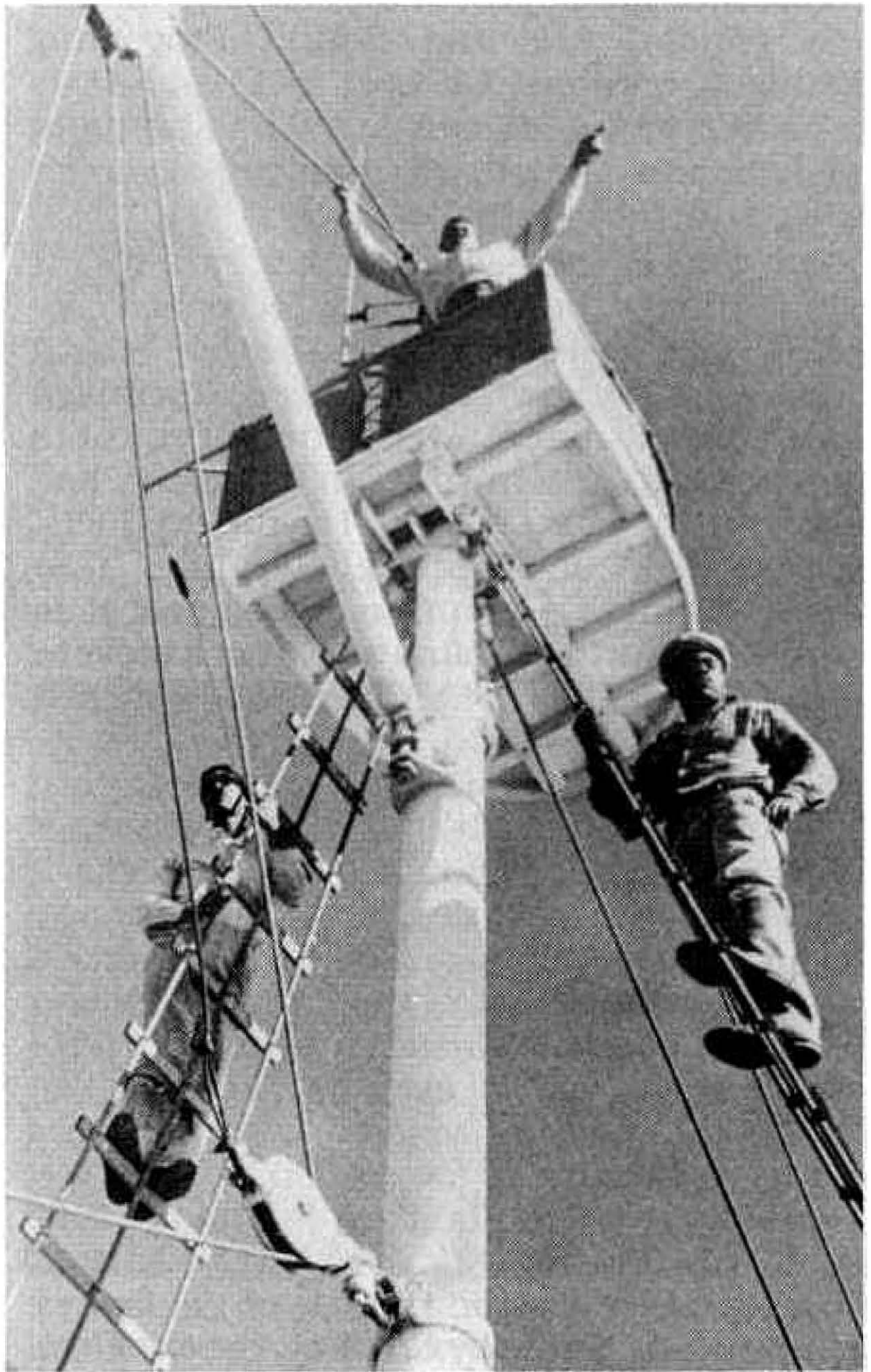


The set is made and the seine is being drawn in to the purse boats. The striker, having "pulled corks" to keep the fish from rushing over the net, is pulled in with the seine. Jerry Schumacher photo, Martha Loftin loan to Hampton Mariners Museum, Beaufort.



A good day's work: a full hold and fish on deck and money for all. Jerry Schumacher photo, Martha Loftin loan to Hampton Mariners Museum, Beaufort.







the fishery from Maine to Texas, grew out of the bankruptcy of another. The second was the Lennoxville plant of Standard Products Company, third largest in the country. Another fish factory, Sea and Sound Processing Company, had one fish boat and handled its catch, but processed mostly trash fish caught by shrimpers and others supplying the area's active seafood packing industry.

One other menhaden factory in recent operation was the one built in Morehead City in 1911 by Charles S. Wallace, the Core Sound pioneer. It is now the Carteret Technical Institute. Wallace Menhaden Products Incorporated, now in the Gulf of Mexico, had sold it in the late 1960's to Haynie Products, Incorporated, of Reedville, Virginia, now Zapata Haynie Corporation, which sold it to the state of North Carolina as part of a move to concentrate all Atlantic Coast processing at Reedville.

Beaufort Fisheries and Standard Products plants are within a mile of each other on Taylor's Creek east of Beaufort, in sight of the inlet giving them a channel to the Atlantic Ocean just west of Cape Lookout. The creek, named for another of the North Carolina fishery's pioneers, also leads to the lower end of Core Sound, which extends northeast to Pamlico Sound's broad and shallow waters and its population of menhaden.

The Standard Products plant, bought in 1964 from Judge Lambert Morris of Morehead City, was on the site of the factory set up so long before by C. P. Dey, the Crisfield, Maryland, engineer who saw the bunkers while running troop trains during the Civil War.

This plant, with a processing capacity of 150 thousand fish an hour during its eight weeks of fall and winter operation, has among modern features newly developed odor control stack scrubbers of fiberglass, installed in 1976 at a cost of 150 thousand dollars, and fifty thousand dollars more for installation. The fiberglass construction is designed to meet the problem of corrosion from salt water sprays, a serious maintenance problem with steel.

About eight refrigerated boats, some from Chesapeake Bay and some from the company's Southport, North Carolina, and Moss Point, Mississippi, plants, normally fish for the Lennoxville plant.

Beaufort Fisheries, now headed by William H. Potter, came into being after the Great Depression had forced under the Taylor's Creek Fish Scrap and Oil Company. W. V. B. Potter, father of William H. Potter, and Claude R. Wheatley acquired the assets, started up again in 1930, and made it a profitable operation. The children of the elder Potter and Wheatley are now the owners of a company capable of processing three million fish every twenty-four hours into more than two hundred tons of meal, oil, and solubles. Annual production, based on catching fifty to sixty million fish, is estimated at five thousand tons of meal, fifteen to sixteen hundred tons of solubles, and forty-two thousand gallons of oil, the latter varying according to yield per fish.

The Beaufort Fisheries fleet includes two smaller fish boats, the *Taylor Creek* and the *Jule*, for the sounds, the former with a capacity of 550 thousand fish, the later 325 thousand. For fishing on the Atlantic, Beaufort uses three converted minesweepers, the *Gregory Poole*, the *Lynne Anne*, and the *Pauline*. At times after the October or November end of the Gulf of Mexico season, otherwise idle boats of other companies are sent to Beaufort to fish on percentage for the company.

Although Beaufort Fisheries sends ninety percent of its fish meal to Holly Farms, the big poultry raiser and processor, it continues one service long since ended by other companies. The remaining ten percent is bagged for sale to eastern North Carolina farmers to mix as protein supplement in feed for their pig parlors.

Like the Standard Products plant and menhaden factories everywhere, Beaufort Fisheries has had to spend heavily for environmental equipment, primarily stack scrubbers to control odors. More than 250 thousand dollars went in five years, mostly on equipment of William H. Potter's own design. He felt that incineration of waste fumes would be more efficient and satisfactory but found it forbidden by law.

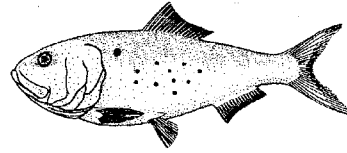
Again like others, Beaufort Fisheries continues to use processing equipment installed years earlier, finding it still producing efficiently. Such equipment has been refined in recent years, but without major changes in technology and design.

William H. Potter, known throughout the industry as its “unreconstructed rebel,” skeptical of scientific studies and recommendations as adding little to what is already known in the industry, is nonetheless praised by federal scientists at the nearby major research center, the Beaufort Laboratory of the National Marine Fisheries Service’s Southeast Center, for ever-willing cooperation. He has been even more skeptical of anything coming from Washington, a feeling shared in considerable degree by many others in or out of the industry, and especially of efforts to manage the fishery for maximum sustainable yield without endangering the species. His feeling here is that the well-being of menhaden is controlled by factors far beyond the reach or influence of the fishery. This again is a feeling shared by others, who argue that menhaden have so many places to go where they can’t be caught—water too shoal for purse seining, restricted or closed waters, remote waters—that the overall population will rise and fall by its own rhythm as much as or more than by effects of fishing. All he really asks is what he has: “the opportunity to fish and good relations with our customers.”

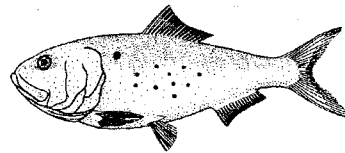
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From Southport and Cape Fear, the latter North Carolina’s southernmost point, to Florida, menhaden are sought by fishermen from North Carolina and Florida. But there is no industry now between there and Fernandina Beach, Florida, at the mouth of the St. Mary’s River, the stream dividing Georgia and Florida at the Atlantic. Nor is there any south of there or on the Gulf Coast of Florida.

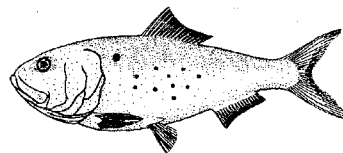
There have been menhaden factories in South Carolina, one built near Georgetown in 1929 and soon closing, another at Yonges Island near Charleston. Wallace M. Quinn, the Marylander from Crisfield, built the Yonges Island plant at White Point in 1946 and operated it until 1959. South Carolina never had been hospitable to the industry, and even in the 1970’s any purse seining had to be done outside the three-mile limit, as off Maryland. Georgia had brief experience with the



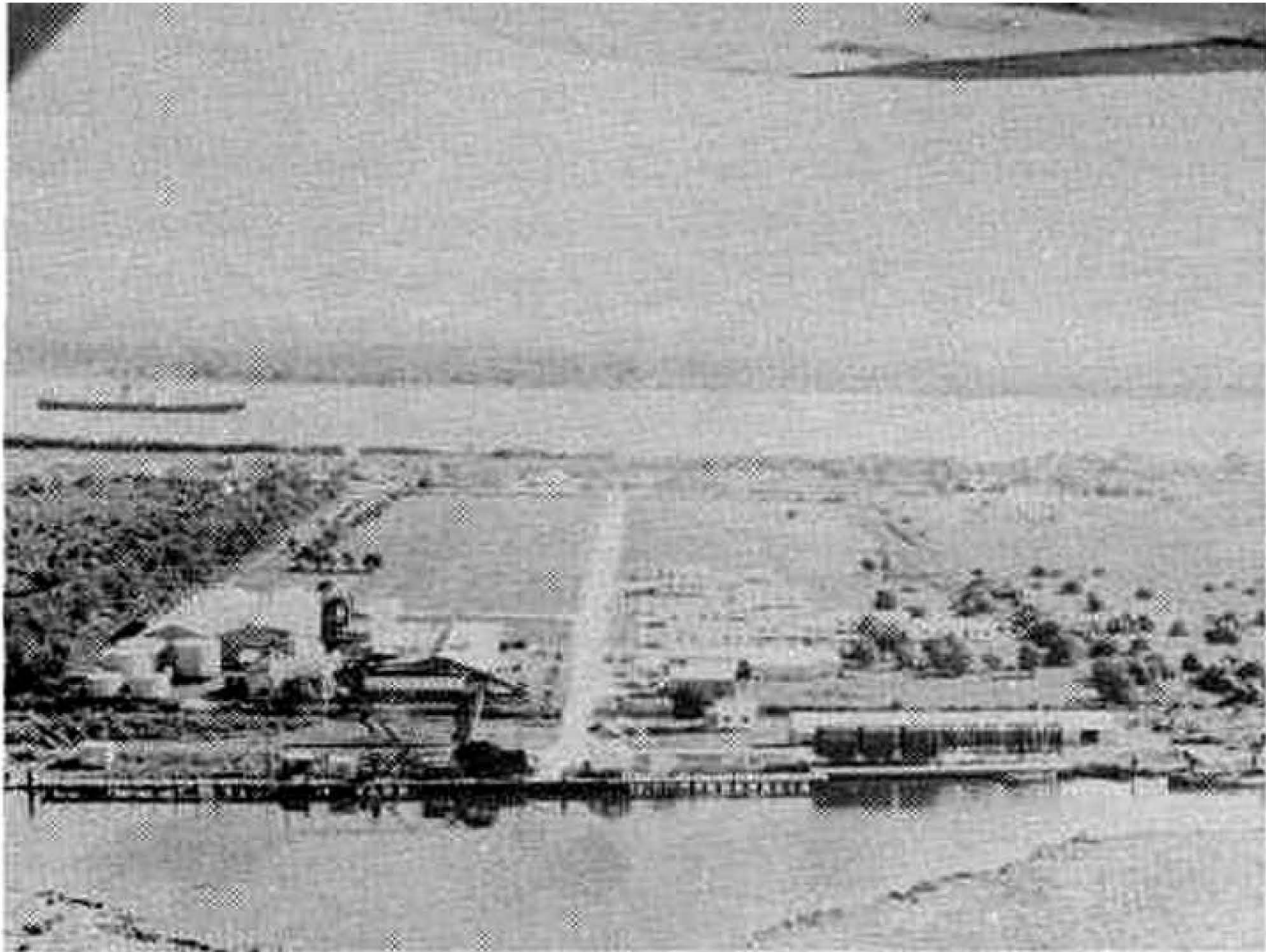
The plant that Harvey W. Smith built at Beaufort, North Carolina, in the 1930’s. Jerry Schumacher photo, Martha Loftin loan to Hampton Mariners Museum, Beaufort.



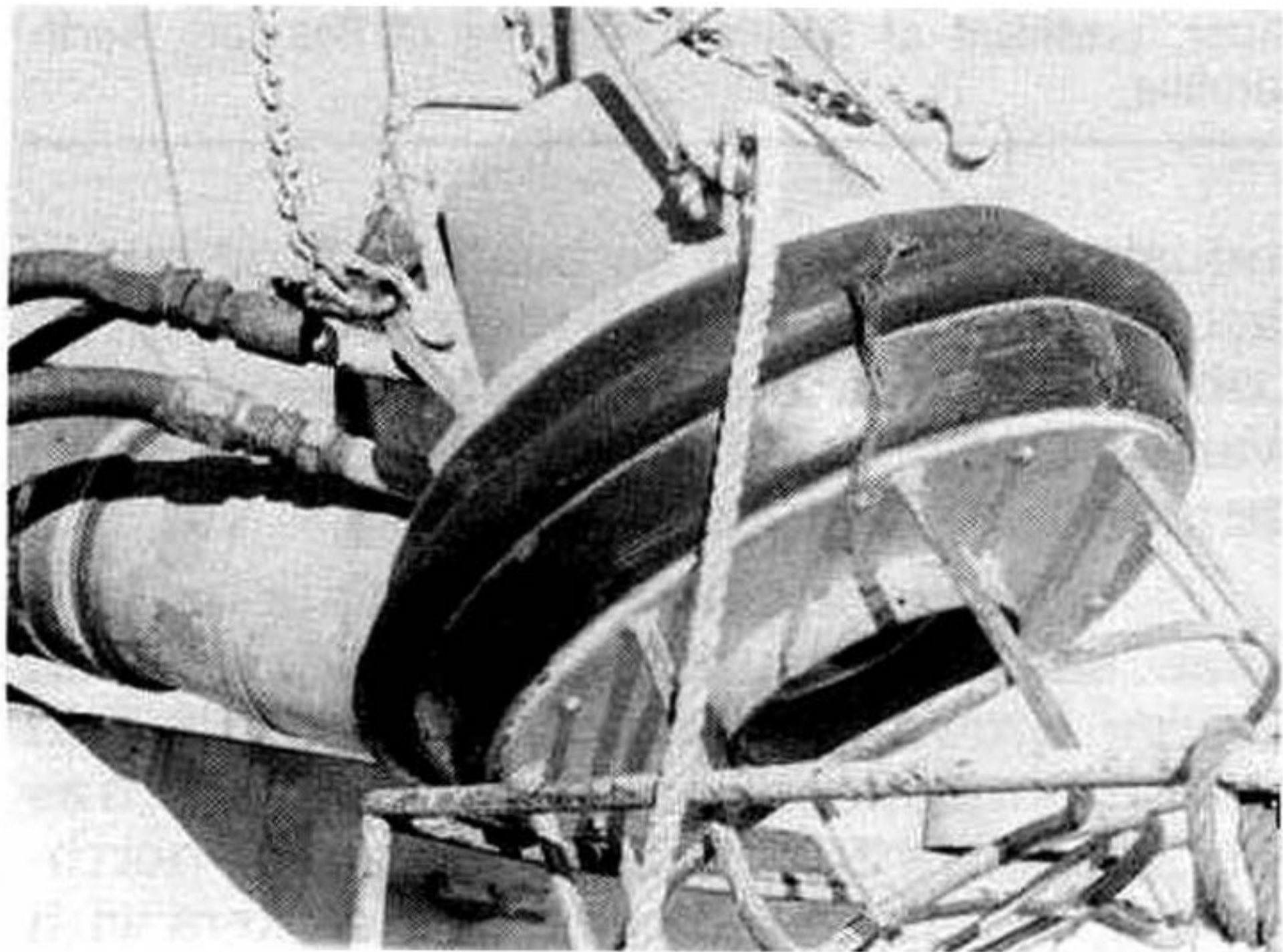
The net house at Smith factory, Beaufort, during the 1930’s. Jerry Schumacher photo, Martha Loftin loan to Hampton Mariners Museum, Beaufort.



The head of a Marco self-powered fish pump used by Beaufort Fisheries on its sounds boats.







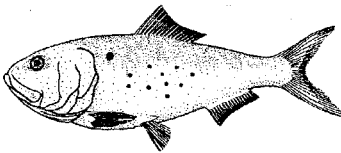


They were at Mayport, at the mouth of the St. Johns, and Fulton, upstream near Jacksonville; at Fernandina Beach, near the upper tip of Florida's northernmost barrier island; and on the Gulf Coast at Port St. Joe and Apalachicola, the latter until 1952.

Mayport activity was stopped by four years of failure ending in 1948. Fernandina Beach, now becoming a resort and retirement area sharing in the popularity of Georgia's "Golden Isles" to the north, at its peak had fishing with up to fifteen boats, with again, one of Wallace Quinn's ventures active. Charles S. Wallace of North Carolina, with his brothers-in-law William M. Webb and Earl Webb, established Mayport Fisheries Company in 1929, to operate its plant for twenty years. By 1949 fish in southern waters were poor in oil, railroad tracks to Mayport had been removed to complicate shipping, and the plant was closed. In 1954 the company rented a plant at Fernandina Beach, built by Otis Smith in 1934 and operated for four years, from Harvey Smith, to be run by J. Clarence Taylor until 1959. The plant equipment then was moved to Wallace's Gulf of Mexico plants at Cameron and Empire, Louisiana.

In 1912 the corporate ancestor to the present single Florida menhaden company was organized. This was the Seminole Oil and Fertilizer Company, later taken over by a South Carolina firm, Nassau Fertilizer and Oil Company. In 1940 it became Nassau Fertilizer and Oil Company, Incorporated, its present name, with James B. Guess, Jr., the founder. James B. Guess III is president, Exteen Corbett secretary-treasurer and manager, and James S. Corbett assistant manager.

Nassau has operated as many as five fish boats in the Atlantic ranging, from April to December, as far north as Savannah, Georgia, as far south as Daytona Beach, and in the late 1970s had two refrigerated steel boats, the *Novelty* and the *Jim Guess*. The *Novelty*, at first only seventy feet long, once served another Quinn company at Empire, Louisiana, until Nassau bought her in 1969, extended her length to 130 feet, and increased her capacity to eight hundred thousand fish. The *Jim Guess* was built by Nassau itself in 1972 as a seventy-eight-foot boat, then lengthened to 112 feet for a similar capacity. Captain James Williams, who started as an



The menhaden industry's "unreconstructed rebel," W. H. Potter, president of Beaufort Fisheries of Beaufort, North Carolina.

industry, with five or so boats fishing out of factories on the St. Mary's River at one time. W. Osborne Holland and Ben Halter, associates of Wallace Quinn, tried an independent venture there in the late 1930's.

The Florida fishery may date back in some small measure to the 1870's, when George Brown Goode's correspondents told him of abundance of menhaden as far south as the St. John's River, the state's great north-flowing estuary. As many as five centers with factories may have been active over the late nineteenth and early twentieth centuries.

engineer, became skipper of the *Novelty* in 1974, and Captain Otis Jones has had the *Jim Guess* since the mid-1960's. Here, as in most other menhaden fishing, there is a Virginia influence. Both boats' pilots—Frank Lokey of the *Novelty* and Alex Decatur of the *Jim Guess*—are from Chesapeake Bay. Lokey was captain of a smaller Nassau boat, the wooden *Tracy Corbett*, in the 1950's and 1960's, and by the late 1970's had more than fifty years of commercial fishing.

Nassau has the contract services of one spotter pilot, John D. Ward, who averages forty-five hours a week in his 1968 Cessna Skyhawk, and has put in as much as eleven and one-half hours in one day and fifty-six hours in a week. During the fishing season he

takes off as soon as he can see and hopes to locate fish close enough to the plant to save the two fish boats overnight trips. They become increasingly expensive with rising costs of the six hundred gallons a day of fuel they and their purse boats burn.

The forty-ton-an-hour Nassau plant operates with a recycle system to destroy odors, gases, and particulate matter, which used to be discharged into the air by fish reduction plants everywhere.

During the ten years from 1966 to 1975, the Florida East Coast fishery landings ranged from a high of more than forty-three million pounds in 1967 to under thirteen million in 1974.

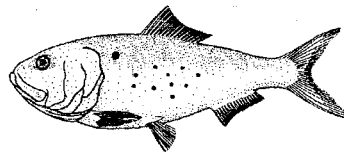
XII. The Gulf of Mexico

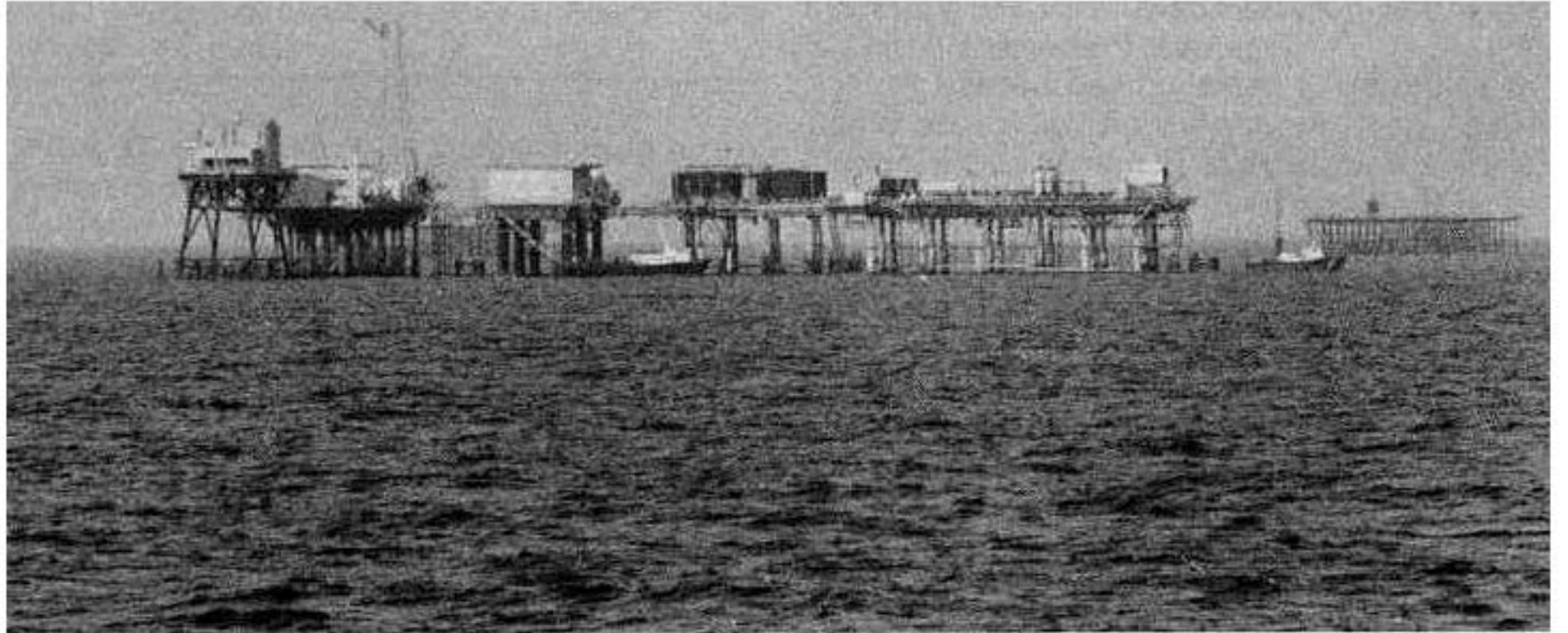
The Gulf of Mexico, the Western Hemisphere's own Mediterranean Sea, covers more than seven hundred thousand square miles. Its greatest length is more than eleven hundred miles, its greatest width nearly seven hundred. Its depths reach more than two thousand fathoms, and its shallow continental shelf is as narrow as six miles off the southern tip of Florida, ten miles off the mouth of the Mississippi River, and as wide as 120 miles off Florida's west coast and 130 at the Louisiana-Texas border.

There has been history on its waters and along its shores, but little describes what has become the most productive part of our oldest and largest fishery. Many of us think of the Gulf mainly as a source of crude oil from

the "cities" of offshore drilling platforms. Yet when those wells run dry, as they must in our endless, blind demand for energy, the Gulf can continue to be a major scene of our menhaden fishery, even though the "discovery" of the menhaden potential dates only to the 1930's and 1940's. In the 1960's it became the single largest fishery in the United States, and in its peak year of 1971, its catch of more than 1.6 billion pounds made up seventy-three percent of all menhaden landed and thirty-two percent by weight of all fish and shellfish caught in the country. Largely with menhaden, Cameron, Louisiana, near the Texas border, and

What Gulf of Mexico menhaden fishermen often see—an oil drilling complex off the coast of western Louisiana.



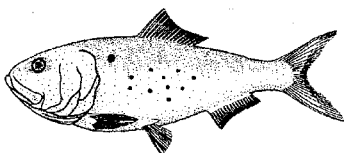




Pascagoula-Moss Point, Mississippi, rank among the top three United States fishing ports. Despite a decline since 1971, to less than a billion pounds in 1977, against increased Atlantic landings, the Gulf still produced more than half our menhaden.

The Gulf of Mexico had no nineteenth century George Brown Goode to ask from Florida to Texas who was catching menhaden and how and with what luck. Landings were recorded first off West Florida in 1880, but of fewer than one thousand pounds. Some landings were reported in Alabama in 1902, but none there since 1931. Scientific and other writings include brief, tantalizing references to menhaden fishing in the Gulf in the late nineteenth and early twentieth centuries, but information on catches and location and plants and types of fish boats is fragmentary. One plant is known to have operated in Texas from about 1900 until at least 1923, and others in the vicinity of Port St.

Captain Carroll Ripley (left), retired menhaden skipper who fished out of Sabine Pass, Texas, during the First World War. His son, Arnold, right, was captain of the Seacoast Products fish boat *Tiny Tim* during the late 1970's.



Joe and Apalachicola, Florida, from at least 1918.

By whom the early enterprises were set up is left untold, although the names of Delaware's DuPonts are part of the Gulf lore. It can be guessed that early fishermen along Florida, Alabama, Mississippi, Louisiana, and Texas shores saw big schools of Gulf menhaden (*Brevoortia patronus*) and their much less abundant cousins, fine-scale (*B. gunteri*) and yellow-fin (*B. smithi*), and caught them in haul seines or trawls, possibly when fishing for shrimp or other species. They found them edible or useful, with manuring of fields and production of scrap for fertilizer and of oil probable. A 1915 industrial chemistry manual notes menhaden oil production in Texas in 1900, with a yield of "3.51 gallons to the 1000 fish." Gulf menhaden now yield twelve to fifteen gallons per thousand fish, against two or so for Atlantic menhaden.

No doubt menhaden also were found useful as bait for mackerel and tarpon, or along creeks and bayous, for crabs. Fishermen tend to find something to do with anything easily caught in volume—except, so far, jellyfish.

During the First World War there was menhaden fishing around Port Arthur and Sabine Pass, where the Sabine River and Lake make the border between Louisiana and Texas. Captain Carroll Ripley, whose father, Wesley Ripley, had before him fished under sail on Chesapeake Bay for menhaden, and whose son Arnold fishes for menhaden after him on Seacoast Products' *Tiny Tim*, recalls spending two years as mate on a small fish boat, the *Tangier*, brought down from Chesapeake Bay by Captain Hezekiah Hudgins. The Ripleys and almost anybody by the name of Hudgins are from Mathews County on the Middle Peninsula of Virginia. The Ripley homes look out on Chesapeake Bay and its big arm, Mobjack Bay, as Ripleys have at least since Carroll's grandfather kept the lighthouse at New Point Comfort.

In 1978 Carroll Ripley recalled at the age of eighty-three that there were two factories at Sabine Pass, one occupying a small corner of an old cotton dock, the other close by. They had two or three fish boats each and produced fish scrap and oil with simple

equipment, mostly for nearby consumption. Others recalled that Mexican labor was imported for the factories.

"The fish were plentiful," Captain Ripley said, "but our boats were small and we couldn't cover much territory, maybe twenty miles each way from Sabine Pass. If we caught two hundred thousand, we'd had a good day. We caught eight million each year, then I came home because I thought I was being drafted for the Army. I found I wasn't, since I had a wife and boy, but I never went back to Texas.

The names of the men who founded and ran the Texas factories then have not survived, either with Captain Ripley or with today's generation of Gulf menhaden people. They were recalled at best as having made acidulated scrap with their Mexican workers.

The factories that Captain Ripley remembered, and a floating factory as well operated by a man named Delaney, had no problem of supplies of fish, but technology was not yet up to coping with the heat of the western Gulf Coast. General industry knowledge held that without refrigeration, neither boats nor factories could keep fish from rotting before processing, and all ventures failed. These included one of the DuPonts' efforts. Later the Burton Shipyard interests of Port Arthur had a factory there.

Recordable history on the Gulf started in the 1930's, with names to be remembered including:

"Kerosene" John Santos Carinhas, who brought his East Coast shrimpers and menhaden fish boats from St. Augustine, Florida, to Moss Point, Mississippi, and Patterson and Cameron, Louisiana.

F. B. Walker and Sons of Pascagoula, Mississippi, whose shipyard built the first all-steel fish boat on the Gulf in 1945 and had built eighteen by 1951, to be sold or leased to menhaden companies.

Wallace M. Quinn, the Crisfield, Maryland, man, also with Atlantic Coast ventures from Chesapeake Bay to Fernandina Beach.

The Smith brothers, Harvey, Otis, and Gilbert, who spread to the Gulf the enterprises they and their father, J. Howard Smith, and uncle, Gilbert P. Smith, had created on the East Coast from eastern Long Island to Fernandina Beach, Florida, with young Gilbert

first setting up Smith Gulf operations on Monkey Island, near Cameron, Louisiana.

George R. Wallace, the North Carolinian whose company dates from 1898 to be the second oldest in the fishery.

The Humphreys' and the Haynies of Virginia, who expanded their Chesapeake Bay enterprises to the Gulf.

The efforts of all and their stories are interwoven. Quinn was seemingly ubiquitous, John Santos Carinhas close to ubiquitous, the Smiths perhaps a little less, perhaps a little more.

Wallace M. Quinn probably should be remembered for starting the modern menhaden fishery on the Gulf of Mexico. In 1939 he built a plant and docks on the west bank of the Singing River, just north of the present highway 90 bridge near Pascagoula, Mississippi, then one at Apalachicola, Florida. Quinn then tried to and did revive the Sabine Pass fishery with a plant built on Keith Lake, just up from the pass, in 1947, and operated until 1957, when it suffered heavy damage in hurricane Audrey which killed 430 persons along the coast. In 1957 he also moved the Pascagoula plant a few miles to Gautier, on Sioux Bayou, just off the Pascagoula River.

Meanwhile, in 1949 he built his biggest and last plant at Empire, Louisiana, sixty-five miles down the Mississippi River from New Orleans, to operate it until 1971 when he sold it to Petrou Fisheries, Incorporated, a unit of International Proteins Corporation of Fairfields, New Jersey. Two years later death ended his career and story.

The late John Santos Carinhas is remembered for his fish boats serving other men's factories. He never had a factory of his own and only a small interest in the Louisiana Menhaden Company plant at Cameron, a unit of the Wallace interests. His boats, at first small and without davits, to force towing purse boats at reduced speeds, fished on shares for others at Moss Point and Cameron, and also Empire. Later modern craft were added, mostly from his own shipyard at Patterson, Louisiana, where he had moved his menhaden and shrimping fleets to build up one of the Gulf's largest shrimp businesses. The fishing and building complex he created is now continued by his son, Joseph E. Carinhas, president of his Patterson Shrimp Company,

his widow, and other family members.

Quinn's 1939 enterprise led to establishment of Pascagoula and its near upstream neighbor Moss Point as leading fishing ports, now with plants of the three largest companies, Zapata Haynie Corporation, Seacoast Products, Incorporated (ex-Smith), and Standard Products Company, Incorporated, within sight of each other at Moss Point.

Harvey Smith followed Quinn and built the Smith factory at Moss Point in the early 1940's despite wartime restriction on labor and materials. In 1945 he and his brother Gilbert built a new plant at Cameron, Louisiana, a few miles from the first Monkey Island site, and started that town toward its present leading rank. After completion of the plant, Gilbert Smith went to manage the Moss Point plant and Harvey Smith remained at Cameron.

Other northern companies became aware of the opportunities on the Gulf of Mexico. The Wallace Fisheries Company of Morehead City, North Carolina, built at Cameron, and Standard Products Company, then of White Stone, Virginia, became the first Chesapeake Bay company to try the new waters.

H. R. Humphreys, Sr., leaving his son to manage the Chesapeake Bay fishing for Standard Products, worked out an agreement with John Santos Carinhas for the use of two fish boats and built at Moss Point. Humphreys modernized the fishing to the point of putting living and galley accommodations aboard the Carinhas boats so the fishermen no longer carried lunch buckets or slept in shore shanties, and of installing davits to end the drag of purse boats towed astern. The new factory gave seasonal employment to fifty men.

The elder Humphreys continued expanding and improving his operation until his death at Moss Point in May 1952. H. R. Humphreys, Jr., took over and immediately faced a problem of developing his own fleet there. Carinhas took his two boats back, and Humphreys bought two others, the *Moss Point* and *Ocean Springs*, from Llewellyn Phillips, another Morehead City and Southport, North Carolina, operator who had leased them to Tuna, Incorporated, at Moss Point. Humphreys chartered two others, the

Lois C and *Lois Kaye*, from the Castigliola Shrimp Company of Pascagoula in 1956 and fitted the *Lois Kaye* with refrigeration, the first menhaden boat so equipped since the *Louise* and *Gloucester* of John Palmer and Ernest Beitzell at Fairport, Virginia, more than thirty years earlier. Others added included the *Tiger Shark* and *Alec Lewis* by purchase and the *Charley Lewis* and *Raven* under lease. The *Charley Lewis* was F. B. Walker's first all-steel fish boat. The *Tiger Shark*, another Walker-built boat, had fished on shares for Wallace Quinn.

A number of other plants were built along Gulf shores in the succeeding years. Quinn put one at Dulac, Louisiana, on the Houma Navigation Canal, and in 1955 Harvey Smith bought the Guarasco factory at Morgan City, and in 1957 the Quinn plant at Sabine Pass, to make it his headquarters.

Meanwhile a small portable set-up was brought to the western Gulf by Charles Bennett, a Morehead City, North Carolina, marina operator. He had bought it from William Saunders of Norfolk, Virginia, who had built the little factory on a war-surplus barge against the advice of friends in the industry and had gone broke. Bennett tried a few locations in Louisiana, the last in a bayou near Dulac, before giving up.

In 1956 a second Chesapeake Bay company came to Moss Point. Reedville Oil and Guano Company, later to become Haynie Products, Incorporated, and now Zapata Haynie Corporation, bought a plant from Tuna, Incorporated.

The plant then had a capacity of thirty-five to forty tons of fish an hour, but no boats. It depended on the fleets of Arnold Walker and the Delta Towing and Fishing Corporation the first year, then bought the *Algarvio* from John Santos Carinhas the next year. Within five years Reedville Oil had seven refrigerated boats in Mississippi Sound and other Gulf grounds. The plant was modernized and expanded over the years and in the late 1970s could handle seventy tons of fish an hour.

The Gulf picture changed little, except for expansion of plants and addition of boats, for a number of years. In 1965, the last Smith plant was built, at Intracoastal City, near Abbeville, Louisiana, by Otis Smith.

However, the Burton shipbuilding

interests of Port Arthur, Texas, on the Sabine River, had reentered the fishery. In the early 1960's, somewhat as a challenge to the growing Smith dominance and following a dispute with Harvey Smith, for whom they had built several boats, they established a menhaden fishing firm, Ocean Protein, Incorporated, of Texas, and a processing firm, Terrebone Menhaden, Incorporated, with plants at Cameron and Dulac, Louisiana.

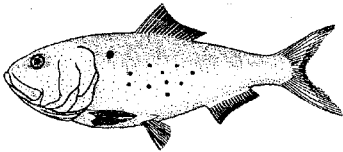
Ocean Protein built up a fleet of fourteen fish boats, with six spotter planes, and Terrebone's Dulac plant could process one hundred tons of fish an hour, the Cameron plant 125. It was a substantial challenge, not

only to the Smiths, but to others exploiting the Gulf's menhaden.

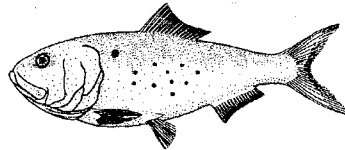
At this time a growing young giant was casting about from its Houston headquarters for new opportunities for diversification. This was Zapata Corporation, founded only in 1954 as an offshore drilling company and already active in oil and gas exploration, copper and coal mining, large scale construction, real estate, and agriculture. In 1967 Zapata made a deal with Burton, Incorporated, and Burton Shipyard, Incorporated, for acquisition of Ocean Protein and Terrebone Menhaden. Zapata was now a fishing company too. Zapata merged the two companies under the name of Ocean Protein with headquarters at Lafayette, Louisiana, and later renamed it Zapata Protein.

Zapata soon became aware, if it had not been so earlier, that there was more to menhaden fishing than the Gulf of Mexico. The Zapata boats cruised with those of the Smith companies, Haynie Products, and Standard Products, and Wallace Fisheries, all

A Seacoast Products fish boat at the dock of the Cameron, Louisiana, plant, being readied for a new fishing season.



Purse boats complete the circle, but it is a slack set around a small school. Zapata Haynie photo by Jim Thomas.







with founding roots on the Atlantic Coast and Chesapeake Bay. The fish boat grapevine, if not formal channels, brought word of the potential there. (Fish boat captains always seem to know what their fellows are doing and can tell you within a thousand fish what Joe caught today. So much for corporate secrecy!)

The result was, in 1972, addition of Haynie Products to the Zapata family, with Haynie's Chesapeake Bay and Atlantic Coast operations and properties involved as well as those on the Gulf of Mexico. Haynie's captains now fished out of Dulac and Cameron as well as Moss Point, and Zapata's Z logotype and blue hulls were spread north.

This then became the menhaden picture on the Gulf of Mexico in the 1970s, with little likelihood of further change in the eleven factories and fleets in the foreseeable future. Cameron and Pascagoula-Moss Point continued as the biggest ports, with Cameron the leader with 306.7 million pounds of all fish landed in 1977, Moss Point 272.2 million. San Pedro, California, was first with 519.5 million. Moss Point had the factories and fleets of the three largest companies, Zapata Haynie, Seacoast, and Standard Products; Cameron

those of Zapata Haynie, Seacoast, and Louisiana Menhaden Company of Wallace Menhaden Products, Incorporated, the one-time North Carolina company now fishing exclusively on the Gulf and ranking fourth in the fishery.

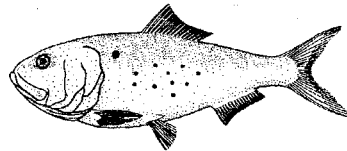
Southwest at Empire, Louisiana, near the Head of Passes of the Mississippi River, were the factories of Petrou Fisheries, Incorporated, the menhaden division of International Proteins Corporation of Fairfields, New Jersey, and Empire Menhaden Company, another Wallace unit.

On to the west was Zapata Haynie's plant at Dulac, and at Morgan City was another Seacoast plant, still another at Intracoastal City, near Abbeville.

During the 1970s the Gulf menhaden fleet ranged from sixty-six to eighty-five fish boats, and crews from 1,122 to 1,445. Factory and other personnel ashore varied from 843 to 973.

J. Y. Christmas of Mississippi's Gulf

Fish are being pumped into the after hold of Zapata Haynie's *W. J. Burton* off the Louisiana coast. Zapata Haynie photo by Jim Thomas.





Coast Research Laboratory at Ocean Springs and David J. Etzold of the University of Southern Mississippi comment in their draft of a Gulf menhaden management plan that the fishery "is a very stable industry measured by market structure, product exploitation levels, and similar factors."

"Member firms... appear healthy enough for survival and sufficiently strong financially to continue to maintain a harvesting fleet of adequate size," they write, but caution: "This is not to say that all firms always show a profit. In fact, earnings fluctuate widely. This is because both Gulf menhaden harvest levels and the markets for fish meal, oil, and solubles fluctuate considerably from year to year."

They estimate that it would cost a new company a million and a half dollars for each new fish boat, so specialized that it would be of little off-season use in other fisheries, and four to five million dollars to build a plant to be supplied by three to five fish boats. (Inflation would increase these figures annually!) Spotter planes would have to be bought or leased, and then a new firm would have to search for captains and crew, management staff, and sales force. Few persons without experience in the fishery could qualify for management, even fewer to staff the fish boats. Thus a new company could only raid—"pirate" from—existing companies.

Gulf menhaden companies, unlike those on Chesapeake Bay where more than a century of fishing has generated family menhaden tradition, must compete for workers with other industries as well as among themselves. The Louisiana plants compete with oil companies and their offshore drilling with many high-paying jobs, and with shrimp and other fisheries. Mississippi plants compete with chemical works, a pulp mill, and a large shipyard at Pascagoula. All fleets get a substantial number of their officers and crews from Chesapeake Bay.

Partly because of the short history, partly because only four states are immediately involved and a fifth marginally so, and partly because of the compactness and stability of the industry, the Gulf menhaden fishery was farther along on a management program in the late 1970's than that of the Atlantic Coast. Both were being developed

under respective State-Federal Fisheries Management Boards, and the Atlantic plan was still in the data-gathering stage in 1978. With all coastal states from Maine to Florida involved, it was expected to move slowly.

On the Gulf, proposals as reported by Christmas and Etzold had been accepted by the states' fishery agencies, the National Marine Fisheries Service, and the industry, and were in large measure in effect. Actually, an informal management plan had been operating for three years as a result of state passage, with industry concurrence, of laws setting a uniform season. Louisiana was first, followed by Alabama, Mississippi, and Texas. Louisiana and Mississippi are the only states with plants receiving landings. Extensive fishing is done off Alabama and Texas coasts, with a limited amount off Florida, mostly around Apalachicola.

The Gulf plan, based on extensive studies by all concerned of biological, sociological, and economic factors, seeks, through the uniform season and state regulations and careful monitoring of fishing effort and catches, to maintain the annual catch at about the volume the fish population can stand without risk of depletion, or "maximum sustainable yield," of around a half million metric tons. This is roughly the harvest of the middle and late 1970's.

Among first steps taken when the plan was formalized was extension of the closing date of the season to include a full week at the end. The season had closed on the second Tuesday in October but now ends the following Friday. The earlier day had been picked for administrative reasons, but many captains had been "cutting out" the Friday before because it was not worth the effort to gear up for only two fishing days. Again, Alabama, Mississippi, and Louisiana passed the necessary regulations, and Florida and Texas regulations already were flexible enough for the change.

The Gulf State-Federal Fisheries Management Board, through the Menhaden Management and Advisory Committees, also adopted a "management system parallel implementation plan," identified components of procedures to implement it, and adopted a standard net log to be maintained by all Gulf fish boats.

In addition to close monitoring of the number of boats and their catches, planned further steps include studies of tagging mortality and for a catch/effort log, formalization of an information data bank, and simulated implementation of the management system. The latter is intended to project possible consequences under optional measures that might be taken in the future if additional restrictions seemed advisable; there could be a fishing quota with allocations to each company, or even, if found legal, limited entry, a highly controversial measure being tried in a number of other fisheries. There was little expectation of any need developing for limited entry since the obstacles to any new entry would be formidable. These would include not only the economic problems outlined by Christmas and Etzold, but environmental and political problems as well. Even if a new enterprise managed to get suitable waterfront property, with deep water and zoned industrial, it would still have to acquire a long list of local, state, and federal permits, all subject to public hearing, before the first concrete footer could be poured.

The overall goals of the management system include maintenance of a strong industry with a dependable resource, development of ability to predict trends in both industry and resource, and evaluation of

biological, economic, environmental, and sociological effects of management policies, with alternate schemes available as new scientific or other information comes to hand.

The predictive ability is expected to reduce economic loss from over-investment; increase effectiveness of management through coordination of research; make possible evaluation of biological, economic, environmental, and social effects of management decision; coordinate administration, research, and enforcement; document biological and economic trends; and improve catch and effort information in case of application to the federal government for foreign participation.

Scientific research continues to try to determine where fish winter and where they spawn offshore. Location of spawning areas is expected in turn to produce information about early life stages and to add to present information on spawning age, fecundity, and reproduction.

Other goals include evaluation of environmental factors and biological processes linking the menhaden to the estuarine ecosystems for better understanding of possible consequences of changes in the estuaries through pollution, dredging, increased boat traffic, or other activities of man.

PART TWO

Men and
Companies and Men

I. The Horseshoe Crab Story

In the summer of an unrecalled year of the late 1880's, two boys cast off in a small boat on the Patchogue River of Long Island's South Shore and sailed five miles across Great South Bay. No great feat, for they came from a sailing family. Their father was Malaga W. Smith, so named for having been born in that Mediterranean port of what is now Spain's "Miami Beachy" Costa del Sol. The elder Smith, like his own father, was a seafaring man, now retired captain of a four-masted ship, the *Annie C. Lewis*, later active in the steamship business.

The two boys' destination was Fire Island, a thirty-mile strip of sand, then uninhabited, a barrier island between the Atlantic Ocean and the Long Island "mainland." Its future as a refuge for writers and artists, and now with two state parks and a National Seashore to protect it from exploitation, was impossible for the two boys to imagine. Their father and Gilbert Potter already had set up a small menhaden factory on Fire Island. However, the boys had an errand almost in keeping with what came to be known as the Horatio Alger picture of American youth of the nineteenth century: do something on your own, make a little money, maybe get rich. It was to be no "rags to riches" picture, however. The boys were neither poor nor hungry. They simply were ambitious. On Fire Island was opportunity, at least for a start.

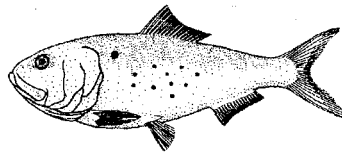
The elder, Gilbert P. Smith, knew where horseshoe crabs spawned along the

beaches, and at certain times of the summer months they came ashore by the millions. Gilbert and his brother Julian Howard Smith gathered all they could handle, sun-dried them, and hauled them back to Patchogue to sell to farmers for fertilizer. It was also discovered that if you threw "ripe" female horseshoe crabs into the chicken pens, the chickens went wild to peck out ovaries and eggs.

This enterprise, which went on for a number of summers, was the start of what was to become, thirty or so years later and continuing for sixty-three, a family of companies, all gathered under the name of J. Howard Smith. These companies bought, caught, and processed not horseshoe crabs but menhaden, from Maine to Cape Cod and Buzzard's Bay and Nantucket Sound, from Amagansett and Promised Land at the eastern end of Long Island Sound to New Jersey, to Chesapeake Bay, North Carolina and Florida, and to Mississippi and to Sabine Pass in the Gulf of Mexico. The fishing effort went briefly north to Nova Scotia for herring and south in the 1960's to Chile for anchoveta. At one time the companies, linked by joint family ownership but each managed competitively—even against each other—by a family member, accounted for sixty-five percent of the country's catch of menhaden and production of fish oil and fish meal.

Gilbert and Howard may also have boiled menhaden in kettles for the factory

The Smith fish boat *Belford* burns at sea in late 1953. Seacoast Products photo.



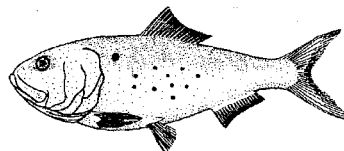
their father and Gilbert Potter had, on the beaches of the island that, by one story, got its name from the fires under beach try-pots cooking blubber in whaling days. It seems probable, for Otis H. Smith, a grandson of Malaga Smith, recalls from family history that Gilbert Potter gave his half interest in the factory to Gilbert Smith, then nineteen years old, in 1900. Young Gilbert worked hard, and Malaga Smith later gave his own interest to Gilbert and Julian Howard, the latter now thirteen or fourteen years old. The two brothers ran it.

There was no problem of fish supplies. Thousands of bunkers were often driven ashore here, as on many Atlantic beaches, by bluefish, mackerel, and other predators. The boys could easily have gathered enough to help the factory while tending drying crabs. There had been four menhaden kettle factories, one at Patchogue itself, on Great South Bay as early as the 1870's, as well as the Smith-Potter plant, and the boys knew about boiling bunkers to make money.

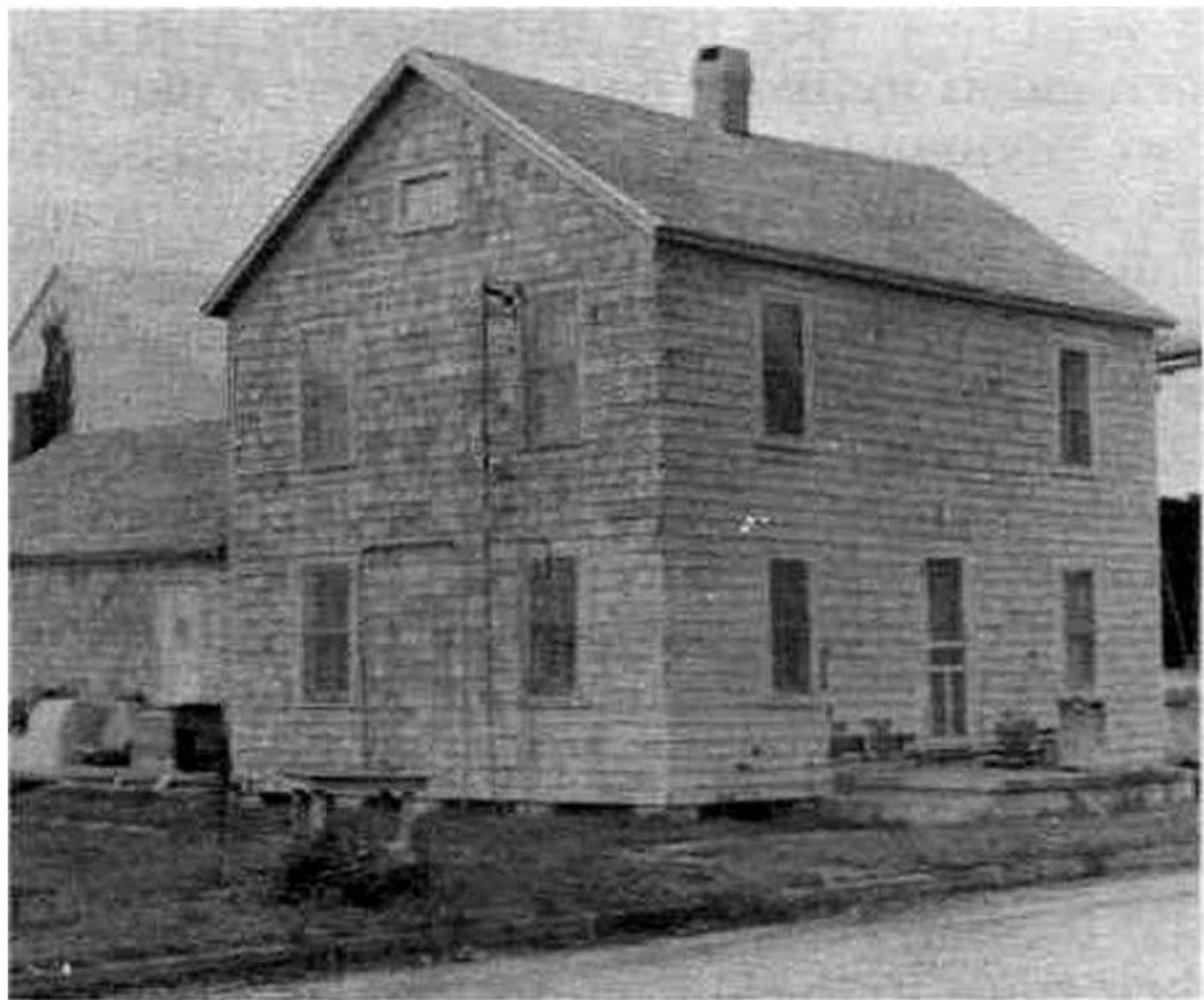
The enterprise went well. Captain Malaga Smith died while both were young, and Gilbert took parental responsibility for Julian and saw to it that profits met family needs and also paid for the latter's education at Valparaiso College in Indiana and in a law school. Howard got his law degree and started practice in New York during the latter part of the first decade of the twentieth century.

But amid his books and apprentice litigation, he could not forget his boyhood and the little business on Fire Island. He heard that across New York Bay, in Sandy Hook Bay formed by Sandy Hook and the New Jersey shore reaching northwestward toward Raritan Bay and Staten Island, there was a small menhaden plant for sale at Port Monmouth, a clam diggers' and pound netters' settlement at the mouth of Compton's Creek. The creek was barely navigable; indeed, the settlement once had been called Shoal Harbor for this reason and because it flowed out on

The first home of J. Howard Smith and his family, on the grounds of the company he and his brother Gilbert founded at Port Monmouth, New Jersey, in 1911.







wide tidal flats of the bay, with deep water two thousand feet or more offshore. The mouth could be approached from the bay only at good stages of the five- to six-foot tides, and the mud flats that kept the pound net fishermen waiting for the flood also provided the clam diggers with work and food for their tables. Ashore they farmed and gardened, and their wives put up hundreds of jars of fruits and vegetables to see them through the winter. New York City and its treasures and pleasures were in sight but not easy to get to, and certainly no place to go for groceries.

In 1854 the settlement was connected to nearby Middletown Village by a new plank road and became Port Monmouth. The next year the Port Monmouth Transportation Company was incorporated, and a steamboat, the *Eagle*, was built. A large hotel, the Carol, went up in sight of the shore and the water.

Steamboats and a railroad, the Raritan and Delaware Bay, with its northern terminus at Port Monmouth, made the community a business center, with the steamers *Tamanend* and *Jesse Hoyt* taking the railroad's passengers on to New York. But another railroad, the New York and Long Branch, was built to give more direct service to New York, and the activity declined. The railroad builders made and broke towns everywhere almost at random as they fought for free land and profitable routes in the nineteenth century.

As George Brown Goode had noted in his history of the fishery published thirty years before Howard and Gilbert Smith crossed New York Bay, fish packing and the menhaden industry had long been a part of Port Monmouth and vicinity. There had been the menhaden "sardine" plant, the American Club Fish Company, whose product Goode reported to be potentially tasty. There had been Cort and Company and Stanley and Company and an "Ocean Trout" factory. At nearby Granville, now Keansburg, Charles Preston of the Greenport, Long Island, menhaden people, had built a factory in 1878 to make fertilizer from menhaden, trash fish, and horseshoe crabs from pound nets in upper Raritan Bay.

Throughout New York, Sandy Hook, and Raritan Bays the pound netters put out their traps in the late winter and the first run

of menhaden usually came in mid-March. The fish ran deep, out of sight to fishermen but not all deep enough to run under the nets.

"You could load a pound overnight," it was recalled by Charles Schnoor, who was born in 1884 and retired from pound net fishing only in 1973. "It was June before the menhaden began to school and the seiners could start to fish."

All the early plants were abandoned in time, although oil later was extracted for use in paint manufacture, with the scrap sold for fertilizer. When Howard and Gilbert Smith came, there were only two plants left, Eastman's, formerly Sweazy's, nearby on Pew's Creek, and the Griffin and Vail plant close to the mouth of Compton's Creek.

The brothers found that Vernon Vail did want to sell the latter, and the price was eleven thousand dollars. The small plant's capital equipment had to include a two-thousand-foot track over the mud flats to the dock to deep water, so that the pound netters and seiners could unload without waiting for the tide to let them into the creek. Close by was the Carol Hotel, which stood until 1943. Then it was torn down for erection of the present office building of the company that grew out of the deal, J. Howard Smith, Incorporated. The deal was made in 1911. The younger brother's name was given to the new company, with Gilbert becoming marine superintendent to deal with the fishermen themselves.

Howard Smith also kept close to the fish and fishermen. Then and for many years afterward, the approach of a fish boat was a signal for him to run out the long track, often followed by his wife, Blanche Opal Grimes Smith, who had never seen anything like this in her native Indiana. Mrs. Smith, who also cooked at the plant, often caught the mooring lines as a boat docked, and her husband jumped aboard to help shovel fish into the little hopper car with side dump gates that ran back on the track to the factory raw box. Later, with his own steamers, he jumped into the holds to help shovel fish into the steam elevator buckets carrying them to the raw box. If he remembered, he pulled on boots first.

"Come, come," he would say, "let's get these fish out!"

J. Howard Smith's children likewise got into the scene. The two girls, Gladys and

Janice, only watched (and ashore played about the grounds which included their small frame home). But the three boys, Harvey, Otis, and Gilbert, the latter named for his uncle, found themselves helping unload fish, or ashore pushing wheelbarrows or turning the drying scrap with hand-dragged wooden-tooth harrows or big rakes. It had to be turned for even drying and also to prevent spontaneous combustion.

In these first days the company depended entirely on the independent pound netters and seiners, most of them still under sail but with here and there a naptha or "make-and-break" gasoline engine. Among captains of sailing seine boats veteran pound fisherman Charles Schnoor remembered were Ben Bishop, Kale Post, and men named Heinz and Ramer.

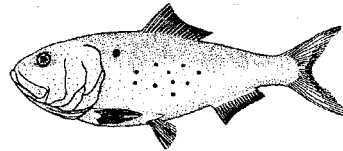
Schnoor recalled that the pound boats—he remembered two as the *Columbia* and the *Sandy Hook*—were gaff-rigged sloops about thirty-six feet long, with centerboards. Four or five men made up the crews, and the boats could carry three hundred bushels of fish, probably thirty thousand bunkers—equal to a small set for a fish boat today.

The fish were bailed aboard at the pound and again unloaded at the Smith fish dock, with a big dip-net by means of a block and fall to the mast head. With the entire crew hauling, three bushels were raised at a time—one hundred dip-nets in all to end a good day's work before going home to tend the garden if the tide let the boats into the creek. If the wind was northeast, they couldn't enter at any stage. The men could only sit out and wait or leave their boats at anchor or moored to the exposed dock.

This heavy manual labor continued for the pound netters, many still serving the Smith plant, until after the Second World War. Schnoor himself believes he put aboard the first power hoist then, installing a five-horsepower Wisconsin engine with a "winder" or winch on his boat.

"I raised six men with the first hoist," he said. "That convinced them we could bail fish."

Schnoor had had his own boyhood experience processing menhaden ashore. His German immigrant father, Jacob, had a small factory on Compton's Creek, bought from a



An 1890's purse boat used on New York Bay. William Dor, grandfather of Ray Richardson, an official of Seacoast Products, Incorporated, of Port Monmouth, New Jersey, is at the right in the bow. Ray Richardson collection.

man named Fisher. The fish were cooked in tanks, then pitchforked to the cider-mill type press.

"We could take care of five hundred bushels a day if we worked overtime," he said. "Our workers were mostly Germans from New York, and I was put to work whenever they got drunk and didn't show up."

Jacob Schnoor later sold the plant, to be converted to a paper pulp mill. Young Charles grew up a pound net fisherman, to give almost all his working life to serving the Smith plant and its predecessor, Griffin and Vail.

Even after the Second World War, pound netting was a major source of fish for Smith, although by now the company had its own fleet of fish boats. Schnoor recalled that many young ex-soldiers returning after the war went into such fishing—"There was no other work for them"—and up to eighty-five traps were set in the area.



"When I quit," he said, "There were only five still fishing."

During the first ten to twenty years, the two Smith brothers were engaged largely in what David Clarke, J. Howard Smith's grandson, would describe as "a bootstrapping operation." They built the little company against not only the problems of the First World War, when fishermen could often do much better working in shipyards, but also the scarcity of bunkers. J. Howard Smith was able to tell the House Merchant Marine and Fisheries Committee in 1942:

...I have known them [menhaden companies] to fish so many boats and to fish so heavily that they [the fish] would leave, and I think that occurred in 1912, when they had all of those big steamers fishing there, and they disappeared from there for a number of years, and returned in 1918, and remained for years, and then disappeared for about seven years.

Robb Leon Greer, in his report to the Bureau of Fisheries for 1914, commented that 1911, when the Smiths started, had probably the largest catch ever known.

The large dividends paid that year gave the industry such an impetus that four new factories were established during that season and eight in 1912. . . . in addition to these, four new ones were being operated in 1913 and two others were under construction. It may be incidentally stated that the fishing during the season of 1913 was practically a failure, at least two of the factories having been forced into receivers' hands."

The Smith factory was not one of them. It survived 1913 and the following poor years until better fishing in 1918, then 1922 and other lean years of the 1920's. The Smith brothers were making money, but President Warren G. Harding's "return to normalcy" and the booming years of the Calvin Coolidge administration, when "the business of this country is business," did not include the menhaden business unless the fish were there to be caught.

In the late teens, possibly on profits from the 1918 season, the Smiths acquired two small fish boats, steam powered, and more

in the late 1920's, among them the *Ocean View* and the *Sterling*. The "bootstrapping" was beginning to get easier, and the company, instead of struggling to stay even, was growing. The Smiths still took all the fish the pound netters could bring in from New York Bay, but their little fleet ranged the Atlantic Coast from New England to Delaware Bay. They followed a policy then as now of "trying to be where the fish are."

In 1932 President Franklin D. Roosevelt told us "the only thing we have to fear is fear itself," a feeling shared by few if any of the five million jobless in that low point of the Great Depression. If the Smiths had fear, they kept it to themselves. They began to develop a fleet of full-sized boats, the first the *Stephen W. McKeever*, bought from the Seaboard Oil and Guano Company of Reedville, Virginia, which had its plant on the seaside of Eastern Shore at Chincoteague. Later, when the Smiths bought the Edwards Company at Reedville, the *McKeever Brothers*, which once fished out of Tuckerton, New Jersey, for a now-gone company of the same name, was added. She was taken to Norfolk to be converted to diesel power. At this time the *Luce Brothers*, named for a New England firm that had started the menhaden operation at Lewes, Delaware, in 1888, was lying in Cockrell's Creek, off the Luther Rice packing house. She was on the bottom but sound. Cockrell's Creek was so loaded with toxic fish factory waste that teredos could not live there to feed on hulls and pilings. (Today the creek has been cleaned up, teredos have returned, and many docks have had to install new creosoted pilings or suffer collapse.) So the *Luce Brothers* was raised, pumped out, towed to Humphreys Marine Railway on Carter's Creek at Weems and rebuilt under Harvey Smith's supervision. She was given a three hundred-horsepower Atlas diesel engine.

The Smith brothers looked elsewhere for other opportunities for expansion. There was one at the eastern end of Long Island, on the Sound side not far from Montauk Point. In 1930 Gilbert P. Smith found the Frank Morse plant available near Amagansett, in the so-called "Promised Land" fishing country. Promised Land is now a charted geographic location on the Long Island shore just east of Amagansett. A mailman had given it the name,

later to be spoken with joy by black menhaden fishermen attracted from Virginia and North Carolina by word of so many fish in that "promised land" up there.

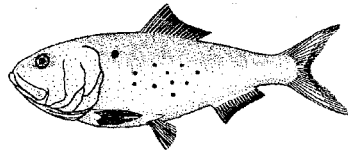
This area, in Long Island's "Fishtail," had long been a center of menhaden fishing. At Greenport, between Little Peconic and Gardiners Bay, D. D. Wells had built the first steam factory, on Long Island at least. Shelter Island and Sag Harbor, the latter a major nineteenth century whaling port, had had menhaden factories too.

George Brown Goode had accumulated the names of nearly two dozen factories on the sheltered waters of the two Peconics and Gardiners Bay opening to Block Island Sound to the east, and on Shinnecock Bay, now spotted with fashionable Hamptons, opening through Shinnecock Inlet to the Atlantic Ocean. In addition, two floating factories were based there in the 1870's. They were the 2,500-ton *Falcon*, under Captain George F. Tuthill, and the *Ranger*, 1,500 tons, which had sampled Chesapeake Bay fishing just after the Civil War.

The menhaden industry, rising with the decline of whaling, helped make Greenport Long Island's largest commercial fishing port. Under its old name of Stirling, for the British earl to whom Charles I granted much of the land and Shelter Island in the seventeenth century, it had gotten a start as a shipbuilding town as well, with hulls built here going to fish for menhaden and hunt for whales, and into the West Indies trade.

When Gilbert Smith bought the Morse plant, the then-dominant Hayes enterprise, Consolidated Fisheries Company of Lewes, Delaware, had a seven-year-old plant on adjacent property, served by twenty-four fish boats. Other plants were close by. All took their fleets across Long Island Sound for winter harbor on the Niantic River at Niantic, Connecticut, itself a major nineteenth century menhaden port.

The Amagansett plant, also within easier reach of the Maine fishing grounds, was quite close to the productive Cape Cod and Narragansett Bays and Block Island and Nantucket Sounds. It drew heavily on the northern menhaden stock with its oil content richer than that of the southern grounds, including Chesapeake Bay.

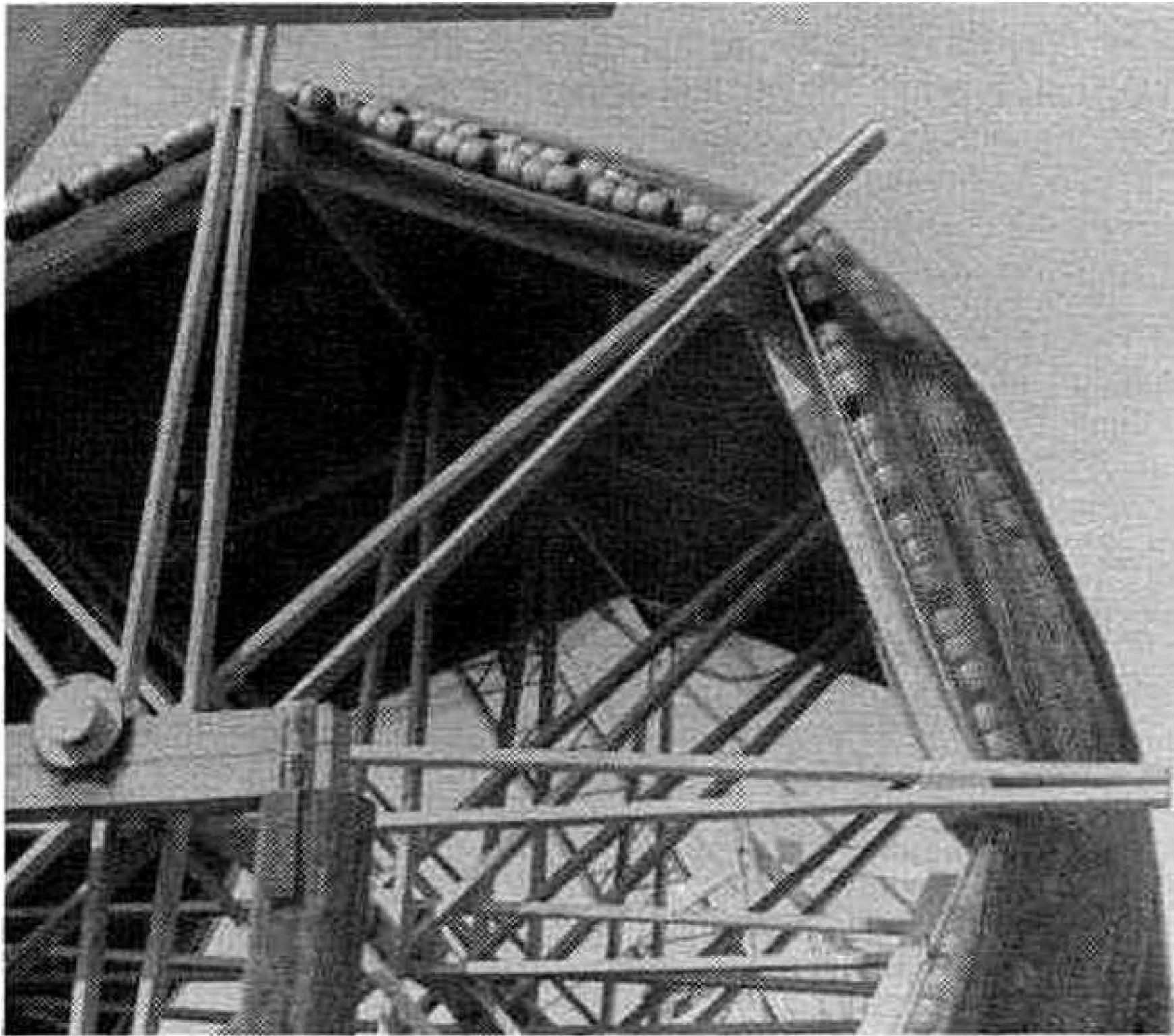


A purse seine reel at the Seacoast Products plant at Port Monmouth, New Jersey.

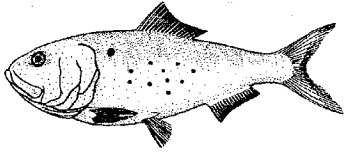
The fishing was so good that Smith, getting seventy-five percent of its catch from Long Island Sound after 1941, imported captains and fishermen from Chesapeake Bay, where the longer season and large number of companies and fleets had developed a sizable population of officers and crew. Many could find themselves busy there, then idle, as plants opened and closed. Mechanization, much of it pioneered on Chesapeake Bay, also reduced labor needs. Such advances included power purse boats, power blocks on the purse boats to raise the seines, and net hoists on the fish boats in the 1950s, and fish pumps to fill the holds from the seines, and others to empty the holds at the factories.

Many Smith captains and crewmen, both based at Port Monmouth and Amagansett and later at plants even in Mississippi and Louisiana, continued to be Virginians through the years, most from the Reedville area, others from Mathews County (which also has sent merchant seamen and captains all over the world) on the Middle Peninsula between the Rappahannock River and York. At the Port Monmouth plant of Seacoast Products, Incorporated, successor company to J. Howard Smith, Incorporated, the parking lot today shows almost as many Virginia license plates as New Jersey.

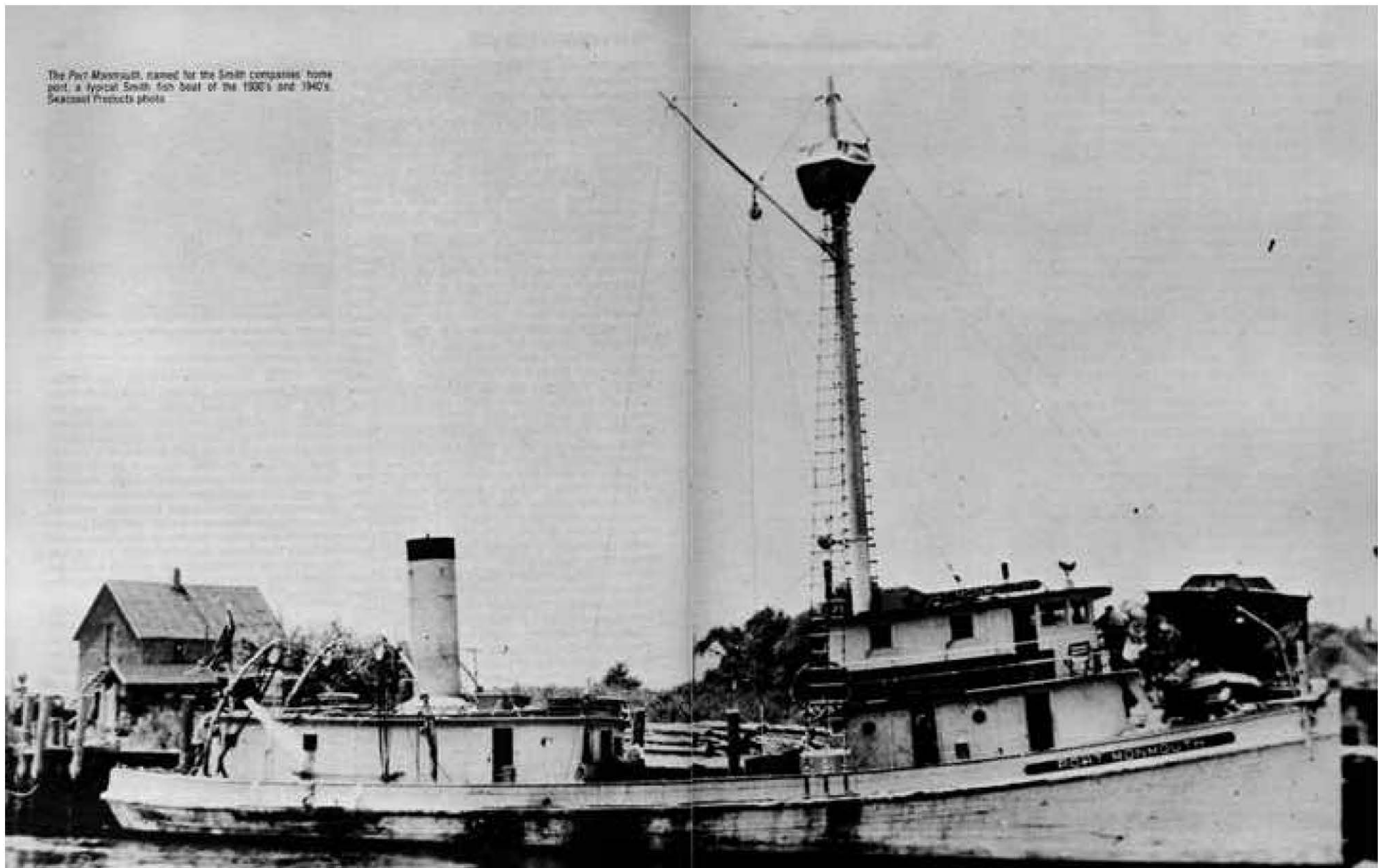
The Amagansett venture brought the Smiths and the Edwards family of eastern



The *Port Monmouth*, named for the Smith companies' home port, a typical Smith fish boat of the 1930's and 1940's. Seacoast Products photo.



The Port Massachusetts, named for the Smith company's home port, a typical Smith fish boat of the 1930's and 1940's. Seacoast Products photo.



Long Island together. This family, in its twelfth generation in America in the late 1970's, reaches back to include Jonathan Edwards, the eighteenth century New England theologian, preacher, missionary, and briefly president of Princeton College. Most of the rest of the line was with the sea: fishermen, whalers, captains, sailors.

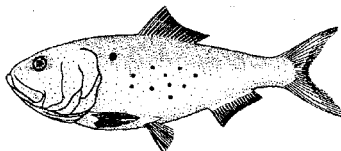
Captain Norman Edwards, the youngest of the family's eleventh American generation and in the late 1970's skipper of the *Tideland*, the industry's biggest fish boat, started fishing himself at the age of fourteen in 1934, on his father's *Magdalene*, a converted submarine chaser from the First World War. Captain Samuel Edwards, who had his master's license for all oceans before he was twenty-three, had four such craft. They kept fifty-two men fishing ten sea traps, or anchored pound nets, in deep water. Another Edwards boat was the ninety-six-foot *Elizabeth Edwards*, with a nephew, Richard, the captain.

The Smith plant at Amagansett depended heavily on Edwards boats while slowly building up its own fleet. Up to 1938, by Norman Edwards' count, half the boats serving Smith were Edwards'. The company even bought the *Elizabeth Edwards*, which had been sent to the Gulf of Mexico when it started its Moss Point, Mississippi, operation in the early 1940's. Earlier it had bought the *Ocean View* from Edwards, only to lose her when the great 1938 hurricane swept Long Island Sound and sank her, drowning six of her crew.

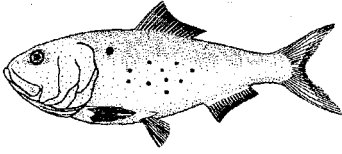
Others included the *Sterling* and the *Willard*, bought at Promised Land, and the *Stephen McKeever* and the *Henry J. McKeever*, named for those other New Jersey menhaden pioneers. The *Willard*, never put in use, finally sank at the dock at Amagansett.

The Virginia and North Carolina fishermen were right in calling those eastern Long Island Sound waters "Promised Land." During the early 1940's possibly seventy-five percent of the Smith catch was from them. Gilbert Smith, concerned over protecting his

The *Tideland*, biggest fish boat of the menhaden fishery, before Seacoast Products repainted its fleet a light green. Captain Norman Edwards is her skipper. Seacoast Products photo.







supply in future years, watched the catch closely. He noted that while menhaden seemed to spawn all along the East Coast whenever the females were ready, there was heavy spring spawning in the Sound. He wanted to keep the Amagansett plant closed until June 15 for undisturbed spawning, the catch to be made when the fish were heading out to the ocean. He also sampled fish daily, opening them to see if they had fed. If they had enough food, he knew fishing would be good in that area for the season.

In the 1930's J. Howard Smith, Incorporated, began expanding southward, with a plant run for a year by Gilbert Smith at Milford, Delaware. In 1931 Harvey, the eldest son, built a plant at Beaufort, North Carolina. In 1934, Otis H. Smith, second son, took the Smith interests to the southern limits of the fishery and bought a factory at Fernandina Beach, Florida.

Meanwhile, New Jersey's town of Tuckerton, on Little Egg Harbor between Barnegat and Atlantic City, had been a menhaden center at least since the 1870's. George Brown Goode found two factories there, operated by James E. Otis and Cyrus N. Smith. There had been another at Atlantic City.

Near Tuckerton the Atlantic City Garbage Company was operating what had been the Newport Fertilizer Company factory on Crab Island, one of the Seven Island group in Great Bay, just inside Little Egg Inlet. The latter company had been processing menhaden since about 1900, fishing first under sail and later with a steam fish boat with a capacity of five hundred thousand. In those bad days after the good 1918 season, the company went broke for one of the most usual reasons—no fish—and the garbage company took it over about 1920.

Smith bought the plant in 1941, and his second son Otis turned it back to fish processing and operated it as Fish Products Company until 1965. After the Second World War six new steel fish boats brought in an average of 160 million fish a year, with two hundred million in the plant's record year of 1953. The fleet, the *Beach Haven*, *Barnegat*, *Sea Girt*, *Brigantine*, *Texas*, and *Moriches*,

cruised the coast from Rockaway Beach on Long Island to Chincoteague, Virginia's first seaside town.

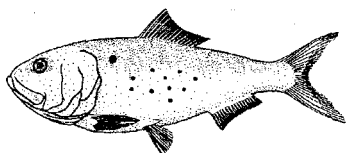
When the plant closed, New Jersey bought Crab Island for one of its "Green Acre" recreation areas, to end the Tuckerton menhaden story. The other Tuckerton enterprise, the McKeever Brothers plant on Story Island in Little Egg Harbor, had long been closed, and in the early 1950's the last mark disappeared with collapse of its old stack. Yet the name is still to be seen elsewhere, with the old wooden *McKeever Brothers* steamer, later a Smith boat, having been hauled ashore to be set up as a roadside restaurant near Seaford, Delaware.

At this very time, on down the Atlantic Coast, across the ten-mile-wide mouth of Delaware Bay, was another field for possible growth. The waters along the twenty-one-mile beaches of Delaware teemed with menhaden in many years, as along the New Jersey shores. And on the Bay just west of Delaware's Cape Henlopen was the town of Lewes.

Here a number of menhaden factories were built over the years on the bay beaches, their two-thousand-foot docks reaching out behind the inner breakwater of the Harbor of Refuge. Even with the breakwater, northerly gales quickly made the docks unsafe for mooring and the fish boats had to move out and anchor, the crews standing watch all the while. If anchors started to drag, the boats had to raise anchor and steam ahead to try for better holding ground.

The Luce Brothers of Niantic, Connecticut, had started the town in the industry in 1888, as noted earlier, although northern and Chesapeake Bay fish boats had worked 150 square miles of Delaware Bay in the 1870's and early 1880's, especially after an 1879 failure of fish to appear north of Cape Cod.

Over the late nineteenth and early twentieth centuries others, including Albert Morris and James C. Fisher of Reedville, Virginia (themselves former New Jersey operators); Joseph Wharton, the "Nickel King"; David W. Burbage, who lost his money in the 1929 stock market crash; and Harlan Josephs with his Atlantic Fisheries Company, followed. Then, in 1923, Thomas,

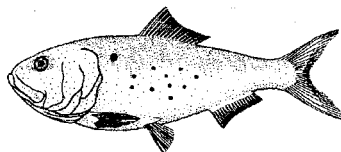


The *McKeever Brothers*, built as a steamer in 1911 for the old Little Egg Harbor, New Jersey, menhaden company of that name, is shown here fishing in the 1930's for a J. Howard Smith company. She had been converted to diesel power. Hudnall Haynie collection.

Richard, and John Hayes and their Consolidated Fisheries took over the old Coast Oil Company factory, built in 1912 and used in the First World War as a minesweeper base. With their effort added, Lewes ranked as one of the nation's leading fishing ports to the mid 1950's.

Consolidated was the company the Smiths had competed with at Amagansett, Long Island, in 1930. The Hayes plant at Lewes, in 1938 possibly the largest of all, employed six hundred men producing meal and oil from the millions of bunkers the big fleet brought in, mostly from Delaware Bay and Delaware's Atlantic shores. The war-time fight of Consolidated to get to fish in the equally rich New Jersey waters is told in a later chapter.

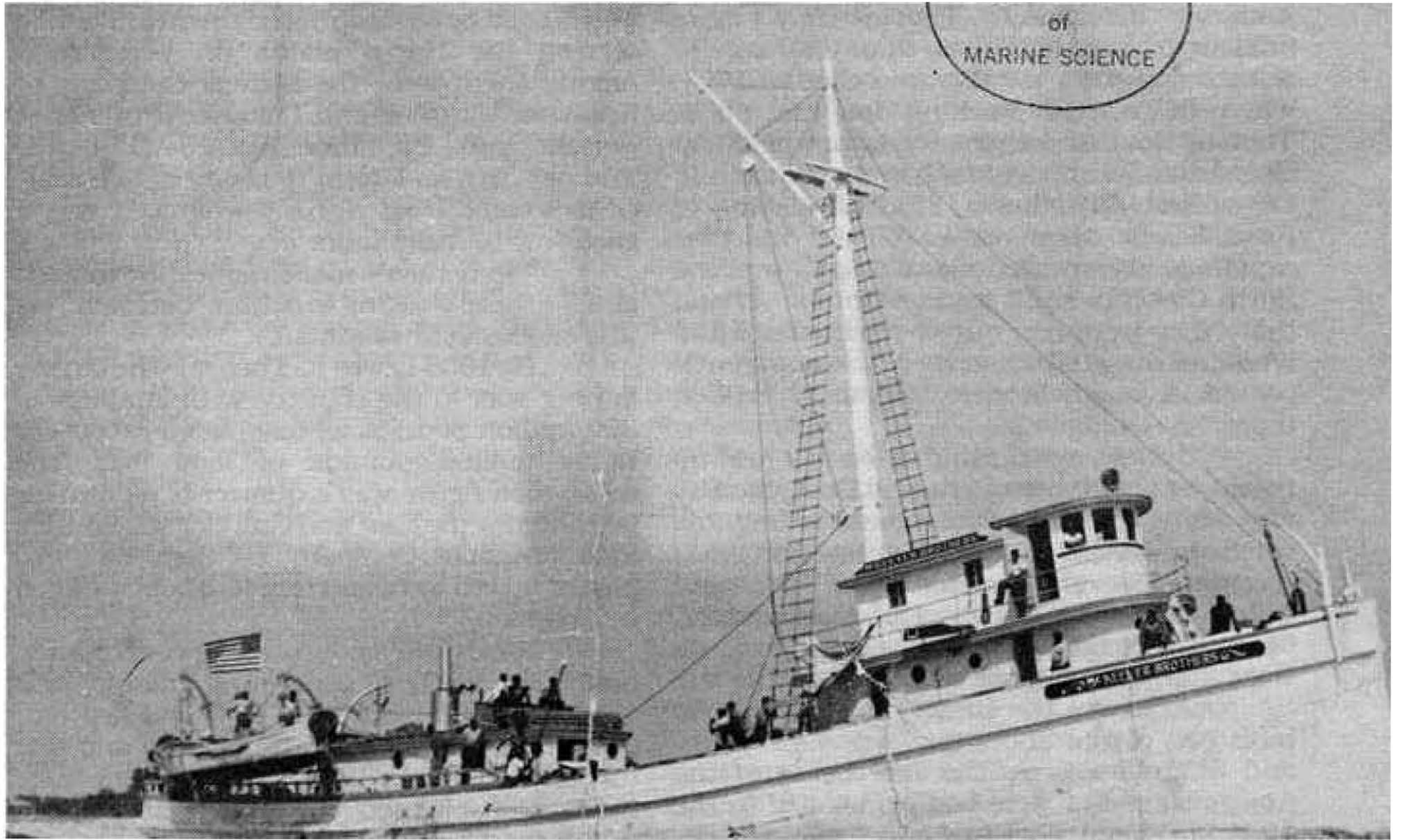
The Hayes brothers, originally from Pawtucket, Rhode Island, had started in

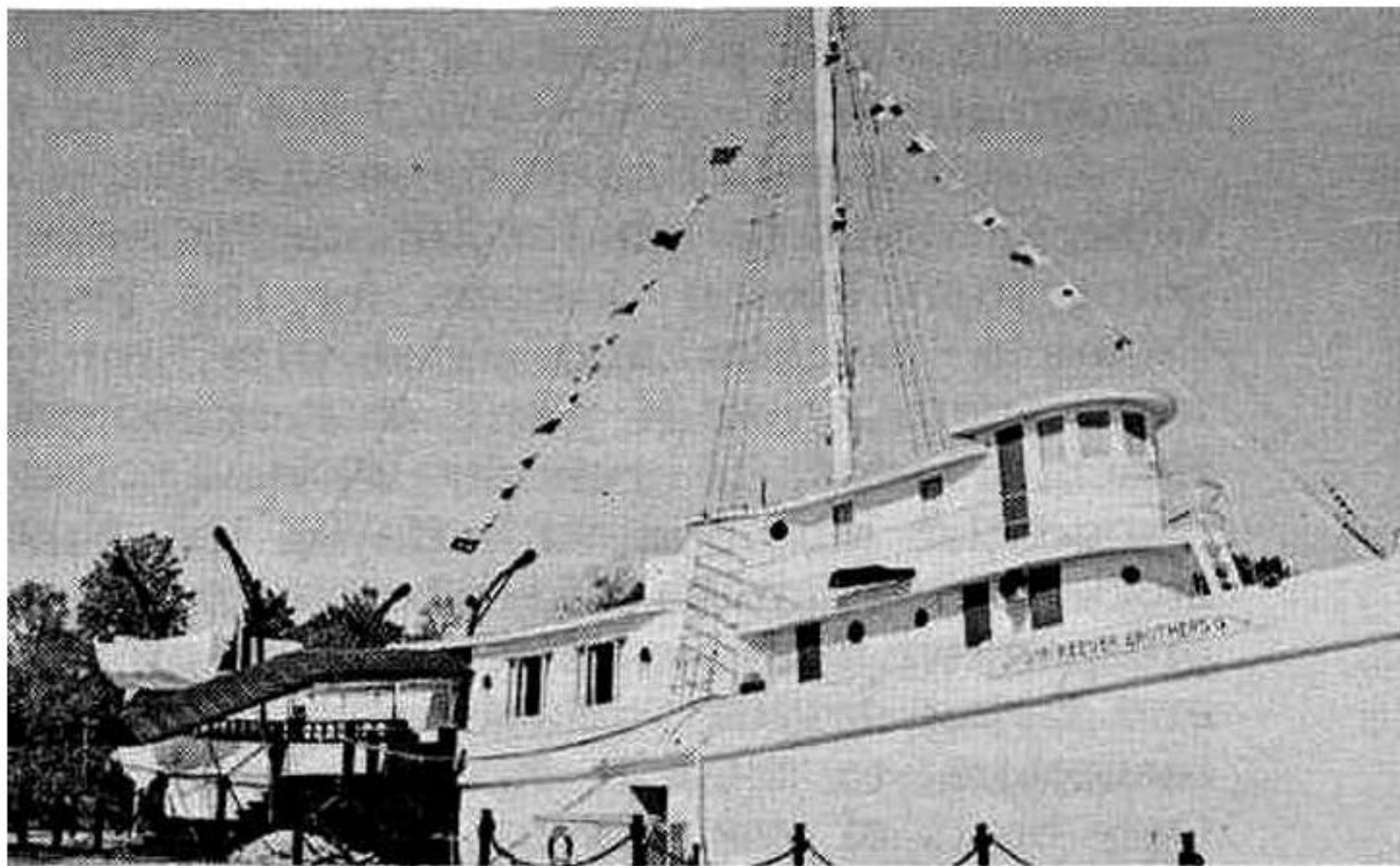


The *McKeever Brothers* after retirement: she was set up on the ground near Seaford, Delaware, as a swank restaurant to end a career that had included service as an anti-submarine patrol boat during the Second World War. Hudnall Haynie collection.

North Carolina about the end of the First World War. Joseph C. Jett, late Reedville, Virginia, plant operator, recalled that they bought a large plant at Southport from "The Syndicate," and ran it as Hayes and

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Anderton Company. "People were more anxious to buy their stock than they were to sell it," Jett said. He also said that by 1924, when he started working for his uncle, Thomas Howard Jett, the Hayes brothers had closed the Southport plant to move north to Lewes and Amagansett. Hudnall Haynie of Reedville, to whom Hayes offered his first captaincy, also recalled a local dispute over the North Carolina stock issue, with one version that "they were run out of North Carolina." Whatever dissatisfaction there was apparently passed. A fourth brother, William, remained there.

Jett's own Menhaden Company fished for a number of years in Delaware Bay and along the Delaware coast, selling his catch to Hayes for a percentage of gross receipts, less charges for "coal, salt, and water," and for sales costs of meal and oil, bags, and freight. The salt was for pickling the cotton nets to preserve them.

At Lewes the Hayes brothers in time built two plants and kept large fleets there and at Amagansett. The fine boats of the Amagansett fleet were badly damaged in the 1938 hurricane. They had taken refuge in the New London, Connecticut, harbor, but gales and high tides put several into the New London streets.

In 1938 the Smiths moved into Lewes. Gilbert P. Smith bought the Atlantic Fisheries plant from Harlan Josephs for the Fish Products Company and called Otis Smith from another Smith plant at Fernandina Beach, Florida, to run it. Whatever the competitive situation with Hayes, the fish stock was big enough to keep both companies prosperous. Even so, Hayes kept hoping—and trying despite vigilance of New Jersey inspectors—to get into New Jersey waters. Only boats of less tonnage than his heavy steamers were permitted to non-residents there. This was no problem for the Smiths, with New Jersey residency both at the Tuckerton plant and at Port Monmouth headquarters. Further the diesel Smith boats carried as many fish as the Hayes steamers, but net tonnage was much lower.

During the 1940's the Hayes fleet was "getting a little age into it," as watermen say. The newest boat had been built in 1920. Joseph Jett's own Menhaden Company boats

were joined by others privately owned, likewise serving the Hayes plants on percentage. Among them were the McNeal Company of Reedville, Virginia, and Colonna Brothers of Norfolk and Captains Wallace E. Lewis, Thomas Jett, and John B. Lowry of Reedville. Others came from North Carolina. It was a good way to make money.

"Tom Hayes made money for himself and for those working with him," Jett said. "He was an excellent salesman."

By 1953 Lewes had become the largest fishing port in the country, with landings of 390 million pounds, all menhaden except for thirty million pounds of food fish. The menhaden figure was a quarter of all bunker landings on the East and Gulf Coasts. Smith's Fish Products Company by then had two plants, served by twenty-five fish boats, staffed by 650 men.

Hayes had modernized his own plants, built an electric generating plant, and gathered a sizable fleet of new and fast fish boats designed for quick unloading and fast turnaround. But in 1954, a year after the huge catch, Consolidated Fisheries was sold to Smith for 3.5 million dollars.

"It was not up for sale," Otis Smith recalled twenty-four years later, "and I did not seek the plant. Tom Hayes was just heartbroken and asked me if I would take it."

Tom Hayes' heartbreak came when his nephew, Richard Hayes' son Thomas, whom they had intended to take over the business, was crippled for life when a racing car he was driving missed a turn. Richard Hayes, Jr., cared for him, but young Thomas was unable to carry on the company. Richard Hayes, Sr., died soon after the sale, and before he was buried, Thomas Hayes also died. The Hayes story was ended.

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Consolidated Fisheries became Seacoast Products, a corporate name to outlive that of J. Howard Smith by becoming the name of the company organized in 1974 when J. Howard Smith, Incorporated, was sold to Hanson Trust Limited of London. The sale and

its industry-wide controversy are detailed in a later chapter.

Otis Smith did much "face lifting" at the Consolidated plant, replacing obsolete or worn machinery and adding the best boats of the Hayes fleet to his own.

"He was a good plant operator," Joseph Jett said of Otis Smith. "He talked with determination and got what he wanted. Men who worked for him didn't need other jobs. He could get anybody he wanted to take his fish boats. All were top men. There was one black captain, Adrian Davis, who often brought his boat in loaded with fish. He was a top line fisherman."

The year after the Tuckerton and Lewes acquisitions, the Smiths came farther south into Chesapeake Bay. The Taft Fish Company, located on an exposed point of the north bank of the Rappahannock River six miles from Windmill Point and Chesapeake Bay, was bought from Colonna Brothers of Norfolk, along with the Bellows and Squires plant at Ocran on Dymers Creek, and three Reedville plants, the Edwards Company, the Menhaden Products Company, and the Morris, Fisher Company.

Of these, only the Taft plant was operated, and that during the Second World War. The others were closed and the fish boats taken to other Smith plants. The Taft plant had had an up-and-down career from its start in 1912. Dr. B. H. B. Hubbard and W. T. James of White Stone, Virginia, had organized the company and acquired two fish boats, each named for a founder, to get in the business that had had such a great season the year before—and disaster the year following. The plant operated until 1927, and in 1928 Dr. Hubbard himself bought it back at a sale and formed a partnership with Walter Mercer, who was later to serve many years as secretary of the Virginia Fishermen's Association. But it remained idle until 1933. Then Colonna Brothers of Norfolk bought it, reopened it, and made Mercer manager.

When Smith took the plant, Mercer continued as manager until it was closed for good after the war. Then he became manager of the shipyard at the old Morris, Fisher plant on Cockrell's Creek near Reedville, where many Smith boats were kept in repair and where older ones were laid up.

The Taft plant, with its tall wooden elevator building at the end of the long dock, slowly went to pieces during the years, with vandals helping, even though Mercer continued to live in retirement in a house overlooking the site. The wheelhouse and deck house of the old Bay Line packet *Potomac*, set up by Ben and Will Colonna as a weekend cottage for their visits by yacht, still stood, to be looted often. Finally, on August 2, 1973, fire destroyed what was left.

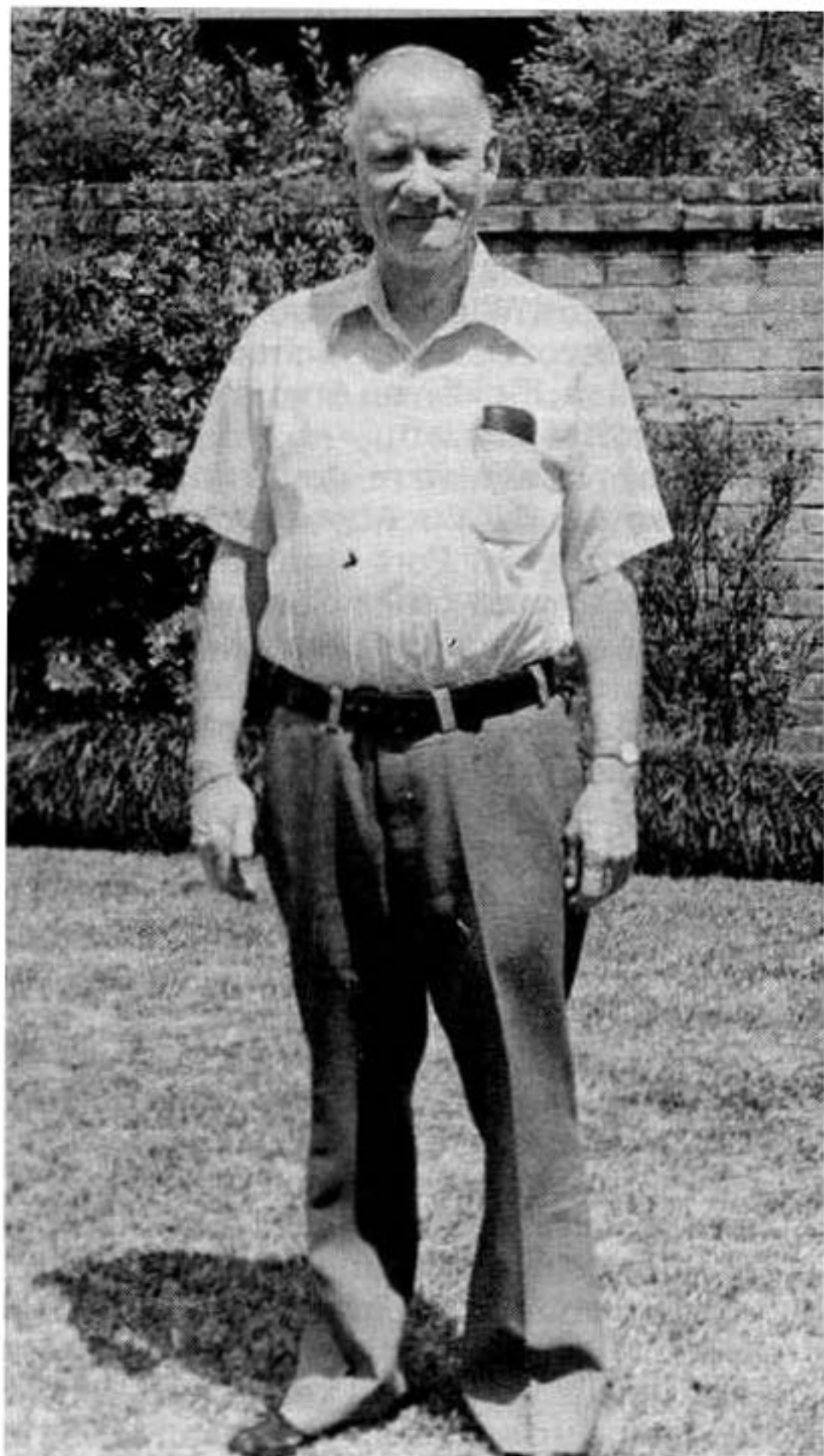
The 1950's were great days for the Smith plants and fleets. About a dozen wooden boats sailed out of Port Monmouth, fishing New York Bay and other close waters. They were enough to keep the plant there up to its daily processing capacity of five million fish. At times word had to be sent to the captains to stop: no more fish could be handled. The company still bought fish from the Raritan and Sandy Hook pound netters, and the nets had to be emptied every day of their expectable overnight catches of up to two thousand bushels, or two hundred thousand fish, to clear them to catch food fish as well.

But nearly fifty Smith fish boats were busy from Delaware north to Maine. There were days when there could be forty or more, mostly Smith, in the Atlantic off Sandy Hook—all getting full holds with a half million to a million fish each. Plants and fleets at Beaufort and Southport, North Carolina, added to the totals.

The fishery's total catch rose almost every year during the 1940's and 1950's, topping a billion pounds in 1948, going up to nearly 1.7 billion in 1953 when thirty-six plants were operating for all companies, and past two billion in 1956, toward the record year of 1961, when almost 2.3 billion pounds—3.4 billion fish—were landed at thirty-five plants.

The Smith companies had the largest share of the totals, up to sixty-five percent in their best years. In 1953, the Port Monmouth plant alone handled 350 million fish, nearly 250 million pounds.

At this time the industry was starting to extend itself toward the Gulf of Mexico. The catch there was growing from less than five hundred million pounds in 1955. In the record 1961, nearly half the total catch from both coasts was from the Gulf, more than a billion



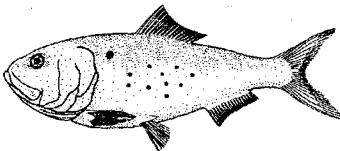
for odorless cat food, had processed all the fish meal for the company until then and had experimented with a French process to produce fish protein concentrate with eighty-five percent protein for possible human consumption.

The Southport plant had been closed in 1965, Beaufort in 1972, to end processing in North Carolina. Harvey Smith, who had managed the companies there, converted to seafood, found it profitable, and continued until his death in Beaufort, February 23, 1976.

"I never knew there was so much money in food fish," he was quoted as saying.

During the 1960's Harvey Smith had made a trial of the Chilean anchoveta fishery, which depends on upwelling of the cold Humboldt Current flowing up the Pacific Coast of South America from Antarctica, for nutrients. He put four fish boats there, and had a fish meal plant ashore, but sold the plant in 1969 to International Proteins Corporation of Fairfields, New Jersey, which still has plants there.

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Otis H. Smith, second son of J. Howard Smith, in the garden of his retirement home in Lafayette, Louisiana.

pounds. In the dreary days of the late 1960's, when the Atlantic catch was dropping toward a 1969 low of little more than 350 million pounds, the Gulf catch rose again above a billion. The peak of well more than a billion and a half came in 1971 when the Atlantic catch was just getting back above one-half billion. The proportions were still about that in the later 1970's.

The Smiths sensed the trend and began recasting their emphasis. Otis Smith shut down the Lewes plant in 1966 and the Tuckerton plant in 1970. The latter, with a special extraction mill for defatting fish meal

When J. Howard Smith, Incorporated, was sold January 1, 1974, to Hanson Trust Limited of London, the Smith name but not its blood all but disappeared from the American menhaden fishery and industry. One of J. Howard Smith's grandsons, David Clarke, became president of the new Seacoast Products, Incorporated, the successor company, and another, Julian Smith, is manager of the Seacoast plant at Intracoastal City, Louisiana, near Abbeville. Clark in mid-1978 joined Hanson Industries, Inc., the subsidiary parent to all Hanson companies in this country, and Robert W. Smith, not a member of the founding family, became president of Seacoast.

One of the reasons given for the sale to Hanson was inability of Smith family members to agree among themselves, along with advancing age. Likely age had less to do with it, although Harvey Smith then was suffering from the malignancy that caused his

death at sixty-eight. Inability to agree, a strange admission in legal papers, was easy to believe. All five Smiths were strong-minded individualists. Harvey perhaps was the most individual in his thinking and action, in some ways quixotic, at least by modern standards of "corporation men."

Ammon G. Dunton, the White Stone, Virginia, attorney whose role in unifying and vitalizing the whole industry also is to be told later, recalled an incident involving an overlap of a foot or so in the property line between the Reedville Oil and Guano plant and the Smith shipyard, Menhaden Products, Incorporated, at Fleeton, near Reedville.

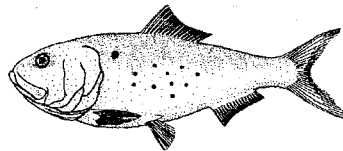
"We had already put up a building extending over the Smith line before we discovered the overlap," he said. "I talked to Harvey and he said there would be no problem, so I drew up a deed to put everything in order and sent it to him. It didn't come back and the next time I saw him I asked about it. He said, 'I told you it was all right, what the hell more do you want?'"

Nor was the deed signed during Harvey's lifetime.

A product of days when a boy walked to his school, and in his case several miles, Harvey Smith was credited with a large share of the responsibility for the growth of the Smith companies. Ammon Dunton, presenting a plaque at the 1974 meeting of the National Fish Meal and Oil Association, reviewed Harvey Smith's life briefly, from the one-room school at Columbia City, Indiana, through long hours in the Smith plant at Port Monmouth, when he hauled fish in a wheelbarrow, bailed oil with a bucket, and turned fish scrap with a pitchfork, to his years of developing or adopting improved processes and techniques.

He was credited with being among the first to install fish pumps on his boats and to use aluminum purse boats with power blocks and diesel engines. He was an early user of air spotting when it became practical after the Second World War.

Harvey Smith was well known at Reedville, even though the Smiths then did no fishing on Chesapeake Bay. He selected and arranged for purchase of all property acquired on Cockrell's Creek, Dymers' Creek, and the Rappahannock River. He directed winter



Harvey W. Smith, eldest son of J. Howard Smith, photographed in 1974, two years before his death.

repairs to Smith boats at the Menhaden Products shipyard.

E. C. "Danny" Ford, for many years assistant, then manager of the shipyard after the death of Walter Mercer, recalled that once Harvey Smith ordered him by telephone to haul one of the bigger boats, one that Danny thought too heavy for the railway.

"I told him, 'Mr. Smith, I'm not going to haul that boat,'" he said. He admitted to being somewhat bull-headed in not saying why. "He asked me who was paying my salary and I told him he was but I wasn't going to haul that boat."



Smith hung up, possibly feeling that after Danny had reflected, he would haul the boat. Danny did reflect and hauled it.

Smith also reflected and realized that Danny knew the boat was too heavy. He called back and said, "Maybe we'd better not haul that boat there."

"Too late, Mr. Smith, I hauled it and the railway broke down."

At the Smith plant at Fernandina Beach, Florida, Harvey was the man who brought materials, except for lumber, and employed builders for a large fleet, with his father buying engines and lumber and his brother Otis "directing routine work."

Harvey operated the Smith factory at Beaufort, North Carolina, from its start in 1931, and added the adjacent Wallace Quinn plant in 1939. With all this and with his widespread work in the Gulf of Mexico, he also helped manage the boats at Port Monmouth and hired their captains.

In the Gulf Harvey Smith built one factory at Moss Point, Mississippi, and joined his brother Gilbert in building another at Cameron, Louisiana; bought one at Morgan City, Louisiana, and bought another Wallace Quinn plant, this one at Keith Lake, above Sabine Pass at the Texas-Louisiana border. He managed the Cameron plant, and with the latter purchase, made the Texas plant his headquarters.

Harvey Smith's career, with its new step into seafood, had to end only when his

long illness finally overwhelmed his vitality. His brother Otis, two years younger, now lives in retirement in Lafayette, Louisiana, less than thirty miles from the Intracoastal City plant. He is close enough for visits during the season to keep up with what is going on in the industry to which he too contributed so much, the company he watched grow, and the plant he built in the expansive days.

Like the other Smiths, Otis is among the last of the men who grew up in the industry at a time when one man could make a mark. Old timers could remember him walking out on the two-thousand-foot docks at Lewes, Delaware, his head down and seeming only to be counting planks. Those old timers knew that he missed nothing, that he knew what he wanted to do and would do it, and that they could depend on him for fair treatment, whether they were captains or the newest of fishing hands. Some captains, none ever meek and few mild, didn't like him. Fishermen, seeing both more objectively if not with detachment, said of this, "Otis Smith let them know who was boss when they thought they were boss."

As one veteran retired captain put it many years after fishing out of Lewes: "If you hadn't fished for Otis Smith then, you just hadn't fished."

To many of them, the S logotype on the Seacoast Products fish boat stacks still stands for Smith.

II. A Century of Haynies

In a land where ancestor worship is a part of life if not religion, the name of Haynie is heard in many Chesapeake Bay creeks and coves. All who bear it perhaps trace back to the John Haynie who stepped on Virginia's Northern Neck, the second white man to settle among the Chickacoane Indians, in the 1640's. In the Bay menhaden industry it is and has been the name of many a fish boat captain, and it is the only name that has lived a century with a company.

By one of those synchronous oddities that delights statisticians, the year 1978 saw both the fiftieth anniversary of Standard Products Company, Incorporated, and the centennial of its competitor across Cockrell's Creek, Zapata Haynie Corporation. The latter cannot claim to have borne the name always, for from 1913 to 1968 it was Reedville Oil and Guano Company, Incorporated, but with Haynies as general managers and presidents, first Raymond L. Haynie, Sr., son of the John A. Haynie who, with his younger brother Thomas, set up kettles and a cider-mill type, walk-around press in 1878 on their share of the Haynie family property, which included all the land now occupied by Zapata Haynie.

Captain Clem Haynie, from another branch of Haynies, recalled shortly before his death at ninety-eight in 1969 taking his first job at the the age of fifteen with the Haynie company in 1886. He described the plant, then briefly at Mila, across the Great Wicomico River from the mouth of Cockrell's Creek, as

"in a primitive state, with only about five hundred dollars' worth of equipment in kettles and hand presses, and one pungy...I did anything a boy could do with a wheelbarrow," Captain Clem said.

Raymond Lee Haynie, Sr., died at the age of sixty-two in 1950. Raymond Lee Haynie, Jr., was president until his death nine years later. Ammon G. Dunton, an attorney of White Stone in neighboring Lancaster County, served as president for two years, became chairman of the board, and was succeeded by another Haynie, Allen W., who claimed, however, only to be a distant ("possibly fourteenth") cousin of the company founder's line.

In 1968 Reedville Oil and Guano Company—"Reedville Oil" to a generation of watermen and menhaden people—returned to the name as Haynie Products, Incorporated, partly because, as Ammon Dunton explained at the annual meeting when the change was announced, "No one knows what guano is now." Neither Reedville Oil nor any other menhaden company had produced fertilizer from fish scrap since the 1930's, even though older pound net fishermen still called bunkers "fertilizer fish." Afterward, they also continued to call the company "Reedville Oil."

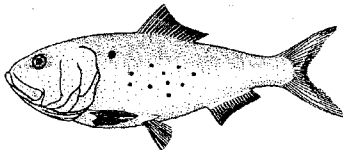
It was a small paradox that with the return to a Haynie, the industry lost its last link by name, through the village named for him, with Elijah Reed. The successor to his own company, Edwards and Reed, had ended





in a fire in 1925. George N. Reed, son of Elijah, had been associated with McNeal, Edwards Company, but except for the village, the name itself had disappeared, with not even a fish boat bearing it. The company's *E. Warren Reed* had long been decommissioned. But Reedville will remain Reedville, even if the Boston-Norfolk megalopolis the demographers worry about runs city streets to every Chesapeake Bay shore.

The company had not carried the name of Haynie alone always in the early days. From 1903, when John A. and Thomas Haynie merged with Snow, Fallin Company, it was Haynie, Snow Company until 1913. Then William S. Brusstar, member of a Baltimore family with menhaden interests, joined the company and it became Reedville Oil and Guano.



Purse seines must be mended regularly. Small tears caused by catching on debris can be mended by the crew of a fish boat, but more extensive work is done by a gang, with the nets spread in a large field like this one at the Zapata Haynie plant near Reedville, Virginia. Zapata Haynie photo.

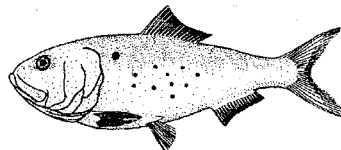
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Raymond Lee Haynie, Sr., was described by those who remembered him as a "remarkable man... very keen... a great man for detail." He and his later competitor also called Raymond, H. R. Humphreys, Sr., were

entrepreneurial kin. Both were aggressive and competitive, and both were excellent businessmen who saw their companies through times fatal to others.

Their differences lay deep within them. Humphreys was extremely capable as an engineer, a man who figured out better ways to do what had to be done, his career to be described in the next chapter on Standard Products. Raymond Haynie turned more closely to the practical biology of the fishery, including the chemical composition of the fish themselves, and to the problem, now quite fashionable in all environmentally based endeavors, of the future of the resource. In his day, few thought much more about that than George Brown Goode had, and most less.

Raymond Haynie also was described as thoroughly aware of the mechanics of the

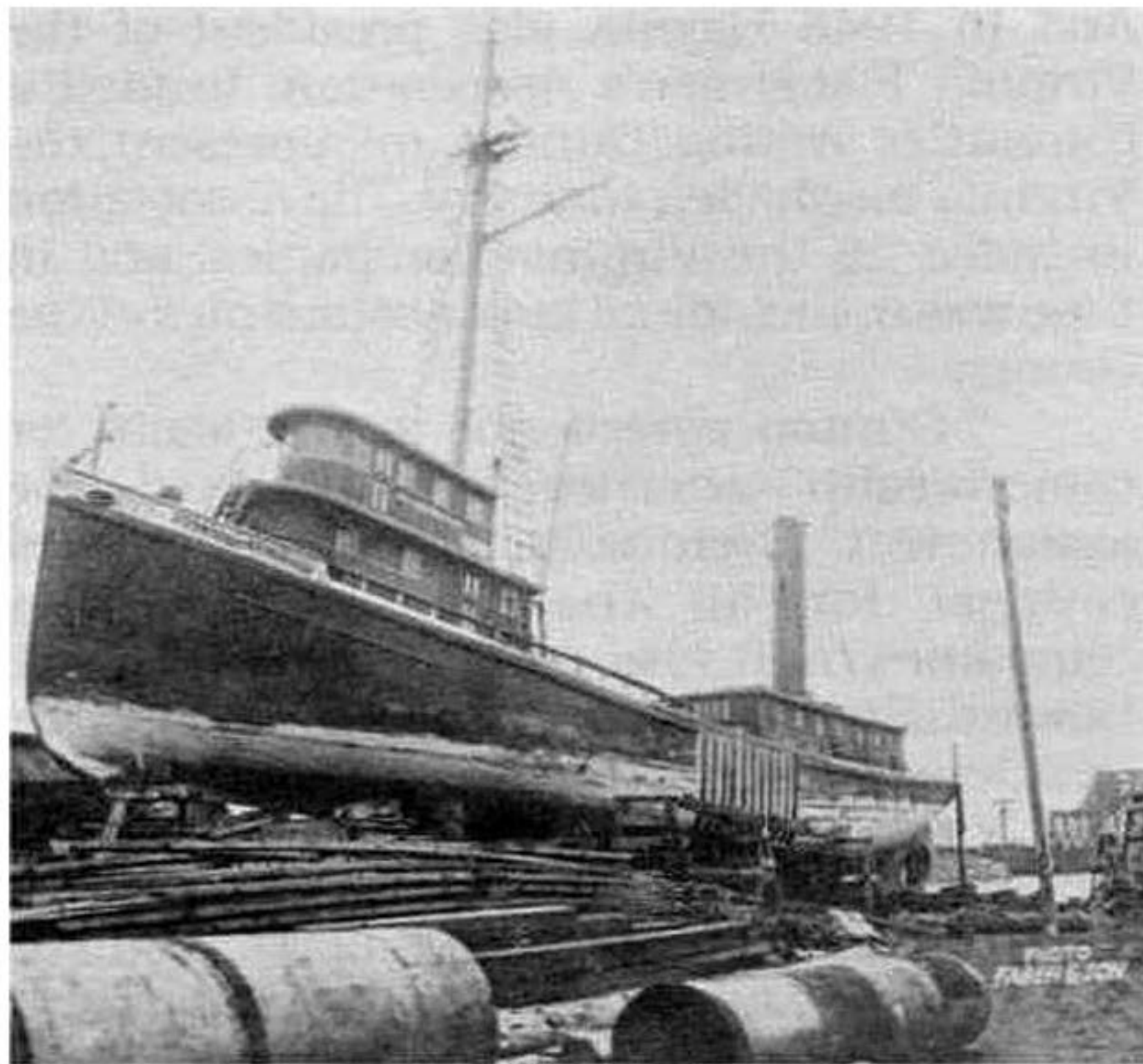


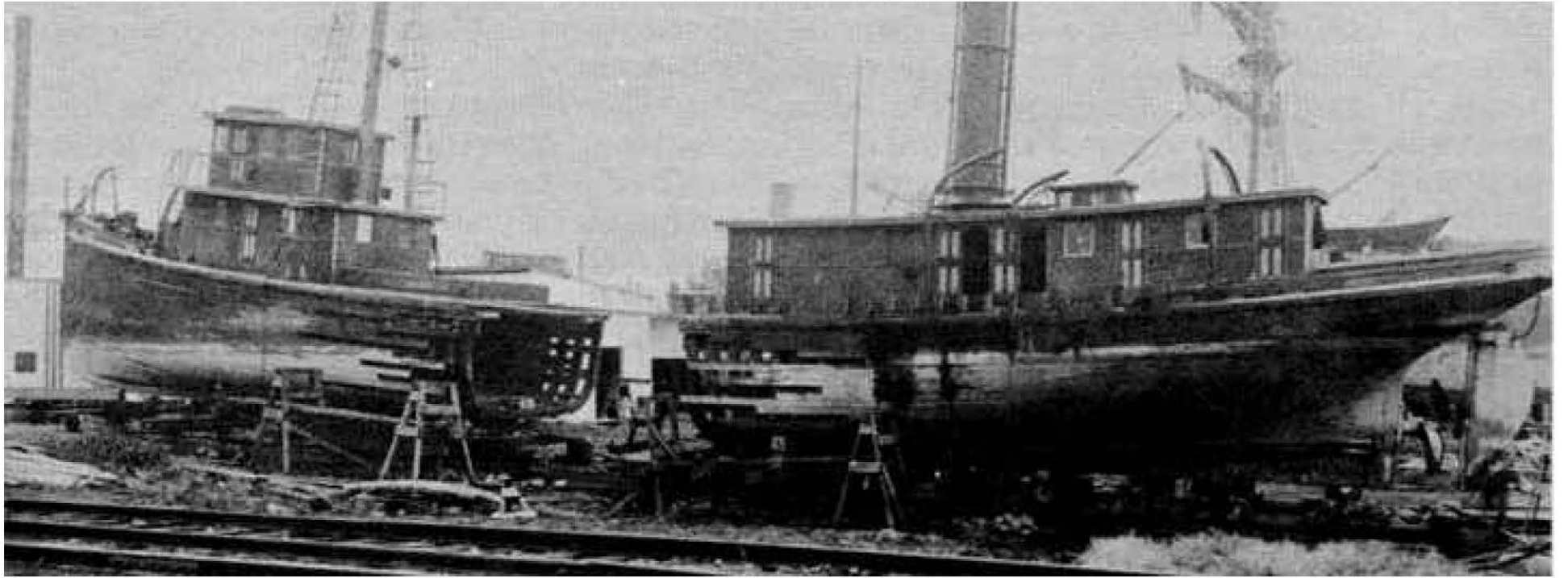
What menhaden look like after reduction. These piles of fish meal are in the Zapata Haynie warehouse at Reedville, Virginia. Zapata Haynie photo.

fishery—how factories and fish boats should be run. As manager under President William B. Crowther, his brother-in-law and a son-in-law of John A. Haynie, until Crowther's death in 1925, he supervised most of the building for the company.

Raymond Haynie helped see Reedville Oil through trials of the 1913-1918 period, when fish were not only scarce but the First World War made a distraction and then a drain of manpower and boats. Reedville Oil paid its stockholders a dividend every year.

He was also described by Ammon

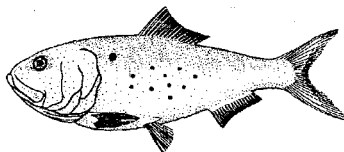




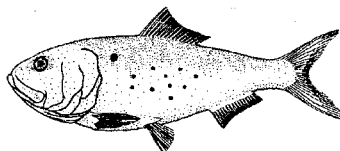


Dunton as “a man who knew when not to do anything—when the best you could do was hold the status quo.” Other associates like Allen Haynie and Captain John D. Deihl, for many years in charge of all marine and fishing activities, recalled him as “very conservative and economical. He didn’t put a dollar into anything until he could see a dollar and a half coming out.”

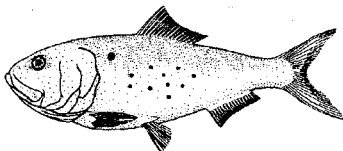
Thus perhaps he was able to take Reedville Oil and its two fish boats through the bleakest year of his generation, 1922, when almost every other of the near score companies



The *William S. Brusstar* of Haynie, Snow Company, being enlarged with a new mid-section at the Colonna Shipyard at Norfolk, before 1913. The *Brusstar* fished into the late 1960’s for the successor Reedville Oil and Guano Company and Haynie Products. W. Harold Haynie collection.



The *Chesapeake*, another Haynie, Snow steamer, being enlarged also at the Colonna Shipyard. W. Harold Haynie collection.



Raymond Lee Haynie, Sr., long-time president of Reedville Oil and Guano Company. Zapata Haynie collection.

on Chesapeake Bay either went broke or came close. The fish disappeared, and contrary to the law of supply and demand, fish meal prices also collapsed. Again, Reedville Oil paid a dividend, although out of capital. Raymond let no one down who had put money in his trust to use.

With all his conservatism, Raymond Haynie kept sight, through his thick glasses, of his workers. “If you were dedicated to your

work." Captain Deihl said many years later, "he backed you up. Once you proved you could do what was to be done, he became a different man to you and let you do it."

Captain Deihl could say this out of his own memory of being "one of his lowest paid hands." Captain Deihl started with the company cannery in 1934, at the bottom of the Depression, at ten cents an hour. Two years later he came to the menhaden side, when Reedville Oil bought the bankrupt Douglas Company, to work six eleven-and-one-half-hour days for six dollars a week and three meals a day. "You always got your three meals." By 1945, he was captain of a fish boat, with Raymond Lee Haynie backing him in every step upward.

Haynie's lifetime spanned the years when the company still cooked fish in kettles, then in open pans, and finally in steam cookers. As a youth he saw early hydraulic presses operated by hand, evolving through steam hydraulic pressing into continuous screw processing. He watched the hand labor of drying fish on platforms in the sun, then batch drying by steam, and continuous drying by direct heat from oil. Afloat he saw the last of the schooners hauling oil and scrap to Baltimore brokers. He saw the steamers scrap the bulky steam engines for diesel, to make possible much bigger fish holds.

And Haynie brought into the company and the Virginia menhaden industry the first of what the Reedville Establishment might consider an outsider, in any moment of forgetfulness that Reedville was named for a Maine Yankee. This was Ammon Gresham Dunton, the White Stone lawyer who in the 1940's was commonwealth or prosecuting attorney for Lancaster County, Northumberland's junior neighbor (erected in 1651, three years after Northumberland and carved from Northumberland) on the Rappahannock River side of the Northern Neck.

Lancaster County then still had its scattering of menhaden companies, and Standard Products Company, Inc., then located on Dymer's Creek, was to be their sole survivor.

Ammon Dunton represented a Reedville company in a suit against Reedville Oil, and won his case. Raymond Haynie, far from upset, wrote a letter of congratulations.

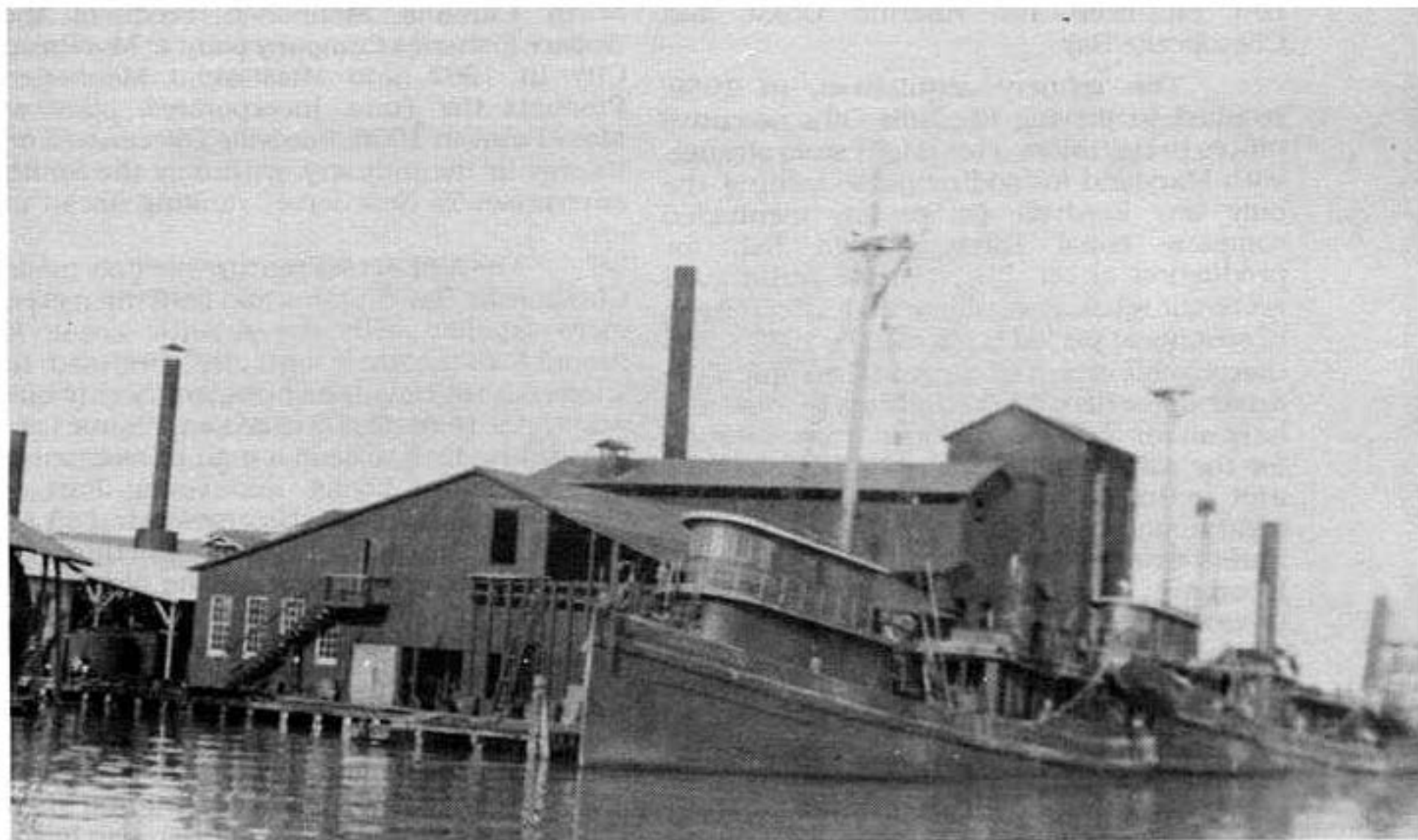
And in 1946 Haynie, also president of the Virginia Fishermen's Association, headed a committee asking Dunton to represent the Virginia menhaden industry. The Association included all the Virginia companies, and in time was to include all major companies of the country.

Dunton agreed not to run again for commonwealth attorney and accepted the assignment. Eventually he became general counsel for all the then-six Virginia companies, and also registered agent for J. Howard Smith, Incorporated, to qualify the New Jersey concern to do business in the state with its Cockrell's Creek shipyard, Menhaden Products Company. When Raymond Haynie, Sr., died in 1950, Dunton became a director of Reedville Oil and Guano, then secretary and vice president. With the death of Raymond Haynie, Jr., nine years later, Dunton was elected president, chairman of the board two years later.

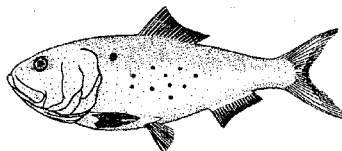
This brought Allen W. Haynie to the presidency. Allen Haynie was a Reedville native who had gone to Chicago to be educated at Northwestern University, but the menhaden blood was in him, and more strongly than through his barely traceable kinship with the John A. Haynie line. His mother was a sister of Wilbur Edwards, of the family that had been associated with George N. Reed and with the McNeals, and who had had his own Edwards Company from 1910 into the early 1940's.

In the middle 1930's Edwards brought his nephew from Chicago to be a trouble shooter. Benjamin Franklin (no kin claimed to the original!), who served as a machinist repairing and servicing the five steamers of the seven-boat Edwards fleet, recalled that Edwards was "Big Boss," Allen Haynie "Little Boss." The three lived in the old Edwards office building, and Allen Haynie and Ben Franklin kept in touch with each other until the latter's death at ninety-five in 1975. Franklin, whose previous machinist experience had been making hypodermic needles, still had a piston ring and a few other small steam engine parts in the tiny shop at his home at Haynesville, fifty miles from Reedville, to remind him of younger days with Allen Haynie and Wilbur Edwards.

Haynie later went to Baltimore in another Edwards enterprise, a fish oil refinery,

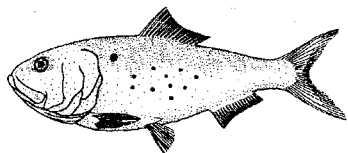






The Edwards Company factory at Reedville, Virginia, where Wilbur Edwards was "Big Boss" and Allen W. Haynie "Little Boss" during the 1930's. Three of the big Edwards fleet of steamers are at the dock. Ben Franklin photo.

organized with a Baltimore group and to become the largest processor of marine oils in the United States. Reedville Oil and Guano, Seacoast Products, a Smith Company at Lewes, Delaware, and Standard Products of White Stone, Virginia, supplied most of the raw oil. Reedville Oil later bought the refinery, then formed a subsidiary, Cadar Paint Company, the name from the initials of the principals. The R was for Raymond Haynie, one A for Ammon Dunton, the other for Allen Haynie. (The C was for a Baltimore businessman, Charles Caltrider, and the D for another Haynie, Delmar, a Baltimore accountant and Reedville native whose family had long been connected with menhaden there.) Cadar later was merged with the older and well-established Hanline Paint Company, with Reedville Oil keeping a one-third interest, still held by Zapata Haynie and still an outlet for



Raymond Lee Haynie, Jr., who succeeded his father as president of Reedville Oil and Guano Company. Zapata Haynie collection.

fish oil from the Atlantic Coast and Chesapeake Bay.

The refinery acquisition, in 1959, resulted in moving Reedville Oil's executive offices to Baltimore. This might seem strange, with Maryland forbidding purse seining, the only way Reedville Oil or any menhaden company could catch enough fish for production of oil. But it made quite good economic sense. Reedville, at least after the end of steamboat packet service in the 1930's, was inaccessible except by car, and then only if the driver knew his way. Baltimore, a railroad and later an air terminal, provided transportation for the salespeople distributing the fish oils and paint vehicles to the forty-eight continental states. And the company owned harbor-front property and had its research laboratory there. However, an urban renewal project forced removal of the refinery to another site, and in 1975 executive offices were moved to the now-parent Zapata Corporation building in Houston, and the refinery was transferred to Reedville. Allen Haynie retired as president and became chairman of the board, soon to find himself far from retired and a most active member of the Mid-Atlantic Fisheries Management Council set up by the Fisheries Management and Conservation Act, effective in 1976 but demanding his attention, and that of all other members, for many months before and after—and still.

Through the years the two Raymond Lee Haynies, Ammon Dunton, and Allen Haynie pushed company growth despite the cyclical swings of the industry. Like a few others, Reedville Oil had carried on for many years a companion herring and herring roe canning business, this at Mundy Point on the Yeocomico River, a Potomac tributary. With the decline of the Chesapeake Bay herring catch in the 1960's and 1970's, blamed by fishermen and scientists alike on intensive fishing, State Department blessed, by foreign fleets off the mid-Atlantic Coast at the start of the late winter spawning runs into the estuaries, this had to end.

Meanwhile Reedville Oil had set up subsidiary companies, New Jersey Menhaden Products Company taking over the Charles Aspenburg plant at Wildwood in 1953, and

North Carolina Menhaden Products the Wallace Fisheries Company plant at Morehead City in 1962, and Mississippi Menhaden Products the Tuna, Incorporated, plant at Moss Point in 1956. Reedville Oil was well on its way in the industry, with only the Smith enterprises of New Jersey ranking ahead in size.

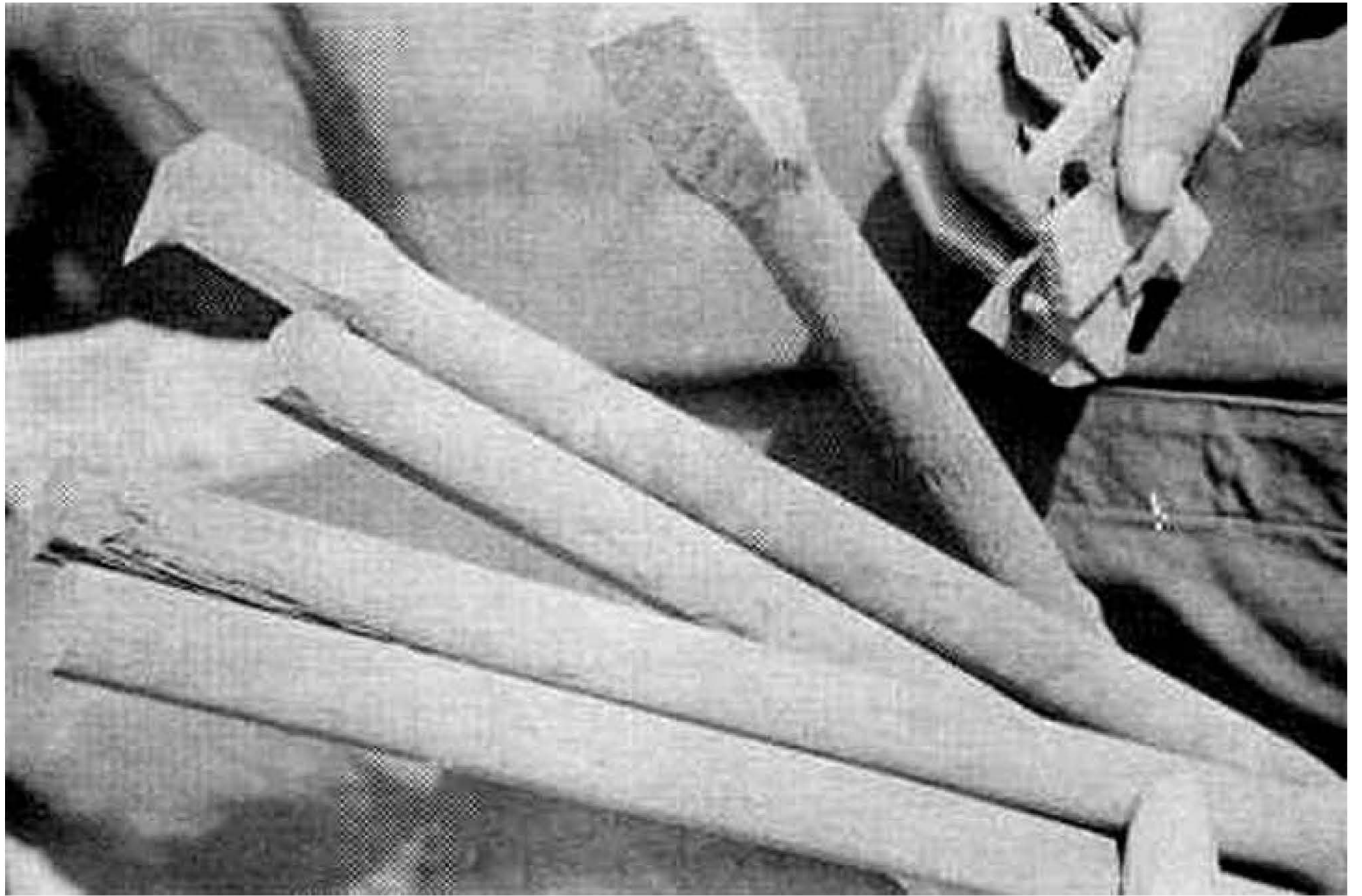
The New Jersey venture not only made Chesapeake Bay captains and fishermen even more familiar with the Atlantic coast, it brought in another "outsider" destined to succeed Allen Haynie as president twenty-one years later. Reedville Oil asked an Atlantic City accounting firm to send a man to reorganize the Aspenburg books, and young Earl J. Conrad, Jr., was sent. He became fascinated. As he watched the company spend eight hundred thousand dollars renovating the plant, and then get every cent back in one fishing season, he decided that was the business he wanted to stay in. He also watched the company's resourcefulness in another season when it lost money on fishing but made an overall profit canning tomatoes and turnip greens!

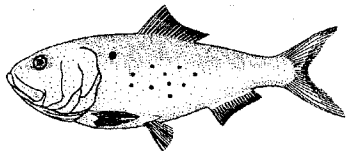
In the 1960's Reedville Oil and then Haynie Products put up to a dozen fish boats on Chesapeake Bay, others on the Atlantic Ocean out of Wildwood and Morehead City, still others in the Gulf of Mexico. Its Bay fleet surpassed the eight boats that the once-dominant but now-departed Morris, Fisher Company had had in the 1920's (when Reedville Oil had but two!). In the 1960's two boats were built, the *Ammon G. Dunton* and the *Allen W. Haynie*, both for the Gulf of Mexico fishery, now overtaking the Atlantic and Chesapeake Bay in volume.

One by one the old "steamers"—the *Margaret*, bearing the name of old Joe Bellows' youngest of seven daughters, the *William S. Brusstar*, and others—began to be retired. Some, like the *Brusstar* (and the *Elizabeth M. Froelich*, *Ocean Springs*, and others of the old McNeal, Edwards and Standard Products fleets) were stripped of engines and fittings and towed to coastal sport fishing waters to be sunk as artificial reefs. Those old hulks were beyond further service to the menhaden fishery, but not all were ready to die.

Captain Hudnall Haynie, a retired skipper of the Smith fleet, towed the *Brusstar*, built in Baltimore in 1902, to a point off





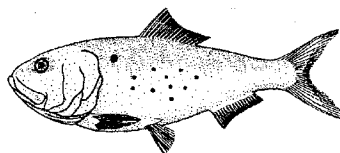


The end, after more than sixty years of fishing: The *William S. Brusstar*, which had fished for Haynie, Snow and its successor companies, Reedville Oil and Guano and Haynie Products, lies on the Atlantic off Wachapreague, Virginia, her seacocks open. She was sunk in November 1968 for an artificial reef for Eastern Shore sport fishermen, but took her own time in going down.

Wachapreague, Virginia's Eastern Shore sport fishing resort, but was hours getting her to sink. Her seacocks were opened and the crewmen rushed back to the steel *Cape Charles*, a one-time Coast Guard cutter. They need not have. In the next few hours Captain Haynie rammed that oak hull three times and made only a barely visible dent in the side, although the *Cape Charles* jarred to a dead stop like an automobile hitting a stone wall. The locust treenails (trunnels) fastening the planking to the thick frames held as well as any steel riveting or welding on a steel hull, or even better. The *Cape Charles* crew, planning to be home for supper, found all they could do was sit and wait. In the growing darkness the *William S. Brusstar*, her bilges loaded with six hundred tons of concrete, finally eased below the waves. She went down level, refusing to display the traditional final gesture of a sinking boat, an upended, streaming bow or stern.

Captain Meredith Robbins of Standard Products had a similar experience sinking another hulk off Chesapeake Light Tower later.

Reedville Oil, with port captain John D.



These locust treenails (trunnels) were the fastenings for the hulls of scores of wooden fish boats built in the early twentieth century. The wedges were inserted in the square ends to lock them in place.

Deihl guiding marine operations, picked up former military vessels, among them the *Joanne*, which seemed to have run guns to Cuba after leaving Navy service, and the *Grafton*, our Navy on the Ohio River at Louisville, Kentucky. Again, Captain Hudnall Haynie was often sent to strange waters, Curaçao for the *Joanne*. The delivery was unexciting, but Captain Haynie found that with the *Grafton*, he had to learn much about Ohio and Mississippi River navigation as told by Mark Twain but never taught on the Bay. Also, she was a wooden boat, and on the Ohio River, which can flood but rarely gets ocean rough, her seams above the water line were dry and open. Once he had left the Mississippi

River the swells of the Gulf of Mexico came through them, and Captain Haynie had to keep pumps going until they tightened themselves by swelling.

The *Joanne* became the *W. T. James, Jr.*, later to make a spectacular rescue in a North Carolina winter storm, also to serve in an unsuccessful experimental winter sea herring fishery sponsored by the federal and state fisheries authorities. The *Grafton* became the *Hugh S. Haynie*, named for a son of Raymond Lee Haynie, Sr., who had gone west to become the Louisville *Courier-Journal's* Pulitzer Prize-winning editorial cartoonist. In time she too was retired, to make way for the bigger FS Class Air Force coastal freighters the company was adopting and converting. In the 1970's they, too, were modernized further with refrigeration—an advance first tried in the 1920's by John Palmer, and to be described in a later chapter.

Ashore the company likewise continued to expand and improve, with its Chesapeake Bay, Wildwood, New Jersey, Morehead City, North Carolina, and Moss Point, Mississippi, plants. J. Frank Jett, a son-in-law of William B. Crowther who had been president until his death in 1925, came to Reedville Oil about the time of Raymond Lee Haynie, Sr.'s death in 1950. Jett managed shore operations and became a director and a vital factor in the company's development, especially during its 1955-1975 period of growth. He installed new equipment, scrapped or modernized old.

From a family almost as extensive as the Haynies on the Northern Neck of Virginia, Jett retired in the mid-1970's but was often called upon for special jobs quite beyond the conventional "consulting" chores thrown by many companies to retired seniors. In the 1970's the parent Zapata Corporation joined Mexican fishing interests in an anchovy venture, to produce fish meal at Ensenada, Baja California. J. Frank Jett went there for several months to supervise construction of the factory for the new company, *Pesquera Zapata*. Returning, he kept on with "retirement" help to his company and friends.

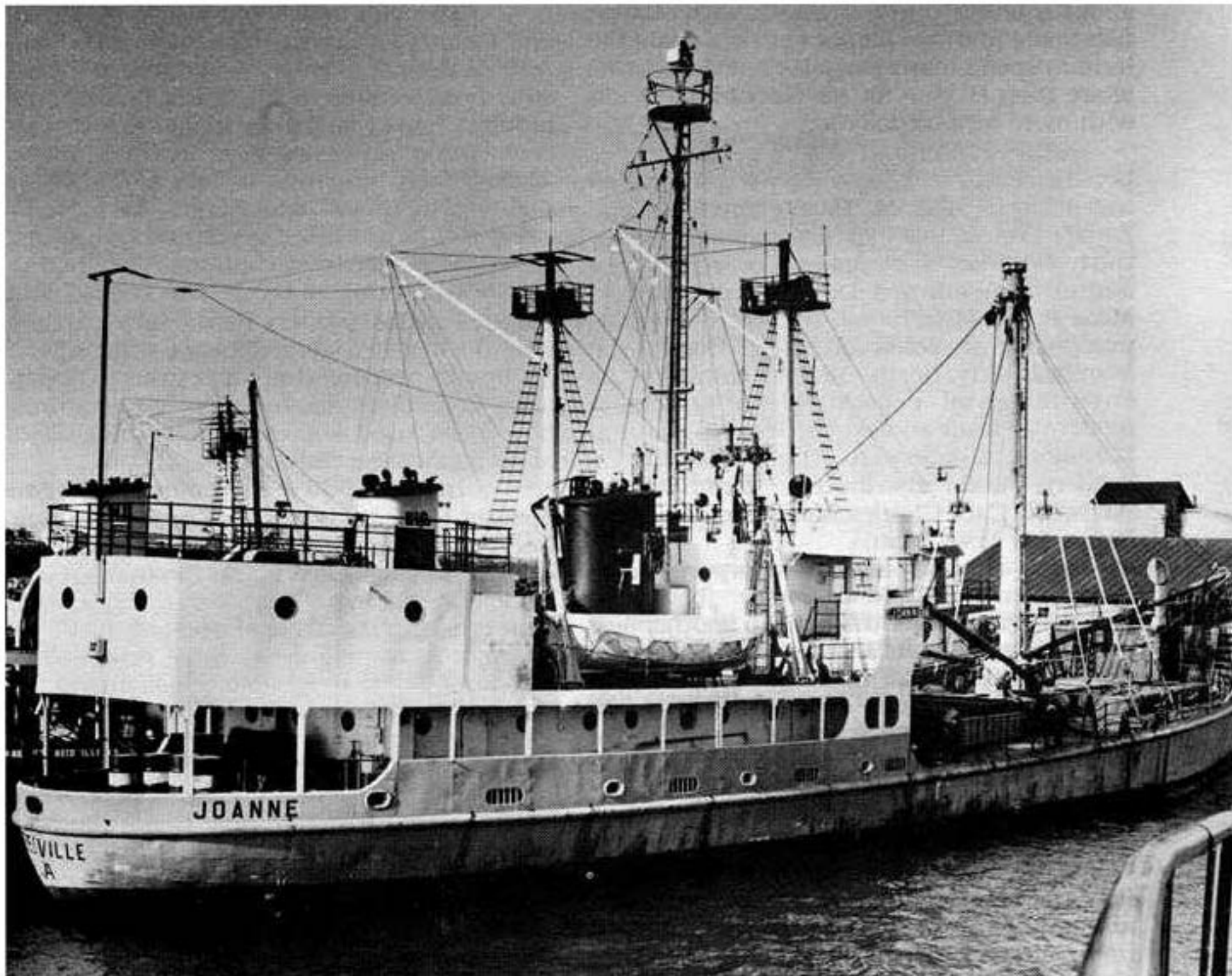
And on Cockrell's Creek docks, Virginians under John D. Deihl, senior vice president in charge of all Atlantic fishing and marine operations for Zapata Haynie

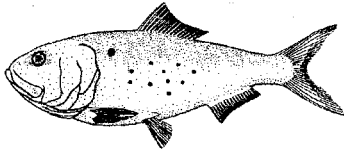
Corporation, until his resignation in late 1977, built much of the factory floating equipment and installed refrigeration in one of the anchovy boats, the *Kino*, as he had in the entire Atlantic fleet of Zapata Haynie. Captain Deihl also had been involved in design of the five-boat anchovy fleet, built at Jacksonville, Florida, and Seattle, Washington. Thus the menhaden fishing and processing know-how of Cockrell's Creek was transported across the continent for a sizable effort to improve the economy of a remote part of another nation.

In the late 1960's and 1970's, with the nation's environmental consciousness aroused—and with new people moving to the Virginia Tidewater with no traditional affection for the industry and unable to grin and say, "it smells like money"—millions of dollars were spent by Haynie Products and Standard Products to combat pollution, both water and air. George Brown Goode had noted ninety years earlier that factory ships overcame one objection by taking odors to sea, but that was no longer feasible, nor even much of a success then.

The odor problem caused Haynie Products' one corporate misadventure during this period. In 1966 the company built a modern new plant at the Eastern Shore town of Cape Charles, close to the mouth of Chesapeake Bay and the ocean fishing grounds. It was to be a model of efficiency, to receive fish caught in the Atlantic and lower Bay and save the fifty-mile haul back to Cockrell's Creek. Cape Charles is on the Bay, nine nautical miles north of the cape itself.

Cape Charles had had its fish plant just after the First World War, out on Sandy Island in Chesapeake Bay, and welcomed the new plant at first. Advanced equipment developed for reduction of meat packing scrap was installed. It did not work as well as the manufacturers said. Cape Charles residents complained, and five years later processing ended voluntarily even though state water and air pollution authorities had found the plant in complete compliance with requirements. The decision, however, became part of a developing company policy to centralize its production, and thus its required environmental changes, at Reedville rather than try to meet varying standards in several





The *Joanne* after ending her career running guns and ready to be converted to menhaden fishing.

places. The Cape Charles buildings were turned to storage of fish meal.

In the late 1960's and 1970's, many a national company cast about for ways to expand its scope. Despite economic ups and downs, these companies had accumulated surplus capital and wanted to do something with it without risking the indignation of politicians and "trust busters." These corporate gatherings of strange bedfellows became "conglomerates" to their critics, "diversified multi-national companies" to stockholders.

Among them was the growing Texas

concern, Zapata Corporation of Houston, whose diversification into menhaden fishing was described earlier. The company, with geographic interests already ranged from the Gulf of Mexico to the North Sea to the Mediterranean and Far East, and ashore to British Columbia, West Virginia, and California's San Joaquin Valley, made an eleven million dollar offer to Haynie Products in 1972. It involved an exchange of Zapata's publicly held stock, common and preferred, for the closely held Haynie stock, mostly in the hands of Reedville area residents—Haynie executives, members of the Haynie families and their kin, friends, and associates. It looked good and they accepted. Haynie and Zapata Protein, its new brother subsidiary, were

about equal in physical assets, with sixteen fish boats and two plants apiece. Zapata did have to spend many more 1967 dollars for its share than Haynie for its older plants, built with more serious dollars.

In January 1974 the changeover became complete. Zapata Haynie Corporation was formed to bring Haynie Products and Zapata Protein together. Assets now included thirty-eight boats; plants on Cockrell's Creek and at Cameron and Dulac, Louisiana, and Moss Point, Mississippi. (Haynie had ended processing at Wildwood, New Jersey, and Morehead City, North Carolina, as part of its environmental centralization policy); a modern fish oil and synthetic resin plant at Baltimore, successor to Wilbur Edwards' oil refinery; and distribution terminals at Wildwood, Cape Charles, Morehead City, Moss Point, and New Orleans.

J. Howard Smith, Incorporated, of Port Monmouth, New Jersey (becoming Seacoast Products at this time in another deal of many million dollars) no longer was the nation's biggest fish meal and oil company. Zapata Haynie was, with nearly 1,300 employees during the fishing season, a third of them at the Cockrell's Creek plant, now the biggest in the industry.

Earl J. Conrad, Jr., the one-time accountant who had become fascinated with menhaden while auditing books, moved up from vice president and secretary to president, and went to Houston. Allen Haynie returned from Baltimore to Reedville, where he had once slept in Wilbur Edwards' office building, as chairman of the board.

Ammon G. Dunton, with thirty years of legal and administrative service to Reedville Oil and the whole menhaden industry, retired. His son, Ammon, Jr., took over the Virginia legal assignments for Zapata Haynie.

In mid-1978 Zapata gathered all its fishing operations—menhaden, Mexican anchovy, tuna, and sardine fishing and processing—into one new subsidiary, Zapata Protein, Incorporated. Zapata Haynie became one of Zapata Protein's four divisions. Earl Conrad became president of the new unit, which accounted for about one-fifth of Zapata's total revenues and ranked the company as one of the largest in the Free World's fishing industry.

Through its late years as Reedville Oil and Guano, its six as Haynie Products, and now as Zapata Haynie, the company moved away from traditional day-by-day fishing. The industry had depended for many years on fish boats going out in pre-dawn morning to fish all day, then returning in late afternoon or night—sometimes late night—with their catches, to be processed by factory night shifts.

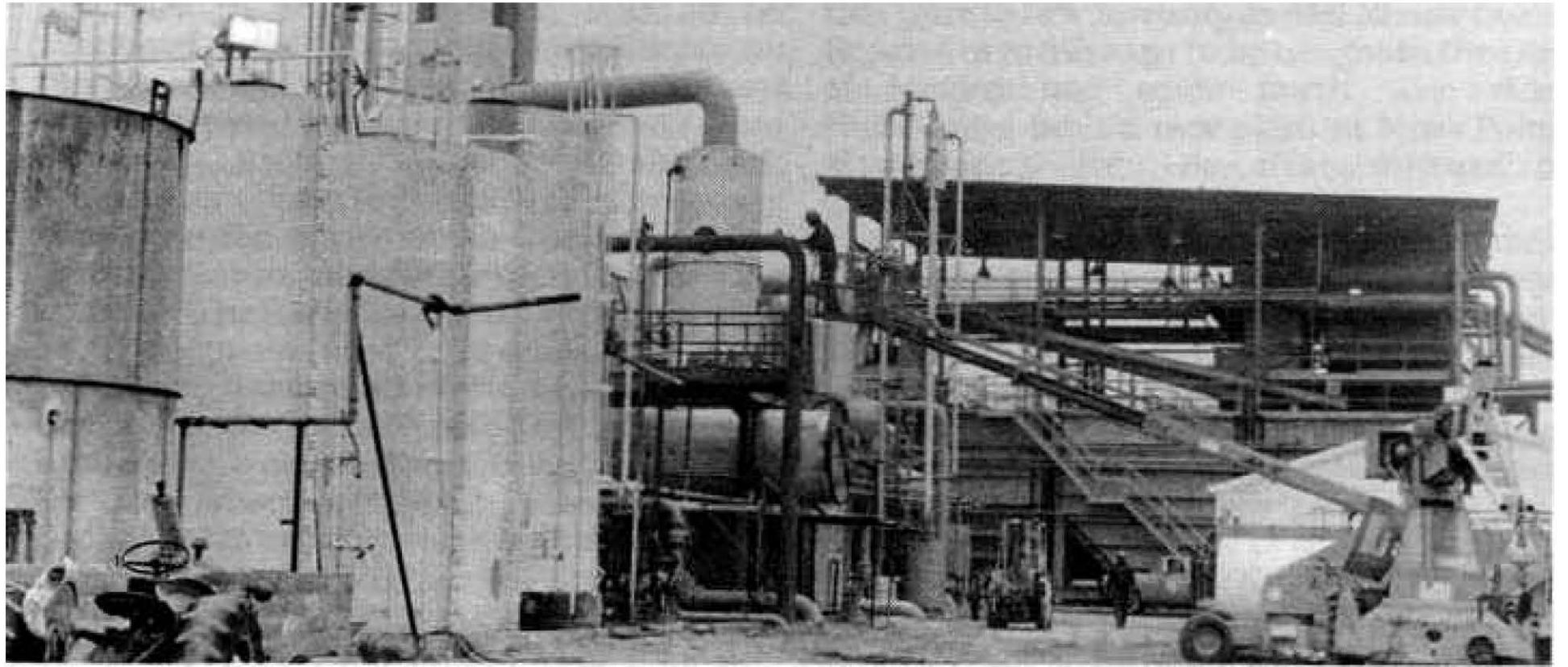
This restricted captains. They had to get back and unload before fish spoiled, and bunkers are fast spoilers. Refrigerated carriers were the key. Refrigerated boats, spraying the holds with near-freezing water to keep the fish fresh regardless of summer temperatures, have been used successfully in the Gulf of Mexico since the early 1950's.

In the 1960's the company began turning to larger boats for Chesapeake Bay. One by one the long-serving wooden boats like the *William S. Brusstar* and the wooden and steel minesweepers and old Coast Guard cutters with capacities of one-half to three-quarters of a million fish were retired. The larger Air Force freighters, build during the Second World War but with many years left in them, were brought to Cockrell's Creek for conversion. These, carrying from a million to a million and a half fish, proved satisfactory. The first, named for Captain Deihl, became recognized as one of the most efficient ever used by the company. Under Captain Leland Robinson, the *John D. Deihl* caught more than one-half billion fish in fifteen years.

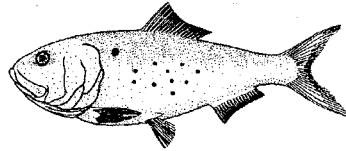
Refrigeration installation began in the 1970's, and the captains were now free to cruise not only Chesapeake Bay but as far up or down the East Coast as seemed profitable. They could come to port in a day if they had full holds, or stay out four or five if necessary.

The company's Wildwood, Cape Charles, and Morehead City plants had given the captains quick access to processing away from Reedville, but now even in the North Carolina fall season, the boats could fish until they had their loads anywhere. The practice meshed and was an essential part of the new company policy of concentrating all East Coast processing at Reedville, and thus all its environmental efforts, with only Virginia and federal requirements to be met.

Just before his resignation, Captain Deihl ventured that the practice would be

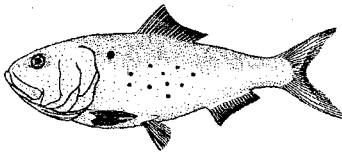






Zapata Haynie's plant at Cameron, Louisiana, one of its largest.

extended in future years, with even bigger carriers capable of staying at sea up to two weeks and holding fifteen to twenty million fish. This, if it happens, will call for further reshaping the habits of fishermen. They have never liked to stay out long, and never have had to. The distant water concepts of European and Asiatic fishermen had always been well outside the American fisherman's thinking, except in the tuna fishery.



A line-up of purse boats ready to fish, at Zapata Haynie's Cameron plant.

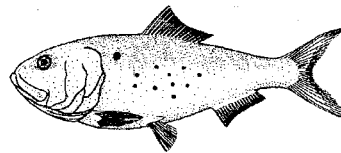
III. "Gravity Never Breaks Down"

What has become the largest menhaden company depending only on its own resources celebrated its fiftieth anniversary in 1978 with a fleet of a score of fish boats, four modern reduction plants scattered from Cockrell's Creek in Virginia to Moss Point, Mississippi, and a record of technical inventiveness possibly a little beyond its number three position in the industry.

Yet Standard Products Company, Incorporated, now operating from what was the last pre-motel age hotel in Kilmarnock, Virginia, and responsible for about twenty percent of the total catch of the fish, started as a small venture, with no more certainty of success than any menhaden enterprise had even in those late days of Coolidge prosperity.

It was April 4, 1928, when H. R. Humphreys, son-in-law of Joseph Foster Bellows, joined with W. R. Rowe and Miss M. Etta Cornelius as stockholders to form a company to take over the bankrupt Lancaster Fish and Guano Company from the Farmers and Merchants Bank of Kilmarnock.

Even in those simple days, menhaden corporate relationships could be complex. Humphreys was still a stockholder in Bellows and Squires, and operator of the shipyard and marine railway at Weems which he and Joseph Bellows had taken over in 1912, eleven years before the latter's death. Miss Cornelius was secretary of the shipyard. Rowe was president of the Northern Neck Mutual Fire Association.



H. R. Humphreys, Sr., who founded Standard Products Company, Incorporated, in 1928 and contributed many advances in processing to the menhaden industry. Humphreys Railway collection.

The new company, with the strangely impersonal name of Standard Products, now had the old Lancaster Fish and Guano plant on Dyer's Creek, near the Bellows and Squires plant, but no fish boat. The ancient *George H. Bradley III*, built in 1871 and the second steam fish boat on Chesapeake Bay and now owned by Captain Ocran Humphreys, was "fishing on percentage." She had been in the Bellows and Squires fleet until the Navy



took her in the First World War, to be auctioned back to her old work afterward, though not for Bellows and Squires. Standard Products leased a second, the *Fairfields*, from Eubank, Tankard, another Kilmarnock company now forgotten. (Cockrell's Creek may have been the center of the Chesapeake Bay fishery then as now, and, then as now, the home of “The Establishment.” But there were half-a-dozen or more companies with their little fleets fishing out of the other creeks on the lower Northern Neck—Dividing Creek, Kilmarnock's Indian Creek, Dymer's, and even the Rappahannock River. Like those on Cockrell's Creek, they came and went.)

The *Bradley* burned in Dymer's Creek in 1929, and her hulk still lies in a cove, encrusted with oysters and, for a few people, with memories of steam. Standard Products replaced her by buying the *R. B. Douglas* and enlarging her to increase capacity from four to six hundred thousand fish. She was renamed the *W. R. Rowe*, for the man with faith in and money for Humphreys. Earlier, the *Elizabeth M. Froelich*, with four hundred thousand deck-load capacity, had been acquired as the first the company actually owned. She was another of the old Bellows and Squires fleet, built originally by Joseph F. Bellows at Pocomoke City, Maryland, for the odd sum of \$4,444.44, and requisitioned for war service.

By 1939, the company had survived the Great Depression and made enough money to think of a new boat. Humphreys and his son, H. R. Humphreys, Jr., called “Peck” then and now, went to Parkersburg, West Virginia, for some good Appalachian oak lumber. With this the *Raymond Humphreys*, with a capacity of five hundred thousand fish, was built and launched at the Weems shipyard to give Standard Products three boats, all owned. But even this small fleet was cut by a third when the Navy took the *W. R. Rowe* for war service.

Despite shortages and rationing, the company, along with the rest of the industry, kept up fishing during the war, with any operations outside Chesapeake and Delaware Bays and Long Island Sound under the threat of submarine attack, even in shoal water.

Young Peck Humphreys came out of his own military service at the end of 1945 and found his father thinking expansion again,

this time to new territory as well as new boats. Reports of menhaden to be caught in the Gulf of Mexico had come north. The elder Humphreys built a new plant at Moss Point, Mississippi, for the first venture of Chesapeake Bay companies there.

Standard Products had now become a father-son enterprise. The senior Humphreys stayed at Moss Point to manage the new plant, while Peck ran the Chesapeake Bay fishing and the plant on Dymer's Creek, in the tiny settlement of Ocran at the end of a tangle of back roads that always threaten to leave a stranger lost in a loblolly pine forest or a marsh. On the other side of the creek, not far away, were the ruins of the old Bellows and Squires plant, idle since its purchase in 1936 by J. Howard Smith, Incorporated, to get its boats, but still a reminder of the Bellows blood in the Standard Products veins.

H. R. Humphreys died at Moss Point in May 1952 at the age of sixty-nine. H. R. Humphreys, Jr., Peck Humphreys, became president of the privately held corporation. His brother, William Lorenzo, managed the Moss Point plant until his death in 1954, and their elder brother, Foster, a marine engineer, managed the Dymer's Creek plant until his death in 1963.

Expansion also was going along on Chesapeake Bay. Standard Products bought two of the three McNeal plants on Cockrell's Creek—McNeal, Dodson Company and McNeal Company in Fairport in 1952, to add four boats to the fleet, up to now including only the *W. R. Rowe*, the *Elizabeth Froelich*, and the *Raymond Humphreys*. The additions were the *G. H. McNeal*, the *William T. Covington, Jr.*, the *A. Vernon McNeal*, and the Bellows and Squires favorite, the *Joseph F. Bellows—Big Joe*. She had gone to McNeal, Dodson in the Navy's post-war auction. The McNeal, Dodson property is the site of Standard Products' present main plant.

Four years later Standard Products moved in another direction—to the North Carolina fishery, which seemed to hold more promise than had been exploited in the ninety years since its start after the Civil War. A plant at Lennoxville, near Beaufort, was purchased from Judge Lambert Morris, rebuilt, and enlarged to the point that by the late 1970's it was the most modern there, with a capacity of

twenty million fish a week. The Standard Products fleet from Chesapeake Bay caught seventeen million the first fall season there.

Further development of the North Carolina fishery by the company came in 1964, when the Brunswick Navigation Company of Southport, the state's other major center for menhaden, was purchased, to add five converted minesweepers to the fleet. These were the *H. W. Anderson*, the *Brunswick*, the *Cozart*, the *Cape Fear*, and the *John M. Morehead*. And at Morehead City, the plant of Robert W. Taylor and Company, with a history back to the beginning on Core Sound, was purchased the same year, and processed fish until 1975; it is now a warehouse. This rounded out North Carolina expansion except for a herring and roe plant at Edenton, bought in 1965 from Chowan Processing Company.

In 1965 and 1966 Standard Products took on the corporate shape maintained through the 1970's with the purchase of two more Chesapeake Bay companies, the first the Menhaden Company with its *William Blundon* and *Belford*, then the last of the McNeal companies, McNeal, Edwards. The company meanwhile modernized and expanded the old McNeal, Dodson plant and in time shut down its original Dymer's Creek plant except for storage of fish meal and oil.

Thus in 1966 Standard Products and Reedville Oil and Guano, across Cockrell's Creek, stood as the survivors of nearly a century of menhaden enterprises on Cockrell's Creek. They were the last and strongest of the fifty or more companies that had risen and fallen within sight of the village of Reedville, and of others on both sides of Chesapeake Bay, the Virginia seaside, and even in Maryland, since the middle of the nineteenth century.

Reedville Oil metamorphosed into Haynie Products, then Zapata Haynie. Standard Products continued Standard Products, subsidiary of no one, almost in the tradition of the days on the Atlantic islands and on Chesapeake Bay when Captain John W. Bunting, Elijah Reed, Albert Morris, the McNeals, Wilbur Edwards, Joseph Bellows, George Squires, and many others could raise money, get boats, and fish.

Hanna Raymond Humphreys, Sr., brought to the industry his personal drive, ambition, and competitiveness, and also his

constant hunt for better ways to fish and handle fish. He gathered about him other inventive men, afloat and ashore, to carry out his own ideas, or equally likely, to work out their own. Other advances developed by Humphreys or his associates included putting gasoline engines in purse boats in the 1930's to end the labor of a dozen to sixteen men pulling on three- and four-man oars, power davits launching and picking up purse boats, and a super decanter in the factory to separate press liquid from fines for centrifuging of oil. This replaced settling tanks and speeded oil production.

It was probably his mother who turned Humphreys to engineering. Strangely for the nineteenth century, she had a degree in civil engineering from the University of Dublin. He himself got only a high school education in Salisbury, on Maryland's lower Eastern Shore where he was born September 5, 1882. But as a young man he followed his mother's inclination by reading technical and industrial publications constantly, especially on engineering subjects.

After getting his high school diploma, he learned the carpenter's trade and by the time he was twenty, he was a home building contractor. Then he became a construction engineer for the Chesapeake and Ohio Railway, working from Newport News, Virginia, to Hinton, West Virginia.

When he was twenty-two, in 1904, Humphreys married Ida Bellows, one of Joseph Foster Bellows' seven daughters, and kept his railroad job. Their first son, Horatio Foster, was born the following year. A year or two later he went to work for his father-in-law, in the planing mill of the Bellows and Squires fish factory a mile from Ida's birthplace. This was his first exposure to the menhaden fishery, and the boat aspects interested him. In 1910 he went to work at a marine railway on Carter's Creek, in the village of Weems a few miles away on the Rappahannock River side of the Northern Neck. Two years later he and his father-in-law bought out Walter Brewster's interest in the railway, and Humphreys, now thirty years old, got to exercise his inventiveness at his own risk.

This he did, meanwhile maintaining his activity with Bellows and Squires until after the death of Joseph Foster Bellows in

April 1923. In 1927 he became manager of the Morris, Fisher plant at Reedville, and in the following year moved out to put his ideas to his own benefit by organizing Standard Products.

His engineering sense, developed at Bellows and Squires, at Morris, Fisher, and now in his own plant, led Humphreys to a practical theory of processing: "Get the fish high and let them fall to the next step." Likewise, when moving oily water mixtures, he avoided emulsification by using gravity whenever possible instead of pumps that would "beat the oil and water together." Comments by others dependent on conventional pumping processes always drew the response: "Gravity never breaks down."

Even with the added responsibilities— and always unexpected complexities—of a new company, Humphreys kept up full attention to his railway. There were dozens of marine railways, large and small, along Chesapeake Bay creeks, but this was one of the largest and one with long experience with the menhaden fleets.

It had been started in 1905 by Thomas and Crittendon, who sold it later to Henry Brusstar of Baltimore and George P. Squires, Joseph Bellows' partner. It now could handle boats of up to 125 tons, and Brusstar and Squires saw it as a repair yard for their own boats, as well as a service available to others.

It was now the only Chesapeake Bay shipyard between Baltimore and Norfolk, sixty or more miles north and south, and Humphreys also saw it as one to build menhaden fish boats, one where he could try out his own ideas. By a few changes in the length and beam of what had come to be a standard design, he increased the capacity of the boat named for himself and built in 1919 by one-fourth.

A series of boats was built to restore the Bellows and Squires fleet so depleted by requisitions for service in the First World War. The one-hundred-foot *Martin* and *Lancaster* were built in 1917, the *Richmond* and *Swanson* the following year. The enlarged *H. R. Humphreys* was 130 feet long, the *Little Joe* in 1921 and the *Annie Dow* in 1923 were 134 feet. In 1942 the yard had another wartime assignment, to change over for mine-sweeping and patrol work the menhaden boats that had been requisitioned for the

Second World War. After the war it reconverted them to their original use.

The marine railway has continued as the only one capable of hauling out fish boats between Norfolk and Baltimore. For a number of years in the 1960's and 1970's Captain John B. Lowry, operating an independent fleet of three former minesweepers, maintained a large drydock in a cove of Cockrell's Creek, mainly for his own boats, but also serving Chesapeake Bay and Potomac River grain and freight boats. However, the drydock, which he had towed from New York's Bethlehem Steel shipyard, was sold again in the mid-1970's, to leave the Humphreys railway as the only facility of its kind in the mid-Bay area. The railway also did extensive conversion work for other fisheries. A number of former J. Howard Smith fish boats, over-aged or otherwise surplus after the company's sale in 1975 to Hanson Trust Limited of England, were rebuilt and rerigged for ocean clam dredging. And an occasional large yacht, sail or power, was brought in for repair or rebuilding. Then, as Standard Products began phasing out its own aging minesweeper fish boats, the railway handled conversions of the larger military transport type to enable them to carry one and one-half million fish or more.

The later boats likewise were refrigerated so that they too could stay at sea longer and would have to depend no longer on fish to be caught close to the factories. Having pioneered in this on the Gulf of Mexico, Standard Products was able to draw on longer experience than other companies. Some observers asked why the pioneer had not done it first on Chesapeake Bay, and the answer seemed to be that the economic geometry of the 1960's and early 1970's indicated more profitable operation from short runs with smaller fish boats "hauling less air." Rising fuel costs, if nothing else, tended to point up the necessity for the gradual changeover.

Whatever, the chances are that Hanna Raymond Humphreys, Sr., would have backed his son to the limit in the decision. Perhaps with his inventive mind, he might have come up with something better—more efficient refrigeration or, who knows, some exotic new technique for keeping the fish firm to the raw box.

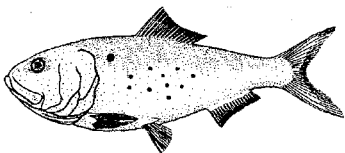


IV. Fifty Years Too Soon

Every industry has its man who came too soon, had too many ideas and spent too much money trying them out, went broke, and died with little to show—except the foundation he left for others. Such a man was John Armistead Palmer, Jr., a one-time bank cashier who moved into the menhaden fishery in 1912 and set off advances that seemed to die before he did, yet now have become vital parts of the industry and fishery.

This versatile man, who also played professional baseball in the old Federal League (he had been captain of his team in his one year at the College of William and Mary), introduced an unready, possibly unwilling, industry to aerial spotting of fish, generation of steam by oil rather than coal, refrigeration of fish holds, and in some measure use of fish scrap for stock feed rather than fertilizer. He also started research into recovery of solids from stickwater, now done in production of solubles, and in putting engines into purse boats and finding some mechanism to apply power to purse nets, now done by power blocks.

All this was in the 1920's, when the industry seemed in some sense still in the nineteenth century, heavily dependent on more manpower than it could afford with its "boom and bust" history, its record of companies opening one season, closing in another when the fish were somewhere else. Almost all seemed convinced that if they made money



John Armistead Palmer, Jr., whose "too many good ideas" put him fifty years ahead of the menhaden industry. Palmer family collection.

this year, they would make it endlessly, with no need for reserves.

John Palmer was born in Kilmarnock, Virginia, May 6, 1877, a son of John Armistead Palmer and Louise Worthington Palmer. As a young man he served in the Spanish-American War. In 1904 he married Constance Elder of Lynchburg, Virginia, who had come to teach at Reedville, Virginia's menhaden capital, after graduation from Randolph Macon Women's College in 1903. In the first decade of the new century he went into banking, in L.E. Mumford's Northumberland Bank of Reedville. The Northern Neck of Virginia had no banks of its own—indeed, depended on steamboat pursers to make deposits and cash checks in Baltimore—until the Mumfords came from the Eastern Shore in 1902.

By 1906 young Palmer was cashier, later president. In 1912 he turned to menhaden, with C.E. Davis Packing Company in Fairport, just down Cockrell's Creek. Davis was one of the bigger companies, with five or six steamers. Palmer became general manager by 1915 in his own drive to provide a good life for his family, in time to include eight children.

During the First World War it was enough for any menhaden company to keep going. The Navy needed boats for minesweeping and patrol duty and the Chesapeake Bay companies, like those everywhere, were asked for their best. Davis sent the *Warren J. Courtney*, *M.M. Davis*, and *John A. Palmer, Jr.*

This set off events that after the war made it possible for Palmer to see what his company could do with rapid communication with its fish boats and try out his idea of finding fish from the air. Palmer took the three fish boats to the Norfolk Navy Yard and reported to the commandant, Rear Admiral W. McLean, who told him to take them to Lambert Point to be coaled. He loaded about one hundred tons and Davis, to Palmer's surprise, was billed. The Navy had paid around ninety thousand dollars apiece for the boats, but loss of their use was costly and Palmer thought the coal bill out of order. After the war he took the claim straight to the Secretary of the Navy, Josephus Daniels (mere citizens could go to the top in those simple days!), and Davis eventually was paid for the coal. Palmer's

eldest son, John A. Palmer III, waited in Daniels' outside office while the deal was made.

This was the start of a relationship that later made possible the purchase of surplus Navy wireless sets and in time the loan of a Navy flying boat for experimental fish spotting. The wireless sets were to try out Palmer's idea of rapid communication. One set was installed in a special room at the factory, filled with the bulky transmitting equipment of the day, and a tower and antenna were erected outside. Other sets were installed in at least two fish boats, with wireless shacks abaft the smokestacks.

The idea was simple and revolutionary. Factories did not know how the catch was going until the fish boats came in and the captains reported in person. The Davis boats now could tell in Morse code, from out in the Bay, how many fish they had and how soon they would be at the dock. The factory then could get steam up in the boilers and have men ready to rush the fish to the cookers quickly without further spoilage; there was enough spoilage in transit—a problem John Palmer was to tackle later.

With rapid communication, even if clumsy as compared with today's instant and endless voice chatter, proven possible and useful, John Palmer moved logically to his next idea. He had concluded that Chesapeake Bay bunkers were really too deep most of the time for the captains to spot them efficiently in the traditional way from the crow's nest, and also that the fish boats would have to range farther, even outside the Bay, to find fish and thus needed quick information on distant schools.

Palmer was no pilot himself, in fact probably never flew. But a man named Taft had brought a two-place Curtiss flying boat to Reedville to take up passengers for a dollar a minute. As Palmer watched the kite-like *Kingfisher* taxiing on Cockrell's Creek and circling over the menhaden factories and nearby Chesapeake Bay shore, he got to thinking what could be done from the air. With his experience in negotiating with the Navy, he worked out an arrangement in 1920 for the Navy to supply a flying boat, larger than the *Kingfisher*, and a pilot. The Navy treated it as part of its pilot training program, and the federal Bureau of Fisheries cooperated. The

two-wing craft, a seeming tangle of wire stays and struts holding together fabric-covered wings, had a water-cooled pusher engine, never too reliable, and the pilot was reluctant to go more than one hundred miles from Norfolk, and refused to get out of sight of land.

John Palmer turned to Jack Harding, a veteran fisherman, to go with the pilot and see if he could find fish from the air. Harding had worked in a munitions plant in Hopewell, Virginia, during the war, and in this post-war period he found himself, like many others, with nothing to do at the age of twenty-six. He listened agreeably to John Palmer's proposition.

Harding was courting at the time, and he had the pilot circle the home of his fiancée, Florence Carey, with a predictable reaction.

"I thought he was the biggest fool in the world," it was recalled in 1977 by Florence Carey Harding, now his widow. "They crashed once near Tangier Island, but there wasn't much damage to the plane."

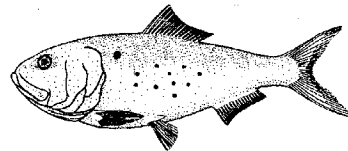
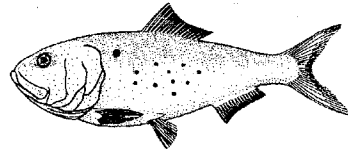
For the experiment the Bay was charted into small areas, and Harding marked the location of schools as they sighted them. He brought reports back to Reedville and the information was tapped out in Morse to the *M.M. Davis* and other Davis boats equipped with wireless.

"Jack thought it a wonderful thing," Mrs. Harding said, "but it was expensive and they didn't continue it after one season."

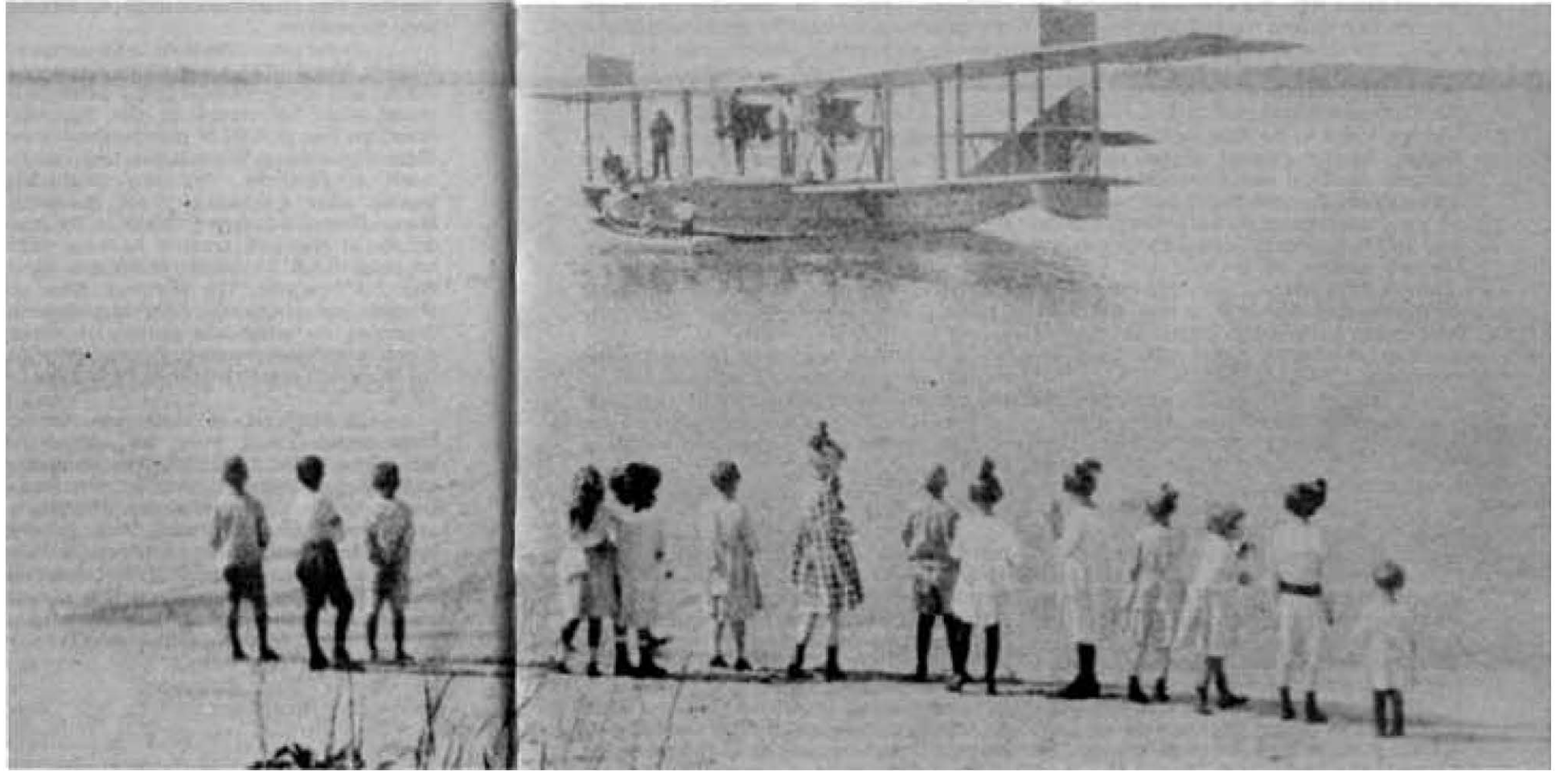
Although only Davis boats could receive Harding's reports, captains in other fleets soon learned to watch those Davis boats. If one wheeled around suddenly and steamed away under a "jingle bell," other captains knew it was heading for fish and they followed.

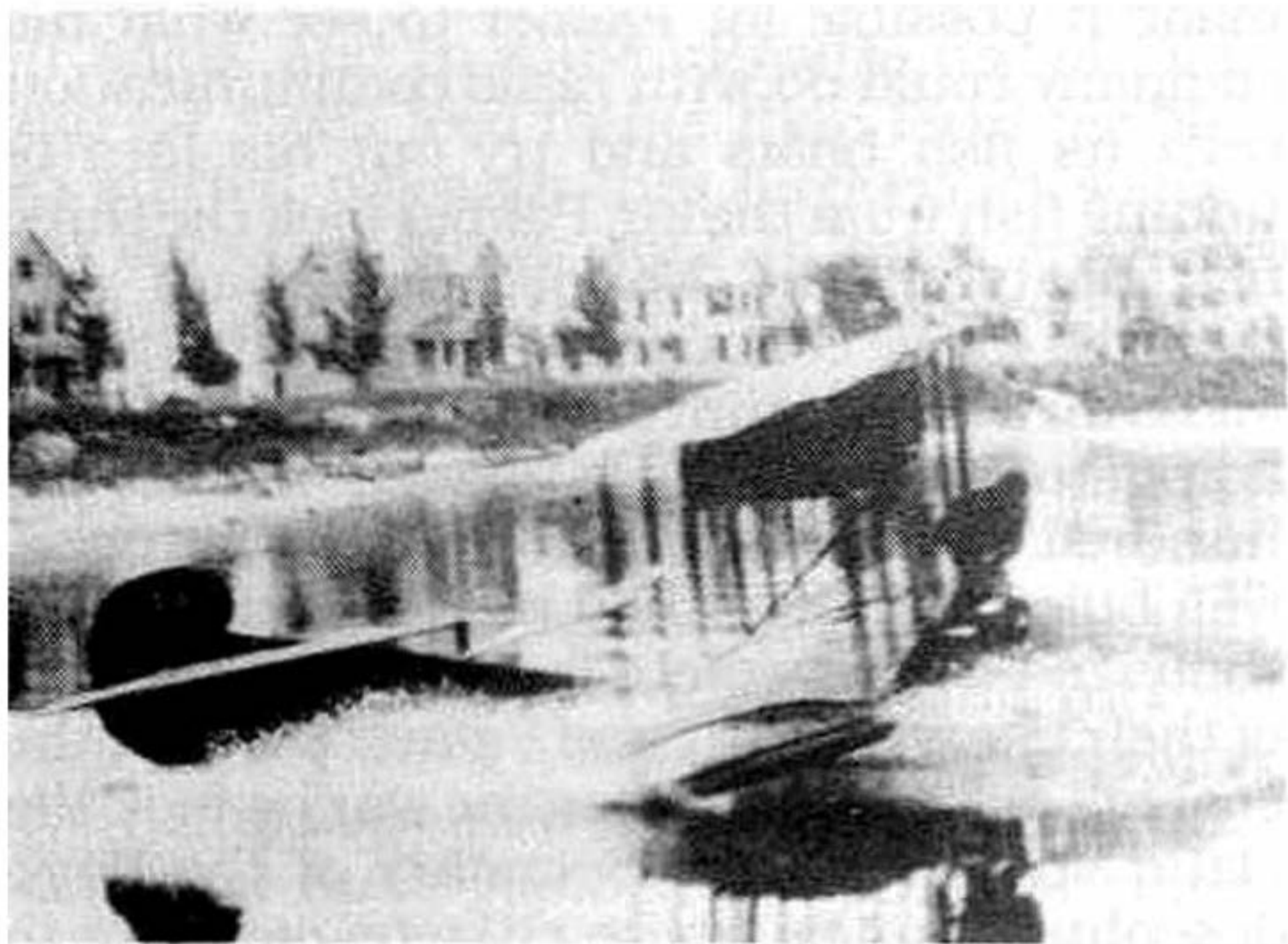
Ten years later a report of the Bureau of Fisheries, by Roger Harrison, called the results "very encouraging" but said the experiment ended when the Navy was "convinced that the practicality of such a means of locating fish had been established." It had for the Navy, but not for the industry. It cost money and nobody was sure yet the airplane was here to stay.

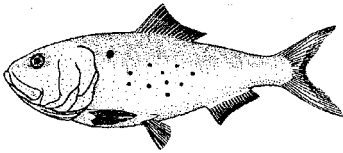
About this same time, John Palmer thought of getting into the menhaden business for himself. In 1921 he organized The Palmer Fisheries, Incorporated, at Reedville, with R. B. Moore, an associate in his other



The *Kingfisher* taxiing on Cockrell's Creek. Palmer family collection.







The kids on the beach gazed at the *Kingfisher* with amazement. John Palmer gazed at it with an idea that it might help spot menhaden schools. Palmer family collection.

business selling engines and marine equipment, and Albert Ernest Beitzell of St. Mary's County, Maryland, a one-time master of Potomac River schooners.

Ernest Beitzell had made a fortune of half-a-million dollars in the wholesale liquor business and a theater chain in Washington. Part of the Beitzell family already had taken root in Virginia's Northumberland County, across the Potomac from St. Mary's County, after the Civil War, and Ernest thought John Palmer's venture might be a provident use for

his fortune. The liquor business had been ended, at least for him, by Prohibition.

They built a factory at Fairport, just west of Timbs' Wharf, upstream from the Davis plant. They had one fish boat, the *Louise*, built at Milford, Delaware, and named for daughters of both men, and later bought an idle Grand Banks steam trawler, the *Gloucester*.

In these two boats John Palmer's ingenuity was put to use. The hull of the *Louise* was towed to Baltimore for installation of an oil-burning water-tube boiler and a one thousand horsepower, triple-expansion Portland steam engine taken from a U. S. Shipping Board ship, the *Caponka*, which Palmer bought for ten thousand dollars. A

second boiler from the ship was installed in the new factory, and the hull later was sold.

The *Gloucester* had been laid up for four years. In February 1922 Palmer and his son John III and fifteen men went to get her at Boston, then found she was at Gloucester. They had her towed to the Atlantic Works in East Boston, hauled, cleaned of six inches of barnacles, and put overboard again for firing up for steam. The men pulled manhole covers on her three-furnace Scotch boiler but could find no new gaskets in Boston. So they soaked the old gaskets in graphite and oil and reinstalled the covers. They fired the boilers, then discovered that all water lines and tanks were frozen solid, but they figured they could make it to Virginia with water from the evaporator.

They got up steam, but when the main stop valve was opened, steam spurted everywhere to fill the engine room. They found that when the ship was laid up, a drain hole had been drilled at the lowest point of each steam pipe. The holes were tapped and plugged after the boiler fires had been pulled. A couple of days later, steam could be raised again.

The engine throttle valve was opened but nothing moved. A steel disc was found between the steam line and throttle. With that removed the engine finally turned over. Two days of test runs about Boston harbor with a compass adjuster, and she was ready to head for Virginia, the water pipes and tanks still frozen. As they passed Virginia's seaside town of Chincoteague, the pipes finally thawed. The *Gloucester* was taken to Solomons, Maryland, for remodeling of deck houses and, more important, installation of oil burners for the engine.

The two boats thus became the first in the menhaden fishery to burn oil—and Palmer thought enough of it that he made his new factory the first to use oil in both boiler and rotary dryer. Oil burning generally was another fifteen years ahead in the industry.

Palmer further had come to a conviction that refrigeration was essential. The *Louise* had come home from her maiden trip up the New Jersey shore in mid-summer of 1922 with the fish in bad shape and with serious loss in yield of scrap and oil. He reasoned that if boats were to go that far, they had to have refrigeration to keep the fish in

condition. Thus, he installed a steam refrigeration system on the *Louise* and after it proved successful, added one on the *Gloucester*.

The system involved ammonia-cooled coils in a brine tank, which also had coils circulating bilge water, with make-up from sea water. Water at forty degrees Fahrenheit was pumped from a false bottom under the fish hold and sprayed on the fish, to percolate through them and return to the false bottom. Installation cost was estimated then at six to seven thousand dollars, with five to ten dollars a day to operate it. This was reckoned a trifle against the two to three hundred dollar daily cost of operating the steamer.

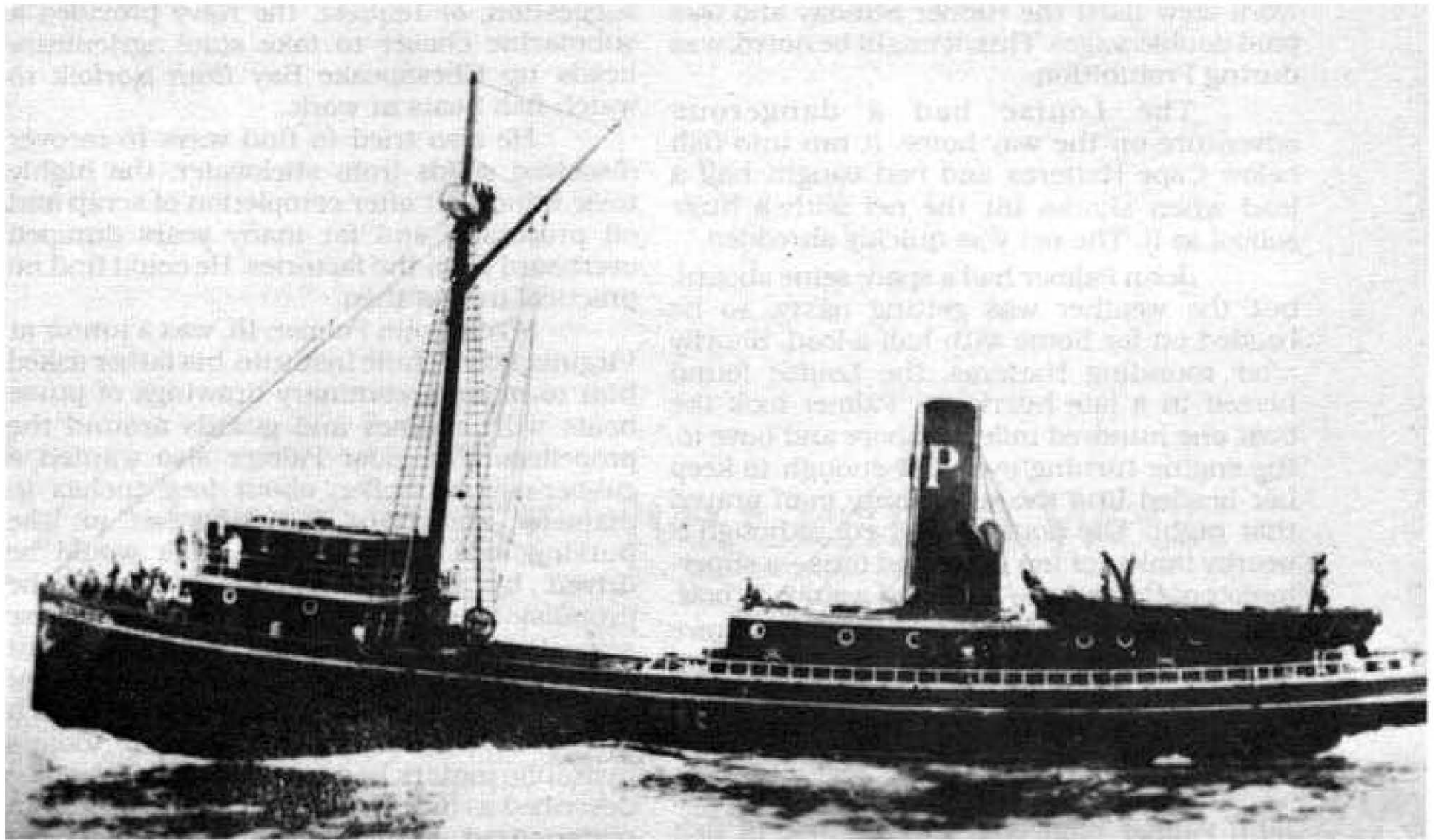
That first trip of the *Louise* "up the beach" was remembered well by Edwin W. Beitzell, a nephew of Ernest, in his book, *Life on the Potomac*. Palmer himself was the captain, one of the few factory men ever doing actual fishing, by Beitzell's memory. A son, Randolph Palmer, recalled the captain as Joe Bowen.

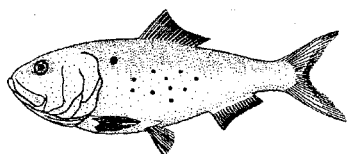
"It was a wonderful trip," Edwin Beitzell wrote, "with five meals each day, which a boy of fifteen could really appreciate. . . . But the voyage of the *Louise* marked the beginning of the end, for in the ten day cruise less than a hundred thousand menhaden were caught, which didn't pay the fuel bill, and the fishing steadily worsened."

As they left Cockrell's Creek, the *Louise* got into heavy seas, and the boy was rolled off his pallet in the captain's cabin. He spent most of the voyage in the crow's nest but had one regular duty—to pick the few bluefish out of the catch for the galley. "And did we eat!" he added. "The best of everything in huge quantities three times a day, with coffee and snacks at mid-morning and mid-afternoon."

Successive bad seasons, coupled with the cost of John Palmer's advances ashore and afloat, gave The Palmer Fisheries the fate of so many other menhaden companies. Ernest Beitzell turned successfully to the seafood business. He refused to take bankruptcy and planned always to pay off stockholders, mostly family and friends, but was unable to do so before his death in 1942, eleven years after Palmer's death.

Edwin Beitzell recalled his uncle as "a contrary, stubborn damn Dutchman with





The *Louise*, the menhaden fishery's first oil-burning, refrigerated fish boat, a product of John Palmer's ideas. Palmer family collection.

many sterling characteristics." As befitting a man who had grown up under sail on the Potomac, he was that stubborn, and probably more so. An old friend once said, "When Ern had the sail bent on and a fresh breeze behind him, even Captain Jiggs of the Horse Marines had better give him room to come through." A brother added, "He would load his schooner to the gunwales, caulk the hatches, get on every piece of sail possible, and with water in his scuppers, take off for port."

In the few years of The Palmer Fisheries' life, John Palmer naturally generated stories. He was a hunter and owned a fine Belgian Francotte shotgun, among others. Once on a fall trip to the North Carolina grounds, he saw a flock of geese high overhead. He took his Springfield rifle out of the pilot house and fired. One goose spiraled straight up, then fell into the Atlantic Ocean. Palmer knew he must have hit the bird's head and sent a crewman in the striker boat to retrieve

it. He told the hand not bring the bird back unless it had been hit in the eye. It was, and the crew was convinced that he could make such a shot any time. That shot may have been a lucky one, but John Palmer brought home twenty-five birds from one box of twenty-five shells on many a hunting season trip to the fields or marshes.

John Palmer, III, recalled another time when all other boats had "cut out" late one fall, but his father took the *Louise* for one more trip south. They had gone as far as Cape Fear, North Carolina, when the rudder jumped out of the shoe. Palmer managed to get the boat to Charleston, South Carolina, and its Navy Yard. It was a Saturday and the captain in charge told him he couldn't haul a commercial vessel without permission from Washington, which had already closed for the weekend.

Palmer returned aboard and thought, then sent a crewman into town for "a goodly supply of spirits." The captain was invited aboard to be sociable, and in time, he mellowed to the point of saying, "To hell with Washington—if you will pay the workmen I will haul your boat out tomorrow morning." A

work crew fixed the rudder Sunday and was paid double wages. This, it might be noted, was during Prohibition.

The *Louise* had a dangerous adventure on the way home. It ran into fish below Cape Hatteras and had caught half a load when sharks hit the net with a huge school in it. The net was quickly shredded.

John Palmer had a spare seine aboard, but the weather was getting nasty, so he headed on for home with half-a-load. Shortly after rounding Hatteras, the *Louise* found herself in a late hurricane. Palmer took the boat one hundred miles offshore and hove to, the engine turning over just enough to keep her headed into the seas. Every man prayed that night. The *Louise* survived, although a nearby tanker of ten thousand tons—a super-tanker of those days—suffered a stove-in bow.

"We were convinced that they were saved by an Act of God," John Palmer, III, said many years later. "If the sharks hadn't kept them from loading the boat, they never would have made it through the night."

Among other technological advances John Palmer pioneered was the use of fish scrap for meal to be added to stock feed. John Palmer, III, recalled that he probably was "principally responsible for getting the [U.S.] Department of Agriculture to promote the use of fish meal as an animal feed rather than as a fertilizer."

"Tests run by the department confirmed that very little of the fertilizing value was lost in passing through the animal," he said. "The hog raisers in the Middle West were especially happy with the increase in bone strength obtained by feeding controlled amounts of fish meal."

Here again he used his charm. At his

suggestion, or request, the Navy provided a submarine chaser to take state agriculture heads up Chesapeake Bay from Norfolk to watch fish boats at work.

He also tried to find ways to recover dissolved solids from stickwater, the highly toxic liquor left after completion of scrap and oil processes, and for many years dumped overboard from the factories. He could find no practical means then.

While John Palmer, III, was a junior at Virginia Polytechnic Institute, his father asked him to make preliminary drawings of purse boats with engines and guards around the propellers. The elder Palmer also wanted a rubber-covered roller, about four inches in diameter and eight feet long, set on the pursing side gunwale. The roller would be driven by gears and clutches from the propulsion engine, to help haul in the purse seine. Before the young man could work it out on paper, poor fishing forced retrenchment and the idea was dropped. The idea, which might have been feasible then if today's hydraulic motors had been available, could be described as one that after another World War, materialized in development of the power block now standard on all purse boats.

The Palmer Fisheries, Incorporated, finally had to go out of business in 1927, and John A. Palmer took his family to Seattle, where he represented the Renneberg press maker on the West Coast for two years. Then he returned, in ill health, to Baltimore, where he died in 1931, only fifty-three years old.

Perhaps he might be happy to return today and hear both factory executives and fish boat captains say of one modern standard practice or equipment or another, "Yes, John Palmer thought of that a long time ago... and we were a long time coming to it."

V. From Sixty-Five Cents a Week

In 1898 Charles S. Wallace, then thirty-four years old, should have thought of himself, by standards of the time, a settled man. He had been married for eight years, he owned his own business, and Morehead City was becoming not only North Carolina's leading seafood center but one of the nation's, in time to rival New England's Gloucester.

But it was a restless time, the year of the short Spanish-American War, a time of expansionism and Manifest Destiny. The United States was coming out of the cocoon of a century. Charles Wallace looked about for new uses for his energy, though most men would think running one of the largest seafood packing and shipping firms in town enough.

It was possibly natural that he turned to the then-still-uncertain menhaden fishery. He had been born in Portsmouth Island, on North Carolina's Outer Banks, December 2, 1864, in the last year of the Civil War, to a family headed by a man who had been bar pilot for Ocracoke Inlet, a major port of entry, until the war, then a fisherman supporting his family from the sea and sailing oysters and salt fish across Pamlico Sound to the town still called "Little" Washington. This man was Captain Robert Wallace, now fifty-five, great grandson of David Wallace who had helped pick a site for a lighthouse in Ocracoke, and son of John Wallace, one-time "patrol" of Portsmouth and overseer for the Portsmouth District.

Portsmouth Island was controlled by

Union troops, and the people endured hard times. The occupation forces often requisitioned, or as the people saw it, stole their chickens, pigs, and other stock. The activities of two sons, Sam, as a blockade runner, and Robert, as a Confederate artilleryman, may have made the Wallaces a special target.

The family traced its ancestry for six generations to Robert Wallis, who brought his wife Rebecca and a dozen other persons from Scotland to a seven hundred-acre grant in York County, Virginia, in 1642. David Wallace was the first to spell the name other than Wallis. Scottish pioneer endurance persisted, and the Wallaces survived.

Young Charles grew up during Reconstruction, when living was little if any better, and helped sail his father's cargoes across the sound and to bring back flour and staples. Charles also tended sheep and sheared the wool for clothing.

When the boy was twelve, Robert Wallace took the family to Morehead City to try for better living. There Charles got a job in William L. Arendell's fish house. He was paid sixty-five cents a week, a help in a struggling family.

During his teens, Charles came to know the fish business well. When he was nineteen, Daniel G. Bell, another seafood man, hired him and he soon became "Dank" Bell's "right hand man." In 1890 he married Nina Webb, and Bell raised his pay to one hundred

dollars a month, a handsome salary for the day.

Five years later Bell died and the young man had saved enough, borrowed enough, and learned enough to buy the business. It had the best of prospects. It was already doing well, and Morehead City now had rail and telegraph service for marketing, and in 1898 an ice plant to improve packing and shipping.

The "Chas. S. Wallace" fish house continued to do well. Wallace owned sailing "buy boats" which cruised the sounds and coastal areas for fish, oysters, and other seafood to be shipped from Morehead City. He found that shrimp, so plentiful in North Carolina waters, could be shipped, and Wallace became the first to do so commercially on the Atlantic Coast.

But on Core Sound and Harker's Island and at nearby Beaufort were half-a-dozen small factories cooking and pressing "fat-backs," the oily, bony fish the Yankees called menhaden, bunkers, and pogies. Some factories seemed to be making money, although the industry had had a spotty record in North Carolina—as elsewhere—from the time C. P. Dey, the engineer of the federal troop train, had seen schools in the Neuse River from his cab during the war. Only a dozen years earlier one operator had gloomily told George Brown Goode there was no way the industry could make a go of it in North Carolina.

Charles Wallace decided to try it in 1898. He built a small "hand factory" on Crab Point, across Calico Creek that flows along the north side of Morehead City. Menhaden, measured 3.3 barrels to the thousand fish, were cooked in large vats, then put through hand batch presses to squeeze out the oil for settling. The solid cake or scrap was spread on raised boards for sun drying, with tarpaulins hastily thrown over when rain threatened. When dry, the scrap was to be sold to farmers for fertilizer. The whole operation was along lines used in New England and Chesapeake Bay throughout the nineteenth century.

But fish boat skippers found it difficult to sail up the creek to the plant. Getting oil and scrap back to Morehead City for shipping was no easier. Charles Wallace wrote it off to experience after a year.

In 1900 he found a better site, near the village of Smyrna, on Jarrett's Bay, an arm of lower Core Sound, and built another hand

factory. His small fish boats cruised the shallow water of Bogue, Core, and Pamlico Sounds. The fishermen were in waist-deep water as much as out of it. They jumped overboard to haul seines by hand and load fish aboard.

The venture was more successful. In time he was able to add a boiler and small rotary flame dryer, and eventually steam-driven screw presses. Instead of fishermen shoveling their catch out, bucket or leg elevators unloaded the boats. Gasoline engines replaced sails, and around 1912 purse seining ended the "jump overboard" haul seining.

By 1911, the business had grown beyond a one-man operation. Wallace, his brother-in-law William M. Webb, and E. A. Council of the Marine Bank in Morehead City formed Wallace Fisheries Company, with capitalization of fifty thousand dollars, ninety percent of the stock held by Wallace himself, and another hand factory was built just west of Morehead City on Bogue Sound.

This too went well, and five years later Charles Wallace tried to expand in another area, with a factory built on Casey's Island, on the Pamlico Sound side of Portsmouth Island, his birthplace. William Webb, John Morehead, and two Wilson, North Carolina, men, Thomas Washington and W. T. Anderson, joined him in the new Portsmouth Fisheries Company. The plant was close to fishing grounds, but more than thirty nautical miles, by barge, from Morehead City shipping terminals. The venture there lasted a year, then the equipment was taken to Southport to set up a factory that operated until 1933.

By 1918, the Bogue Sound plant had added a continuous steam cooker and screw press to speed production. A mechanical drag brought fish from the dock dump to the factory raw box.

Just before the First World War, Wallace began using larger fish boats, some with gasoline power. Two-masted schooners still sailed, but with auxiliary engines. At the Smyrna plant boats with cabins aft and a mast and boom forward for easier bailing of fish were used. The largest boat was the sixty-five-foot *Sickle*.

The Smyrna plant itself was improved further. Dump cars, dragged up an incline by a

horse- or mule-driven winch, later steam-driven, carried the fish from the dock to the raw box. Both dry and acidulated scrap, the latter a press cake treated with sulphuric acid to keep flies away and prevent later maggot infestation, were produced. Oil was put in barrels for shipment. All factory supplies, including coal for dryers and steam boilers, had to be hauled there by barge, and scrap and oil back to Morehead City. Rising costs finally forced closing the plant, but not until it had given Wallace and his company thirty years of service.

In the post-war period Wallace Fisheries continued to improve its fleet as well as its plants. At first the largest craft, the sixty-five-foot boats, towed the purse boats, but as others from eighty-five to one hundred feet long were added, davits were installed so that the purse boats could be carried at better speeds and with less risk of damage. The first boat with davits was the *Southland*.

Wallace experimented in other directions during the 1920's. At a time when almost all fish boats to the north, on Chesapeake Bay, along the mid-Atlantic coast, and on Long Island Sound and in New England were still steam-driven, he put in eighty-horsepower diesels, later one hundred horsepower, with compressed air starting.

He also picked up a gasoline-driven, 110-foot submarine chaser, surplus from the First World War, and converted it to menhaden fishing. After the Second World War, many menhaden companies followed the example, mainly with minesweepers.

Other improvements afloat included a power hoist for the dip-net bailing fish from the purse seines, and a pursing engine in the captain's boat to end laborious hand pursing. A Hickey engine was equipped with double cat-heads to wind in the line, and with this it was found that bigger cotton nets could be used.

Outside the industry meanwhile an important advance had come, and in time it would end selling fish scrap cheaply for fertilizer. Feed companies discovered what a number of farmers and individual millers already had found out, that fish meal was a good protein additive not only for stock but for poultry feeds. Ralston Purina and Quaker Oats Companies are credited with pioneering, but the origin may have been in an order to Wallace

Fisheries from the Weimar Republic government in Germany during the late 1920's for two small shipments of meal as a substitute for another protein product in swine feed. The orders came not long before printing press inflation destroyed the Weimar government and made it possible for the then-small National Socialist Party of Adolf Hitler to seize power.

In the 1930's a number of local millers in North Carolina began buying fish scrap from Wallace to grind and mix with corn, to be sold to country stores for retailing to farmers. Elsewhere, particularly in the Chesapeake Bay area, farmers took wagons and trucks to the fish factories for scrap, which they ground by hand to mix with their grain. From this the use of fish meal in stock and poultry feed grew to a point that the federal government prohibited use of scrap for any other purpose during the Second World War. Guano disappeared from the industry. If, as seems likely, the petroleum shortage continues to grow, there is a possibility of farmers having to go back to fish scrap for fertilizer. Most chemical fertilizers are petroleum derivatives, now getting increasingly expensive.

In the later 1920's a second generation of Wallaces entered the business. Charles Wallace's son George Roberts, born October 13, 1906, had worked after school and during vacations at the Bogue Sound plant and in the family shipyard, among other jobs high school boys could find in those pre-minimum wage days. He came out of Trinity College and its successor Duke University in 1927 with a degree in business administration and special training in accountancy. He was put to work at the Smyrna plant to look after the fleet. His college training enabled him also to improve company administration, and his experiences with the boats and crews developed a love for the industry.

In 1929 the elder Wallace, who also had served three terms in the state legislature, set off on another venture. With brothers-in-law William and Earle Webb, he formed Mayport Fisheries Company to build a factory at Mayport, Florida, at the mouth of the St. Johns River. There were fish to be caught in the Atlantic along the Georgia and Florida coasts, and the company continued active there until 1949, when rail service ended. William Webb

was in charge until 1932, Charles Wallace from 1933 until his death in 1945, Gordon Webb, his nephew, for the next two years, and George Wallace for the last two.

In the early 1930's gasoline power began to replace oars in purse boats. In Fairport, Virginia, the boatyard of E. C. Rice and Sons, which then built most of the purse boats in the Virginia and mid-Atlantic fishery of cedar on white oak, produced engines, with baskets to keep seines out of the propellers, to sell for 1,800 dollars a pair. This was more than the North Carolina plant owners felt they could afford to pay.

Young George Wallace and his father wanted power purse boats, so he and Tom Lewis of Morehead City worked to see if they could cut the cost. They took Model A engines, the highly reliable four-cylinder power for the little cars that replaced Henry Ford's Model T's, converted them, and with less expensive baskets, sold them for seven hundred dollars a pair.

By 1931 George Wallace knew he would stay with the menhaden business and became secretary-treasurer and a stockholder. He had charge of the Smyrna and Morehead City fleets, and of the larger of the boats fishing out of Mayport. After the closing of the Smyrna plant in 1931, he had the small Sound boats serving there sell their fish to the C. P. Dey plant in Beaufort. In the spring of 1933, he persuaded his father, despite the Depression with oil selling for eight cents a gallon and meal for thirteen dollars a ton, to operate the Morehead City plant with the small boats. This proved profitable and continued until 1943, when the Second World War had taken too many fishermen for the summer operation. Fall fishing continued until 1962, and the plant was sold to Reedville Oil and Guano Company of Virginia in May 1963.

During the late 1930's and until the United States entered the war, George Wallace had been thinking about the Gulf of Mexico. Stories had come north with fish boat captains of plentiful fish, and Wallace Quinn was operating near Pascagoula, Mississippi, and Apalachicola, Florida. Charles Wallace, William Webb, and Earle Webb, the latter also general counsel for General Motors Corporation, were skeptical, but George

Wallace was convinced. After the death of Charles Wallace in 1945, he made the decision. He and his cousin Gordon Webb went to Morgan City, Louisiana, to see a man.

"John Santos Carinhas was the man to talk to," Wallace recalled. "My father had known Captain John from St. Augustine [his first base of operations] and had enormous respect for his ability."

Captain John, whose own story is to be told later, had several boats fishing for Wallace Quinn out of Pascagoula, and shrimpers too. He suggested that Cameron, Louisiana, was the place to build their factory. The Smiths from New Jersey had put one on Monkey Island there, the Calcasieu River was a good harbor, and the whole western Louisiana and upper Texas coast was at hand for fishing. Perhaps Captain John even then had a feeling that Cameron would become one of the nation's top fishing ports.

The three men went west to Cameron, met Joe Doxey, secretary of the Cameron Parish Police Jury (the local government), and waded through marshes amid clouds of mosquitoes, looking for a site. A few weeks later George Wallace returned, incorporated the Louisiana Menhaden Company, and leased a site on the east bank of the Calcasieu. During construction, everything had to come by boat. Later a road was built to link the plant with Cameron.

Captain Carinhas backed up his faith in Cameron, in menhaden, and in George Wallace by buying an interest in the plant and sending four boats to fish for it.

"We had no contracts," George Wallace said. "There was nothing but a handshake."

The plant, with one cooker, three presses, and two dryers and a capacity of one hundred to 125 thousand fish an hour, cost about two hundred thousand dollars. Buckets or "stiff leg" elevators again were used to unload the three Wallace and four Carinhas boats. For the first time, Wallace used an air spotter. The fish boat crews were given shore bunkhouses to live in because Louisiana heat and humidity made sleep impossible aboard the boats.

The Wallace center was moving from North Carolina with the success of the Louisiana Menhaden venture over the following years. In 1949 another Louisiana

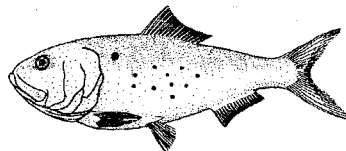
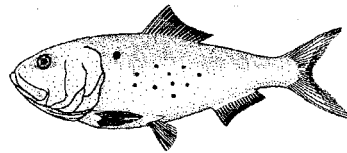
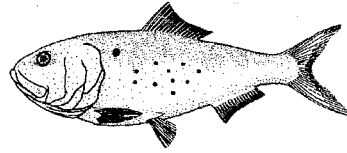
project was undertaken, this at Empire, sixty-five miles down the Mississippi River from New Orleans. Another Quinn plant was already being built, and there was access via the tangle of bayous and canals either to Breton Sound and the eastern part of the Gulf and Mississippi Sound, or the western part, at least as far west as the Cameron boats came east, via Southwest Pass.

Judge Leander Perez, the dominant political figure of Plaquemines Parish, had asked John Santos Carinhas about the possibility of another plant there, and Carinhas passed the word to Wallace. A meeting was arranged. With the assistance of the Parish, the way was opened to locate at Empire. Construction started in January 1950, operation in May. The plant was similar to Cameron, except that centrifugal oil separators were installed and fish pumps instead of elevators emptied the boat holds. The process rate was the same one hundred to 125 thousand an hour. The big difference was the construction cost—tripled.

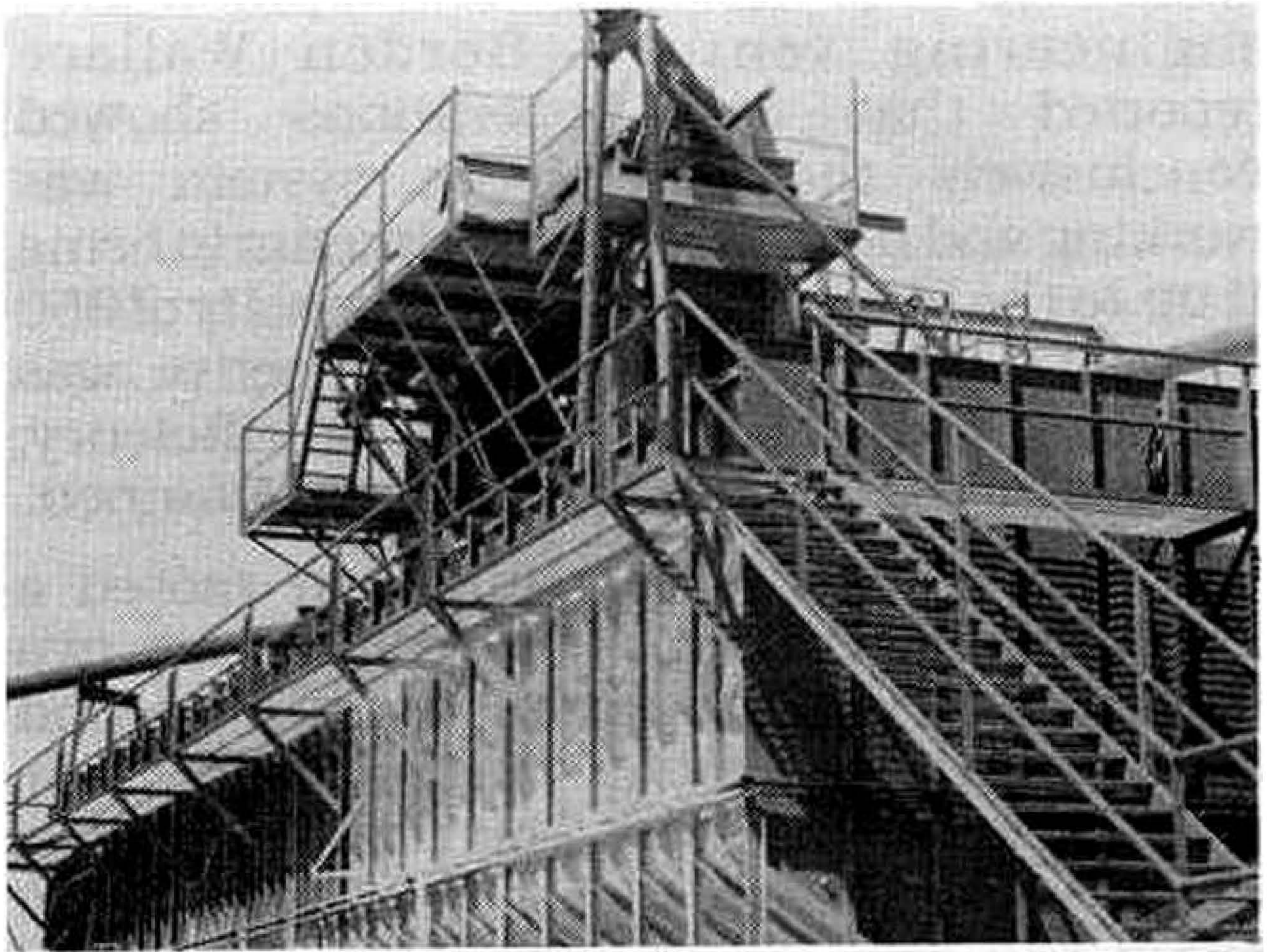
Even so, the Wallaces, George now in retirement back at Morehead City and his son Borden and their associates, might wish today they could build a factory anywhere for six hundred thousand dollars. More than ten times the old Cameron factory cost went in 1976 to 1978 into a new plant at Cameron, even with moving much machinery from the existing plant. The old one, increasingly expensive to operate, also was apparently settling in the soft ground so that parts were easily flooded by abnormal tides.

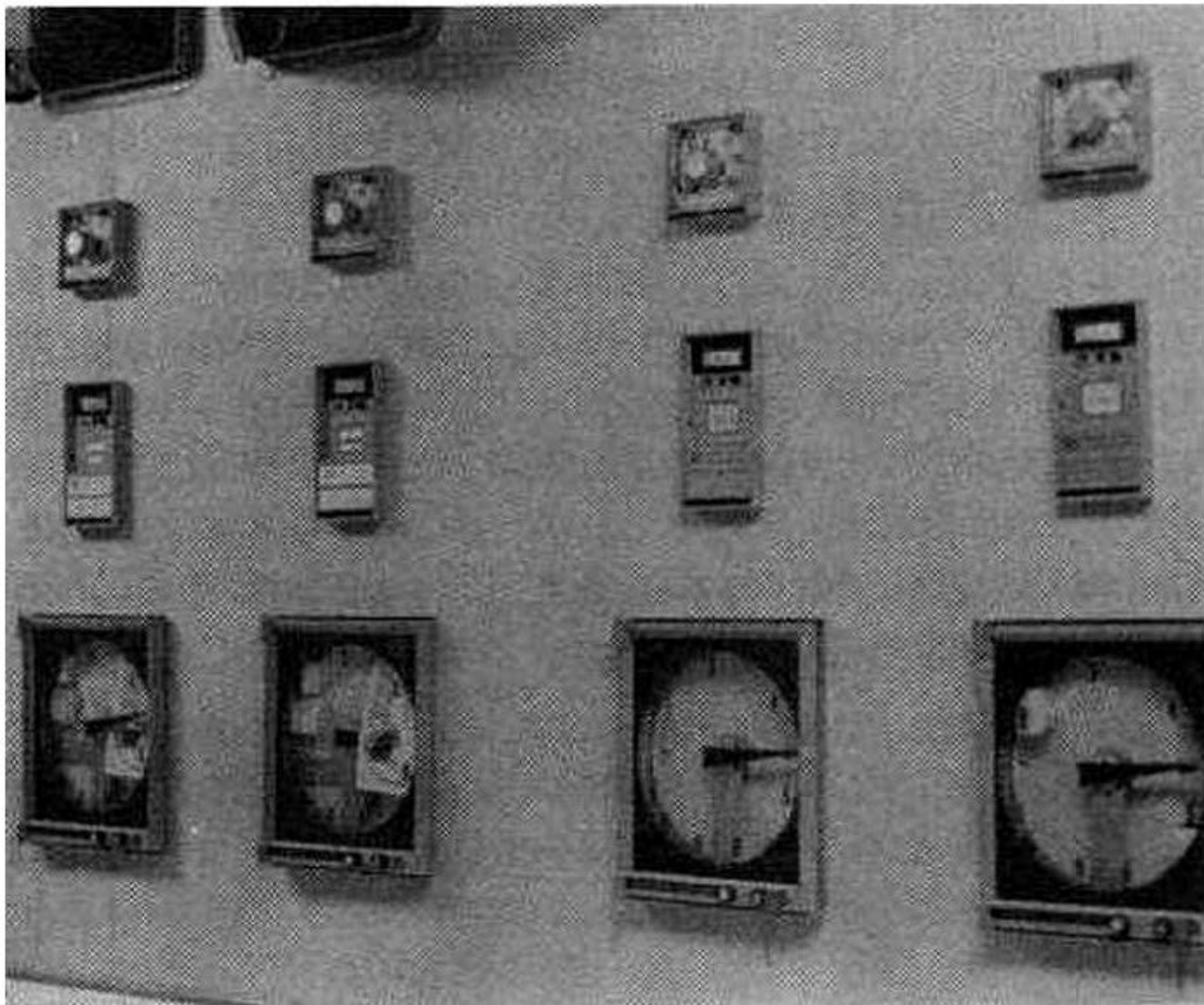
The new plant, highly automated for efficient production, is a product of engineering and economic thinking growing out of the eighty years of Wallace experience, coupled to modern electronic controls. All Wallace executive personnel were involved. This included Jack Styron, president of Wallace Menhaden Products, Inc., the Louisiana successor to North Carolina's Wallace Fisheries Company since 1972, and of Louisiana and Empire Menhaden Companies; H. L. Dickens, Sr., executive vice president and general manager of Louisiana Menhaden; Borden Wallace, vice president; and Ed Swindell, chief engineer. Dickens was credited with primary responsibility for design and layout.

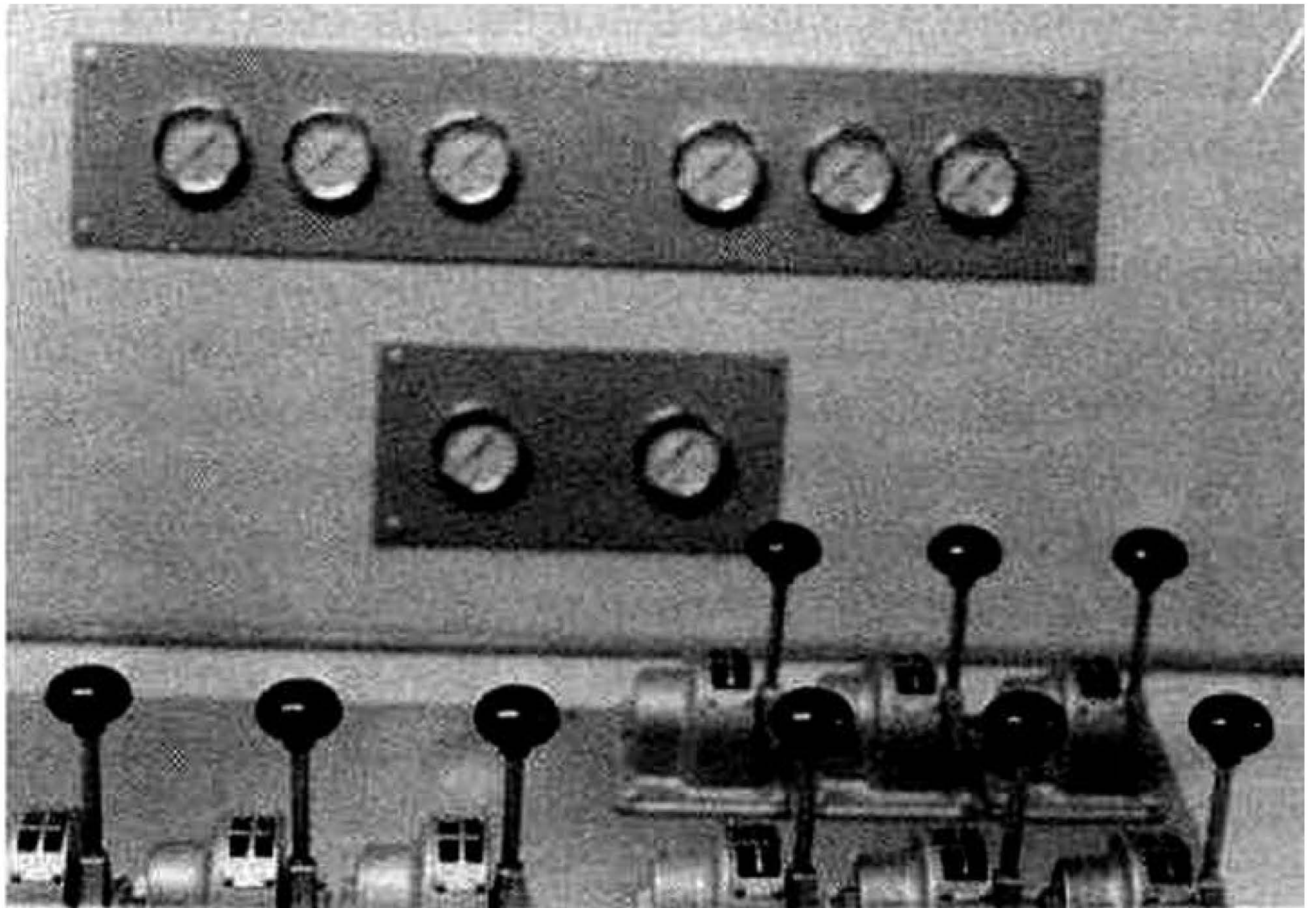
A view of the new Louisiana Menhaden plant at Cameron, Louisiana. The plant, intended to be hurricane-proof, is almost completely automated.



Some of the controls and gauges in the two control rooms of the new Louisiana Menhaden plant. Two men can guide most of the production from these two rooms.







The plant went into production with the start of the 1978 season, and while there were "bugs"—as in any new and sophisticated engineering venture—Borden Wallace reported that early operations showed conclusively that the basic system was working and needed only adjustments to bring it up to the planned processing capacity of 350 thousand fish an hour. The objective was increased capacity for operating efficiency, and no increased fishing effort was planned.

Integrated with equipment moved a few hundred feet from the old plant are two new Heil dryers, to make four, a second Rennenberg multistage press, and four straight screw presses. The plant still uses direct cookers with hydraulically controlled speed and drive. Temperatures can be dialed from one of two control rooms to maintain constant levels in the automatic steam system, with sensors monitoring temperatures from cookers to presses and dryers.

All boilers and evaporators are controlled automatically from a second control room, and all heat equipment is heavily insulated for energy efficiency. The boilers are all fire tube type for almost complete extraction of heat, with exhaust gas discharged nearly cold.

The control rooms, looking like those of a power plant, provide exact adjustment of almost all phases of operation by turning a dial, pressing a button, or moving a toggle. The screw presses can be varied within one-half revolution per minute, with readings shown on air-over-hydraulic gauges. All controls are dual for immediate back-up in case of failure. There are 108 electric motors, including back-

ups, and seventy usually are running at any one time. Dickens estimated that thirty-six thousand feet of copper wire had gone into the installation.

With Cameron in the Gulf hurricane belt, all electrical equipment is raised above the highest known tides for minimum flood damage to motors, switches, relays, transformers, and other gear so vital to factory operation.

Nor does a hurricane damage stockpiles. All Louisiana Menhaden storage is at a warehouse at Holmwood, nearly forty miles away on the road to Lake Charles, safely beyond high water. Here is also the only scrap turning machine in the industry. This is a complex of dry screws to blend and sift the meal for complete mixing, with one man in control. Conventional practice is to use a small bulldozer, but Louisiana Menhaden has depended on the fixed machinery since the 1950's.

The new factory was planned to operate only at night after the eight fish boats serving the plant had been unloaded. If more than one thousand tons of fish are brought in, overtime—daytime—is required.

All this is a long way from the little hand factories on Jarrett's Bay and Bogue Sound back in North Carolina. "Chas. S." Wallace lived long enough to see his Wallace Fisheries well along on its course. His son George Wallace retired and returned to Morehead City, content that the company, with one of the longest corporate lives in the industry, would carry on the good Scottish name of Wallace, ex-Wallis, through at least another generation in his son, William Borden Wallace.

VI. The Printer's Devil

When Wallace Melvin Quinn entered New Orleans Medical Center in November 1972, he was eighty-two years old and hoping it might be possible to start anew in the menhaden fishery and business he had served and loved for more than forty years. All he wanted for the moment was to get well. He knew he had the nerve for any new project, a factory here, a fish boat to be built there. But the flesh was tired, and he died on April 21, 1973.

This ended a career, and took away a name, that had left a mark from New England to Texas, not only in menhaden fishing but in seafood and in a completely unrelated endeavor of providing tents and canvas storage tanks for the Army at war.

That career embraced the building, or purchase, and operation of ten factories, and the development of fleets to keep them supplied with fish. The calendar of starts of new enterprises might seem to mark the trail of an itinerant, moving always, but at least eight factories were in production to some degree at the same time, mostly in the period from the 1930's to 1971, when the last was sold.

This man and those whom he gathered about him became involved in more menhaden factories than anyone in the long history of the fishery. Only the J. Howard Smith family of Port Monmouth, New Jersey, for many years the largest menhaden enterprise in the country, could claim as many,

and four of theirs were bought from Wallace Quinn.

Little in Wallace Quinn's early life pointed to what he was going to do, except perhaps his boyhood in Crisfield, Maryland, then priding itself as "the Seafood Capital of the United States." He was born August 9, 1890, in Pocomoke City, the Maryland Eastern Shore's southernmost city, to Katie Melvin and Lorie C. Quinn, Sr. There were five boys in all, including two by Lorie Quinn's late first wife.

When Wallace was five years old, the family moved to Crisfield, where his father established *The Crisfield Times*, a weekly newspaper to remain in the family until 1968. All members got to work on it, and Wallace found himself as a chore boy, printer's devil, and later hand typesetter and printer. Even in later life, he kept a financial interest in the paper and in Democratic politics of Crisfield and Somerset County. The Quinns always had been active Democrats, with one member or another often running for and being elected to city and state offices.

Wallace Quinn got into seafood, but oddly not in "the Seafood Capital." In 1913 he married Katherine Augusta Colbourn of the neighboring Colbourn's Creek and Marion Station community. The wedding took place, however, in Youngstown, one of Ohio's big steel centers, where her father, John Colbourn, had started a produce and oyster business. Wallace went to work for him there.

After the birth of their first son, William Clarke Quinn, on November 7, 1914, the young couple returned to Crisfield, and Wallace went into the wholesale seafood business with his new Wallace M. Quinn Company, processing, packing, and shipping hard and soft crabs, crabmeat, oysters, and fish. With Railway Express Company then providing free re-icing in transit, he developed a profitable clientele.

Through the years, which included the birth in 1919 of their second son, John Wallace, and in the 1920's and early 1930's, the seafood business prospered, but Wallace Quinn kept looking about for other interests. Among them was a terrapin farm, with Elyard Holland, to add this gourmet's delicacy to his seafood line. He also opened seasonal businesses in soft shell crabs and scallops in Morehead City, North Carolina, and for a few years another in New Bedford, Massachusetts, in New England scallops.

Other interests included a tomato cannery, timberland, and stock market investments—the latter suffering in the 1929 crash but not wiping him out. He had enough left for a venture in something else he had been looking at—the menhaden fishery. Among his associations at Morehead City and elsewhere in his seafood travels were the Wallace and Webb families, whose menhaden plants and fleets were already well established there, and the Smiths. The business and potential profits looked good.

Quinn had added to his Crisfield businesses the Daugherty Marine Ways, a sizable boatyard on the Annemessex River, and he decided to build a fish boat there in 1928. Larry Daugherty and his men designed and built the boat, one hundred feet long and the largest ever built in Crisfield. Quinn bought his own pine for the planking and oak for ribs, had it sawn and dried, and delivered it to Larry Daugherty. The boat, the *Wallace M. Quinn*, was launched without an engine and towed down Chesapeake Bay to Norfolk, where there was a crane big enough to hoist a two hundred horsepower Atlas diesel engine, direct reversible, into the hold. (Diesels were massive then!)

After being fitted out, the boat was sent to Morehead City, but the factory it was to fish for did not open that season because of "hard

times." She was taken on to near Georgetown, South Carolina, to supply a joint venture factory there. It too was on hard times and operated only a part of the season, then closed for good. The *Wallace M. Quinn* finally found work, towing barges with sand and gravel for a new highway between Georgetown and Charleston.

These were late years of Prohibition as well as early ones of the Great Depression. At Fernandina Beach, Florida, were a number of menhaden factories; one, on the Amelia River, had been seized by the federal government because it had been a cover-up for whiskey running. In 1931 it came up for auction and Wallace Quinn bid it in. He formed Quinn Menhaden Fisheries, Incorporated, and put many of the unemployed of the area to work, manning the *Wallace M. Quinn* and an old boat, the 110-foot *J. Earl Morris*, bought for salvage and rebuilt back home at Daugherty's in Crisfield.

Wallace Quinn now was in the menhaden business. He made it go. Like the others, he made acidulated wet fish scrap for fertilizer to be sold to Swift's in Savannah, Georgia, Merchant's Fertilizer Company and Davidson Chemical Company in Charleston, and others. Most of his fish oil went to Procter and Gamble Company in Cincinnati for soap. In time oil-fired rotary kiln dryers were added to turn the wet fish press cake into dried scrap and meal when its value as a protein ingredient for poultry feed was discovered. His first customer was Ralston Purina Company.

Wallace Quinn's first boat was named for himself. Later ones honored friends and political cronies back on the Eastern Shore, or family members. The *J. Earle Morris* was named for a political buddy in Princess Anne, Maryland. He then built three wooden boats, the *W. Osborne Holland*, named for the son of the man who ran his terrapin farm, in 1935; the *Harry C. Dashiell*, for another Princess Anne political friend, in 1936; and the *William C. Quinn*, for his own first son.

Quinn remembered the Morehead City-Beaufort menhaden people, and in 1935 he bought a plant at Beaufort, next to Harvey Smith's. The Fernandina boats were sent there for fall and winter fishing. Virginia boats came down from Chesapeake Bay companies

off and on over the years to fish for this Quinn plant, and Quinn himself added the *M. M. Marks*, a wooden boat, in 1941, and the *John W. Quinn*, named for his second son and built at the Crisfield yard in 1945. Another boat was the *Benson H. Rigg*, named for another Crisfield man who was one of his closest business associates. She was added in 1950, but unfortunately lost that December off Ocracoke Island. The plant itself was operated until 1955, when Harvey Smith bought it.

In 1937 Quinn had tried his luck back north on Chesapeake Bay, at Harborton, Virginia, on Pungoteague Creek about twenty miles south of his hometown of Crisfield. On the site of the old Albro J. Morse factory, he built another and put two associates of his Morehead City seafood operation, Doiley Wade and his son Ikie, in charge. The Crisfield office handled bookkeeping and shipping.

The nearby Maryland third of Chesapeake Bay was closed to purse seining, but Virginia's continued open and active. However, fishing was poor, one steamer burned, and the Depression was still with us. Quinn closed the plant after the 1938 season.

Quinn now became among the first to look seriously at the Gulf of Mexico. Florida fishing had always been in the Atlantic Ocean, out of Mayport and Fernandina Beach, but Quinn and others kept hearing how many menhaden there were in the Gulf. There had been unsuccessful efforts to get something started there, especially in the Sabine Pass area of western Louisiana and eastern Texas, during the First World War.

In 1939 Quinn decided to have a try. Captain John Santos Carinhas was going to Louisiana with his menhaden fleet and his shrimpers too. "Kerosene John" generally knew what he was doing.

Quinn built a new plant in 1939 on dredged-up marshland on the Singing River, across from Pascagoula, Mississippi, the first plant built on the Gulf Coast in twenty years. Doiley Wade came down to be superintendent and James E. McGrath of Crisfield, long one of Quinn's closest confidants, office and sales manager. In the first year Quinn made only acidulated scrap from the plentiful fish brought in from Mississippi Sound and other close waters by two boats, one a new wooden *L. C. Quinn*, named for his father and built at

nearby Moss Point by Oscar Howard, a friend from Crisfield. The other was a leased Chesapeake Bay buy boat, the *Majestic*, owned by Captain Billy Stanford of the many Stanfords of the Potomac River town of Colonial Beach, Virginia. In 1940 Captain Stanford sent down the then fifty-six-year-old *Amanda F. Lewis*, the Chesapeake Bay pungy which had hauled many a ton of oysters, canned tomatoes, and other freight between Coan Wharf on the Coan River, a Potomac tributary, and Baltimore for E. Fallin and Brother, and was still under sail as late as 1939. Captain Stanford converted her to power at the Krenz Marine Railway at Harryhogan, Virginia. A deckhouse with wheelhouse above was set forward, and a mast with crow'snest abaft this superstructure. The carved likeness of Amanda F. Lewis, wife of her first owner, Captain M. O. Lewis, was removed from her transom and given to the Smithsonian Institution. Robert F. Burgess reported in 1963 that she was last heard of in Haitian waters in 1949 and that if still afloat she would be "the sole remaining example of the pungy hull."

In this same 1940 Captain Wesley Robinson and the man he introduced to menhaden fishing, Captain John Santos Carinhas, provided a converted yacht, the *Amanda*. Quinn meanwhile had another boat, the eighty-five foot *Fletcher Cox*, a sister ship to the *L. C. Quinn*, built at the plant site and named for another old Crisfield friend. A large North Carolina buy boat, the *Jeff*, was brought down by Reuben Gutherie of Beaufort. In 1941 Quinn had another wooden boat, the ninety-foot *Doiley V. Wade*, built at the plant site and named for the plant superintendent.

The late 1930's and early 1940's were years when Quinn always seemed to be building, buying, or leasing boats and building plants as well. The year after the Singing River plant got into production and began making money, he put another at Apalachicola, Florida. Florida's Gulf Coast had had one thirty miles to the west at Port St. Joe, a DuPont venture that had been abandoned, and Quinn bought some machinery from it and set up just west of the railroad bridge up the Apalachicola River from the town. He also got the *M. M. Marks* from Port St. Joe, rebuilt and refitted her, and had her bringing fish

from nearby Florida waters. The plant, managed by Ikie Wade as superintendent and first W. Osborne Holland and then Norman Maddox, another Crisfield man, as office and sales manager, operated until lack of fish forced closing in 1952. Later it was sold to Gilbert Smith of the J. Howard Smith family.

Just after the Second World War Quinn expanded back northward with a small plant on the Edisto River of South Carolina, near Yonges Island twenty miles west of Charleston. This plant, opening in 1946, used Fernandina boats when Florida fishing became slack, with Ben Halter of Fernandina, Doiley Wade, and Arthur G. Teston as superintendents, Osborne Holland office and sales manager. The plant was able to keep active for thirteen years before lack of fish closed it.

Meanwhile Quinn had headed off in still another direction. He formed a new Quinn Menhaden Fisheries of Texas, Incorporated, and opened a new plant in 1947 at Keith Lake, on the Port Arthur ship channel just up from Sabine Pass.

This, the first plant in Texas since the futile attempts of the late teens, had two to five fish boats in eastern Texas and western Louisiana waters, and might have continued indefinitely except for the devastation of two hurricanes, one Audrey which killed 430 persons and swept a long section of the coast June 27-30, 1957, plus the influx of fish meal imports from Peru, where the anchoveta fishery was expanding rapidly. Audrey flooded the plant and shut down production temporarily, and Quinn looked for another, and safer, site. He found it far to the east on the Houma Navigation Canal at Dulac, Louisiana, and took the Keith Lake oil separator centrifuge there and set up again. He sold the Texas plant, with its buildings, presses, boilers, and scrap sheds and conveyors, to Harvey Smith, eldest son of J. Howard Smith who had brought the Smith interests to the Gulf along with his brothers, Otis and Gilbert.

Meanwhile another factory had been set up at Keith Lake in the late 1940s by a Port Arthur group headed by Harry Rosen. The company, Port Arthur Menhaden, hired Alfred Davies and Ben Halter from the Quinn staff. The plant later was sold to Harvey Smith.

At the time of the move to Dulac, Quinn

moved his Pascagoula plant from Singing River to Sioux Bayou, off the Pascagoula River near the village of Gautier. He expanded it with the first fish solubles plant of its type on the Gulf Coast, a joint venture with the Glidden Company, paint manufacturer.

Two years after the opening of the Port Arthur plant, Quinn already had come back to Louisiana for what turned out to be his biggest and busiest plant. This was at Empire, sixty-five miles down the Mississippi River from New Orleans, well located for quick access to two rich fishing grounds in Breton Sound to the west, via the Empire and Ostrica locks, the other west of the delta, via the Empire Canal, to beyond Grand Isle. Empire also had a railroad siding for shipping out fish meal and oil.

Here Quinn Menhaden Fisheries of La., Inc., was set up, and in the late 1940's and the 1950's the plant accumulated the best fish boats, best captains, and best crews of the entire Quinn fleets. From 1947 through 1971, new fish boats and old ranged east and west and brought their catches to Empire. The newer craft were refrigerated, and some still fished in the late 1970's for Petrou Fisheries, Incorporated, the International Proteins Corporation subsidiary that bought the plant in 1971.

Among 110-foot steel vessels built for the Empire plant by the Mike Fletchas Shipyard at Pascagoula were the *Dixie*, the *Lorie C. Quinn II*, named for a grandson; the *Sigmund Schoenberger*, for a friend at nearby Buras. The Wilson Shipyard at New Orleans built the *Wallace M. Quinn II* and the *Dr. William C. Quinn*, the latter named for his elder son.

These five boats were later refrigerated, as was found increasingly necessary in the hot Gulf climate. In 1962 the Fletchas yard built two more refrigerated steel boats, 120 feet long, the *Wally C. Quinn* and the *Jonathan Quinn*, both named for grandsons, and then his last boat, built in 1965, the *D. A. Wainwright, Jr.*, named for the Empire plant superintendent. Wainwright later died of a heart attack a week after Hurricane Betsy of 1965 put him through the stress of trying to oversee flood recovery work.

The plant did recover from Betsy's damage. Machinery and boilers which had been under water for several days were dried

out and repaired. Fish meal and scrap were reprocessed. Buildings and other properties had suffered appalling damage. What could be rebuilt was rebuilt; what could not was built anew. Luckily, the fleet of fish boats was little if any hurt.

As is the way, the experience faded, except for lessons taught. Then it had to be endured again in 1969, from Camille. The renewed damage—hurricane damage cannot be avoided no matter what you learned from the last one—coupled with Wallace Quinn's own health and age (he was now eighty years old) resulted in the decision to sell the plant. In that same year of 1971 the Quinn plant at Fernandina Beach, Florida, was sold to Nassau Fertilizer and Oil Company, the survivor of the Florida East Coast fishery, and the plant at Gautier, Mississippi, child of his first Gulf of Mexico venture on Singing River, was closed.

Quinn's elder son William had become a doctor, his younger son John had gone into other business. The Smiths had four of his plants, Nassau had Fernandina, and Petrou, with roots in the Chilean anchoveta fishery

but with Benson Riggin and other Quinn men on its staff and Quinn boats in its fleet, had Empire.

The Wallace Melvin Quinn story had ended, but the man who had left his mark, at first in seafood, then with bunkers, from Crisfield, Maryland, to New Bedford, Massachusetts, to North Carolina, to South Carolina, to Florida, to Mississippi, to Louisiana, and to Texas, had two years of life left to think about a productive career, and perhaps to think of what he might still do if he had twenty years, or even ten.

As his son John Quinn put it five years after his death, Wallace Quinn was "a self-made man whose main business interest in life had to do with the sea and the creatures in it."

His elder son, Dr. William Quinn, added: "He had plenty of nerve for starting new projects and keeping a tight hold on the reins of his businesses himself. It could be said that as Mr. Quinn's health went, so went his business."

VII. Kerosene John

For five hundred, perhaps one thousand, two thousand, or more years the Algarve province of southern Portugal has bred seafaring men. Through the centuries they ventured south on the Atlantic Ocean to explore the west coast of Africa and to round its southern capes, east through the Pillars of Hercules to trade with the Mediterranean world, west and north to the tin mines of Cornwall, and on northwest across the Atlantic to the great cod banks of the New World.

At the western tip of the almond growing Algarve is Cape St. Vincent, the Romans' Promontorium Sacrum, one of the most famous of Europe's western headlands. Nearby is the town of Sagres, where Dom Henrique, Prince Henry the Navigator, for forty years maintained his institute of cosmography and exploration, until his death in 1460. To the east, across the Río Guadiana and the Spanish border, is the Columbus country, the province of Huelva with its town of Palos from which the first Voyage of Discovery departed August 3, 1492.

Halfway between the two historic centers is the Portuguese sardine fishing—now also resort—town of Olhão, close to the city of Faro. It is three thousand or more miles from Olhão to Florida and the Gulf of Mexico, and in 1913 a sixteen-year-old boy, born there October 18, 1896, left off fishing in Portuguese waters on his first step toward becoming a pioneer in the part of the American menhaden

fishery that has come to be the country's largest.

The boy, or young man as a sixteen-year-old had to be then, was João Santos Carinhas. He spoke no English but was not heading entirely for the unknown, for a brother, Manuel Jesus, was to meet him at the dock in New York and take him aboard his own Long Island Sound and Atlantic Ocean smack to help handline for bluefish, bring them to the Fulton Fish Market in lower Manhattan, and make enough money, and a little more, to stay alive.

There was plenty of historical reason for the move. Portuguese fishermen had long been aboard Gloucestermen working the Grand Banks, and aboard whalers out of New Bedford, Sag Harbor, and other whaling ports. They were always the best of seamen and fishermen. Their own native land still sent sailing ships to the Grand Banks for cod and halibut. Today their descendants make up much of the fishing population of New England.

The young man and his brother, only six years older, expected to have to work hard to make a living, and they did. Fifty years later John Santos Carinhas, now Captain John, could say of the long hours of raising sails on the smack by hand, hauling lines by hand, and carrying out all other labors by hand, often in freezing or even sub-zero weather: "If luck was good, if we could find fish, and if there was wind to get us to market before the catch

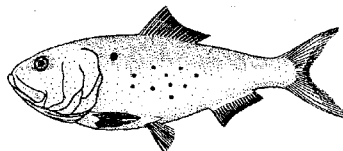
rotted—and if the price was right—I made thirty dollars a month.”

Yet out of that thirty dollars John Santos Carinhas saved a little and in two years was able to repack his suitcase and seabag and take a train for Florida. His native Olhão was about on the thirty-seventh parallel and warmed by the spreading eastern end of the Gulf Stream, and he hoped for something like it closer to where the Gulf Stream started.

Again, he was not venturing to the unknown. He had learned net making and mending in Olhão and indeed was among the first there to make and use a purse seine for sardines. His father, Manuel Lopez Carinhas, had died when the boy was ten, and work was part of his early life. Now, a former Yankee, Captain Wes Robinson, who for many years in the early part of the twentieth century came to the mouth of Chesapeake Bay annually following the mackerel, had moved south to fish for menhaden, out of St. Mary's, Georgia, and Fernandina Beach and Mayport, Florida. He needed a good net man and young John Santos had been recommended.

John Santos fished and maintained nets for Captain Robinson for five summers, to open a friendship that lasted through their lives. He started on the one hundred-foot *Libby*, a two-masted former Gloucester schooner. In 1921 Captain Robinson gave John Santos his first menhaden captain's job—with the *Caroline*, fishing out of St. Mary's with twenty-four men crowded aboard in her eighty-five feet. Captain John was grateful for all Captain Wes taught him about menhaden. In 1940, when Captain Wes, as Virginia friends recalled it, had suffered business reverses, Captain John joined with him to buy and convert to menhaden fishing a seventy-foot yacht, the *Amanda*, with Robinson the captain. In the mid-1940s they were co-owners of another, and it bore the name *Captain Wes Robinson*. It was Carinhas' first steel fish boat, built by the F. B. Walker and Sons shipyard at Pascagoula, Mississippi.

During those late teens of the century, John Santos Carinhas put the rest of each year to shrimping, and by 1916 he owned a twenty-two-foot shrimper, the *Pelican*, with a five-horsepower Lathrop engine. Eighteen months later he sold it and went to St. Augustine, founded in 1565 and this country's oldest city.



John Santos Carinhas, "Kerosene John," acknowledging his introduction at a National Fisheries Institute banquet. He attended the annual NFI meetings faithfully. *Fishing Gazette* photo.

A Portuguese colony already there took him in. He soon found a job on a shrimper operated by Salvatore Versaggi, founder of an extensive shrimp business. The boat, the *Gorizia*, had a sixteen-horsepower Lathrop kerosene engine to take her through St. Augustine Inlet to the Atlantic Ocean, and the experience gave him a liking for that type of power, and also the nickname that stayed with him—"Kerosene John."

"That was my American education," he said many years later of his early work, "fishing and making nets."

Shrimping was good and John Santos did well. He fished with the Versaggis for several years and again saved his money. In 1919 he was able to buy another shrimper, the *Surprise*, built by Mike Tiliakos. He installed a twenty-four horsepower kerosene engine, a two-cycle Lathrop. He was happy with his new boat. "That's what a fisherman does with his money," he said. "I was feeling pretty proud of myself."

His boat must have given him trials, too, as most do. Some Virginians and others who came to know him also recalled that there were times when "he fished with one hand and pumped with the other." It was a lucky fisherman who had not done likewise at some time.



In 1921, when he had also saved enough of his money from fishing for Captain Wes Robinson and from shrimping, to think of a settled life, he went home to Olhão for five months and returned with a bride, Rosa. The young couple made their home in St. Augustine, but their happiness was brief. Rosa soon became ill and died.

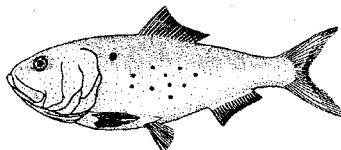
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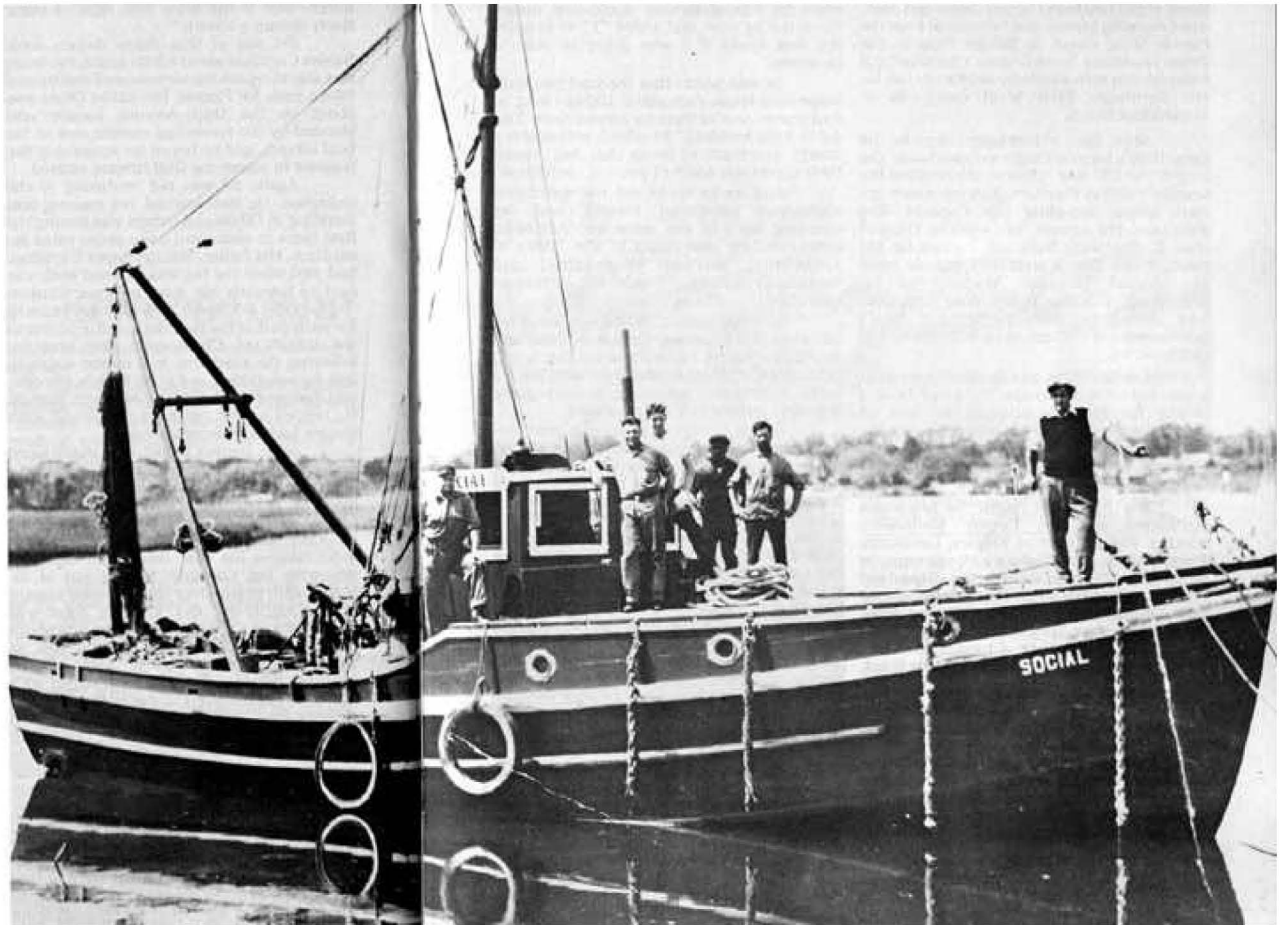
John Santos still wanted a settled life ashore, although he was making money with his *Surprise*. "I sold her and went into the processing business," he told an interviewer in the 1960s. "That was in 1926. I wanted to have my own business. I wanted to live ashore." On September 26, 1925, he married again. His bride was Frances Tringali, daughter of Joseph Tringali of Fernandina. They returned to St. Augustine and bought a house.

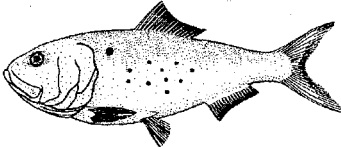
Captain John's shrimp and menhaden interests now were intertwined, and would remain so. It is hard to say now whether he should be remembered more for one than the other. By 1926 his shrimp business had grown beyond his start with the kerosene-powered *Surprise*, through co-ownership of three early diesel shrimpers, the *Social I*, *Social II*, and *Social III*, forty-five to fifty feet long each. He had a packing shed at St. Augustine. Shrimp then brought only three cents a pound, but growing demand and better prices increased his fleet to nine. When tremendous catches of white shrimp began to be made in the Gulf of Mexico in the late 1930's, he left Florida to reestablish his fleet and business at Patterson, Louisiana, four miles west of Morgan City and its gateway to the Gulf shrimping grounds via the Atchafalaya River.

With his nine-boat shrimping fleet, he had built up a four-boat menhaden fleet. He was also building a shipyard at Patterson, to turn out shrimpers and fish boats for his own use and for others too. His name, with

"Kerosene John" standing on the bow of his shrimper *Social* in the mid-1920's. At left beside the wheel house is his brother, Manuel Jesus Carinhas. *Fish Boat* photo.







those of his brothers Manuel Jesus and Jack, was becoming known and influential from the Florida West Coast to Sabine Pass at the Texas-Louisiana border. Jack Carinhas had followed him to this country in 1920, to fish for the Seminole Fish Meal Company at Fernandina Beach.

John Santos' menhaden fleet by the early 1950's included eight wooden boats, the largest the 137-foot *Admiral*, the smallest the seventy-five-foot *Freedom*. And there were six steel boats, including the *Captain Wes Robinson*. The newest then was the 114-foot *Jose E. Carinhas*, built and named for his younger son, then a seventeen-year-old cadet at Admiral Farragut Academy of St. Petersburg, Florida. Today, Jose Carinhas, now Joseph, carries on Captain John's businesses—in shrimp, in menhaden, and in shipbuilding.

Captain John also had part interest in a number of other boats. He never built a factory for himself, although he had an interest in the Louisiana Menhaden Company factory built by the Wallace Fisheries Company, then of Morehead City, North Carolina, at Cameron, Louisiana.

But his boats fished for Louisiana Menhaden and for Empire Menhaden, another Wallace unit at Empire, Louisiana. They fished for Wallace M. Quinn in Mississippi. They fished for Standard Products Company when that firm expanded from Chesapeake Bay to the Gulf at Moss Point, Mississippi. They fished for Reedville Oil and Guano, another Chesapeake Bay company, when it came south to Moss Point.

And in 1952, when the whole catch of the menhaden fishery was a little more than two billion fish, mostly on the Atlantic Coast, Captain John's fleet produced 230 million, better than ten percent, and almost all from the Gulf of Mexico. His only Atlantic catches then were out of Morehead City, North Carolina, again for the Wallaces.

By the late 1960's Captain John's shipyard at Patterson had a working crew of sixty-five men, busy with his own boats and with jobs, repair or new construction, for others. At that time he explained that a lugger which would have cost five thousand dollars

when he started fishing would cost ninety thousand by now, and added: "I had to build my own boats if I was going to stay in business."

He was proud that the yard had built seven steel boats, each about 150 feet long, in four years—four of them for his own fleet. "You got to keep building," he added, pointing to a nearby graveyard of hulks that had passed their expectable score of years of usefulness.

And as he could call his apprentice shrimping, menhaden fishing, and net mending work of the teens his "American education," he said again in the 1960's of shrimping, shrimp processing, and menhaden fishing, "That's my American education."

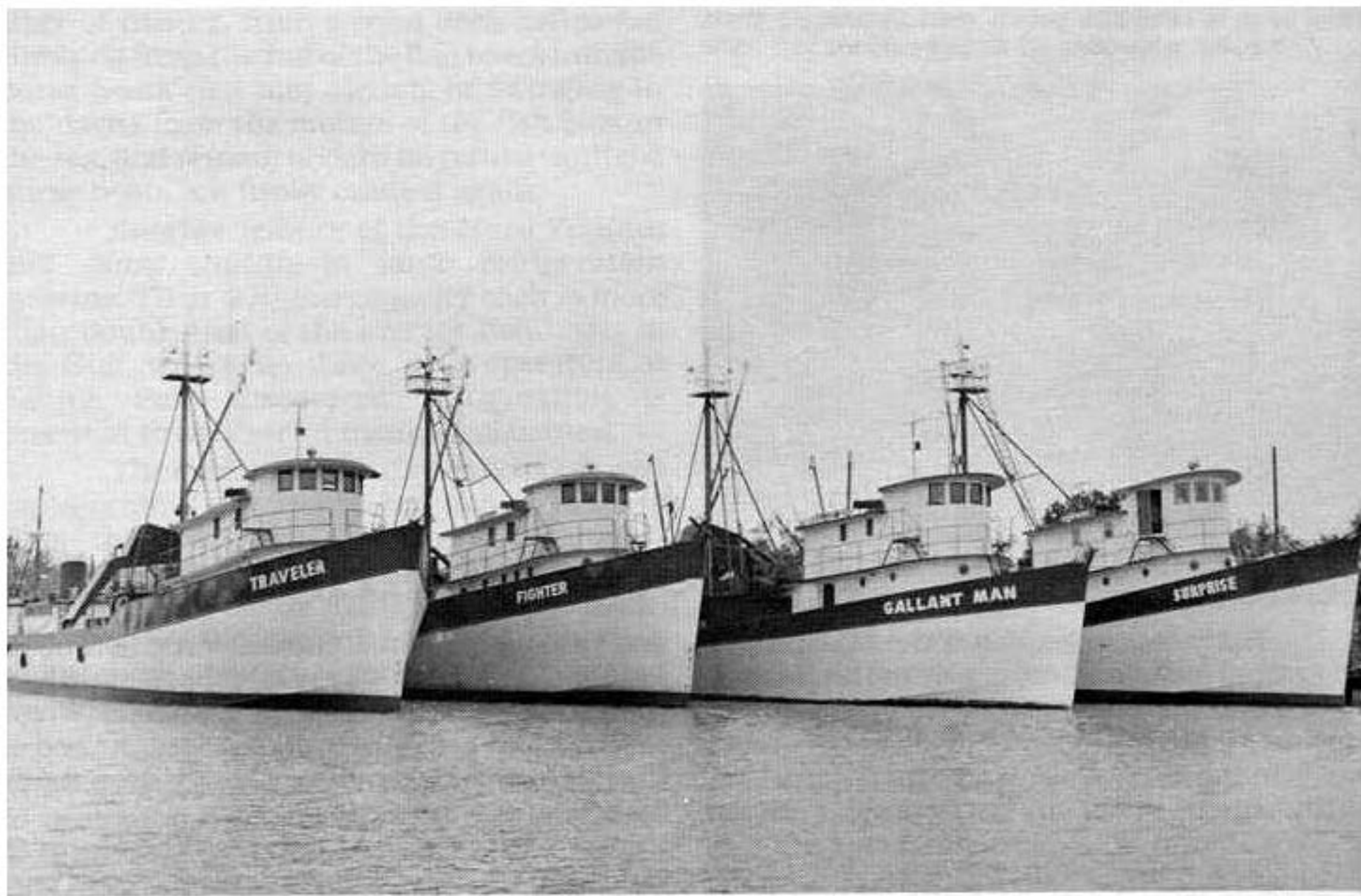
It might seem from the outline of his life that John Santos Carinhas lived and worked largely for himself and his family and old friends, like Captain Wes Robinson. Many a man, Portuguese native or of Portuguese descent, testifies to a larger picture.

It was always a European tradition that when a man emigrated to the United States and whatever better life he expected there, he remembered where he came from and did something for his native people. He sent money back when he had it. He sent for family to join him. He sent for kinsmen and friends if he saw a way for them to make good in what we used to call "the melting pot" before we got to thinking of ourselves only as "native Americans."

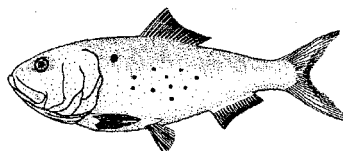
Captain John likewise remembered where he came from. Today the Gulf Coast has many a Portuguese name, in its fisheries and ashore, that came because of his help. Today there are net menders at the Empire Menhaden Company plant who are here because of John Santos Carinhas, a man who left their country so many years ago.

Captain Carroll Ripley, now retired at his home on Virginia's Mobjack Bay shore, recalled fishing with Santos out of Fernandina Beach, and with a Portuguese crew. Captain John interpreted orders. "I told him," Captain Ripley said, "and he told them. We fished."

Captain John Santos Carinhas died on Good Friday of 1976. His wife, Frances, son, Joseph, and three daughters, Anne C. Broussard, Joyce C. Hebert, and Dianne C.

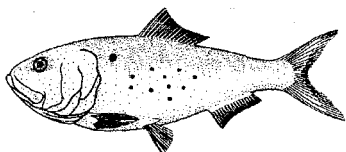






Four of the Carinhas menhaden boats, built at his Patterson, Louisiana, shipyard. Photo copyright Skeets W. Folse.

Austin, carry on his businesses, now among the largest of their nature on the Gulf Coast. Much of what they do is in his memory, and their scrapbooks are full of notes to keep that memory fresh and their work productive.



Portuguese net menders at the Empire Menhaden plant at Empire, Louisiana. These men are among the many helped to this country from his native Portugal by John Santos Carinhas, who learned net mending himself as a boy in the sardine fishing village of Olhão, on the southwest Atlantic coast of Portugal.

VIII. Petrou and Innovation

Sixty-five miles down the Mississippi River from New Orleans, nearly to the Head of Passes and the Delta waterways to the Gulf of Mexico, is a menhaden company with roots partly in the old Wallace M. Quinn enterprises, partly in its own inventiveness. Perhaps Wallace Quinn's experimental spirit was included in a bill of sale, for Petrou Fisheries, Incorporated, operates in an atmosphere of "Let's see if it works and will make money for us."

Petrou was founded in January 1971 at Empire, Louisiana, by International Proteins Corporation of Fairfields, New Jersey, on property bought from the Quinn Menhaden Fisheries, and including a number of Quinn fish boats.

Petrou in the late 1970's had a fleet of seven boats, fishing mostly east of the Mississippi, in Breton Sound, with some activity to the west as far as Morgan City, Louisiana. This hardly tells the story. Three of the boats are unconventional, the third, the *Maria C*, the most so, and incorporating the thinking of the men who operate her and the computerized processing of much of their thinking.

The first of the three was the *Mary Virginia*, built by Sigler Shipyards of Jennings, Louisiana, in 1974, followed by a sister ship, *Mary Judith*, both with purse boats carried inboard on cradles on deck rather than outboard hanging from standard davits. The obvious advantage is in docking

and undocking. On a conventional fish boat, the captain must always allow for the width of the purse boats hanging at his stern. When several boats are bringing in loads at the end of the day, purse boats often must be dropped to maneuver for unloading.

With these two, and with the *Maria C*, built by Burton Shipyard of Port Arthur, Texas, in 1977, the captains simply bring them alongside the dock or another boat with only fenders needed to protect the hulls.

The bar type, inverted L davits, swinging on pins at the deck, are hydraulically powered. They are set apart at a distance greater than the forty-foot length of the purse boats, with the L heads extending over the bows and sterns of the purse boats. Steel cables drop from hydraulic winches at the heads to the purse boats.

One man at a control panel on deck handles the entire raising and lowering of the boats. The winches raise them from the cradles, and the davits swing them outboard for lowering to the water. When the set is over, they can be hoisted aboard if no more fishing is to be done soon, or if the day's work is ended.

The boat handling system traces its origin to the early 1960's when Gibby Dize, Petrou's top captain, first began to question the conventional davit procedure. Captain Dize, a Chesapeake Bay waterman from Maryland's Smith Island, called the new system both time saving and far safer. The crew can board the purse boats, at least at the

start of fishing, from a solid deck instead of climbing from the rail of the fish boats into the purse boats that may already be swinging in the davits from the motion of the fish boat in the sea, and remain aboard on return until the purse boats are firmly cradled again.

Another feature of the *Mary Virginia* and *Mary Judith* is large refrigeration systems. Their 270-ton capacity each is more than double that of the average fish boats in the Gulf, where, as those early operators at Sabine Pass discovered, refrigeration is essential to successful menhaden fishing.

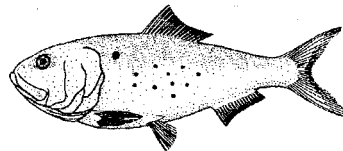
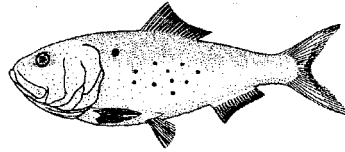
The extra capacity makes possible very rapid cooling of water in the fish tanks, and thus the fish boat can approach fishing grounds more rapidly and much closer at the start of the day before filling them. The system also uses hot dip galvanized steel rather than raw steel in an effort to prolong its life beyond the normal four to five years.

Advances found practical on the *Mary Virginia* and *Mary Judith* were carried further in designing the new *Maria C*. She might be said to be a joint design project of Captain Dize, Horst Brose, chief design engineer for IPC; Jacob Dermer, plant manager; Will LaPoint, fleet superintendent; and Dalton Berry, laboratory chief—and all others with the Petrou and IPC concept of looking for better ways.

In ship design, they changed the geometry of the stern section to eliminate vibration and stern dipping, the latter a special problem in the shallow waters of many of the Gulf's fishing grounds. Water flow to the propellers was made more direct, and a longer rudder stock with longer bearings was made possible for less bearing wear.

The stern was further designed unconventionally to make handling and, again, boarding purse boats easier and safer, and to protect them from damage in bumping the fish boat when being towed from set to set. The stern of the *Maria C* was notched to mate with the purse boat bows. The purse boats are drawn into the notches by a hydraulically powered cable system, to be held firmly regardless of sea conditions, almost as integrated sections of the ship itself. Pull rope pelican hooks are used to make the boats fast to the haul-up cables, so that crewmen can

Maria C's notched stern, mating with bows of purse boats when they are drawn up on the underwater ramps.

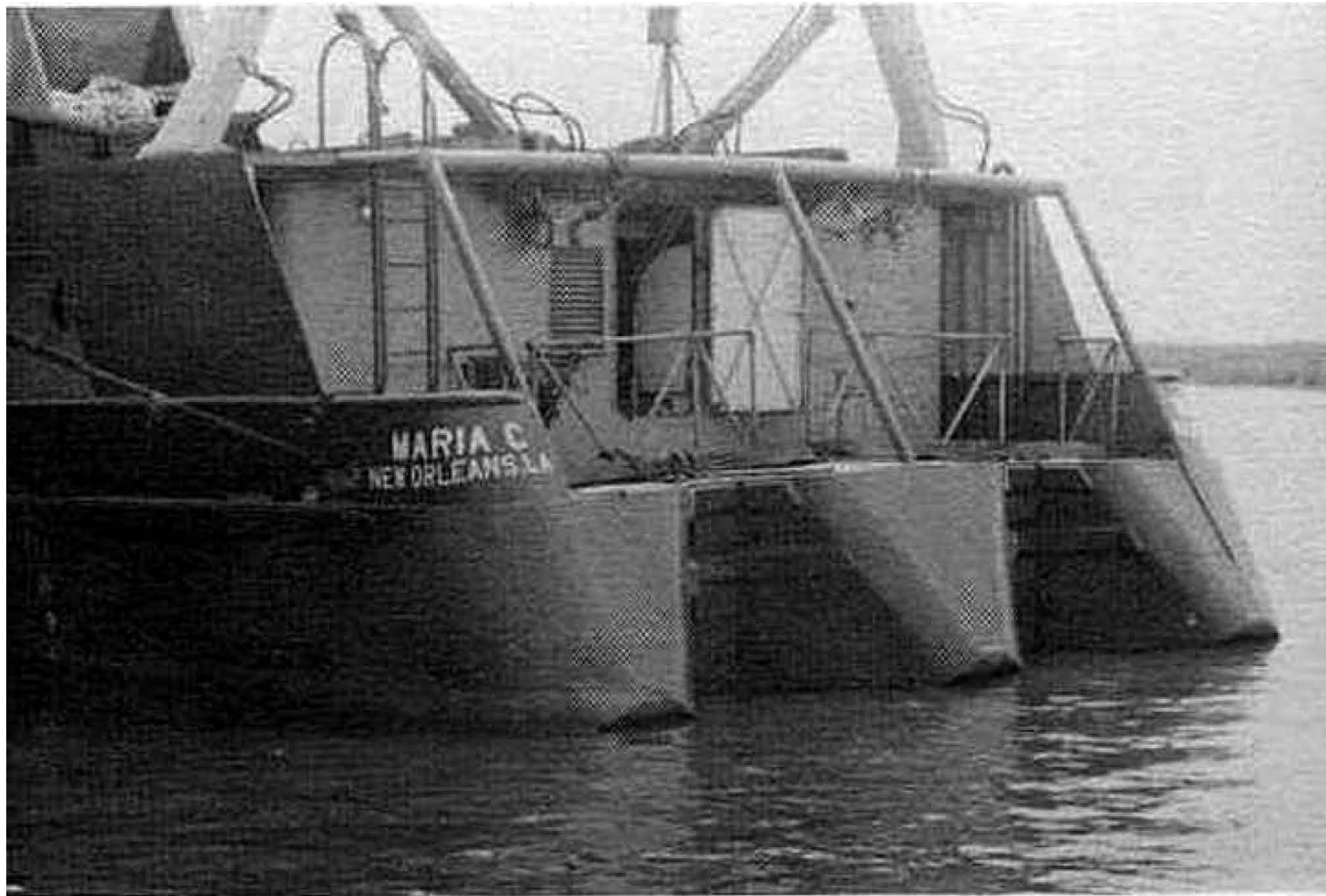


Purse boat cradle and port after davit on the *Maria C*.

release them quickly and safely when starting off to make a set.

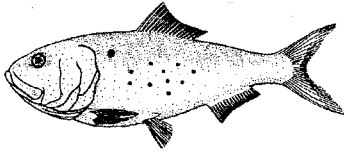
Other features of construction of the *Maria C* include mounting the brine chillers of its refrigeration system vertically in the after fish holds for easier cleaning of storage areas. Ammonia level indicators are on the sides of the chillers for easier visibility.

The fish holds of the *Maria C* are protected by accordion-type hatch covers of foam-core steel sandwich construction instead of planks. Hand winches open and close them between sets. Removable plywood lids cover openings for fish conveyors, themselves of aluminum construction for

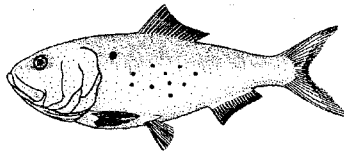
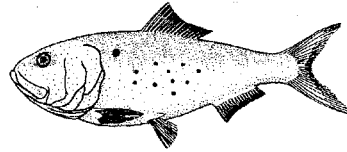




One of Petrou's jet-driven purse boats being launched. Note absence of propeller cage and other bottom fixtures.



Close-up of the jet drive mechanism. The jet orifice itself is covered.

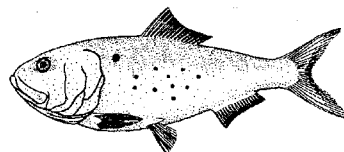


A conventional purse boat's propeller cage to keep the purse seine from being fouled in the wheel.

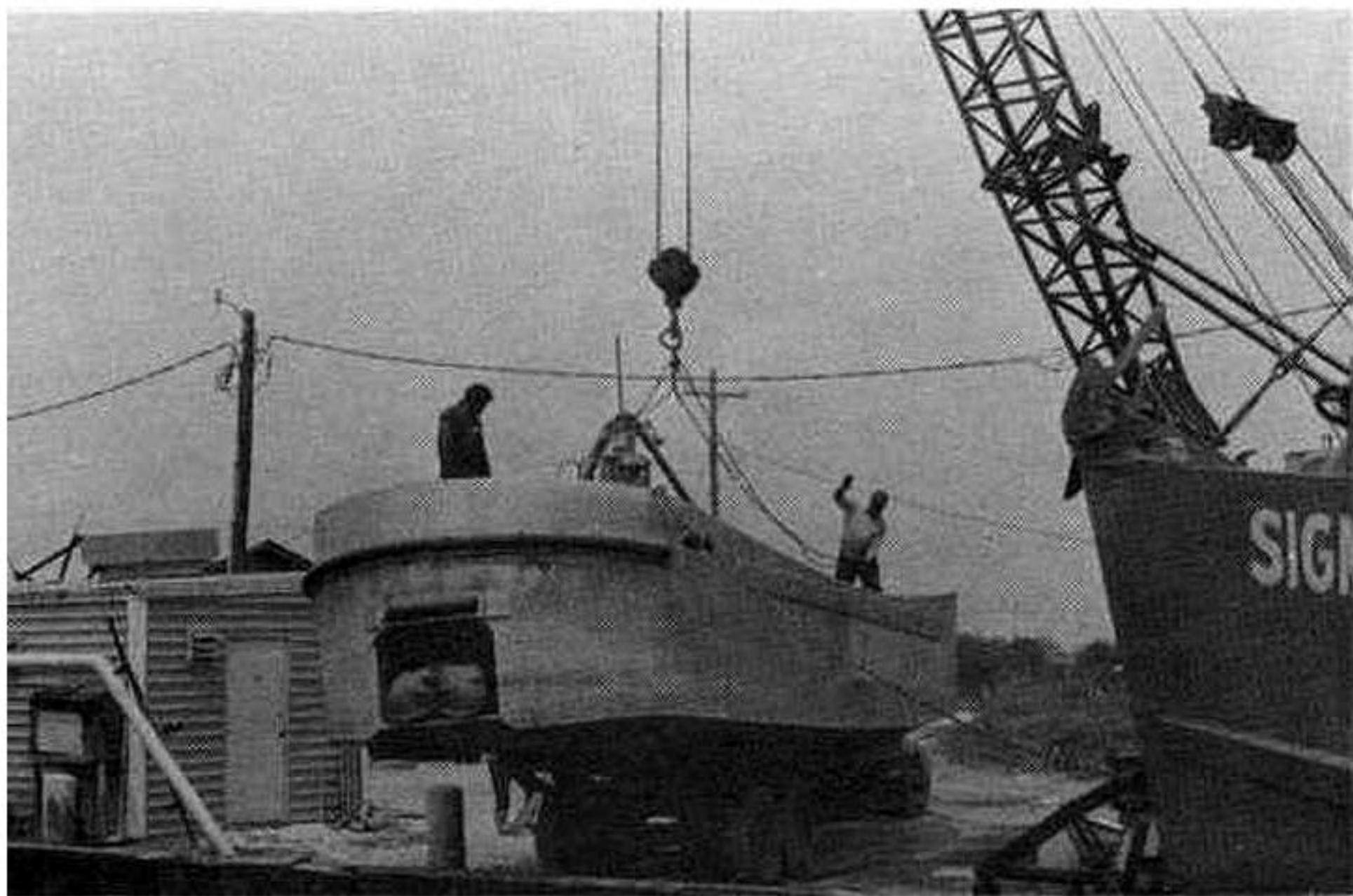
expected greater resistance of salt water corrosion.

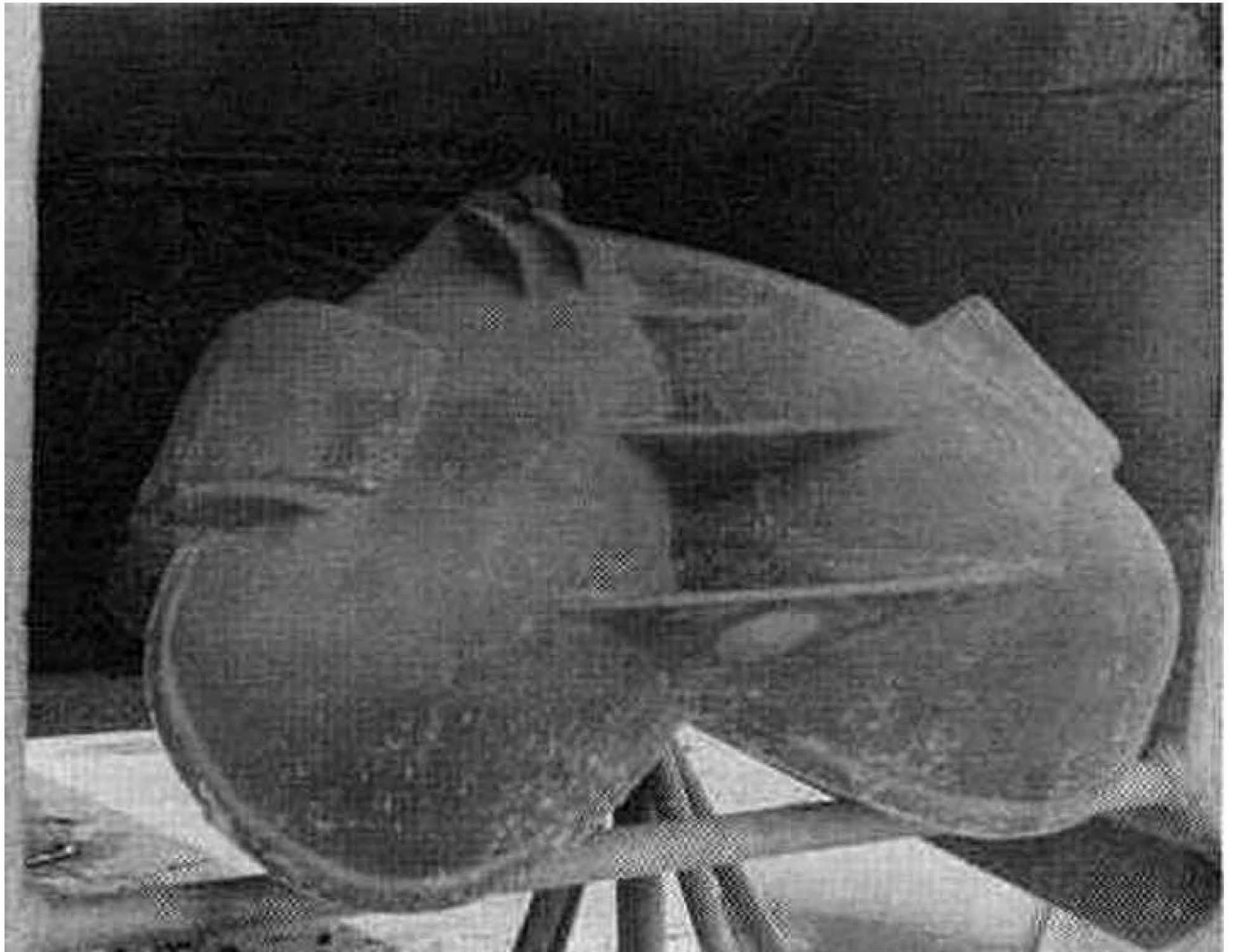
The hull was designed with little sheer from the waist aft to achieve more level decks fore and aft, and to eliminate the uphill climb for crewmen walking forward in the area of the galley and crew's quarters. Freeboard was kept low in the waist for easy boarding from the purse boats when the seine is alongside for pumping fish.

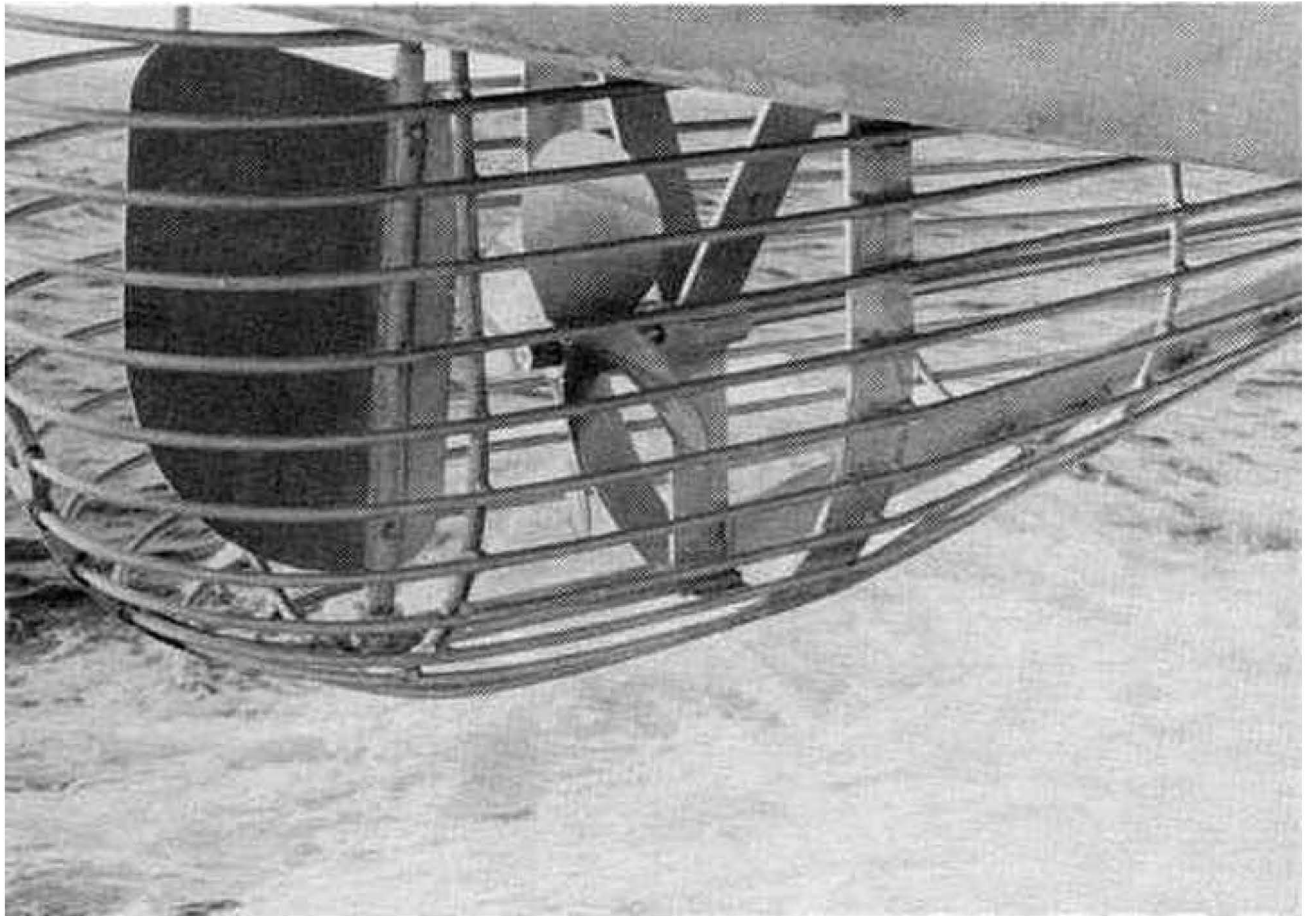
On all three fish boats, the traditional mast and crow's nest have been retained, but redesigned for greater safety and strength, particularly for hoisting the net on the gaff.

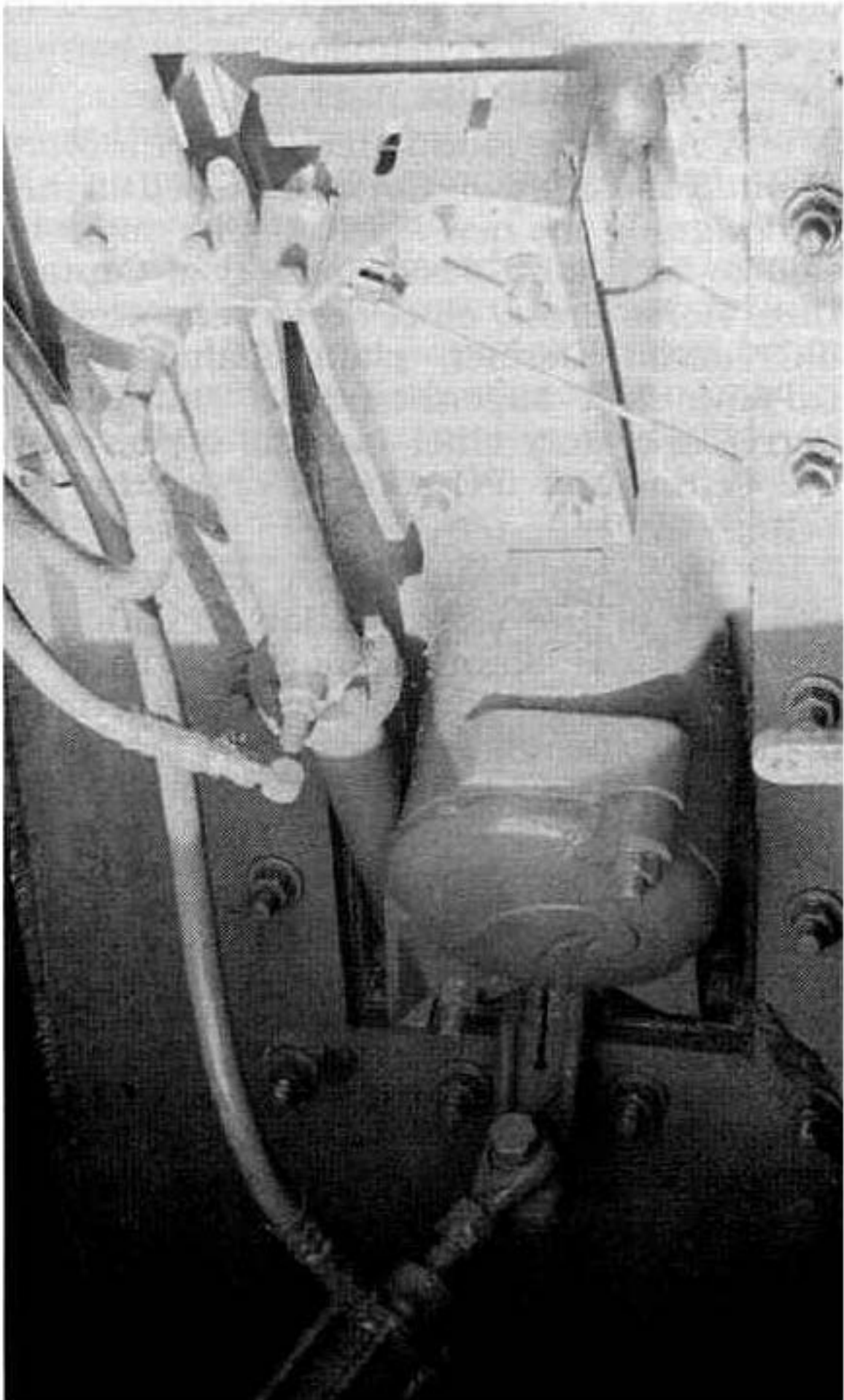


The jet pump at the stern of the purse boat.



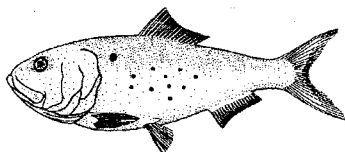








Controls in the wheelhouse of *Maria C*. Steering lever is at left, twin throttles at right. Windows slant in from the tops for better visibility of foredeck, especially during rains or fogs.



The mast, patterned after those of West Coast tuna seiners, is in effect a tripod, with a main steel vertical section braced forward by two rigid steel stays secured just aft of the wheelhouse, instead of the usual cable stays to chain plates on the gunwales. Where most captains and mates ascend to the crow's nest on ratlines on the stays, or by powered elevators riding the stays on some fish boats, those of the *Maria C*, the *Mary Virginia*, and the *Mary Judith* go up rigid ladders set on the ships' centerlines from the forward deckhouse roofs.

On the *Maria C* the gaff boom pivots at the base of the mast instead of above the main deck, an assembly intended to reduce the bending moment and increase the load capacity.

Inside the wheelhouse, where steering is electrical by lever rather than by wheel, all-around visibility is provided to save the helmsman the necessity of stepping outside when maneuvering to make sure of clearances and conditions. A flying bridge with controls atop the wheelhouse makes possible a close watch of purse boats during a set.

The purse boats themselves are likewise unconventional—driven by jets rather than by propellers in their familiar aluminum baskets that keep nets away from the blades. The experimental drive—tried once on Chesapeake Bay in the 1960's with inadequate converted automobile engines—has convinced Petrou that future replacements of present conventional purse boats will be jet-driven.

While jet propulsion has been tried for pleasure boats in this country, Petrou had to go to New Zealand to find one adequate to moving a purse boat. Design engineer Horst Brose saw them at the 1975 Fish Exposition at Seattle, learned that our Coast Guard used them in work boats and that some West Coast Canadian fishermen were trying them in skiffs. He liked the potential and inquired, to learn that in New Zealand they were used extensively by tugboats, which must have great power for their size and be maneuverable as well.

Jet propulsion is simple, depending entirely on the law of physics: each action is followed by an equal and opposite reaction. A hydraulic pump, driven by a two hundred-horsepower General Motors 671 diesel engine, sends water out through a nozzle in the stern of the bottom of the boat. This provides the "action," the movement of the boat the "equal and opposite reaction." (It is not the jet of water pushing against the body of water floating the boat!)

Directional control—steering—is achieved by directing the jet nozzle itself, not with a rudder. Captain Dize found that while no early jets in small boats steered well or at all at slow speeds, the purse boats with the Hamilton jets adopted steered at idling speed, turned "on a dime," could move laterally to keep the seine from being swept into shallow water by currents or even to tow it to depths where the *Maria C* could get to it to pump fish. The two purse boats also can run parallel side by side without being lashed together, for quick separation when starting a set.

A jet purse boat needs only four inches of water to cover the intake. At first a rudder was installed, which added more than a foot to draft, but it was found unnecessary and was taken off. The intake, an opening two by three inches on the bottom, is protected with a steel grill to keep the net and floating debris from being sucked in to the impeller.

Among other advantages Petrou found in the first season of operation of the jet purse boats were complete lack of cavitation, and most unexpectedly, much less wear on the purse seine. Twenty-one million fish were caught with only a few small holes to be repaired, while the net used on conventional boats needs constant repair. Further, it was

found, the fish seemed not to hear the approach of the purse boats, since almost all the noise was on top of the water rather than in it. Thus there was less spooking; fewer stabs or haul-backs.

Whether jet propulsion will be adopted generally remains to be seen. It may be recalled that it took many years in the nineteenth century for fishermen everywhere to adopt the purse seine. Yet if the Petrou experience continues productive, others can be expected at least to try it. Some retired captains now wonder why the idea was not exploited further in the 1960's.

With Petrou, the features of the *Maria C* and the jet-driven purse boats are regarded as progress, but not all the progress to be

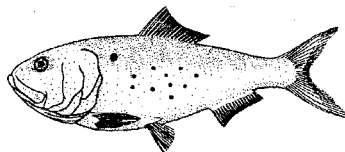
made. The team does a lot of fishing for a comparatively small establishment, and ashore processes a lot of fish with a Rotadisc indirect dryer for fish meal that is claimed to eliminate burning of meal particles and formation of dust, to increase protein yield, and to protect the meal from pollution by particles or chemicals in fuel oil. The Rotadisc, made by Stord Bartz Industri A/S of Bergen, Norway, is used extensively by fish meal producers throughout the world, with the Soviet Union, a leader in use of factory ships, having at least 150 afloat. The dryer, along with Stord Bartz equipment—including a twin screw press, indirect cooker, and stack scrubbers to eliminate odors—has been in use here since 1972.

IX. Dunton's Hump

As is the way in a competitive industry, few heroes get worshipped, or even recognized, at least in their lifetimes. The menhaden industry, through its trade organization, the National Fish Meal and Oil Association, from time to time presents plaques and certificates at its annual meetings, then goes on with new business. Perhaps a little more honor is due a stocky Virginian who started a successful law practice at the bottom of the Great Depression, turned to county politics, and in his senior years might have found himself a judge if he had not been deflected into "the fish game" thirty years earlier.

Ammon Gresham Dunton's "deflection" was mentioned briefly, in a previous chapter. While his corporate service was to Reedville Oil and Guano Company and Haynie Products, Incorporated, Dunton was really a man of the entire industry, as far as federal and state governments and the public itself could tell. When you wanted to know something about the industry, he was the man to talk to. When you had a complaint, he was the man who would listen—possibly the only man in days before the menhaden industry (and industry generally) came to realize that its desires and plans might conflict with someone else's.

Even while serving Reedville Oil, Ammon Dunton was able to act as counsel for other companies, and without passing secrets or proprietary information one way or the other. It was only when he became president of



Ammon G. Dunton



Reedville Oil for a brief "caretaker" period after the death of Raymond L. Haynie, Jr., in 1959 that he found it necessary to end some of his more general work.

Yet through the 1960's and early 1970's, he was a unifying force. When the industry met, it met in the Chamberlin Hotel at Old Point Comfort, always in the Washington's Birthday week of February. Ammon Dunton, who had revitalized the Virginia Fishermen's Association to represent ninety percent of the industry, was in effect host and co-manager. He and Walter Mercer, secretary of the association and manager of the J. Howard Smith, Incorporated, shipyard at Fleton, Menhaden Products, Incorporated, until his death, "ran the show."

Dunton liked the Chamberlin because it was comfortable, and in those days you could get a room for nine dollars a day—seven dollars next to the elevator shaft. It looked out on lower Chesapeake Bay and Hampton Roads and you could see ships and shipping. It was close to where Elijah Reed had first set up his kettles more than a century before. And, when you came down to the lobby, you could see anybody you wanted to see—no hunting through half-a-dozen restaurants, bars, discotheques, or other hiding places of modern meeting complexes.

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Critics of the industry—and there have been many—grumbled during his career that "any time you try to do something to head it in, Ammon Dunton runs to Richmond or Washington and stops you." If so, that was his assignment, to guard against what the companies regarded as threats to their continued prosperity or even existence. Everybody is entitled to a voice in his state or national capital and Ammon Dunton was effective. Had he not been so, no one would have grumbled except in the industry.

Among his first labors was that of keeping peace just after the Second World War between the fish boats and the military

services. Restricted areas had been set up in Chesapeake Bay for Navy bombing target ranges. Some were still there a generation after the war. Along the Atlantic Ocean, there were firing ranges off Wallops Island and south of Virginia Beach. There was a submarine cable across Hampton Roads. The locations were all charted, easy to avoid if you were just passing in a boat. But with a fish boat, an occasional set was made outside a restricted area or away from the submarine cable, and a strong tide carried the purse boats, seine, and fish boat into forbidden territory. The Coast Guard then arrested the captain. This could mean a fine and, more seriously, fishing time lost. Almost any captain could spare the money for the fine, but it was hard to face an idle crew that knew other boats were out making money.

Pre-season meetings with commanding officers of the Naval Base at Norfolk and Fifth District Coast Guard at Portsmouth helped keep the problem in hand. The officers likewise were invited to the annual meetings at Old Point Comfort. In the "old home week" atmosphere of the Chamberlin, with nautical talk and fishing gossip in the air, ways were worked out to keep the captains out of trouble, most of the time.

For all Ammon Dunton was a defender of the industry, he could be depended on for information, favorable or unfavorable. During the 1960's there was a serious spill from a barge delivering heavy number six fuel oil to the Reedville Oil and Guano plant at Fleton. He got the facts out to the newspapers and public. He knew well that although the spill was no fault of the factory, many would blame it anyway on an argument that if there had been no factory, there would have been no spill.

Again, a Reedville Oil fish boat made what turned out to be a disastrous set in North Carolina waters during a fall season. The school caught, in a rare occurrence, turned out to be sea trout or weakfish instead of bunkers. Ammon Dunton made it public, providing full detail on the captain's dilemma: if he dumped the set, most or all the fish would be dead to drift up on beaches and he would be violating the law as well; if he kept them, he was breaking another law. He brought them in and was arrested and fined. Ammon Dunton told it all.

And it was Ammon Dunton who did

much to draft a code of ethics intended to meet pressure from sport fishermen in a campaign to get the Virginia General Assembly to ban, or at least heavily restrict, purse seining in Chesapeake Bay. The code committed the menhaden fishery to much self restraint, with nothing asked in return from the sport fishermen.

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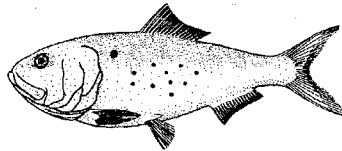
It was another of the fishery's little paradoxes that of all Ammon Dunton's services to it and to all American fisheries, only one came to bear his name, that irreverently. A new steel fish boat was named for him in the late 1960's, but that has been done for many a man long in the industry, or long in friendship with a company owner.

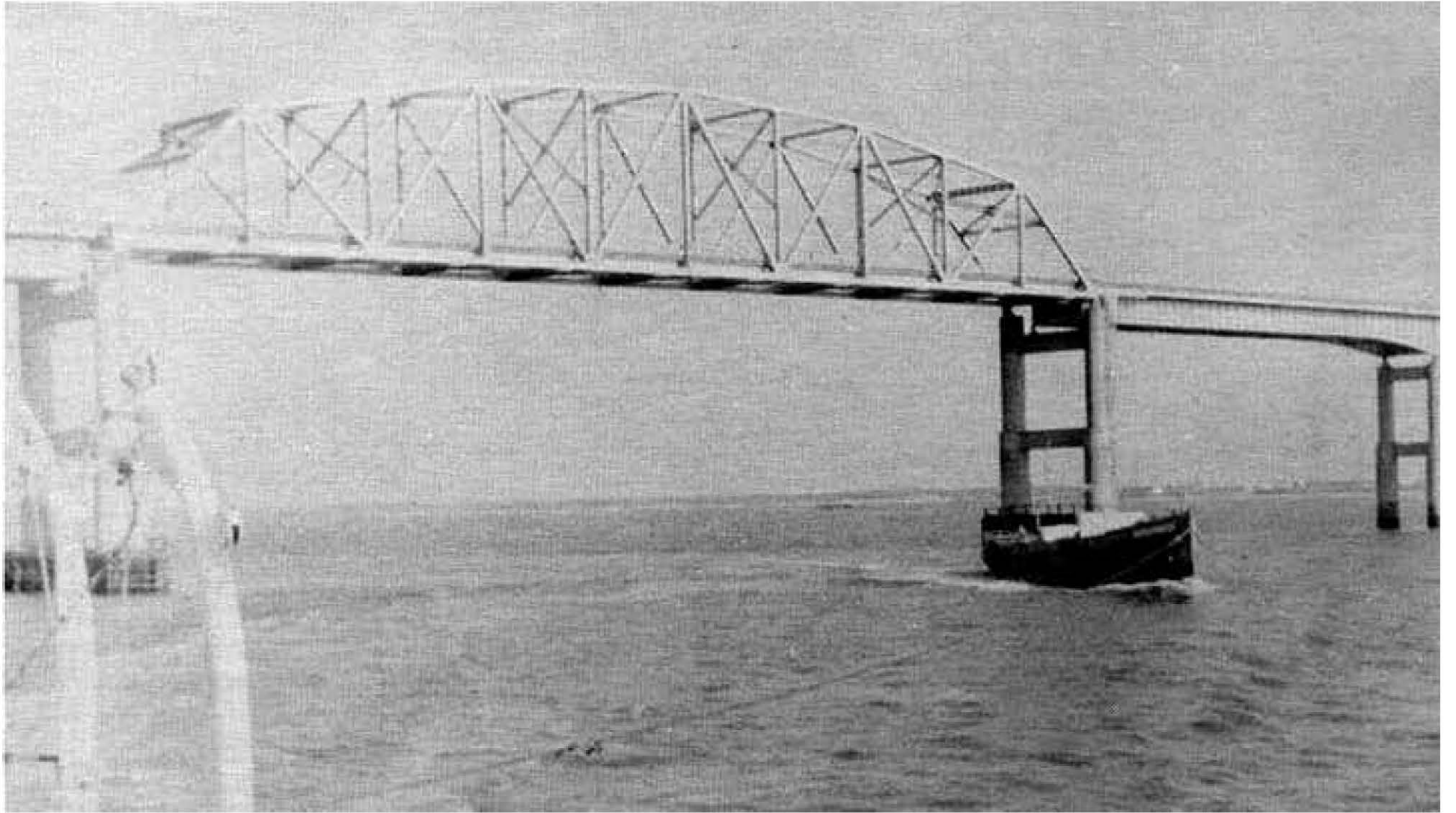
He served for six years in the Department of Interior's American Fisheries Advisory Committee and on a similar group for

the Department of State. He was one of two fisheries representatives of a special forty-man committee appointed by President Lyndon B. Johnson to advise on trade negotiations. He was a longtime member of the executive committee of both the Virginia Fishermen's Association and its successor National Fish Meal and Oil Association. With his law practice and business interests, he served on the boards of the Virginia Chamber of Commerce and the Virginia Manufacturers' Association. All this was embalmed in association and corporation minutes when he retired.

Yet one-half mile out in the mouth of Chesapeake Bay from Fishermen's Island at the southern tip of the Eastern Shore, the otherwise level Chesapeake Bay Bridge-Tunnel structure rises to give seventy-five-foot vertical clearance over the North Channel between the island and the Inner Middle Ground with its shoals. This is "Dunton's Hump." It was not in the original design of the seventeen-mile bridge-tunnel. The bridge with fifteen-foot vertical clearance would have run level for five miles to the northern tunnel

Dunton's Hump.





under Chesapeake Channel for ships headed up the Bay for Baltimore or Washington. Thus, if a menhaden captain cruising the lower Bay side of the bridge learned of a "steamer size" school of bunkers—maybe one hundred thousand fish "with good color"—on the ocean side, he would have to race ten miles to get to it. Fish do not often wait.

Ammon Dunton and the industry heard of this in the design stage of the engineering marvel. He made trips to the Chesapeake Bay Bridge-Tunnel Commission meetings and in time got his point across. This section was redesigned for passage of the tallest mast of any fish boat then afloat.

Some said it added five hundred thousand dollars to the cost of the Bridge-Tunnel by the time it was completed in 1962. No doubt if the commissioners had known the money troubles they were to have with light traffic and unbudgeted low receipts of tolls to cause default on one series of bonds, they might have refused to hear Ammon Dunton's point.

Fish boat captains think it good that the commissioners couldn't see ahead.

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After his retirement, Ammon Dunton could perhaps sleep a little later in the morning at his home on a bluff overlooking the lower Rappahannock River, then go to his law firm's new building in a pine grove in White Stone. Before leaving, he might pick up his binoculars and look up and down the river to see if any fish boats were making sets, as he had done often in other days. If the boats were out, he could hope the sets were good.

At the office he might find a stack of work, some of it passed to him on a theory always popular among juniors, "He doesn't have much to do now, let him handle this." He kept busy, and often as court-appointed attorney for someone broke and in trouble.

The menhaden fishing world moved on without him in person, but with much that he gave in forty years.

Part Three

**MEN AND IDEAS AND
SONGS**

I. The Inventors

Modern industry professes to seek innovators, creative people: men—and now, reluctantly, women—who ask always whether the present way is the best to build mousetraps or space ships. Ralph Waldo Emerson seems not to have noticed that pathways are not always beaten to their doors, but it does happen. The menhaden industry and fishery has benefited from time to time from innovation, although anything to do with fishing and the sea has always come against those who see no reason to change what Daddy and Granddaddy did. Our own merchant marine built clippers long after steam became practical, and George Brown Goode and Captain E. T. DeBlois told how it took more than forty years for the purse seine to be accepted generally by New England fishermen.

Technological progress likewise came to the menhaden business by fits and starts. Many a kettle and hand press factory was still producing oil and guano long after John Tallman of Portsmouth, Rhode Island, William D. Hall of Wallingford, Connecticut, and D. D. Wells and his son Henry of Greenport, Long Island, showed that steam was better. Elijah Reed's first factory, set up at least seventeen years later to bring the industry to Chesapeake Bay, was a kettle and press works, as was the first Haynie factory, the 1878 start of today's Zapata Haynie Corporation. It was 1879 before Reed went to steam, twelve years after he sailed into Chesapeake Bay, but still with the first steam factory on the Bay.

Nor were sails quickly replaced by steam, and it may be recalled that one of George Brown Goode's correspondents casually thought that steam fish boats around Boothbay, Maine, did "not appear much more profitable." The wind cost nobody eight dollars a day.

The steam dryer, invented by Albert Morris, followed "mechanization" of sun drying by Bellows and Squires, with a horse and drag shovel turning the fish scrap on open air drying racks to end hand raking and forking amid the smelly stuff. Later a wooden-toothed harrow replaced the drag shovel. The Morris process, where adopted, ended much of the traditional rush to cover the scrap with tarpaulins when one of the Bay's fifty-odd summer thunderstorms exploded out of ragged, purple, northwestern skies. The scrap likewise had to be covered at night to keep off the dew.

Again, none of this spread in a season through the industry. Many a plant stayed with tried and true methods long afterward, partly because of conservatism, partly because of lack of capital. In good years they got by. In lean years it might be the difference between breaking even and going broke.

The changeover from sail to steam, pioneered in northern waters and brought to Chesapeake Bay by Elijah Reed's *Starry Banner*, followed by Bellows and Squires' *George H. Bradley III*, came along somewhat parallel with the turn to steam ashore. Both

lightened labor but did not end it. The life of a menhaden fisherman or factory hand continued to be all-day labor.

Some idea of the contrast between today's highly mechanized fishing and plant operation can be had from one of the few descriptions of the industry after publication of George Brown Goode's books, written by Robb Leon Greer as an appendix to the 1915 report of the U. S. Commissioner of Fisheries for the 1914 fishing year. Apparently 1912 was Greer's last available statistical year, and he reported forty-eight menhaden factories on the Atlantic Coast, worth \$3,625,983—possibly what one medium-sized one could be built for today if you already had the waterfront land, zoned industrial. The center of the fishery and industry already had left New England and Long Island, with nineteen factories reported for Virginia and twelve for North Carolina, against one for Maine and two for Connecticut in New England, and five, including one floating factory, for Long Island. Delaware had two and Maryland one, and Florida to the south one. The Gulf of Mexico had not yet been discovered.

The menhaden fleet included 147 vessels worth almost the same in dollars as the plants ashore—again perhaps the price of one large modern vessel built anew. There were also "some auxiliary schooners," almost all in North Carolina. The internal combustion engine was beginning to challenge steam, with twenty-nine fish boats driven by gasoline, one in New Jersey big enough to carry four hundred thousand fish. There were 386 purse and striker boats fishing 274 purse seines. They caught more than one billion fish to produce 6.6 million gallons of oil worth 1.5 million dollars, and nearly ninety thousand tons of scrap worth 2.1 million dollars. It was a good year for the 2,159 factory hands and 3,735 fishermen, the former earning more than five hundred thousand dollars, the latter more than one million.

Yet Greer found, as many an operator had before and has since, that success came and went. The catch of 1911 was "probably one of the largest known [no actual figures were available, nor are they now for most years between 1899 and 1920] and the large dividends paid that year gave the industry such an impetus that four new factories were

established during that season and eight in 1912; in addition to these four new ones were being operated in 1913 and two others were under construction." But, he added, "it may be incidentally stated that the fishing during the season of 1913 was practically a failure, at least two of the factories having been forced into receivers' hands."

He found the number of factories lower than in some previous years but noted their larger size and modern equipment and added, "The possibilities are probably greater to-day than ever before." Greer described the steamers then as "built somewhat on the tug model, with an extra high bow, which serves a two-fold purpose, that of rendering them more seaworthy and giving the pilot the advantage of a much greater scope of the sea."

This "extra high bow" was the profile of many a fish boat, and steamers built early in this century were still in service almost into the 1970s. The steam engines had been scrapped for diesel (gasoline apparently did not continue in use much past Greer's time) and the coal bunkers turned to oil tanks and bigger fish holds, and the tall stacks cut down, but otherwise the boats were much the same. A pioneer in an almost mid-century move away from the old steamers, built of wood and fastened with one-inch locust treenails (trunnels), was a Chesapeake Bay captain, Wallace E. Lewis, who in 1947 tried the first war surplus minesweeper.

"Many of the steamers now in use," Greer continued, "are lighted by electricity and also have searchlights and are modern in every detail." Not all, and again, for years afterward. Wallace Lewis recalled when he started in 1926 as a deckhand on the then forty-year-old Morris, Fisher steamer *Northumberland*, "my job was to run the 'dynamo.'" He filled running lights and interior lamps with kerosene, polished them, and lighted them with kitchen matches at sunset. There wasn't a watt of electricity aboard, except in such primitive hand flashlights as the captain or mate might own.

"The largest one in use," Greer wrote, "has a capacity of over a million fish, but a larger one was built at a cost of \$100,000 and with a capacity of at least one and a half million fish." Today's fleets range in capacity from 750 thousand to two million fish. Converted Air

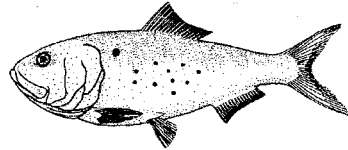
Force freight ships make up most of the larger vessels, minesweepers and other small patrol craft from the Second World War the smaller. The latter began disappearing with increasing age in the 1970's. Many new boats, designed specifically for menhaden fishing, were built in the 1960's and 1970's, most of the later ones on or for the Gulf of Mexico. One, the 220-foot *Southland* of J. Howard Smith, Incorporated, was sold after a few years and cruised thousands of miles in the Pacific Ocean on petroleum exploration for Gulf Oil Corporation. A sister ship, the *Tideland*, continues to fish.

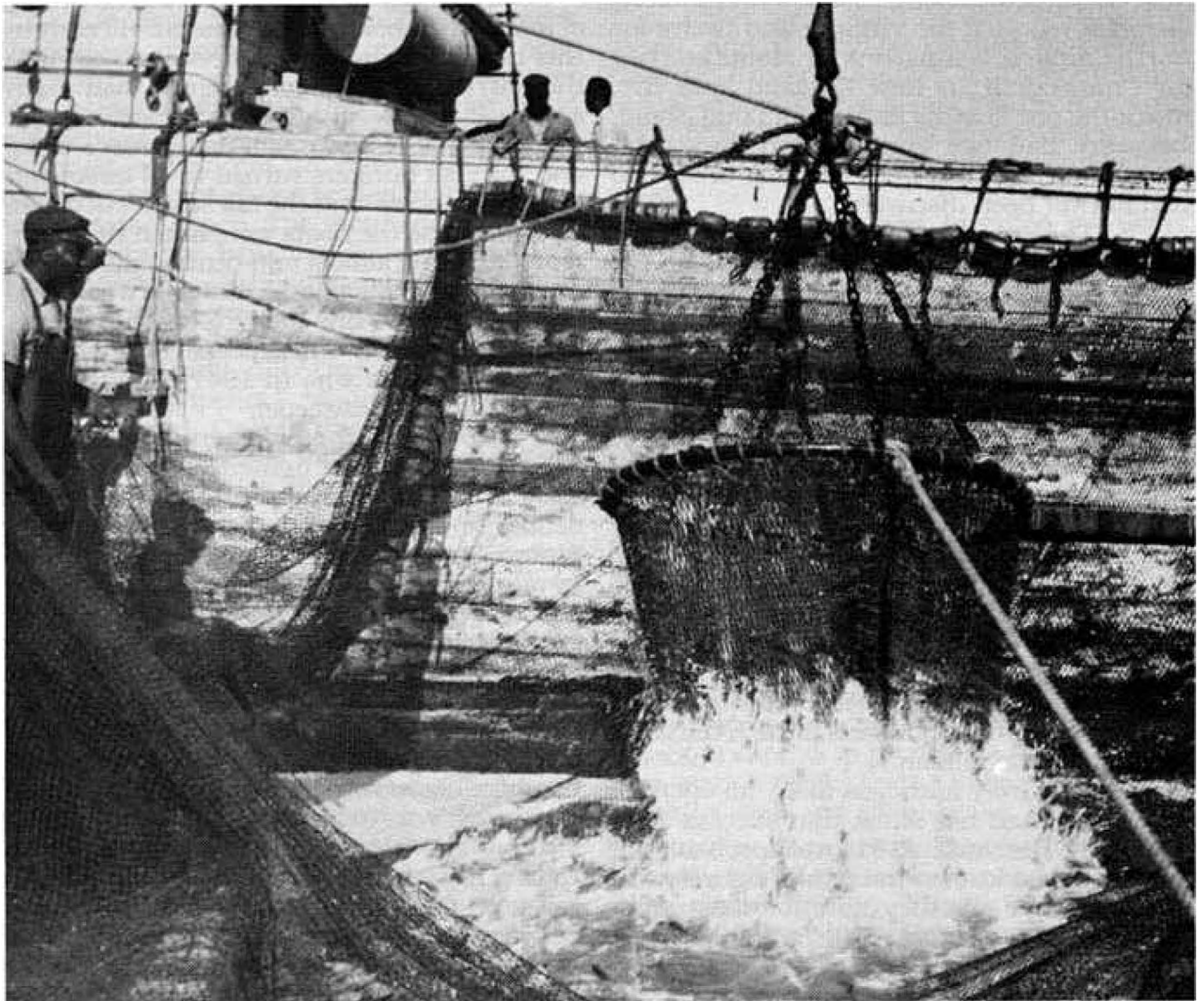
Perhaps because much on Chesapeake Bay could start without so great a burden of "the way Granddaddy did it," at least in this fishery, a substantial part of the efficient

operation of today's fish boats and factories came out of individual and group thinking of the Bay men, afloat and ashore.

Among major developments has been refrigeration, tried, as told earlier, on The Palmer Fisheries' *Louise* and *Gloucester* of Fairport, Virginia, in the early 1920's, but not used again until Standard Products adopted it on its Gulf of Mexico fleet in 1956. Refrigeration, now on all Gulf boats and many others, makes possible longer trips, with New Jersey boats able to cruise south or north, Chesapeake Bay boats to venture to the New Jersey and Long Island waters or to North

A load is raised to be dumped into the fish hold of the old wooden steamer. National Marine Fisheries Service photo, from old Bureau of Commercial Fisheries files.





Carolina, North Carolina boats to the Florida grounds, Gulf boats anywhere in their heat and humidity—all to return to port with fish in good condition.

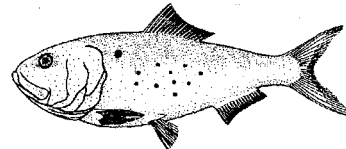
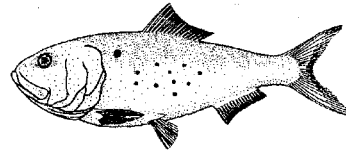
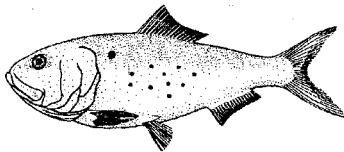
Soon after the Second World War other technological advances came along. One of the most important was the triple-action piston fish unloading pump to take the fish rapidly out of the fish boat hold and into the factory raw box. This was perfected by H. R. Humphreys, Sr., in 1945 and 1946, and built

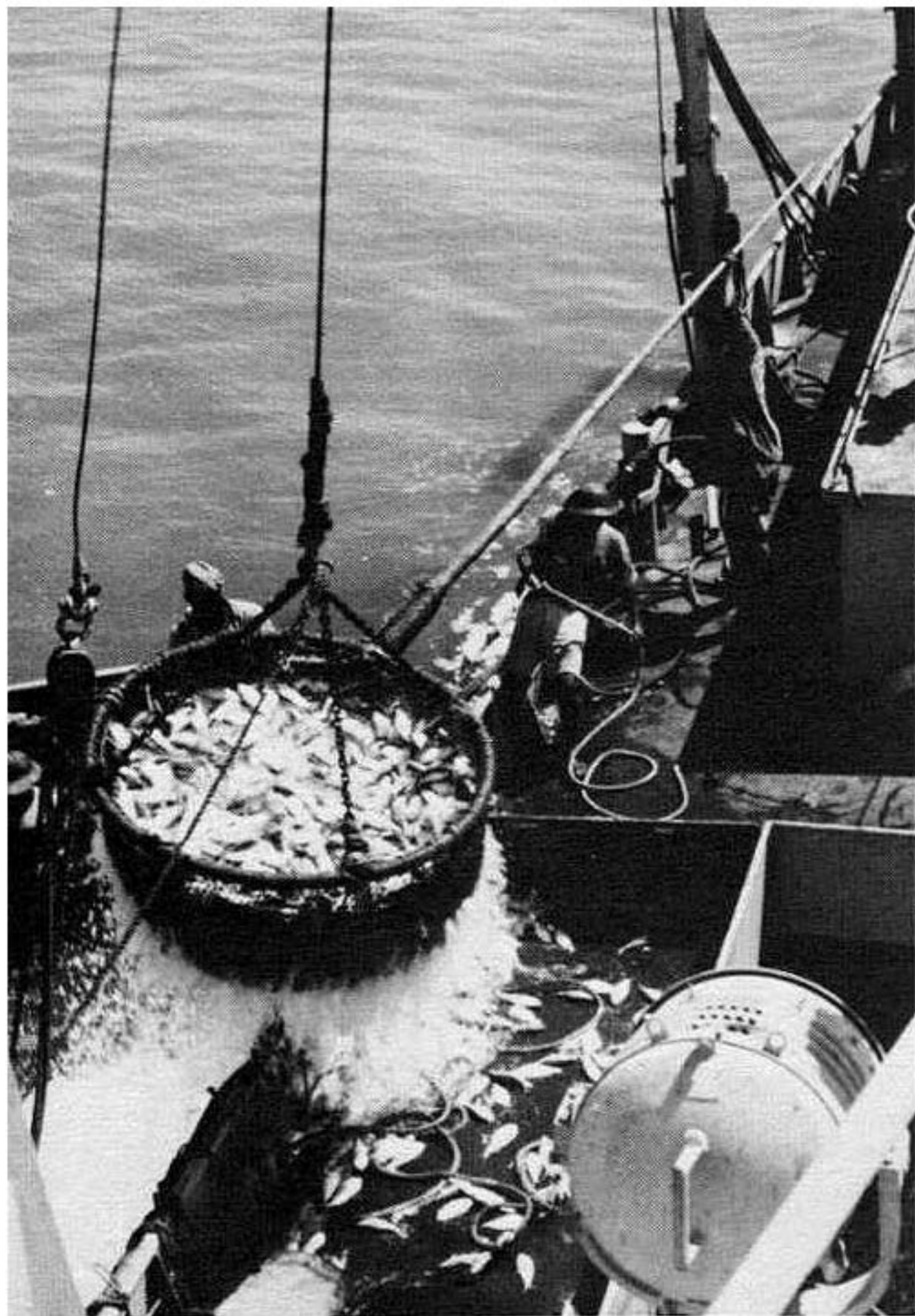
by his second son, William Lorenzo, at the Humphreys Railway at Weems, Virginia. It ended generations of hand labor, first with fishermen shoveling deck-loads to the docks, then scooping fish in the holds to bailing tubs to be hoisted ashore to first wheelbarrows, then to cars or conveyors to take them to the raw box to await cooking; and finally half-a-dozen men shoveling them into the buckets of

Before the invention of the fish pump, menhaden were bailed aboard the fish boat. The big dip-net picked up two to three thousand fish at a dip from the hardened mass of fish in the purse seine against the side of the fish boat. National Marine Fisheries Service photo, from old Bureau of Commercial Fisheries files.

Bailing almost completed: only a few fish remain in the purse seine, and the dip-net has a light load. National Marine Fisheries Service photo, from old Bureau of Commercial Fisheries files.

The last of the catch is dipped by hand while a bunt puller holds the seine. National Marine Fisheries Service photo, from old Bureau of Commercial Fisheries files.









a "marine leg," or movable vertical elevator which dumped them into conveyors.

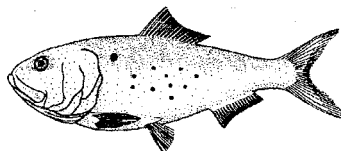
An attempt was made to adapt the unloading pump to shipboard use to end slow bailing of the catch from the purse to the hold after a set. However, the piston pump, designed to move eighty-five percent solids, did not work well with ninety-five percent water and five percent solids from the purse. Then Grafflin S. Prather of Gainesville, Florida, designed a centrifugal pump, and fish now are sucked through a fourteen-inch hose from the tight triangle made by the purse boats against the side of the fish boat—one hundred thousand every eight minutes. Wallace Lewis, as a Standard Products captain, designed an open throat foot valve to keep the pump primed. Formerly the pump was primed with

two three-inch auxiliary pumps, with a ten- to fifteen-minute delay.

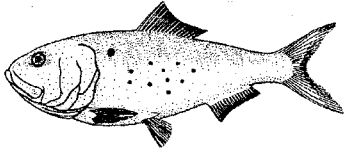
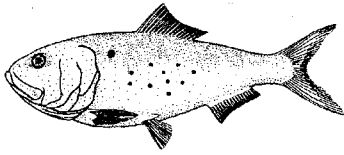
Now a fish boat, instead of being idle for one to two hours after a set and helpless no matter how big a school of fish comes by, is fishing again in minutes to half-an-hour, according to the size of the set.

Greer reported that the old way of bailing fish aboard made possible loading half-a-million an hour. In 1931 another government report by Roger W. Harrison estimated that two to three thousand fish were raised with each dip, or from 120 to 150 thousand an hour. Both found the set itself took thirty to forty minutes.

A good set: the pump has started to suck more than one hundred thousand fish into the hold of the *Joseph F. Bellows*.





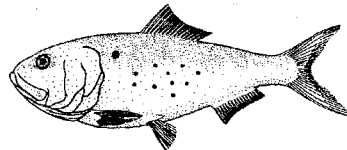


Greer described the dockside unloading procedure of 1915 as using bucket-type elevators "in all the larger and best equipped factories. "In former years," he said, however:

"the fish were all removed from the vessel hold by means of tubs each having a capacity of 500 fish. While this method is now regarded as

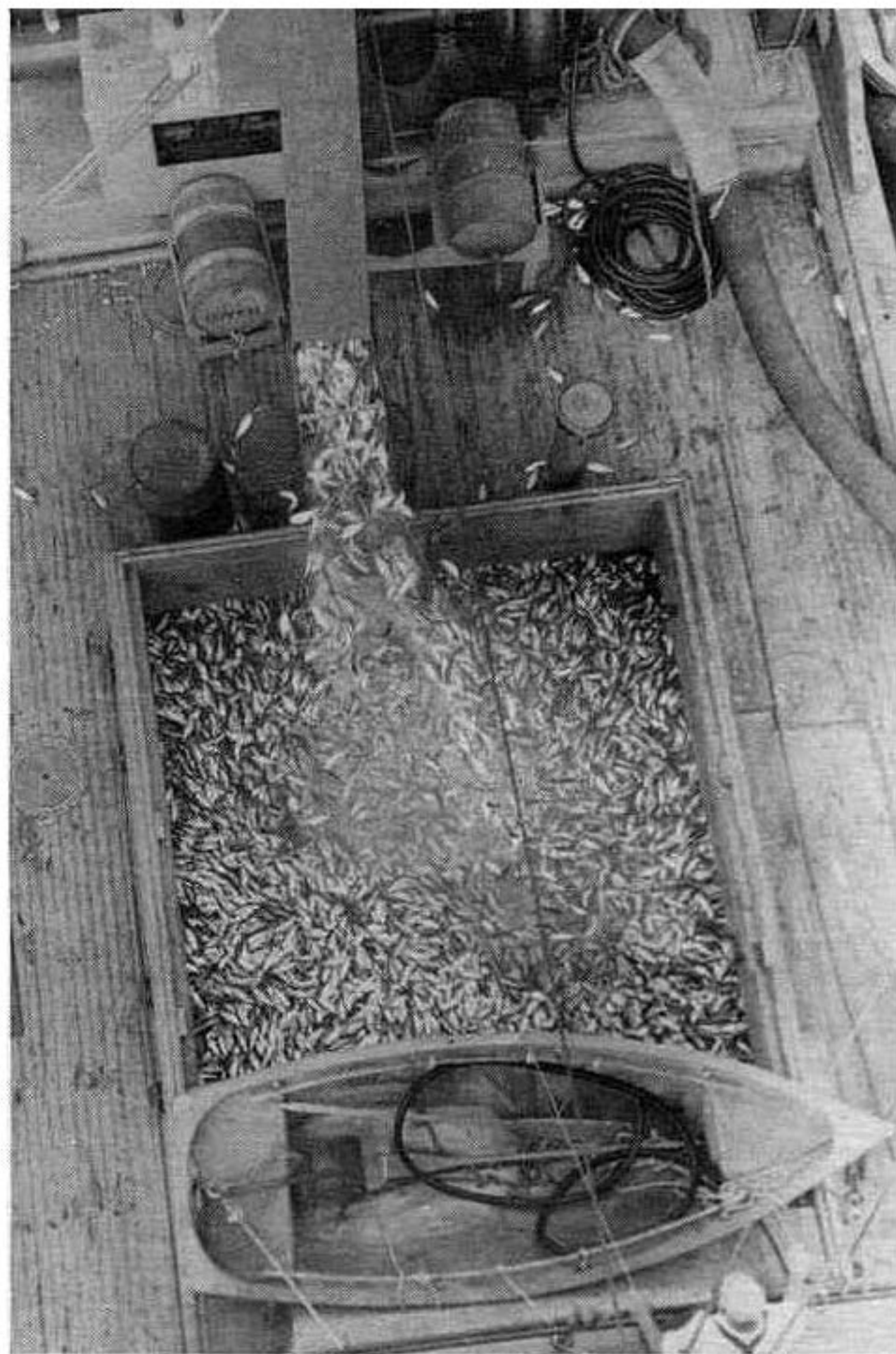
Gulls go into a frenzy over the water being discharged while fish are pumped into the fish hold.

A fish hold rapidly filling. Bunkers by the thousands flow down the chute into the *Joseph F. Bellows*. At upper right the fish pump hose extends over the rail to drop into the purse net alongside. This 1963 photo shows the striker boat still carried, although its usefulness had been ended by air spotting.









antiquated, it is yet in use in a few of the smaller factories. The tubs are filled by hand and raised by means of a block and tackle and the fish are dumped into bins or small cars which convey them into the factory.

The post-war synthetic fiber boom gave fishermen everywhere nylon nets, far stronger than cotton, to end the nightly chore of salting or "pickling" the seines to keep them from rotting before the season was out. One season was all to be expected at best from cotton. Standard Products was the first company to use nylon for purse seines.

This in turn led to other advances making full use of nylon's strength on the Bay. A power hoist was developed by Captain John B. Lowry, an independent with a small menhaden fleet and repair yard, to raise the net to the fish boat's steel gaff while it is held against the side of the boat by the purse boats to be pumped. This action compresses the fish further for easy pumping. The power hoist can be traced to a northeaster "breezing up" near Cape Charles in the mid-1950s. The water was getting rough and Captain Wallace Lewis, now skippering Standard Products' *Joseph F. Bellows*, feared he had to dump a good set of two hundred thousand fish before the *Bellows* got in trouble.

"I had a fall hitched to the masthead to pull it up to dump it," he recalled, "but found the net wouldn't rip. So we raised it and saved the fish. John Lowry went on with this and developed the gaff raising equipment."

Captain Lowry's contribution, along familiar trial-and-error lines, first replaced the conventional twenty-foot gaff on his *John O* with a longer one set about twelve feet above deck. This buckled on a large set off Manasquan, New Jersey. He quickly unbent the three-quarter-inch steel cable from the fish pump hose, wrapped it around the boom, and ran it to the masthead. "The fish came up dry and I knew what to do now."

Later at the factory he put blocks to the gaff so the net could be winched up, and the next year he ran three cables from the mast, one to the hose, two to the net, so "we could shift from one to the other as the net rose the limit on each."

"We were the only ones using the rig

that year," he said. "But the next year everybody had it. Soon it was hydraulic powered, as it is now."

Captain John D. Deihl of Reedville Oil and Guano Company, now Zapata Haynie Corporation, also worked on power net hoisting equipment of a different design.

Another major advance, forced by the increasingly "labor intensive" nature of the fishery, was the hydraulic power block, by which pursing is done quickly with the net hauled back into the purse boats mechanically instead of by the straining muscles of two dozen or more bunt pullers. Twin wheels or sheaves eighteen inches in diameter with shallow rubber-faced cones on their inner surfaces pull the net up at any desired speed. This appeared in 1955, with Captains Lewis and Deihl first trying them. But the wooden purse boats were too round in shape, and the power blocks not only pulled the net up but pulled the boat gunwales down to swamp them.

The next year Standard Products built four pairs of redesigned steel purse boats and tried them on the *Tenderheart*, *Rowe*, *A. Vernon McNeal*, and *Joseph F. Bellows*. The designer of the power block, Mario Puretic of San Pedro, California, worked with Captains Elwood Turlington, Robin Routt, Norman George, and Wallace Lewis to adapt the technique developed for ocean tuna fishing to menhaden. Captain John D. Deihl had one set of power blocks installed on two purse boats and used them a week with each of four fish boats. Puretic was honored by the U. S. Patent Office in 1975 as "Inventor of the Year" for his work on the power block.

With the redesigned steel boats—later J. Howard Smith, Incorporated, introduced aluminum purse boats, now standard throughout the fishery—the power block turned out to be a major improvement.

"We had more trouble convincing the crews that they would work than actually working them," Captain Lewis recalled. "They called them 'boats with horns.' But we knew the power block had to come because companies were going broke with too much labor."

The device made possible fishing with eight men in each purse boat instead of fifteen

to seventeen, and Captain Lewis credited it, plus earlier development of deeper seines, with saving the industry in the late 1950's. The deeper seine was another contribution of Captain Lewis and his mate, E. Vincent Haynie, later captain of the Standard Products fish boat *Frances*. While they were fishing with the *Blundon* in the 1940's, they decided that the eight-hundred-mesh nets seventy-five to eighty feet deep by 125 fathoms long, were losing too many fish. They had one ripped open and added three hundred meshes to increase depth by about thirty feet, "and a set of seventy-five to one hundred thousand fish became three hundred thousand." The cork floats of the bunt line no longer were pulled under to let fish escape over the top.

In the 1960's Captain Lewis designed a level wind winch to end more of the hand labor in pursing, and snap rings which opened so the purse line did not have to be threaded through the eighty rings. He and H. R. Humphreys, Jr., president of Standard Products, patented an automatic device to end manual coiling of purse lines, with frequent fouling.

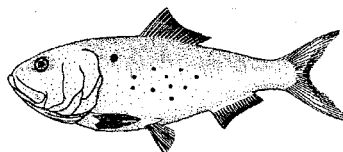
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Possibly the most productive of technological advances has been air spotting, and this too had its first trials on Chesapeake Bay, as told previously. It was more than a generation coming into general use, partly for lack of rapid two-way voice communication by radio, partly because of its cost, and again partly for reasons deeply rooted in instinctive conservatism. Fishermen had long known that the captain and mate in the crow'snest could not possibly spot all the schools, possibly not even the best schools, and those only if within a mile or two. But they also had long known that this was the way it had been done for generations. Probably no one recalled reading, or ever had read, what Professor Samuel L. Mitchill told the Literary and Philosophical Society of New York in the early nineteenth century: "From the high banks of

Montock, I have seen acres of them purpling the waters. . . ."

During the First World War it was well-learned how a man in an airplane, then still a new thing worked out by those two bicycle mechanics from Dayton, Ohio, less than a score of years before, could see much otherwise hidden from the generals in their tents or on their horses. The idea dated back at least to our own Civil War, possibly even to the French Revolution, when soldiers went up in observation balloons to try to peer across battle lines. Thus in the post-war period of

In 1963 Captain Wallace E. Lewis, right, one of the fishery's most successful skippers, lends a hand here on a Chesapeake Bay set a short time before his retirement. In the background is Standard Products' fish boat, the *Joseph F. Bellows*.





1919 and 1920, many men were thinking of airplanes and their uses. In the menhaden fishery it was the one man, John A. Palmer, Jr., still remembered as "fifty to seventy-five years ahead of his time," and, as already recorded, also trying refrigerated fish holds.

After Palmer's brief but successful experiment with a borrowed Navy flying boat and a clumsy wireless relay of observer Jack Harding's reports of fish locations, Roger Harrison's 1931 report to the Bureau of Fisheries urged menhaden operators everywhere to work out a cooperative effort at fish spotting. (This would bring the Justice Department's anti-trust division shouting and swarming on the industry now.) But it took another World War, with even greater advances in aviation, to bring air spotting to the menhaden fishery. Even then the development had to await adequate quick communication. With the slow wireless relay, the fish were somewhere else when the steamers got to the areas Jack Harding had found. But instantaneous radio voice communication from plane to ship, made possible in the war, was the answer.

There were occasional earlier attempts. Captain Hudnall Haynie of Reedville, Virginia, fishing for Otis Smith out of Lewes, Delaware, in the late 1940's, went up with a pilot in Smith's own plane, located schools, and brought information back for captains to use the next day. Again, the fish often were not there when the fish boats arrived.

Norman Edwards, long in the service of J. Howard Smith companies, now Seacoast Products, Incorporated, recalled another experiment in the early post-war period with flier Charles Smith. Smith searched the water off Nantucket and returned to the steamer and dropped notes in bottles, to be retrieved by the striker in his drive skiff.

In the early 1950's air spotting began to take full advantage of wartime advances. As might be expected, the "walkie-talkie," used in many a battle to keep units aware of what each other was doing and to get help to beleaguered men, was the start. In the Lewes, Delaware, fishery, for a time the captain stayed in the crow'snest giving orders to the mate in the lead purse boat by walkie-talkie. The next step was from an airplane, the pilot using one to direct

the captain in his purse boat below.

Both Hudnall Haynie and Norman Edwards, and no doubt others, tried this. Captain Edwards recalled that with spotter pilot Dave Timidaiski overhead holding the transmitter in one hand and maneuvering with the other, Captain Edwards learned where the fish were off Nantucket in 1951. That sixteen-week season, he said, he caught nearly thirty million fish, the largest catch ever brought in to the Promised Land factory at Amagansett, Long Island. His boss, Gilbert P. Smith, said that was enough—"let them spawn for another season."

At first, the communication was used to direct the striker's drive boat. Later, Timidaiski said, the purse boats towed the drive boat with the pilot overhead directing the purse boats. The drive boat was left at the cork line of the seine at the beginning of the set to keep the fish from rushing over the corks. Finally the striker was found no longer necessary. Although the drive boat survived into the 1960's, it was used less and less, finally not even carried aboard the fish boats.

Air spotting thus ended a unique job. The striker was the most important man in the fishing crew, picked for his skill with the tender, round-bottom rowing boat in any kind of fishing weather, for his eyesight, and for his agility. He was in line for promotion to mate as soon as the mate had been given a steamer of his own. George Brown Goode described the work of the striker in early days, and it changed little during the years, except that he no longer carried white pebbles to throw at the bunkers to head them into the seine.

Captains of fish boats which carried strikers during the 1950's and early 1960's recalled that in the haste of getting after a school, the drive boat with the striker in it was often thrown overboard. The actual drop was only a few feet—even less if there was already a good load aboard and the fish boat was "all mashed down"—but the striker was on his feet and rowing, facing forward, the second the boat was in the water. They rarely flipped.

The striker's duties were simple but not easy. When the captain called from the crow'snest, "Fish! In your boats!", he started for the school. If he succeeded in getting to the far side—and that he had to do most of the time if he didn't want to be demoted to a four-man oar

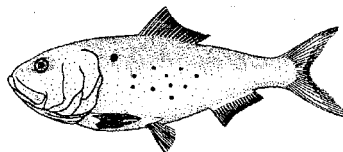
in a purse boat—he watched the fish closely and signaled their movements to the purse boats getting ready to separate and pay out the net. He stayed about fifty yards from the school, and if it stayed motionless, he held an oar vertically. If it started moving, he pointed the oar in the direction. If he held it horizontally while pointing, they were moving fast.

With the school in the right position, he signaled the purse boats to separate. By working his oars back and forth with short strokes, he drove the fish toward the purse boats starting around them. If they tried to dodge, he splashed or “struck” with the oars (hence “striker”) to stop them. Often he had to maneuver quickly, reversing or heading off in another direction. All the while he called or

chanted, “Play fish, play fish, play fish. . .”, or “Here the fish play, here the fish play. . .”

The purse boats closed around the school with the striker inside the circle. He rowed to the far side to “pull the corks” of the bunt to keep the panicking fish from going over the top. He pulled up the bunt-line on one side of the drive boat and secured it to a short rope from a hole in the upper edge of the ceiling, then did the same on the other side, going from side to side until half-a-dozen ropes had been attached on each side with quick release half bow knots. He watched closely to pull the knots and release them if the

A striker or drive boat, long retired but still sound. This one had been taken from an old fish boat of the J. Howard Smith fleets.





weight of the fish seemed about to capsize his boat. With the set complete and ready for bailing the fish aboard the fish boat (in later days pumping them), he released the bunt ropes, rowed over the net, and moved to the stern to be towed to the next set or be hoisted aboard. Between sets, he worked on deck, mended nets, and learned all he could about fishing except engine room work.

Richard Scott of Syringa, Virginia, who had fished from Maine to the Gulf of Mexico for all companies in thirty or more years, served for four years as striker on the *John L. Lawrence*, a Smith boat under Captain Dick Edwards, sailing out of Amagansett, Long Island. He found the work exacting but safe as long as the striker did everything right and well. He had seen others capsize their drive boats when they failed to get a balanced strain on the ropes securing the bunt, but it had not happened to him. Nor to many another who served earlier—but not later. By 1963, when Scott retired to a shore job, the striker's work was done entirely from the air. A man in a small airplane was giving signals in plain language: "A good steamer-size school about a mile off the port bow... good color... moving west... that's right, you're heading for it now... okay... make your set..."

By now the captain has seen and made his own estimate of the school, whether it is actually "steamer-size"—about one hundred thousand fish—and big enough to be worth catching and the individual fish big enough to handle in the seine without being gilled or caught in the meshes. Gilled fish have to be pulled free by hand and only delay getting ready for another set.

The captain shouts the old cry, "In your boats!" Some sound their horns or whistles. The fishing crew already is waiting at the stern or even in the purse boats, the mate taking the port boat. The captain runs from the pilot house aft to the starboard boat and the two boats lashed together, are cast off from the fish boat, their diesel engines roaring as they sheer off toward the school. The captain's boat steers.

From overhead to the captain's receiver: "A little to starboard... they're moving that way... all right, separate..."

The port boat casts off and both start their semi-circles.

"They're still moving... a little more to port, a little more... all right, close in... hurry... you got them... hurry, they're starting to the gap—close it!—come on around, come on around..."

The set is made. The school is milling about inside. The tom has been dropped (no longer by the strongest man aboard but from a hydraulic winch), the net closed or "pursed" at the bottom, and the fish caught. The power blocks on both purse boats begin to draw in the net, reducing the circle rapidly. The fish rush from side to side, bellying out the bunt under the cork line and sending a froth to the surface in their frenzy. In a few minutes the purse is as tight as the power blocks can make it. The captain raises his hand to signal the fish boat to come alongside. The pilot, the ship's keeper while the purse boats are out, brings it up, careful not to let the net be swept by the tide into the propeller to ruin the whole operation and even the whole day. The purse boats form the sides of a triangle, their sterns to the side of the fish boat. The gaff hoist is lowered and lashed to the net to harden it further, the fourteen-inch-diameter fish pump hose is lowered into the mass of writhing fish, and soon they are rising to the chutes that dump them, via directional gates, into the holds on top of the last set. The cook stands by with a crab net or gaff and watches for the occasional bluefish or striped bass or trout that might help feed the crew (and save them money—they pay for "grubbing the boat"). More likely he will see only a small shark to two, a dozen stingrays, even a turtle, and thousands of sea nettles, the stinging jellyfish that are as much a nuisance to fishermen as to bathers on the beaches.

The captain climbs aboard again to take the hydraulic hoist and pump controls which the pilot has been manning, again in command of his ship. The spotter has disappeared to find fish for another boat, and in the pilot house the radio is still going: "good steamer-size school a couple of miles off your starboard bow..."

Some captains, like Arnold Ripley of the Seacoast fleet, rarely go out on a set, choosing to remain in the crow's nest to radio their own orders to the purse boats. Others, wondering how much they are still in charge, venture away from air cover from time to time.

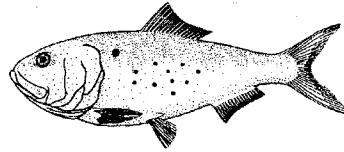
One or two will perhaps cruise “up the beach” on the Atlantic north of the Virginia Capes when most of the fleet is busy in Chesapeake Bay, or into Tangier Sound or another area of the Bay itself where others have not yet ventured. Then the hunt returns, in small measure, at least, to the primitive techniques of early days.

The captain sends no man high in the rigging of a schooner, but he and his mate climb to the small square crow's nest sixty-five feet or so above the water. They sit there, steering by remote control (up to the 1950's they called steering orders by old-fashioned voice pipes to the helmsman in the pilot house). They scan widely, looking for the “whips” and the “color.” The whips are the little splashes from the tails of the bunkers cutting the water, the fish themselves swimming much of the time just under the surface. As some of George Brown Goode's correspondents related a century earlier, the little splashes of a big school can look like raindrops. The color is the black (or “purpling”) patch in the water of the full size, mature fish, with occasional flashes of “white sides” as the fish twist to show their bellies. An experienced captain can tell the age and size of the fish as well as the total number in the school from these clues. If blues or striped bass invade a school, a dozen or so bunkers may jump out of the water, looking like the spurt of a fountain, and the captain gets a direct reading on individual size.

When the captain and mate see what they're looking for, the familiar moment of excitement comes... again, the old time call, “Fish! In your boats!”... the rush aft... the speeding toward the school. Now all depends on the captain, mate, and men. From their places only six feet or so above the water, they must, like the old-timers, watch the movements of the school with no crackling of instructions from on high in their ears. The pilot back aboard the fish boat can call them if he sees the school better, but basically the men are on their own. If it turns out to be a “stab”—the fish sound and disappear—or a “haul-back”—the fish escape before the seine can be pursed—it's just fishermen's luck and bad at that. Some aboard may wish for the hum of the airplane again, and the captain knows that he tested the odds and lost.

These “loner” ventures are thus a luxury not indulged often. Still, a man also may just come upon a school of half-a-million fish that nobody knows about and make a set that will have everybody aboard jumping for joy. If you do, somehow the word will get around. Within ten minutes the masts of half-a-dozen fish boats will be on the horizon, heading “all rung up” to see what there is for them here. The same thing happens when a spotter puts a fish boat on a good school away from the fleet. His instructions are supposed to be on a private channel, but again, the word gets

The striker in his drive boat as a set is completed. He is “pulling corks” on the far side of the purse seine while the purse boats meet and the crews prepare to draw in the seine. Jerry Schumacher photo, Martha Loftin loan to Hampton Mariners Museum Beaufort, North Carolina.

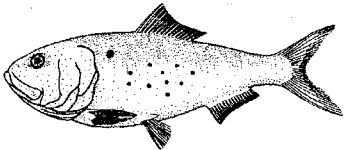




around via "snooper" radios on every fish boat.

For all that, the spotter and his plane today are indispensable. Each company maintains a squadron, with the fliers sharing in the proceeds of the catches they help find. The air now can seem crowded, with competing planes keeping out of each other's way by flying at agreed different levels. As with spotting of swordfish and other species in other waters, the practice has become a profession.

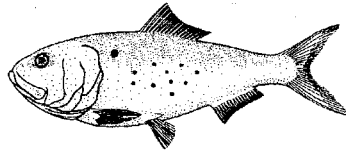
The crowsnest vigil: In 1966 Captain Leland Robinson of the *John D. Deihl* and mate Marvin Beauchamp scan the waters of Chesapeake Bay for the cats paw-like disturbance on the surface made when thousands of tails of menhaden are "whipping." The *Deihl*, a converted military transport ship, was fishing away from the fleet and the air spotters at the time.

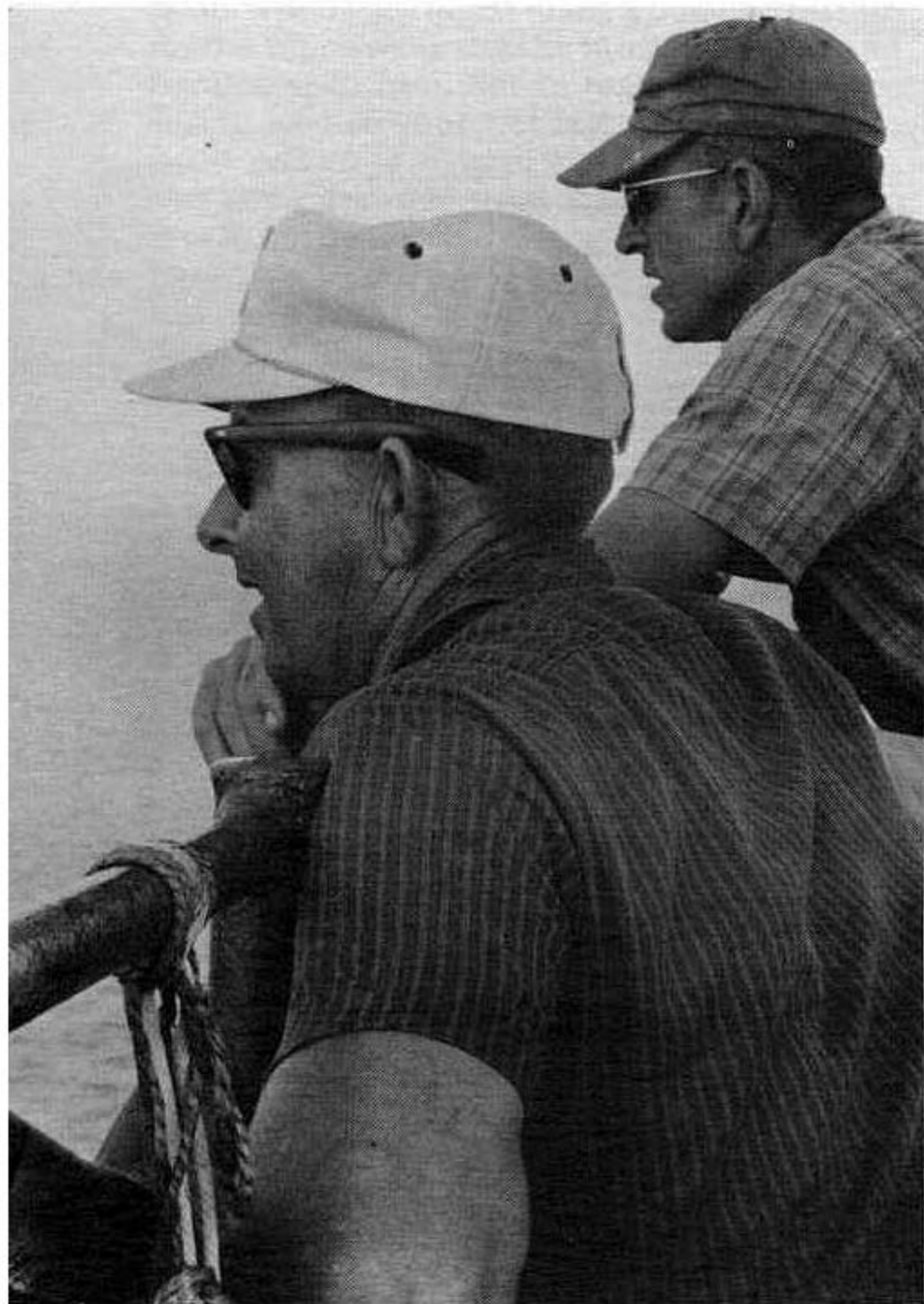


The spotter is not only a highly skilled operator of his aircraft, he is a communications specialist. He talks to his captains below on private channels, VHF radio-telephone, or Citizens Band. Beyond that, he also becomes almost as knowledgeable as a captain on the fish. Some at times get carried away in enthusiasm and tend to make a "purse boat size" school of ten thousand fish sound like a steamer size, but most can size up a school for volume and age quite well.

Nor is the spotter pilot likely to be displaced soon by the next technological advance, remote sensing of fish from satellites, to be described later. He can follow fish, just as the striker followed them in his drive boat; the satellite can only say, at best: this is where fish ought to be, or where they were on the last pass.

The spotter pilot at work. Bob Kell looks down on Chesapeake Bay to see what he can see for fish boats beneath him.







II. The Men All Singing

If the life of today's menhaden fisherman is strenuous, with intense activity suddenly breaking idle waiting, his father remembers when a day's work might spread through twenty-four hours, with little rest except between sets.

Changes, particularly since the Second World War, have taken out much of the sweat, though far from all, to amaze the men who grew up and grew old in the fishery, with little to help them but their bare hands. Power, mechanical or hydraulic, has been applied to almost anything today's fisherman does, even though in the end he must add brute strength to the skills he has developed.

Men still active in the fishery in the late 1970's, or only recently retired, know well a time in the 1920's and 1930's when they might give much of the night to taking coal aboard their fish boats with wheelbarrows, then fish all day. Each Chesapeake Bay factory had its pile, brought up from Norfolk's coal docks, and ten to one hundred tons might have to be "rolled on" for the next day's steaming from set to set. Boats at Lewes, Delaware, got their coal from Philadelphia. The amount depended on the size of the fish boat and how much it had burned the day before. With some, the practice was to wheel the coal to the edge of the dock and shovel it aboard through manholes, then trim by wheeling along a plank track to the other side. On others, two lines of men with wheelbarrows served the boat, one dumping on the inboard

side, the other wheeling across deck to the outboard. Only a few of the old steamers were oil fired, among them the *B. H. B. Hubbard*, the *Margaret*, and the *Long Island*. The rest had to have this nightly coal service to fish tomorrow.

With a boat bunkered, the men could rest briefly, while she steamed out before dawn for wherever the captain thought the fish might be. With daylight the captain, mate, and striker were in the crow'snest—also called hawk'snest—at the mast-head, looking from horizon to horizon for the "whips," for the color of fish that told them they might put in a good day. They might see only unbroken stretches of water, the fish having gone elsewhere. Or the weather might turn bad, with water too rough to make a set if the fish could be seen.

The cry from the crow'snest, "Fish! Get ready below, boys!", set off a scramble. The mate and striker rushed down the ratlines, the mate to the port purse boat, the striker to his drive boat. The captain stayed aloft, watching the fish and watching the striker.

At the call, "Lower them down, boys!", the purse boats were eased quickly down from the davits to the water and sixteen to twenty men jumped into each. They manned each of the five heavy sixteen-foot ash oars, one man standing to stroke on each oar, three others sitting to pull.

When the striker signaled the location of the school, the captain rushed to his starboard boat. The two boats cast off, lashed

together with a coupling line. The captain's boat had three oars on its starboard side, two on port, the mate's the three oars on the port side. This made turning easier in the circle around a school.

When the captain shouted, "Open!", either on signal from the striker spreading his arms or on his own judgment, oars on the inner sides were pushed to separate the boats and start the set.

Aboard each purse boat was a seine setter, a ring setter, a rigger, and the bunt pullers, the latter the least experienced and lowest paid. Aboard the mate's boat was the line carrier, whose job was to leap to the captain's boat with the end of the purse line as they closed the circle. Good line carriers could jump twelve feet or more.

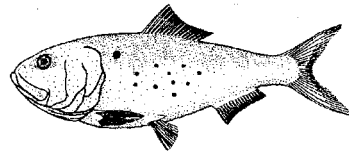
As the boats rounded, the seine setters paid out the net over the stern deftly, so that the men at the oars could maintain a steady stroke and speed and the captain or mate could steer with oar or tiller without interference. With the circle complete, the biggest and strongest man on the captain's boat dropped the tom to close the purse. If everything had gone right, if the striker had done his work well and the seine setters and ring setters had done theirs well, if the captain and mate had done theirs well, the fish were caught.

Now started real work. The net and its fish had to be raised, and all aboard hoped it would be the best set of the day, the week, or the season, no matter how much work and strain that meant. The boats were cleared, with the oars cast overboard out of the way. Lanyards kept them from drifting away.

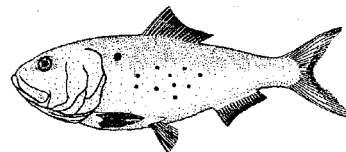
While the fish "rolled" from side to side—bellying out the net under the cork line—the striker worked the far side of the circle, "pulling corks" to keep the fish from escaping and turning the set into a "stab" or failure. If the fish escaped before the circle was completed, a "haul-back" was forced.

In the purse boats the bunt pullers began their labors, easy at first with only fathoms of net to bring in until the fish began to be bunched. Seine and ring setters joined in, until all loose seine was back aboard.

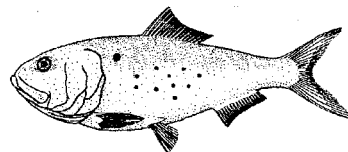
Then the steamer came alongside, the pilot easing its port side against the angled



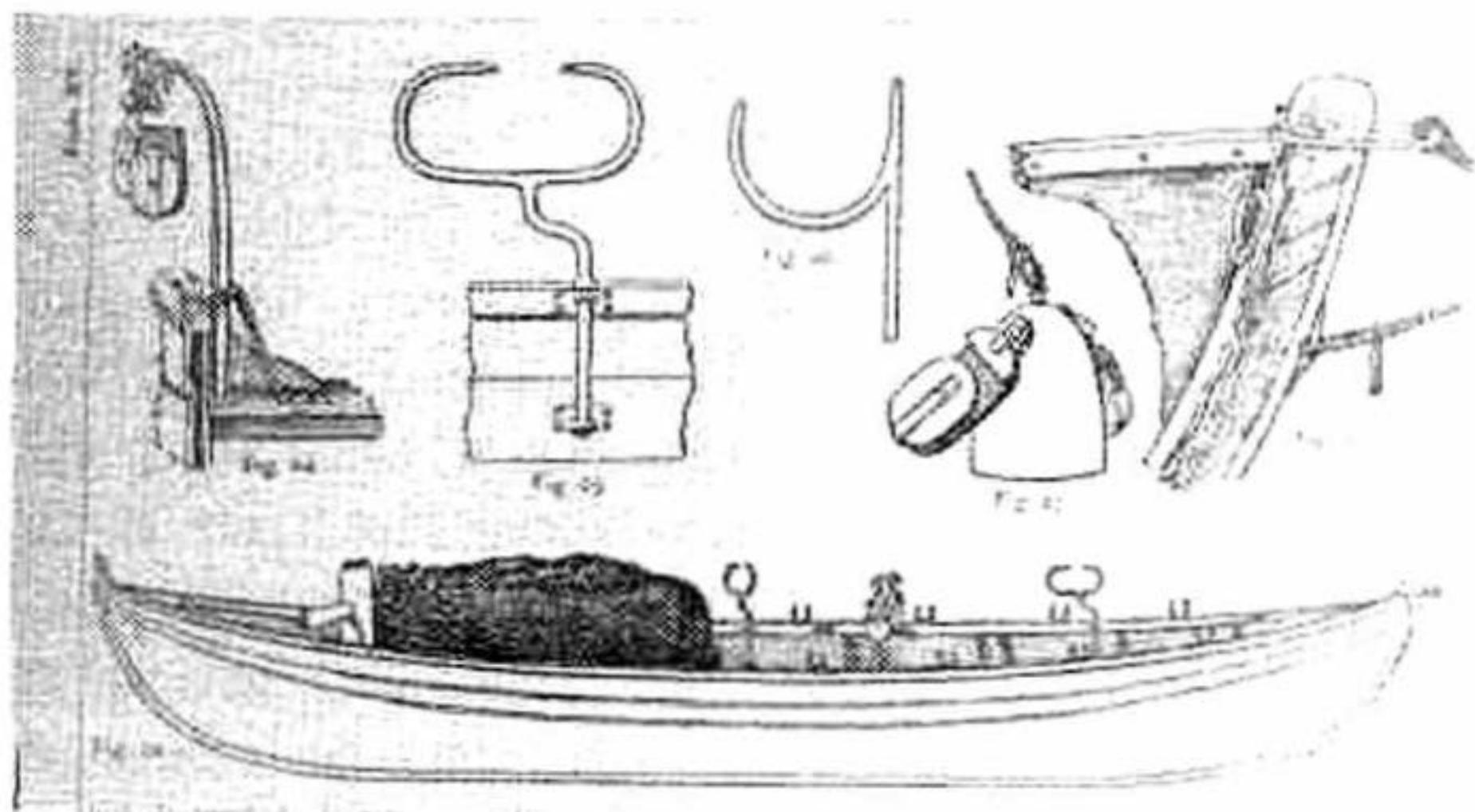
From Goode's *The Menhaden*: a drawing by J. H. Emerton of a nineteenth century Cape Ann seine-boat. Figure 22: seine-boat, 88 feet long, showing seine in position, ready to be set. Figure 23: section of stem of seine-boat, showing towing-links and gear. Figure 24: pursing blocks, showing method of attachment to thwart of seine-boat. Figure 25: oar-rest and fastenings (new model). Figure 26: oar-rest and fastenings (old model). Figure 27: purse-weight and pursing blocks.

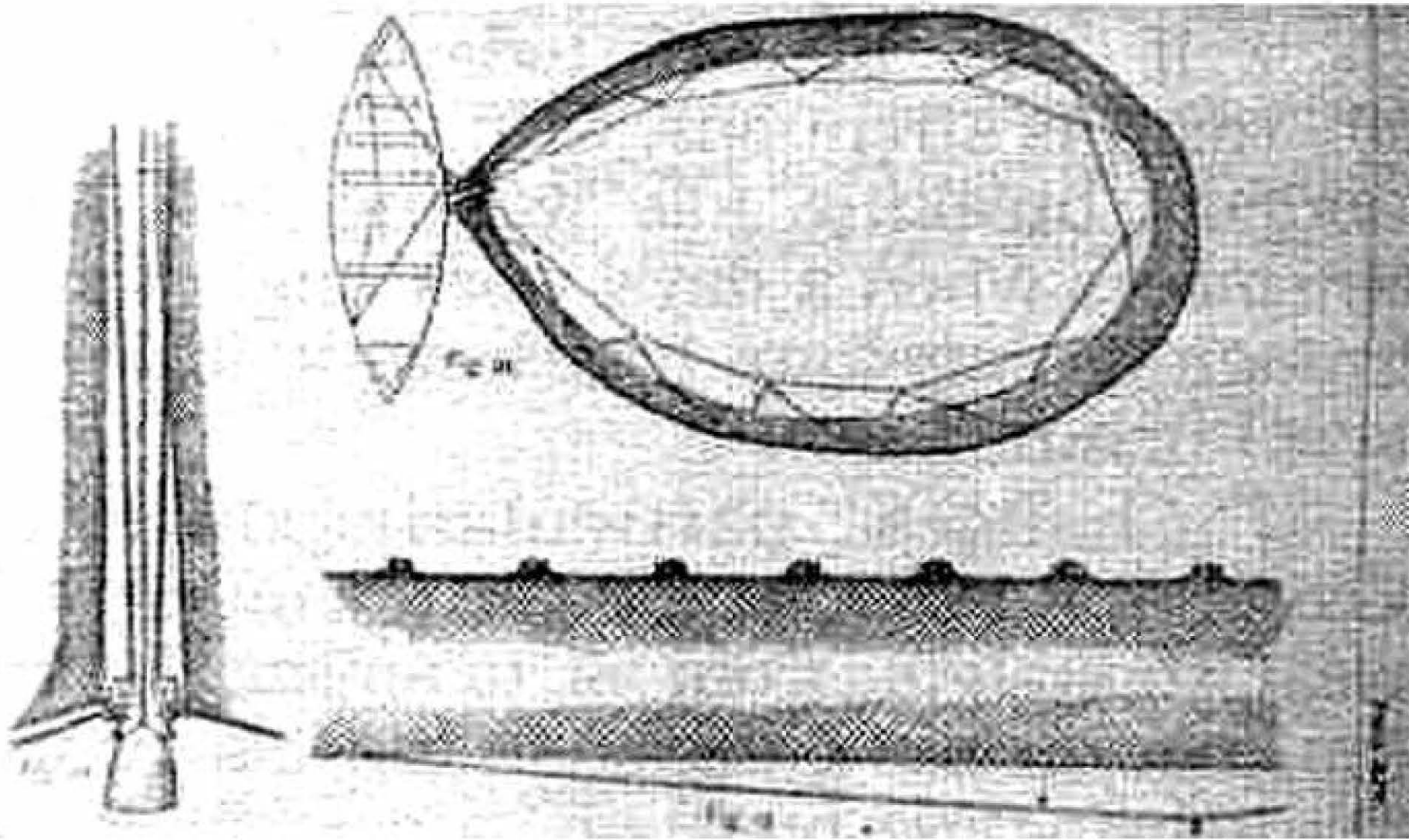


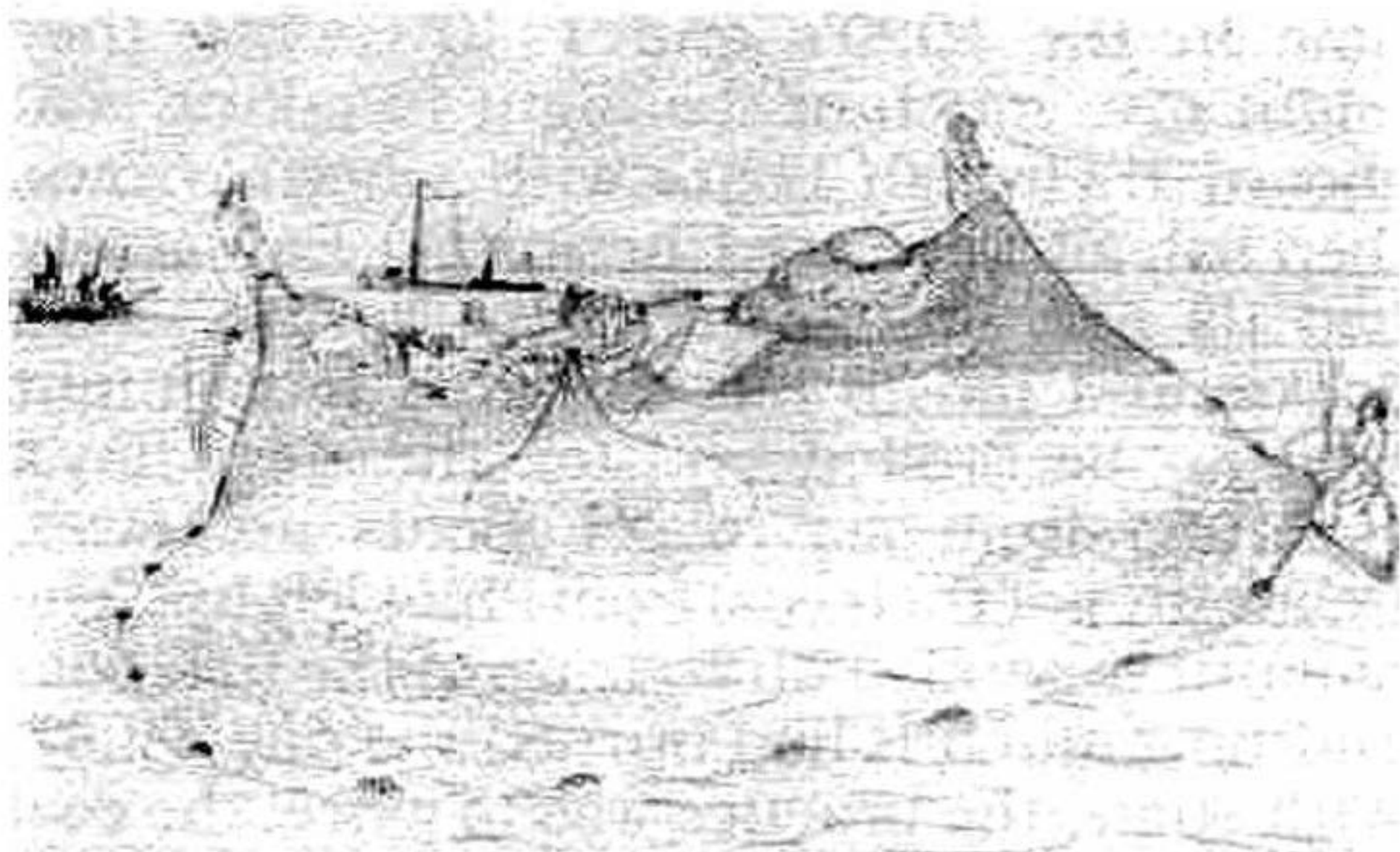
Diagrams illustrating the use of a purse-seine, from Goode's *The Menhaden*. Figure 19: section of seine showing cork-line and lead-line with bridle for pursing. Figure 20: lower part of purse seine showing the arrangement of the pursing weight. Figure 21: Diagram showing boat and method of pursing the seine.



Pursing of the seine is nearly completed in this nineteenth century drawing by H. W. Elliott from Goode's *The Menhaden*.







THE MENHADEN FISHERY.

Illustration showing the Menhaden fishery, with a large vessel and several smaller boats hauling a net. (From the U.S. Fish and Wildlife Service, Bureau of Fisheries, Washington, D.C., 1910.)

sterns of the purse boats with the seine between them in the familiar triangle for bailing, later pumping, the fish into the hold. The pilot then (and now) had to be a skilled boat handler, aware of wind and tide, to bring the steamer into position without fouling the propeller in the seine. Tidal rips or cross currents or contrary winds could force him to make two or more passes before the purse boat sterns were lashed to the steamer side, with lanyards dropped to hold up the seine.

Now came the heavy labor of raising the seine further to pack the fish into a dense mass for the bailing dip-net. If the captain knew he had an extra large set—half-a-million or more fish—that could not be raised by his own men, he might sound four blasts on whistle or horn for a sister ship to help. The latter's purse boats then were lashed to those of the first to keep them from being pulled under at the gunwales. This could put forty or more men pulling together, half in each boat. A nearby fish boat, whether from the same company or not, could be depended on to help, if not making a set itself, for no more reward than a treat of ice cream or beer for the crew that night in port, such was the quiver of excitement among the men in the joy of a good set. Further, no captain knew when he too might have to sound four blasts to save a set and any captain refusing to help would soon be known as "dirty."

At first the net came up yard by yard. The men's fingers clawed into the mesh. Their shoulder and back muscles flexed. The men leaned back, their feet at first solid against the white oak ribs of the purse boat, then somehow finding footing amid the folds of the net.

With a heavy set it soon came to a point where muscle was not enough. Then the captain called out, as Ira Swift of the Smiths' *E. Warren Edwards* did to Charles E. Williams of Reedville, Virginia, many a time, "Charles, start up a chantey!"

Charles sang out and the men joined, with a pull and a heave to gain a foot or so. Another verse, another foot. "Each pull, they'd sing." Their voices, like their muscles, were attuned to everybody else's.

The verses came out of the chanteyman's store of couplets built up over his years of fishing and hearing chanteymen

before him. Within this store was room for variation—addition of a word, a halfline, a line, either about the immediate situation or some recent event or particular person. This store, with the chanteyman's own flexibility and invention, was so important that a good chanteyman was a prize.

Any pattern was likewise flexible, as shown by a group of seven recorded by Captain John B. Lowry of Reedville on his own fish boat *John O* during sets over several days in the mid-1950's while fishing out of Wildwood, New Jersey. Captain Lowry knew the chanteys were something to be preserved, but perhaps did not realize then that he was making a lasting archive of something about to disappear. He hung his tape recorder microphone on the bridge rail, about seventy-five feet from where the purse boats would be made fast. There was no screening, no filtering out of the roar of the engine. Captain Lowry got everything!

It was a matter of "take what comes." With light sets—ten, twenty, fifty thousand fish—there would be no singing. The men could "harden" the net with little exertion, possibly with little interest. They fished with a will, as men have pitted themselves against nature always. Yet a light set meant little money, and with families at home, they had to think of that.

But when that heavy set came, when the purse boats had surrounded two hundred thousand or more fish and all knew there was work ahead to get them into the hold before they died to become dead weight, inspiration came to the chanteyman. The men "went crazy" over the feel of the net, in delight of doing what they loved and singing about it. They also "went crazy" thinking of the money in that net.

The drama and sweetness of the verses were heightened by the preceding and between-verse noisy, obscene chatter. The men sounded like a flock of geese quarreling over corn, yet in the same rhythm as the actual singing. They scolded each other for not pulling their weight or crowding. . . "Get your big fat ass over there, man!" . . . almost as if they weren't all friends and neighbors and brothers and fathers and sons ashore.

The chanteyman drew his starting words from something known to all. Each had left a woman behind, some perhaps several. If

she loved him, she hated to see the week start but was glad when he came back with money. Another verse was about a mule on a mountain, though few of these coastal fishermen had seen much of mountains. A third sang of Lazarus and two mountains. Lazarus could have been the Biblical character, more likely the mule that plowed the garden at home, or a mine mule he remembered if he had actually been to the mountains to dig coal. Other menhaden chanteys in a Library of Congress collection include verses about "Old Lazarus the mule... he shit on the commissary counter!"

A verse had another familiar touch—a bare exclamation, "Birmingham Road." This is often heard in southern folklore, with similar expressions such as have come out in the lovely ballad, "Birmingham Jail."

And again, like sailors everywhere, they thought always about women, and not necessarily only those they were married to, some shaking like jelly, some long and tall, some easy, some not.

Here are transcriptions of Captain Lowry's recordings. It is impossible to put down the simple words the way they were sung, in sweet, strong voices of men straining together, with the obscene chatter making an almost melodious introduction and interludes, and the roar of the engine, rising as the fish were sucked in full volume through the hose and dropping to a hum when the net was empty and the set complete, a strangely vital part of the harmony.

To see how it went, think of the chanteyman, who might be any one of the fishermen or the striker, either singing on his own or being called on by the captain. The men leaned down with their hands and fingers in the net, their chins to the gunwales. The chanteyman sang and the men responded and leaned back and pulled until their bodies were angling back toward the far gunwale. If the net came up a foot or two, they reset their hands and the chanteyman started a new verse. If not, he remained silent while the men tried to shift for a better pull. Then he sang again. "When they got together good," Captain Lowry said, "they pulled about everything on earth."

SONGS FROM THE JOHN O

(Shouting and chatter)

Chanteyman:

*I left my baby standin' in the back
door cryin',
Honey, don't go!*

Fishermen:

*Lawd, Lawd, don't go!
(Shouting and chatter)*

Chanteyman:

I'd go home but ain't got no money!

Fishermen: (drawing words out)

*Lawd, Lawd, ain't got no money!
(Shouting and chatter)*

Chanteyman:

To pay my way—!

Fishermen:

*Lawd, Lawd, to pa-ay my wd-ay!
(Shouting and chatter)*

Chanteyman:

*Yes, I'm gonna row here few days
longer,
Then I'm goin' back home!*

*(Here they got the net up and the
singing stopped, the chattering
resumed.)*

A second heavy set:

Chanteyman:

*I got a mule on the mountain, called
him Jerry,
Bring him down!*

Fishermen:

*Lawd, Lawd, bring him down!
(Shouting and chatter)*

Chanteyman:

*If I go get him, who in the world goin' to
ride him?
Gonna ride him myself!*

*(Here two or three men might shout,
"Go get him, I'll ride him!")*

Fishermen:

*Lawd, lawd, gonna ride him myself!
Gonna ride him to—!
(Shouting and chatter)*

Chanteyman:

*Go and bring me old bad Lazarus!
Bring him dead or alive!*

Fishermen:

Dead or ali-i-ve!

(Shouting and chatter)

Chanteyman:

*Found old Lazarus down between
two mountains!*

Fishermen:

Lawd, lawd, 'tween two mountains!

A third set:

(Shouting and chatter)

Chanteyman:

*We're goin' home but got no ready
made money!*

Fishermen:

One more dollar and a quarter!

(Shouting and chatter)

Chanteyman:

*Gonna make one more dollar and a
quarter,
Then I'm goin' back home!*

Fishermen:

One more dollar and a quarter!

A fourth set (here another of the three or four chanteymen in Captain Lowry's crew started the singing).

(Shouting and chatter)

Chanteyman:

Birmingham Road!

Fishermen:

Lawd, Lawd, Birmingham Road!

A fifth set:

(Shouting and chatter)

Chanteyman:

*My little woman shakes like jelly all
over!*

Fishermen:

From the hips on down!

(Shouting and chatter)

Chanteyman:

My little woman shakes like jelly over!

Fishermen:

From the hips on down!

A sixth set:

(Shouting and chatter)

Chanteyman:

*Bitin' spider, goin' round bitin' every-
body!
But he didn't bite me!*

Fishermen:

Lawd, Lawd, don't bite me!

A seventh, especially heavy and to be lost if impossible to raise:

Chanteyman:

All the weight's on the mate's boat!

Fishermen:

Hey, hey, honey!

(Shouting and chatter)

Chanteyman:

We gonna save them if we can!

Fishermen:

Hey, hey, honey!

(Shouting and chatter)

Chanteyman:

She's long and she's tall!

Fishermen:

Hey, hey, honey! Long and tall!

(Shouting and chatter)

Chanteyman:

Want to see her—!

Fishermen:

Hey, hey, honey!

Chanteyman:

I have a girl in Baltimore!

Hey, hey, honey!

Fishermen:

Streetcar runs right by her door!

Hey, hey, honey!

(This last verse was not on the recording but was recalled by another fisherman who had heard the "Hey, hey, honey" refrain many times on other boats.)

The men were an hour and a half to two hours completing the set, and the *John O* could head for Wildwood only well after dark.

These men were within a few years of ending the singing forever. Captain Lowry loved the songs he had heard since he started fishing in 1934 aboard the *Alden S. Swann* and knew that his men were among the best at fishing and at singing. Ironically, he had a hand in the mechanization that put power to the task that had been performed by men's muscles and songs. He developed the "raise rig," the powered hoist from the gaff that raises the net against the side of the fish boat to harden the fish for the pump. There is much physical labor still, but it is brief.

In the same time period the power block was developed by Mario Puretic to purse the net and draw the ends back aboard the purse boats to confine the fish in an ever-diminishing ball of water until they were tight enough for the fish boat to be called alongside. Nylon had come along to make nets strong enough to take the power.

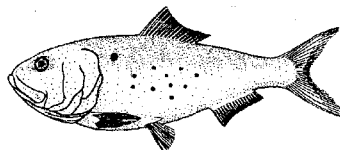
Many more captains remember the chanteys and their chanteymen. Entirely different songs might be sung on other boats and on other fishing grounds. They are now lost, except in the memories of fishermen.

Captain Arnold Ripley of Susan, Virginia, one of the best of the East Coast captains, could remember a season on the Smith boat *Green Run* when he kept on a striker whose fishing skills were doubtful but who was a great chanteyman. "You couldn't raise a set without him."

The origins of the menhaden chanteys seem to have been in North Carolina. Charles E. Williams recalled first hearing them when he was there on the *Stephen J. McKeever* in 1929.

"We were fishing near another boat just about sunrise," he said. "They had a big set and they couldn't raise it. Then they started singing. Another captain came along to help, and all the men started singing and raised the net. The chanteys moved up the Chesapeake Bay and on north after that. Off Delaware they had their own. Sometimes after a hard day when we sang a lot, I couldn't talk at night."

Sherman Curry of Kilmarnock, Virginia, who fished for thirty-five years from New Jersey to Florida before going ashore to farm, said his father, McKenney Curry, who had fished on Chesapeake Bay under sail,



Sherman Curry, a farmer on his tractor after putting in thirty-five years fishing and singing for those heavy sets. He recalled yachts coming out of Atlantic City to hear the men sing.

never mentioned chanteying. And after the power block and raise rig came, fishermen soon said of the chanteys, "We'll box them up and send them back to North Carolina."

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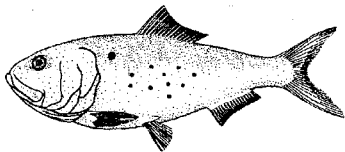
Much of the singing was heard and seen only by the fishermen themselves. But at times, as when the fish boats were off New Jersey's shore resorts, yachts came out for the performances.

"Man when we fished up near Atlantic City and coming in, the men all singing, and those yachts came out just to hear them and see them bring up the catch," Sherman Curry said.

Charles Williams likewise could remember such scenes when the *E. Warren*







It's still work: These fishermen show the strain in the final hardening of the seine after all the power on the purse boats and on the *John W. Dempster, Jr.*, has done its job.

Edwards and Captain Swift were fishing off Asbury Park.

"We made a big set and started to raise it," he said. "Yachts came out and stood by to hear us. Some of them even tied up to the purse boats, just to hear the men singing. It sounded like a band out there on the water."

The fishermen, who might have wondered with reason who these people were with nothing to do but drift around while others worked, nevertheless seemed to enjoy the spectacle. There's nothing like a gallery to turn work into a performance. Sherman Curry also recalled that the visitors at times climbed aboard the purse boats and handed out beer or ice cream.

Captains with a puckish sense of humor occasionally had fun with chanteys, to mystify fellow captains. Captain Lowry recalled his own prank with the recording made on the *John O.*

"On the way in late that night I played the tape back to see how it sounded," he said. "I held down the [transmit] button on the radio and it went out. Pretty soon I heard some other captain on the radio saying, 'Is that crazy bastard still fishing?'"

Captain Arnold Ripley also held down the button once while his *Green Run* crew was chanteying. He had slipped off from the rest of the fleet in fog and was making a good set while other boats were drifting, their captains wondering where the fish had gone—and where he had gone.

"The chanteying went out," he said, "and everybody knew I was catching fish but they didn't know where and it was driving them crazy!"

□ □ □

Curiously, the fishermen's memories seem to date menhaden chanteys only to the

1920's. George Brown Goode in his exhaustive survey of the nineteenth century fishery does not mention them, and Stuart M. Frank, chantey specialist at New England's Mystic Seaport Museum, comments that "chanteying was seldom (if ever) a part of the ordinary regimen aboard fishing vessels, few of which were of a size or mechanical magnitude to make chanteying necessary or desirable."

But Goode's survey was largely from New York Bay and Long Island Sound north and east. His information on Virginia, the Carolinas, Georgia, and Florida was limited. And in these states the fishery depended heavily on blacks for its fishermen.

The Library of Congress collection, small though it is, includes recordings and transcriptions made with the Harvey Smith fleet out of Beaufort, North Carolina, and others at Bennettsville, South Carolina, and Mayport, Florida. The latter, made in 1940, includes verses quite similar to those Captain Lowry recorded. They included "ready-made money," "one more dollar and a quarter," the girl "at the back door cryin'," and, echoing "hey, hey, honey," a refrain, "walk around, honey." After the mule Lazarus' performance on the commissary counter, "he just walk away!" That refrain came in another, in the tradition of making fun of a superior, which warns, "Cap'n, all your men goin' leave you . . . we just walk away!"

These and Captain Lowry's songs are clearly part of the southern work song tradition with its frequent gospel roots. They are like the songs sung for generations in

logging, cotton chopping, rail laying, steamboat loading, and scores of other kinds of hard work, and in prison gangs. The men sang to lighten the load, to make the work easier, the day end sooner, the money come a little faster, and, again, to make fun of a supervisor with impunity. How could he know, dozing on a horse, what they were saying?

The menhaden fishermen sang to raise the seine, in some cases as with Captain Lowry's last set, to save one seemingly too heavy for men's muscles. In a way for them, the chanteys made the achievement, the big set, theirs as much as the captain's or the company's.

Many work songs came to be recognized as music only in the 1920's. Then a few scholars began to wander through logging camps and cotton fields and road gangs to find variety, infinitely beyond "I Been Workin' on the Railroad" or "Water Boy." Thus it is quite possible that south of Virginia menhaden chanteys go back to the Civil War era, when the fishery's potential in the south began to be exploited. Captains, not expected to be musical or sociological scholars, may simply have taken them as the usual way of doing things.

Whatever their origin, the chanteys continue strong in the minds of men who sang them and men who heard them. Captain Lowry, no sentimental man in or out of retirement, admits, "When I play that tape, I get goose bumps all over."

Charles Williams, one-time chanteyman, adds, "Fishing ain't no fun any more."

III. An Easier Life

Captain John Lowry's tape picked up the noises of the engine running the fish pump. That device, developed by Grafflin S. Prather in Florida, speeded loading fish from the seine to the hold. Before it came into general use, men's muscles did much of the job—bailing fish, or transfer by large dip-net.

With the steamer alongside, the sterns of the purse boats made fast to her wooden side, against frayed rope fenders, the bows together to form the triangle, and the fish "hardened" by the chanteying men, the captain called, "Who's going to bail them fish—somebody get up there!"

It was the riggers' job, but they might be unable to leave, with their fingers buried in the mesh. So any four or five men scrambled aboard. An engineer operated the donkey engine to hoist the dip-net and its two or three thousand fish at the call from the purse boats, "Go ahead, donkey!" The men pulled a line to swing the gaff and net over the fish hold. One man jerked the line that opened the dip-net at the bottom, and wildly flapping fish, throwing spray everywhere, dropped. Again and again, "Go ahead, donkey!" The pile of fish rose in the hold, those on top still flapping, here and there a stingray or shark, a few blue crabs, or even, to the delight of the cook, a rock or blue.

Toward the end, the dip-net might get only a half load or less, and a fisherman picked up the last fish with a crab net. Finally, the dip-net was stowed, the donkey engine shut off, the seine carefully re-stowed on the sterns of the

purse boats, and they were dropped aft to be towed to the next set. Or, if the day was over, they were hoisted by the donkey engine in the davits with their triple blocks and falls.

While the steamer headed for the factory, the seine was overhauled for "pickling" for tomorrow's fishing. Gilled fish were picked out by hand—a slow task if a set had been made on a school of small ones—along with crabs, stinging jellyfish, or just flotsam. Then the nets were laid out in the purse boats, which had been partly filled with water, as they hung in the davits. Four bags of salt were spread over the nets and the water in the bottom of the boats was pumped up with hand bilge pumps and thrown over the nets by buckets. All this was necessary if the cotton mesh was to last the season. Now an old-timer can look at the seines that need no pickling and wish nylon had been invented in his day.

When the boat had docked and the fish in the hold had all been forked—again by hand—into the bucket elevator to be hoisted to the raw box, the crew was free to go ashore—to roll on coal for tomorrow, or in the later diesel days, to go to the bunk houses or home, if that were close enough. The last boat in stayed moored at the elevator, the earlier ones kept three line tenders aboard to tie them up elsewhere.

On Saturdays, when there was no fishing, the seines again had to be treated—"dry salted" this time. The men pulled them on the fantail of the steamer, spread them, and

others stood on the roof of the after deckhouse and shoveled salt on them. The nightly salting did not end the care. The seine had to be spread to dry, and if rain came up during the night, it had to be stowed or covered quickly, for rain water would rot it.

Thus the day went, six days a week, with the nights to be spent back at the coal pile, or trying to sleep aboard the steamer or in the bunk houses despite bedbugs.

Fish boats today are almost "hospital clean," at least as compared with those of the early years of the twentieth century. Sensitive souls still sniff at the odors in the holds, especially those still unrefrigerated, and object to fly-covered dead fish lying here and there on deck, some no doubt for days or weeks! Yet among chores recalled by Len Lowry, another retired captain who started in 1931 on the McNeal, Edwards *Pequod* at eighteen dollars a month flat, was going about with an oil drip can and squirting kerosene into cracks to try to cope with the little red pests he called "chin chins."

"The kerosene just seemed to make them mad," he said. "They'd come out doing flip-flops and bite twice as bad."

Fishermen still active, men like Raymond Curry of Heathsville, Virginia, now cook on the big Seacoast Products *Tideland*, recalled the bedbugs as particularly trying when the fleets were anchored behind the breakwater at Lewes, Delaware, in bad weather, away from the exposed docks. The men couldn't go ashore even briefly because the boats had to be kept under steam to take the strain off the anchors. "There were no showers and no heads," he said. "All we could do was sit out there and take them."

Step by step the lot of the menhaden fisherman has improved, perhaps not steadily, with the conservative nature of fishermen resisting some changes, individual economic problems of company managers, or great economic problems like the Depression of the 1930's, slowing others. Little changed during either World War. A slowing factor may have been the fact that for the most part company managers did not fish, and captains and fishermen did not manage.

In the mid-1930's, despite the Depression, gasoline engines began to be

installed in purse boats to end—slowly—the use of four-man oars. Wooden purse boats, many built at Fairport, Virginia, by Emory C. Rice of white oak and Virginia white cedar, were replaced first by steel, then aluminum, to meet the strains that power, later to become diesel, put on hulls. The purse boats got larger, with more complex and sophisticated equipment, so what Emory Rice built for a few hundred dollars has become a fishing machine costing one hundred thousand or more a pair.

Diesel power began to replace steam in the fish boats, with a few designed and built for diesel, the rest converted. The bulky steam engines were scrapped, coal bunkers replaced with fuel tanks and larger fish holds. Men with wheelbarrows dumping coal through manholes were replaced by one man watching an oil hose. Standard electric generators now provide power for everything from the galley freezers to the captain's shaver, with no Wallace Lewis needed to run the "dynamo"—clean lamps and lanterns and fill them with coal oil.

Captain Lewis, who retired in the mid-1960's to raise and sell soft shell crabs and take charter fishing parties out on Chesapeake Bay in his forty-foot *Hiawatha*, also remembers learning to steer on the Morris, Fisher steamer *Northumberland* in 1926, with no power assistance or auto-pilot. "Captain Bob Snow asked me, 'Boy, can you steer?' I said, 'Yes, sir.' 'See that piling?' he said. I said, 'Yes, sir.' 'You steer for it,' he said. 'I don't want any to the west and not much to the east.' I said, 'Yes, sir,' and took the wheel."

The years after the Second World War brought more spectacular changes, described in detail in another chapter. Among them were nylon nets. These not only did not have to be pickled, but were strong enough to hold many thousands more fish. They also were strong enough that the seine could be hardened far more efficiently with the gaff hoist. Even now, used purse seines in good condition can be sold to other fishermen for lighter work, as in shrimping.

The technical advances, especially the power hoist and power blocks, came when badly needed in the economy of the fishery. Menhaden fishing had always been what economists call "labor intensive." It needed too

many men to do its work—twenty-eight to forty-two to each steamer. Many were what was then regarded as “common labor”—unskilled, at least to the man ashore, however adept, well-coordinated, and skillful the fisherman had to be. But common labor became increasingly costly after the Second World War, and many felt the fishery could “go broke” without complete mechanization.

It is mechanized, and fishermen's lives have changed. Crews are down to seventeen men, including the captain, mate, pilot, two engineers, and cook. Newer boats are bigger and the men less crowded while working. The galleys, often with modern restaurant equipment, are far more adequate to keeping the men fed, even if at times they must leave meals unfinished. (Fish can't wait for dessert and coffee.) Refrigerated water fountains have replaced galvanized water tanks or wooden barrels with tin cups in the bows for everybody, from captain to newest bunt puller. Fishermen credit J. Howard Smith, Incorporated, with first giving them ice water to drink. Ice boxes with drinking water pipes through the ice chamber were installed, and the men put aboard several hundred pounds of ice before sailing.

The crews' own quarters are roomier, and as clean as the men care to make them. At least no one need go about now with Len Lowry's oil can squirting kerosene into cracks.

The boats have long had heads to end the ancient practice of “going over the side,” preferably to leeward. For years the steamers and early diesels offered only the stern rail to sit on, with a rope hand-hold. When the federal and state governments first began to get fastidious, flush toilets were installed, and some got jammed with rope or trash as fishermen with outside privies at home became fascinated with their operation.

Newer boats now provide showers for officers and crew alike, and living quarters and galleys are often air conditioned, especially in southern waters. Some have television aerials showing above deckhouses, and the newest have yachty mahogany paneling in the officers' quarters.

Many improvements have come with general raising of living standards ashore. There are people alive today who did not consider themselves under-privileged,

disadvantaged, or just “put upon” if they did not have inside plumbing when they were young. On Virginia's Northern Neck there are families who thought college for their children more important. And for many the nightly shower will never wash out memories of the galvanized tub and Saturday night baths—“whether we need them or not.” Likewise, a half century ago, no fisherman expected sanitary luxury afloat.

Other improvements resulted as company managers came to realize more and more that without fishermen, there would be no fish for those millions of dollars' worth of cookers, evaporators, dryers, centrifuges, trucks, buildings, and boats. Thus wages have risen, though never as fast as the men would like. Guarantees insure that no man will go home to a hungry family. There have long been end-of-season bonuses (called by the men themselves “hold-backs” because it was money they didn't get until then) to keep crews intact to the end. The flat wage that Len Lowry and his generation started at during the Depression is now a figure per thousand fish, and a good fisherman with good fellow crewmen and a good captain can take home a sizable check even after sharing it with Washington's Caesars.

Possibly this gamble, the chance that this coming week will be the big one, is a factor in the years of apparent indifference among the men to organization. No unionization drive has lasted. There have been a few strikes, never industry-wide and rarely lasting more than a few days. Evening talk by other fishermen of good catches, of money being won on that gamble, likely had the men itching to get back aboard.

Another factor in improvements, although probably not so great as the government likes to think, has been stricter regulation along industrial lines. Captains have long been licensed by the Coast Guard, and fish boats carry all standard safety equipment. Now the government goes on to require, among other things, split toilet seats.

A factor in the fishermen's personal economy has been ready availability of unemployment compensation and other welfare benefits for any choosing to spend the off-season watching television. In a good season a fisherman can make enough in six

months to keep many a shore worker's family fed for the year, yet qualify for benefits with little adjustment of truth. Nor has the practice been confined to his end of the fishery. A number of captains readily admit to getting their winter "whiskey money" that way—taking names of persons to whom they had "unsuccessfully applied for work" off grave markers along the road to the welfare office. Nobody seems to ask questions, and if there's anything wrong, it lies in the welfare industry itself, with too many good federal and state jobs hanging on a head count of recipients.

Nor is the practice as general as anti-welfare critics charge. Many fishermen and captains turn the winter to business ventures, as Raymond Curry has with an excellent small restaurant exploiting his skills as a fish boat cook. Or they tong for oysters, shifting to pound netting in late winter and spring. For years on Chesapeake Bay the herring season ended, even if herring were still running, when the men left for the fish boats with the start of the menhaden season the last Monday in May. (The decline of the herring fishery has thinned that tradition substantially.) Other fishermen spend the winter cutting pulpwood, especially in the Chesapeake country with its several large paper mills.

□ □ □

Possibly a less noticed feature of life in the menhaden fishery has been its lack, officially and to a large extent in practice as well, of racial discrimination, at least in its later years. Traditionally the fishery, at least from the mid-Atlantic south and throughout the Gulf of Mexico, has depended heavily on Virginia and North Carolina black men for its crews—for the fishermen, the men with straining muscles, doing what some might call the "dirty work" that no one else would do.

Yet today throughout the fishery, there are whites and blacks working together in the purse boats, white muscles and black muscles straining together, white skills and black skills linked to make each set a money-maker for all.

There is only one pay scale—the rate per thousand fish paid each member of a crew for the fish put into the hold. A man is a good or bad fisherman first.

Nor are blacks restricted, as they once were, to the lower jobs. There are black captains, mates, pilots, and engineers. One estimate in the late 1970's was that in the whole fishery, half or more captains were black, many with excellent fishing records. The J. Howard Smith companies first tried black captains in the 1930's, as did the Wallace Quinn companies.

A factor in extensive use of blacks in the fishery has been dependence on Tidewater Virginia natives. From Port Monmouth, New Jersey, to Cameron, Louisiana, fish factory parking lots show dozens or scores of Virginia license plates, mostly from Northumberland, Lancaster, Middlesex, Mathews, and Gloucester Counties. Good fishing crews and officers tended to be developed on Chesapeake Bay because of the concentration of the industry there through the latter half of the nineteenth century and first half of the twentieth, and blacks made up the larger part of the labor pool. When northern companies started to explore the potential of the Gulf of Mexico in the 1940s, they took their men along. Now the opening of the Gulf season sets off an early April migration of Virginia fishermen to Moss Point, Mississippi, and the Louisiana fishing ports. The situation is similar on a smaller scale in North Carolina.

It cannot be said that the menhaden fishery and industry are a Utopia of race relations. Human attitudes run through it the same as any other. Yet perhaps it can be said that in fishing for menhaden, what a man can do comes as close as anywhere to being the measure of what he is and becomes.

This possibly has come about through interplay of social and economic factors. In a 1967 doctoral dissertation on the social structure of Atlantic Coast fisheries, Victor A. Ligouri traced out some of these factors, including the "gamble" of menhaden fishing that made it possible for blacks to aspire to economic success—good money—beyond their reach in most other kinds of work, at least before opportunities began to open up to them in the 1960's and 1970's in other fields. Coupled with this has been a necessity for

cooperation. Ligouri quoted a New Jersey captain as saying, "Colored or white, they're working for the same thing—money. That makes for good relations."

Further, "each man knows that at any

moment the success of an entire operation may rest on his effort, and, ideally, he performs accordingly." Ligouri quoted a fisherman: "We're all out here to catch fish. You got to work hard and fast while they're there."

Part Four

**ARGUMENTS
AND/OR QUARRELS**

I. The Spice of Trade...And Laws

For a fish that few inland Americans know, and they only if in the feed business or making paint, linoleum, antibiotics, or other products specialized enough to use fish oil, the menhaden has been the subject of much eloquence in state legislatures, Congress, and courts, the latter from county to United States Supreme Court. Coastal legislatures from Maine to Texas have enacted laws, at times with little understanding of the fish, the fishery, or the industry, and often with representatives from tidewater counties having to make deals with upland colleagues who want something special in the hills.

Many disputes have been quite local, as between the nineteenth century New England inshore net fishermen and the menhaden steamers working at sea, or between menhaden and sport fishermen, some of the latter determined to be convinced that the fish boats' huge hauls include the very trophy fish they plan to catch.

Others generated rhetoric on states' rights, with Article X of the United States Constitution cited for and against, and lately Article XIV on equal protection of the law.

It is not hard to sort out the dynamics of the major disputes. Conservation and property rights are usually cited along with states' rights, but competition for the fish itself, for the almost brainless bunker that is such a prize, is at the bottom. If nobody wanted bunkers by the millions and billions, nobody would care what became of them so long as

they did not wash up on beaches to offend the public nose.

The competitive urges in earlier days often spent themselves in actions by fish boat captains and crews—cutting nets or purse lines, or scattering schools. At times this spirit even was generated among members of just one company's fleet, especially if the low captain expected to be fired at the end of the season.

Executive level disputes tended to be more gentlemanly, at least in public, although uncharitable language could be exchanged.

A major dispute arose during the Second World War, when the federal government was seeking all possible ways to supply the war machine. Fish meal was needed for stock and poultry feeds to maintain the flow of food abroad; in fact, its sale for fertilizer was prohibited. Fish oil, an ingredient—like any fat—of glycerin, was of interest to munitions producers. Thus a congressman from Delaware, Philip A. Traynor, introduced a bill to suspend all state restrictions on menhaden fishing for the duration. His state was host then to one of the largest menhaden firms, Consolidated Fisheries Company of Lewes, and also to at least two major makers of explosives, Hercules Powder Company and E. I. DuPont de Nemours Company.

At a hearing before the House Merchant Marine and Fisheries Committee April 23, 1942, Traynor pursued his theme. At this time, menhaden were not the major

source of fish meal or oil. In 1940 pilchard, or sardine, oil production more than doubled that of menhaden, and while menhaden meal production was slightly greater than pilchard, it was only about a third of the total production. However, the pilchard fishery on the West Coast was declining, as were other sources of oil and meal, such as herring.

Among the coastal states, only Maine gave unqualified approval to the bill. North Carolina had no objection. Connecticut thought there should be more study of the fishery and urged "every effort to conserve this valuable resource rather than to exploit it during the present emergency." Delaware, where the proposal originated, had no restrictions and no comment.

New York, New Jersey, Maryland, and Virginia were against it, joined by Washington and Vermont. Washington said the bill "might provide precedent for an extension of Federal authority over fisheries of the west coast regardless of species, thus eventually breaking down state rights." Vermont, with no marine fisheries, was concerned over possible spread to inland waters.

It became apparent that the bill was simply a struggle between Consolidated Fisheries of Delaware and the state of New Jersey and its menhaden companies. Consolidated Fisheries wanted to fish in the rich New Jersey waters and contended that New Jersey, while permitting non-residents to fish, had changed tonnage limits for vessels from net to gross to exclude the large Consolidated steamers. Neither Consolidated official giving testimony, P. L. Young, executive assistant, nor Thomas H. Hayes, treasurer, expressed more than passing, formal interest in fishing in Maryland, Virginia, or other waters to the south, or in New York or New England waters. But across Delaware Bay from Lewes, menhaden were to be caught from Cape May north to Sandy Hook, and only New Jersey companies were getting them.

There seemed to be no question of New Jersey's right as a sovereign state to change tonnage requirements as it pleased, but Hayes complained that the only ones who benefited were "two operators in New Jersey."

"In the meantime," Hayes added, "I went to one of these operators to see if there

was anything one way or the other that we could do to effect a compromise. He happens to be a foreigner of Swedish birth, which is not against him, but this part is against him, he could stand up to me, an American citizen, who has been in the fishing business all my life, and tell me that he owned the ocean, seventy-five miles of the Atlantic Ocean, and that he would like to see anybody in it." (Hayes apparently meant Charles Aspenburg, who with his brother Knut operated a menhaden factory and fleet at Wildwood, near Cape May, later to be sold to Reedville Oil and Guano Company of Reedville, Virginia.) The question of the operator's Swedish birth excited the committee briefly, with comment that naturalized citizens had all the rights of native citizens.

"Well, naturalized or unnaturalized," Hayes replied, "I do not think any man has a right to stand up and make a statement like that. I am sure that if he was an American-born person he would not make a statement like that, that he owned seventy-five miles of the ocean."

The statement, if made, was agreed to be asinine. The committee did not inquire further. Hayes went on that New Jersey had harassed him so far in 1939 as to "board one of our vessels that was taking fish and arrest one of our captains and accuse him of kidnaping and they indicted him." (Captain Hudnall Haynie of Reedville recalled the incident as an involved witness, nearly forty years later. He said the inspector boarded the *Medrick* while he himself was fishing the *W. L. Messick* close by, both inside New Jersey's three-mile limit. Another inspector came alongside the *Messick*, which had completed bailing fish aboard from a set and was heading for the open sea "all rung up." "I was in the crow's nest," Captain Haynie said, "and he shouted at me to stop. I pretended I couldn't hear him and kept going until we were outside the three-mile limit and he had to give up.")

When New Jersey officials had their turn, George C. Warren, Jr., president of the Board of Fish and Game Commissioners, told of years of trouble with Consolidated Fisheries and said "protective measures" had been taken because of the "depredations of [Hayes'] company." He said there had been three charges against the boat and captain in the

indictment, and Chairman Schuyler O. Bland of Virginia had to warn that "if we go into a trial of the matters between you and Mr. Hayes we will never get through the hearing."

Warren agreed but said if the bill became law (as it did not), "our coastal waters would be thrown open to the depredations of menhaden vessels of all tonnages." He added that more than sixty boats then were fishing for menhaden off New Jersey and "they are taking all the menhaden that they possibly can."

Possibly the most interesting, if less exciting, testimony came from J. Howard Smith, who in 1911 founded the company that became the largest in the country for many years—and which in time, through a subsidiary, took over Consolidated Fisheries at Lewes in a 3.5 million dollar deal that made the running dispute academic.

The Smith companies, based at Port Monmouth, New Jersey, had started seeking menhaden not with big fish boats but mainly with pound nets. Until after the Second World War they still depended heavily on smaller boats, a point that J. Howard Smith stressed to the committee—and at the same time told a little more of the competitive practices of the captains.

He said that fish boats must make little noise and added:

Never run in a big boat in front of them and try to chase the fish in, because that is the end of your fishing for a few days.

We go out quietly, go around them, and we will carry the boat lines quietly out a distance from where they are catching fish, and then go alongside as quietly as possible and bail them aboard so that we will not scare the fish in that territory, and that applies to all of the boats that we feel are advisable to operate in that territory.

You take out where the waters are open, the way it used to be, we would go out there and these big boats did not come singly but they came by fleets, and they would go into these schools of fish and after threshing around out there, trying to scare the fish into their nets they would run through those fish that they could not get in order to keep other people from

getting them. That has been going on for many years.

Smith conceded that "we have some very nice men in this industry [but] these captains are jealous of each other. And they come there and turn a big wheel and run the steam engines making considerable noise and it frightens the fish and it splits them up, as we call it, and it takes days for them to get together again and in a position where our local boats can go out and catch them."

Smith's solution for increasing production for war needs was simply to send small boats out "every day and bring them right to the local factory."

He did not think that menhaden could be exterminated, but added that in 1912—described by Robb Leon Greer in his 1915 report as a year when eight new factories were built for complete failure of the fishery in 1913—"all those big steamers" had driven the fish away until 1918.

"The fish know their enemies, and where they are fished too much, they will leave that place."

Smith's testimony was to be echoed thirty-five years later. Then a key Smith operating company, Seacoast Products, Incorporated, now British-owned but managed by Smith family members and associates, went to the United States Supreme Court to invalidate Virginia's fishing residency laws that seemed over-restrictive and aimed mainly at keeping the Seacoast fleet out of Chesapeake Bay and territorial waters of the Atlantic.

The court case was a climax to a four-year struggle over laws nearly two centuries old restricting fishing in territorial waters to vessels enrolled and registered in this country. The result was a modification of policy if not of law, expected to affect all kinds of fishing in all territorial waters. Some thought it good, some bad, and some just wished the matter had never come up.

Always it had been accepted unquestioningly that if you wanted to fish in American waters, or engage in any coastwise trade, you did it only under the American flag, and that meant American-built boats, American-manned, American-owned. And fishermen already were becoming alarmed by the close approach in the 1950's, 1960's, and

1970's of the huge fleets of European nations, especially from the Soviet bloc.

Then, on October 16, 1973, the National Oceanic and Atmospheric Administration, a Department of Commerce agency that includes the National Marine Fisheries Service, published a proposed "interim policy" that indicated possible approval of foreign ownership of American fishing companies, or at least lack of objection, on review of applications to the Maritime Administration for transfer of fishing vessels. The Maritime Administration is likewise a Department of Commerce agency.

Actually the interim policy appeared to have been established two months earlier, in August 1973, when a Japanese company, Kyokuyo Corporation, took over Whitney-Fidalgo Seafoods, Incorporated, and its 163-boat fleet, with approval to continue American flag fishing for salmon in the Pacific Ocean off Alaska and Washington.

The policy listed as considerations, in the impact of any proposed foreign investment in American fishing enterprises on conservation and management of U. S. fishery resources, employment of U. S. citizens, competition, and "other social and economic factors."

Robert M. White, then chief of the National Oceanic and Atmospheric Administration, declared in the notice of intent in the *Federal Register* that under present law aliens could own controlling interests in U. S. fishing companies. He added that he recognized that "in the case of foreign investment . . . there may be unusual circumstances relating to the fisheries resources, the fishing industry, and U. S. consumer, and national interests."

"While, on balance, it is believed that unless foreign investment . . . would present special problems that cannot be handled by present or future U. S. laws," he continued, "such investment should not be considered detrimental . . . but rather serving U. S. interests in a beneficial manner. However, foreign control of the fish harvesting segment of the fishing industry is of considerable concern. Therefore, NOAA has developed . . . the interim policy."

J. Steele Culbertson, then director, wrote that the National Fish Meal and Oil

Association saw the sale of "U. S. companies and flag vessels to foreign investors as a direct threat, not only to these [fish] resources, but to the domestic fishing industry and its U. S. ownership as well." Approval of such a sale, he added, "would be most irresponsible." (This was written when the Whitney-Fidalgo sale to the Japanese company was already four months in the past.) Culbertson said further that foreign investors would "have the machinery for forming a combined fishing operation with their foreign vessels operating offshore, whereby the catch by the foreign vessels . . . could be offloaded on to their U. S. flag fishing vessels at sea for transporting into port."

Earl J. Conrad, Jr., president of Zapata Haynie Corporation, now the nation's largest menhaden company, joined with a protest that there was "no way that foreign investors participating in U. S. fisheries can establish corporate policies designed to be in the best interest of our industry or our country."

He suggested that foreign non-fishing firms would be able to do what might get their American counterparts into anti-trust trouble—invest in fishing enterprises. He also raised the past complaint of failure of the State Department to "protect our continental shelf"—a reference to long-time routine opposition by the State Department to any effort to extend U. S. fisheries jurisdiction beyond the twelve-mile limit—and said, "at least the Department of Commerce can protect our coastal zone by reserving it for U. S. citizens."

The Zapata Haynie letter was dated November 27, the Association letter December 28, 1973, just three days before the January 1 deadline for comment on the proposed interim policy, and also just three days before announcement of the sale of the J. Howard Smith enterprises to Hanson Trust Limited of London. There was some feeling elsewhere in the industry that if the federal agencies didn't know the deal was under way when the interim policy was published, they should have.

The arguments were repeated in detail at the NMFS hearing March 20, 1974, on whether to advise the Maritime Administration to approve transfer of the Smith fleet to the new ownership. Standard

Products Company, Incorporated, of Kilmarnock, Virginia, the third largest company, joined with a statement calling the Hanson application "a back door approach by foreign investors to reap the benefits of this vast American effort [to] protect the inshore fishery environment for the benefit of our domestic coastal fisheries."

To this V. G. White, vice chairman of Hanson Trust who had been shuttling between London, New York, Washington, and Port Monmouth, New Jersey, for months, replied that the acquisition was an investment and nothing more.

"The Smith management is expert in running a complex operation in which Hanson Trust has no experience whatsoever and, being utterly inexperienced in this field, it would be foolhardy for Hanson Trust to interfere," he said in a statement presented at the hearing. "The relationship of the menhaden business to the United States—as to ownership of assets, management responsibility, employment policies, subjection to United States regulations and controls, and marketing of products, will not be affected...."

He said Hanson Trust further arranged to give term contracts to the Smith management; to keep all vessels under U. S. registry "and subject to all U. S. regulations"; to continue employment of fishing and other personnel, "presently almost all U. S. citizens"; and to "develop, in cooperation with National Marine Fisheries Services, sound conservation policies and practices." Seacoast since has been a leader in pressing for conservation management of the fishery.

White saw Seacoast's fishing business developing "in a healthy manner," competing vigorously, and contributing "its full share to the United States' economy." He also said that if Seacoast ran into financial trouble, "Hanson Trust has the resources to supplement their original investment."

Less than four weeks later, on April 17, Hanson Trust had authority from the Maritime Administration, on recommendation of the National Marine Fisheries Service, for the transfer.

Five months later the National Oceanic and Atmospheric Administration had worked out a "final policy" intended to set up

safeguards against the ills the protestants foresaw. It provided briefly that the director of the National Marine Fisheries Service would, in reviewing any application to the Maritime Administration for transfer of fishing vessels to companies under foreign control, place "particular emphasis on the reasonably foreseeable effect of the grant of the application on the fish resources to be exploited by the applicant."

Other considerations included:

- Whether the foreign country involved conducted its own fishing operations "in a manner which diminishes the effectiveness of any international fishery conservation program to which the United States is a party."
- Whether there should be an exception made to any federal policy on foreign investment that might interfere with approval.
- The effect on stocks of fish to be exploited.
- The effect on the company itself, especially its continued employment of U. S. citizens, possible sale of fishing assets, planned use of profits, and whether subsidized vessels were involved.
- The competitive situation resulting and possibility of unfair trade practices.
- The effect on suppliers of the company.

How many of these safeguards would have come without protest by the menhaden interests will never be known. It seems safe to say that the protest at least moved NOAA and the NMFS to take a more detailed look at what they were doing, an action not always to be expected in a federal agency.

The Association and Standard Products now seemed to accept and make the best of the *fait accompli*. Zapata Haynie fought on, in the Virginia General Assembly.

Virginia had long had a law, as had many other coastal states, setting commercial fishing residency restrictions. Virginia's dated in substance to 1871 and was described by George Brown Goode as the strictest in the nation. It forbade non-residents to catch "any fish" for conversion to oil, scrap, meal, or guano in Virginia waters, which include two-thirds of Chesapeake Bay and the big tributary

estuaries, the Rappahannock, York, and James Rivers (the Potomac is Maryland-owned). Non-residents were further forbidden to be interested with residents "as partner or otherwise, except as stockholder in a domestic corporation." A resident was forbidden even to "knowingly permit any non-resident to use his name" in any fishing company. A non-resident could, however, seek menhaden—mentioned specifically here rather than "any fish"—in the Atlantic within the three-mile limit under license from May to November. (Almost all menhaden along the coast are caught inside the three-mile territorial limit.)

It was this latter provision, a loophole occasionally used by Smith boats over the years, that Zapata Haynie tried to close, and did close for two fishing seasons. The General Assembly in 1975 passed, without a dissenting vote, a further restriction denying licenses to take either food or industrial fish commercially to "any person or firm not a citizen of the United States." For a firm to be a citizen under the new law, seventy-five percent of its interest had to be owned by citizens and the president, chairman of the board, and a majority of its directors had to be citizens.

Seacoast Products, British-owned now but again claiming entirely American management, challenged the law by applying, through its subsidiary New Smith Meal, Incorporated, for licenses for half-a-dozen boats to fish for menhaden in territorial waters. J. Howard Smith had not fished in the Bay for many years. Seacoast was denied the licenses. It then went to court to contend that *both* laws were unconstitutional, the old and the new, and fishery law administrators from Maine to Texas and on the West Coast snapped to attention.

Seacoast argued to a special three-judge federal district court at Newport News, Virginia, that the Virginia refusal of licenses to non-residents while granting them to residents was discrimination "in contravention of the Fourteenth Amendment assurance of equal protection of the laws."

The court agreed and ordered Virginia's Marine Resources Commissioner, James E. Douglas, Jr., defendant in the case, to issue the licenses. On the question of Seacoast's alleged "alienage," the court held

that a 1964 federal act superseded "the vitality" of the Virginia act. This federal act forbade "any vessel, except a vessel of the United States," to fish in territorial waters, and the court pointed to the Maritime Administration action allowing Seacoast's fleet "to be documented unconditionally as vessels of the United States."

Virginia, joined by Maine, Maryland, Massachusetts, Delaware, and New York, appealed to the U. S. Supreme Court. Backing the state as *amici curiae* or "friends of the court" were Zapata Haynie, the Virginia Seafood Council, and twelve seafood packing firms. Counsel for the *amici curiae* declared themselves surprised by the district court finding of federal preemption, contending this "concept sprang full-blown from the heads of the three judges. . . without any argument or evidence offered or taken. . . ." The whole ruling, it was argued, would "wreak havoc among the fishery and shipping laws of many states." Alaska, Delaware, Massachusetts, and Washington were listed as forbidding fishing by aliens, and Delaware, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New York, Rhode Island, Vermont, Washington, and Wisconsin as forbidding fishing by non-residents.

They argued further that "foreign interests. . . would lack long-range motivation to conserve the resource"; would "attempt to maximize short-term profits"; would overfish with breakdown of voluntary compliance with regulations; and that other foreign fishing vessels would "seek U. S. shell corporations" to gain American documentation.

In oral arguments James E. Moore, assistant attorney general, told the Supreme Court that Virginia had "suffered at the hands of foreign-owned fishing interests." "There has been, in some cases, complete and utter destruction of our fisheries," he added, apparently referring to the sharp decline in the Chesapeake Bay herring fishery, blamed by scientists on Soviet and other foreign trawlers taking river herring offshore before the spring spawning runs into estuaries.

Counsel for Seacoast, John J. Loflin, pointed to the competitive situation and said, "We are now accused of being a predator simply because we are now a foreign company. We have exactly the same interest in

conserving this resource as our competitors do."

The Supreme Court upheld the lower court in a decision that accepted as an issue the validity of the two Virginia laws, admitted that the Seacoast claim was "basically constitutional in nature," but treated it as "'statutory' for purposes of our practice of deciding statutory claims first to avoid unnecessary constitutional adjudications." The difference between "validity" and "constitutionality" was one for learned counsel in the offices of a dozen attorneys general from Maine to Texas to worry about.

Virginia's Commissioner James E. Douglas, Jr., had gone ahead to issue the requested Seacoast licenses, Virginia not having asked for a stay of execution of the lower court order pending Supreme Court action. After the lower court decision, there were indications that Virginia expected it to be upheld.

In the Supreme Court opinion, written by Justice Thurgood Marshall, a formal discussion of whether Virginia's laws were a valid exercise of police power was elaborated in a long footnote that found the new alien law no "response to the grave problem of overfishing of American stocks by foreign fleets," nor the earlier law an essential enforcement mechanism for net size restrictions.

"The claims are specious," the opinion said:

Virginia makes no attempt to restrict the quantity of menhaden caught by her own residents. A statute that leaves a State's residents free to destroy a natural resource while excluding aliens or nonresidents is not a conservation law at all. It bears repeating that a "state may not use its admitted powers to protect the health and safety of its people as a basis for suppressing competition."...A State cannot escape this principle by cloaking objectionable legislation in the currently fashionable garb of environmental protection.... Seacoast is subject to all United States shipping and fisheries laws. And the record does not support the claim based on enforcement of net size restrictions.

The opinion noted the interests of

other coastal states with their "discriminatory fisheries laws," saw these restrictions growing with increasing scarcity of natural resources, and foresaw a "proliferation of residency requirements [which] would create precisely the sort of Balkanization of interstate commercial activity which the Constitution was intended to prevent."

A confusing aspect was the spectrum of court thinking. The decision was unanimous, but Virginia's Justice Lewis F. Powell joined with Justice William F. Rehnquist in an independent opinion, concurring in part, dissenting in part, but not affecting their votes. They suggested that the court's "treatment of the States' interest in their coastal fisheries appears...to cut a somewhat broader swath than is justifiable in this context."

"Neither mere displeasure with the asymmetry of the pattern of state regulation, nor a sensed tension with a federal statute," they added,

will suffice to override a state enactment affecting exploitation of such a resource. Barring constitutional infirmities, only a direct conflict with the operation of federal law—such as exists here—will bar the state regulatory action.... This is true no matter how "peripatetic" the objects of the regulation, nor however "Balkanized" the resulting pattern of commercial activity.

Seacoast had won a roughly parallel case in Rhode Island a year earlier, in June 1976. That state had a regulation restricting menhaden fishing in its waters to boats of less than ninety feet long, in effect only Rhode Island boats since almost all the rest of the Atlantic and Gulf of Mexico fleet is much larger. Seacoast challenged the regulation, and a special three-judge federal court agreed with the company contention that the regulations violated the equal protection, privileges and immunities, and commerce clauses of the Constitution "because they discriminate against boats from states other than Rhode Island." The court held further that the state failed to prove that it would suffer "any harm whatsoever" if larger boats fished there.

Its opinion declared, "It is in undisputed fact that the menhaden resource

is in danger of depletion due to overfishing," but noted that the state's own memorandum of law acknowledged its own regulations to be of "minor importance in this vast, migratory resource."

The decisions seemed to leave the menhaden captains free to fish almost where they pleased. Their legislatures now had to find language that would preserve such states' rights as have survived growing federalism and still come under the present Supreme Court's concept of "validity" and/or constitutionality.

Possibly the key word to be their guide would be "discrimination," one increasingly volatile with emotion because of civil rights pressures and counter-pressures. Maryland,

for instance, would have to decide whether its laws against purse seining and crab dredging were discriminatory toward Virginians, who are allowed to use purse seines in summer and to dredge for crabs in the winter. Maryland also might have to decide whether many of its own inter-county restrictions, with different requirements on either side of a tidewater county line, discriminated against someone. Virginia would have to decide whether it could, as it did at the behest of sport fishermen, keep menhaden boats out of the big estuaries and most of the smaller creeks entering Chesapeake Bay, without discriminating.

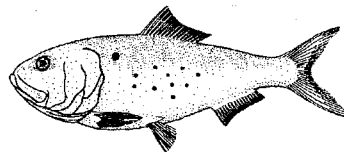
Other states had parallel problems. That is why some people, even in the menhaden industry, wish the matter had never come up.

II. Who Owns This Water, Anyway?

It may be accepted that when two men are fishing within sight of each other, each suspects the other is getting more than his share, and by foul means, and is keeping the fish from coming this way, and at any rate his very presence is an offense against the peace and dignity of the United States if not the Holy Writ. When one is fishing for fun, dropping his line from his own banged-up skiff or gold plated yacht, or from a head or charter boat that charged him good money, and the other for a living, using all mechanical, electronic, and now even extra-terrestrial help ever invented, this suspicion can approach homicidal intensity.

Competition for the commons of the water has been a most trying problem of the menhaden fishery, further complicated by intramural conflicts with other commercial fishermen—lobstermen, crabbers, and pound netters among them. George Brown Goode noted instances in the nineteenth century, and in the twentieth it occasionally has come almost to a point of violent conflict. For both phases legislatures and marine resource agencies have tried to make rules, and the Coast Guard and local marine police have at times had to come steaming out to keep the peace.

An intensifying factor, particularly in the sport fishing phase, is the interdependence of many kinds of marine life. A contention by menhaden fishermen that they want only menhaden, that blues and rockfish or



Seacoast Products tells where to call if you think something about a fish boat's actions aren't right.

anything else would be only an uneconomic, net-chopping nuisance, and that they rarely catch more than half-a-dozen food fish of any species a day anyway, not enough for the crew's cook, can be confirmed almost any day aboard a fish boat. But for the sport fisherman it leaves a further question of whether suddenly taking one hundred thousand bunkers out of the water deprives the local blues and rock of their dinners and sends them hungrily elsewhere, probably far away. Some marine biologists agree; others say probably not. The menhaden industry thinks it is only taking a small part of what the



FROSTY M...

FOR INFORMATION ON CALL
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predatory fish—higher trophic levels, as scientists call them—have missed. Some sport fishermen are persuaded; more are not. It may depend on the day's luck. Reason seldom has been a major part of human mental equipment in competitive situations.

The problem has been most acute in heavily fished waters with visible shoreline boundaries—Long Island Sound, Virginia's end of Chesapeake Bay, Mississippi Sound among them. Here a good summer day sees not only scores or hundreds of yachts a-yachting, but many more private boats small and large, anchored with one line or fifty out, others trolling and looking like South Sea isles with all their outrigger poles. Aboard are keen-eyed men and women, watching for strikes—and also for explosions of seagulls elsewhere telling that blues are driving bunkers to the surface and that's where we ought to be.

Over the horizon come large shapes—fish boats whose spotter planes have located schools of bunkers, perhaps the very ones the sport fishermen spotted by gull activity—and soon sets are made.

Everybody has a right to be where he is. Nobody is breaking a law.

But it's getting crowded. To the sport fishermen, it's the fish boats doing the crowding and we were here first today. To the menhaden captains, it's the sport fishermen and we've been out here a hundred years.

Long Island Sound was a scene of conflicts of emotions in 1973. This was at a time when a good stock of menhaden, created by a large year class in 1969, was available. There had been a shortage of soybeans, principal competitor to fish meal as protein for feed. The Peruvian anchoveta catch, the resource of the then-world's biggest producer of fish meal and oil, had failed in a recurrence of "El Nino," the periodic shift of the Humboldt Current along the Pacific Coast of South America. Fish meal prices here rose to five hundred dollars a ton—from two hundred dollars.

Any menhaden company fished heavily, and one of the biggest concentrations of bunkers was in the western end of Long Island Sound, both in New York waters west of the Byram River and in Connecticut waters to the east. There the six fish boats of Seacoast Products, Incorporated, a unit of what was

then J. Howard Smith, Incorporated, of Port Monmouth, New Jersey, made set after set in early summer.

The situation was ideal for what activists of the 1960's called "confrontations." Sport fishermen felt they were being smothered out of their own waters—their private waters, some thought. Menhaden captains, no patient souls themselves, felt that sport fishermen were a nuisance interfering with a legitimate and traditional way of making a living, and for no reason better than fun.

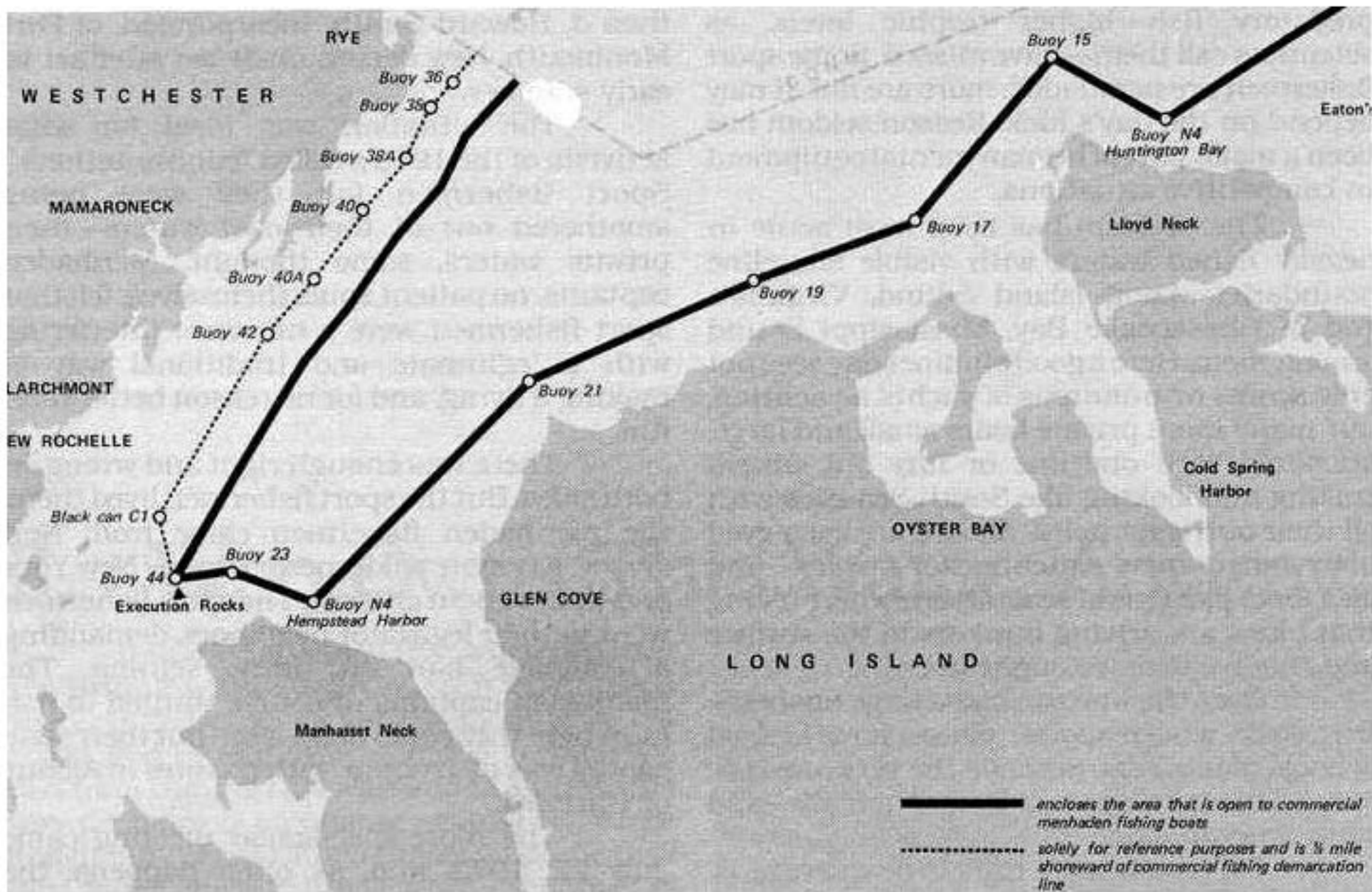
There was enough right and wrong on both sides. But the sport fishermen lived there, the menhaden fishermen came from New Jersey, a remote wilderness to many New York and Connecticut citizens. The sport fishermen went to their legislator neighbors, demanding a complete ban on purse seining. The menhaden captains of course wanted to fish anywhere they could make a set, but their state capital was in Trenton, with no votes in Albany or Hartford.

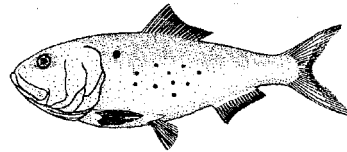
The most spectacular meeting came July 22, 1973, and, as often happens, the result—months later—was perhaps not all either the sport fishermen or the menhaden captains wanted, but at least a compromise.

The fish boat *Arthur J. Minners* of Seacoast Products was fishing off Stratford, Connecticut. About six p.m. its purse boats made a set, and as the *Minners* awaited the signal to come and pump fish, a dozen sport fishing boats from Fairfield and Bridgeport surrounded her, circling to keep her from the purse boats. The tide was edging the *Minners* and the purse boats toward shallow water off Pleasure Beach.

The Coast Guard was called. Two and one-half hours later a patrol boat came, with the circular blockade still under way in the gathering darkness. Coast Guardsmen boarded one sport fisherman and arrested the operator. The rest of the fleet disappeared in the dusk. The *Minners* was free to pump the set into her hold and return, under Coast Guard escort, to the J. Howard Smith plant at Port Monmouth.

At that time, by federal court order, purse seining was permitted to one-half mile from shore, and the demonstration was part of a campaign to restore a short-lived statutory





two-mile limit. The Connecticut General Assembly had fixed the latter at sport fishermen's demands the previous October, but Seacoast and its affiliate, New Smith Meal Company, challenged it in court as an unconstitutional and unreasonable restraint of interstate commerce. On July 12, two weeks before the "naval" incident, Judge Jon Newman issued a temporary order reestablishing the half-mile limit pending disposition of the case on merits. Many sport fishermen were furious.

In a hearing two days after the incident, Federal Judge Robert C. Zampano listened, then took attorneys for sport fishermen and Smith into chambers to work out a compromise. He drew a dividing line on a chart from Green Ledge Point off Norwalk Islands, through Penfield Reef, buoy twenty, Charles Island, and Pont Point at buoy twenty-two, then continued the half-mile limit elsewhere along the Connecticut shore.

Later an agreement between Smith and the sport fishermen established a buoy-to-buoy line for the entire Connecticut coast. It starts at the Byram River breakwater, just east

A chart (not to scale) of the demarcation lines for commercial fisheries in Long Island Sound.

of the New York line, and extends to the Stonington breakwater, just west of the Rhode Island line.

In New York pressures were similar but with no comparable "confrontations." Even so, the *Minners* incident was undoubtedly in the thinking as the New York Assembly considered a bill, passed unanimously the following January, to establish lines for the short Westchester County shoreline and the western end of the Long Island shoreline. Up to then the only New York restriction on purse seining was to require a special license for each vessel and to forbid non-residents making sets on the Atlantic side within three nautical miles of shore between Fire Island and Romer Shoal light, in the mouth of lower New York Bay.

The new limits kept menhaden seining along the Westchester shore one-half mile seaward of buoy lines from Execution Rocks northeast to the Connecticut line, and from buoy to buoy along the Island side as far

as buoy thirteen off Eaton's Neck. The rest of the Long Island shore to Montauk Point, including the once-busy grounds off Promised Land, Amagansett, and Greenport, was left open.

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In the background of the New York compromise was much thinking by enough calmer sport fishermen to restrain hotheads who had closed their minds to any thought but that menhaden fishermen were "raping" the Sound. One of the calmest was T. D. Keatley, then editor of the *Southern New York Sportsman* and principal author of the bill, submitted by State Senator Joseph Pisani and Assemblyman Richard Mannix, which established the compromise in the New York Conservation Code.

Also in the background, and of equal weight, was what was agreed to be a completely cooperative attitude by Seacoast and New Smith Meal, through their president, David H. Clarke, also president of J. Howard Smith, Incorporated, and a grandson of J. Howard Smith. Clarke subsequently discharged one menhaden captain who had disregarded the restrictions. While there have been occasional instances of fish boats getting across the line, either because of misjudgment or disagreement over its location or by action of tidal currents during a set, the competitive problem seemed in the late 1970's as close to being resolved as ever likely in an imperfect world of fishermen.

Keatley conceded that there were still sport fishermen unconvinced and determined to remain so. "For the most part," he wrote, "these are very vocal men who will not listen to facts and tell all sorts of wild stories about the boats working all night and taking untold tons of striped bass and bluefish. It does little good to explain such things as the fact that while night netting of bunkers is legal, it makes little economic sense or that the commercial men do not want to take bluefish in the set because

of the damage which they do to nets." (Some menhaden fishermen, in turn, think they gave up more than they got and refuse to think of sport fishermen as people with rights. Unreasonableness knoweth no demographic boundaries!)

Keatley pressed the contention that if sport fishermen were to have enough big striped bass and blues in the Sound, there must be plenty of bunkers. "To catch fish," he said, "it is necessary to follow the bunkers. Harbors without menhaden provide little action for sportsmen."

If this is so—and again, some marine scientists think that with or without menhaden, predators will find enough to eat among other species—the real problem, beyond keeping sport and commercial fishermen content if not ecstatic, may be in management programs seeking to assure a continuing stock.

Clarke, later president of Seacoast Products that is the successor company to J. Howard Smith, Incorporated, has long recognized a menhaden management program as essential for both the industry and the sport fishery. At a July 1976 meeting of a group to discuss management, Seacoast presented this statement:

Presently, laws in the Atlantic Coast states pertaining to menhaden fishing are a hodge-podge, contradicting each other, antiquated, and with little direction toward true conservation practices. They will tend to become more involved through pressure by sport fishermen and other interests....

Many of the present laws... have been brought about by political pressure and pressure from other sources totally unrelated to fisheries conservation. Without proper management it can be anticipated that this will continue. Some of the state directors, not by their own choosing, are placed in situations where they cannot deter the passage of undesirable legislation. The only course of action left for industry is in the courts, which... is expensive.

It is a little ironical that at least parts of

the menhaden industry had launched a cooperative program intended to meet complaints of sport fishermen the year before the Long Island Sound situation developed. In 1972 the Smith companies joined with Haynie Products, Incorporated, and Atlantic Fisheries, Incorporated, of Reedville, Virginia, in a "Menhaden Code of Ethics" designed to improve relations with sport fishermen and any others whose business or recreation brought them close to menhaden fishermen and fishing in waters of Connecticut, New York, New Jersey, and Delaware. These would include, among commercial fishermen, pound netters, oystermen, crabbers, and lobstermen. Others would be operators of beaches and shore resorts and waterfront residents.

The code, setting a fine of five hundred dollars for any captain found guilty for a first violation and 2,500 for later offenses, also made captains responsible for their own defenses in any criminal action.

Among restrictions:

- No fishing on Saturdays, Sundays, or holidays between the Friday before Memorial Day and the Friday after Labor Day.
- No fishing within one-half mile of any "heavily populated beach or fishing pier."
- No overboard disposal of garbage or trash, with use of antifoaming agents in fish pump discharge water when pumping within three miles of shore or in a bay, river, sound, or inlet.
- No release of dead fish, with any left in a seine after pumping to be "loaded aboard manually," and with another fish boat to be called to take any fish beyond capacity.
- "Extreme caution" required near oyster grounds, crab, lobster, or bass pots, with no disturbance of stakes or markers.
- Adherence to any agreement to remain out of areas where purse seining might otherwise be legal.

A further requirement which might seem unenforceable but which has been met by many captains willingly was this: "The attitude of the captain and crew toward oystermen, lobstermen, pound net operators, crabbers, sport fishermen, operators of pleasure craft, party boats, and everyone else,

must be friendly and cooperative at all times."

There have been frequent instances of captains going to some pains to be "friendly and cooperative." Many a Chesapeake Bay crabber and New England lobsterman has been given a bushel or two of bunkers for bait. Pleasure boaters have been helped out of troubles and a few have been rescued.

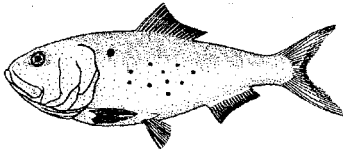
Other captains no doubt have done less, and some may have done little and deliberately. Attitudes, as the federal government often finds to its surprise, are hard to define, even harder to prescribe. In specific cases, it may depend on who is telling the story.

A substantial portion of this code was embodied in law in Delaware in 1974, including the prohibition against fishing on weekends or holidays. By agreement, menhaden fishing in Delaware waters now ends on Fridays, when sport fishermen begin to appear and beaches start to come alive with picnickers and swimmers. Gene Baker, treasurer of the Delaware Bay Protective Association, an organization of sport fishermen, comments here that the whole menhaden-sport fishing program works well because of the attitude of Seacoast and its officials. "Simply put," he said, "we ask and they do everything to comply."

The code, which has spread in some form to almost all menhaden country, depends almost entirely on the menhaden fishery and industry. It neither requires nor expects reciprocal action by any other parties to any potential dispute, nor even understanding of fishing problems or techniques. Thus, where it is working, menhaden people may be, though not necessarily will be, given credit. Where not, they take the blame, sometimes justly, sometimes not. Here and there one or another company has cleaned up dead fish on a beach when no one could be sure what caused the kill.

Among measures to keep complaints from getting out of hand has been the Seacoast Products practice of placing signs with company telephone numbers in large type on the fish boat bridge rails. Anybody with a complaint, afloat or ashore, knows where to call.





A Tangierman gets a supply of menhaden for crab pot bait from the *John W. Dempster, Jr.*, in 1973. He offered to pay, but Captain Kenneth Davis, whose fishermen had caught a half million fish that day, waved him off and said, "We'll never miss them."

As a lesser gesture, Seacoast repainted its *Tideland*, biggest in the fishery, light green after years with a black hull. The 220-foot boat looks more yachty, less formidable. Other Seacoast boats, traditionally white, likewise now are light green. All Zapata Haynie boats are blue for a touch lighter than the old red and grey of the Reedville Oil and Guano and Haynie Products predecessors. A different blue marks the fleet of Petrou Fisheries, Incorporated, of Empire, Louisiana. Wallace Menhaden

Products boats are white. Small matters, yet advertising agencies have spent millions of clients' dollars searching for the right color for a product, and there is an active subdiscipline among psychologists on color effects.

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Elsewhere in the menhaden fishery, competition for the water and its products has produced other restrictions. As in northern and Delaware Bay waters, there have been

occasional outbreaks, although nothing on the scale of the Long Island Sound skirmish.

The Maryland third of Chesapeake Bay and the entire Maryland-owned Potomac River have been closed to purse seining since 1931, to the delight of sport fishermen in a state that has thousands of them resident, thousands more swarming in every summer from other states, neighboring or distant.

In Virginia, where a code of ethics similar to that of the northern grounds has been in effect since the late 1960's, restrictions have tended to increase. Fish boats no longer may make sets inside almost all the many tributary creeks. They stay below the bridges near the mouths of the Rappahannock and York Rivers.

In the summer of 1974 a dispute with crabbers got into a Virginia court. A Standard Products fish boat made a set near Smith Point, during which three crab pots were destroyed. The crabbers then cut the cork line and tried to tow the seine. All involved were fined and the crabbers were given suspended jail sentences for destroying the seventeen-thousand-dollar purse seine.

In 1977 four fish boats, two each from Zapata Haynie and Standard Products, made sets inside the mouth of Dividing Creek, causing bad feeling among waterfront residents and watermen who had pound nets there. The residents called the Virginia Marine Resources Commission, and an inspector sped to the creek and issued citations to three captains whose boats were still pumping fish. The fourth had finished pumping and thus was not seen by the inspector actually violating the law. All three were fined and warned that another offense might bring revocation of their licenses. Possibly more

upset than the waterfront residents or the pound netters were officers of other fish boats. Several were quick to say the offenders should have lost their licenses and gone to jail, too.

All three were on their own in court, with no company help, except that Standard Products' attorney notified the court immediately that its two captains would plead guilty and accept agreed penalties. They had to pay his fees personally. The Zapata Haynie captain got his trial postponed until after the fishing season. He got the same fine and warning.

As with all such incidents, much more damage was done to the industry and menhaden fishermen generally than profit to those involved. For months afterward, it was hard to find anyone on Dividing Creek, resident or waterman, to say a kind word for the entire industry, with some saying bitterly, "They do it all the time." Indeed, the judge who imposed the fines recalled that he had seen fish boats inside Indian Creek, where his home was located, and said, "That wasn't very smart, to make a set in front of the judge's house."

And again, as with all such incidents, they were statistically trifling against the huge volume of fishing that went on day after day without incident, with no crab pots or oyster stakes touched, no pound netters watching "our bunkers" go into fish boat holds, no sport fishermen feeling crowded or thinking they see tons of "our rock and blues" flashing down chutes into fish boat holds, no waterfront residents whose scenery was cluttered with "smelly fish boats." But it is a human failing, or at least characteristic, to remember best what makes us angry.

Part Five

**BIOLOGY AND
TECHNOLOGY**

I. Bunker Biology

As George Brown Goode saw nearly a century ago, menhaden are plainly intended, in one of nature's casual cruelties, only to be eaten by other animals—or put to use by and for man. Like anchovies, pilchards, mullet, sardines, herring, shad, and many others, they are ideal for these purposes. In the bunker anatomy there is no provision for security—no claws, barbs, teeth, ink sac, not even extra swimming speed or flying fish's "wings" to flee, and little hope of species survival except through fecundity. If menhaden, bunkers, pogies, fat-backs, were not spawned by billions and perhaps trillions, they could be rendered extinct, whether by bluefish, striped bass, whales, sharks, seals, or a hundred or a thousand other predators, or by the intensive mechanized hunt by fishermen to turn their rich, oily flesh into useful and profitable products. At best, their population could decline to a point where men would find fishing for them unprofitable and predators would have to depend more on other prey.

Among natural factors making sure menhaden are to be pursued to death:

- They school densely and often in tremendous numbers to make themselves an easy, compact target for predators or fishermen. Such schooling may be a survival mechanism itself—but only against natural enemies statistically unable to decimate such masses.
- They prefer the Atlantic Ocean's or Gulf of Mexico's inshore waters and

estuaries most of the year, to make themselves quickly available without long chases by fish boats—no distant water fishing as for tuna, or as foreign fishermen must practice to reach our grounds.

- They follow fairly regular migratory paths, so that both predators and fishermen know just about when and where to expect them.
- They give predators just what they need for their own growth and health, and they give the fish meal and oil industry its most economical and available resource.

Again, their best defense is fecundity. Atlantic females, looking exactly like the males, squeeze out their eggs—thirty-eight thousand to more than six hundred thousand apiece by estimates—at sea or in larger bays and sounds, between midnight and dawn. As with many pelagic or ocean species, spawning is only routine living, not conscious act, although some instinct, some biological change or release of a stimulant chemical, times the males' release of sperm to match the females' release of eggs. But there is no courtship dance or other act to indicate that little boy bunkers and little girl bunkers even know each other, must less get momentary fun out of perpetuating the species. One scientific synopsis puts it: "Atlantic menhaden are heterosexual. They possess no accessory reproductive organs, and there is no way to distinguish the sexes externally."

Nor, again like many others, is there parental care. Spawning fish go their way, leaving the spherical, transparent eggs, 1.3 to 1.9 millimeters in diameter (specks by English measurements) floating as plankton on or near the surface. There they may be food for larger plankton and other organisms. Often the eggs thus serve only the next school of menhaden, their mouths open to take in anything.

The eggs hatch within thirty-six to forty-eight hours, and if there are currents to carry the larvae into the estuaries—the inlets, creeks, bays, and sounds with their marshes and wetlands—for shelter and nourishment, possibly a month later, there is a chance for survival. Even then, a sudden two- or three-day cold snap could drop water temperatures close to freezing to kill many of those missed by everything that feeds on them in those miles.

But if currents run offshore, or if a storm or just a persistent offshore wind briefly changes surface currents, eggs and larvae are swept away from shelter, few to become juveniles. Several seasons of unseasonable offshore winds could indeed spell lean future years for predators, lean future catches for fish boats. Such climatological shifts, including abnormally cold winters, may be little more than blips on a century-long curve, but also may be one reason for the menhaden fishery's cycles of good and bad years. Great years, environmentally speaking, produced the great Atlantic classes of 1951, 1953, 1955, 1956, and 1958. The last sustained the fishery to 1963. There was good survival in 1966, but the spawning stock by then was so extremely low that the fishery was helped little. In 1969 there was a high survival rate, but stocks continued so low that only 2.7 billion recruits were estimated to have come into the fishery. However, this apparently helped the Atlantic fishery to recover in the early 1970's.

As will be seen in the next chapter on experiments with satellite remote sensing, it may become possible in time to detect climatological and oceanographic shifts in early stages, and thus forecast the trend of the fishery in time for conservation measures.

There has been concern that the menhaden fishery can suffer the fate of the Pacific sardine fishery, which collapsed in the 1940's and had not recovered thirty years

later. It has been noted that the peak sardine landings in 1936-37 were within four percent of the Atlantic menhaden peak of 1956. Yet one conclusion is that the very dependence of menhaden on estuaries for juvenile growth helps preserve the fishery. The Atlantic and Gulf Coasts are laced with estuaries, from the St. Lawrence River to Texas' Laguna Madre, with thirty-eight on the Atlantic alone from Cape Cod to Cape Canaveral known "to provide an environmental link in the life history and biology of the Atlantic menhaden." There are forty-eight more on the Gulf Coast.

Somewhere from Maine to Florida and from Florida to Texas there will always be some area where some young menhaden find sanctuary and grow enough to enter the fishery. Luckily menhaden are not like their shad cousins, always returning to start another generation where they were spawned.

On the Atlantic at least, the actual spawning sites are known by inference more than by observation. Although during the Second World War there was at least one Chesapeake Bay company canning menhaden roe, the ripe females, those ready to leave their eggs in the water, are rarely caught and nobody has actually seen spawning going on. You can go up a salmon stream and see it happen, but you can't get into a mass of bunkers and see here a female and there a female laying eggs. Biologists come to their conclusions largely by noting the relative numbers of inactive, maturing, and spent ovaries in females that have been caught, or by observing whether eggs and small larvae are found in their plankton nets. If eggs or larvae are brought up, spawning females must have been by.

Most of the Atlantic spawning is believed to take place in the South Atlantic Bight, from North Carolina's Cape Hatteras south and west to Florida. Studies of sample females getting ready to spawn indicate a cycle there of a limited spawning during the northward migration in the spring, limited early and late summer spawning as far north as Cape Cod and occasionally into the Gulf of Maine, increased spawning during a southward fall migration, and intensive winter spawning again in the South Atlantic Bight. All is over the Continental Shelf.

What happens after the fish move

offshore in midwinter is known in general, but not in detail. When the surface schools disappear off North Carolina, they apparently break up and the fish go deep. There is probably a general mixing of fish from all areas before they begin returning inshore and northward in late winter, to sort themselves into age and size groups along the coast by early summer.

When the surviving larvae find sanctuary in the estuaries, in largest volume in late winter and early spring, they move up to fresh water to metamorphose into adult form, at about thirty-five millimeters (less than an inch and a half) long. As they grow, they move downstream to saltier water. Young or adults get along well in waters with salinity as low as one part per thousand, almost potable for humans, or as high as the open ocean's thirty-five or thirty-six parts per thousand. Larvae do best in twenty-five or better.

The young spend six to eight months ranging in the estuaries. Bluefish, summer flounder, weakfish or sea trout pursue them, herons stalk them in shallows and marshes, osprey, pelicans, gulls, and other diving birds hit them from the sky. The young bunkers may find limited peace at night, although an extreme low tide can strand thousands.

Parasites, including the little "bug" that Benjamin Latrobe called a "foretaster," and also worms and fungi, can afflict them day or night. Red tide, the dinoflagellate that can poison humans, likewise can poison bunkers. Chemical pollution can drive them away or kill them. Sewage, inadequately treated by our many medieval treatment plants or even raw when rainstorms overwhelm combination storm and sanitary sewerage systems of big cities or rural septic tanks, uses up oxygen to kill them. Decaying dead algae, from a bloom caused by other types of over-enrichment of the water, also use up oxygen. Low dissolved oxygen in the water kills millions, particularly in upper Chesapeake Bay, during late spring and summer months, when water temperatures can go above twenty-seven degrees Celsius (eighty Fahrenheit). And industrial wastes kill or drive away many others. They appear to take up DDT, the now-banned but still and long to be present pesticide, from plankton, without effect on growth. However, they spread it further

through the ecosystem to harm at least fish-eating birds such as osprey and bald eagles. Or some developer, intent on making a killing with "useless swamp," fills a hundred acres of marshes to deprive the young bunkers of shelter and food.

It thus can be said that every ill afflicting our estuaries, whether natural like a tropical storm or hurricane dropping uncountable tons of fresh water, or man-made like oil spills that can smother eggs and larvae and befoul wetlands to keep the young from using them, likewise afflicts young menhaden.

Most of these young, two to three inches long, stay in East Coast creeks and rivers until September or October. They feed on zooplankton at first, mostly tiny crustacean cousins of the crab, then develop the filter feeding apparatus—the open mouths that accept anything swept into them. One estimate is that an adult passes from twenty-three to twenty-seven liters (a few more quarts) into the mouth, out the gills, every minute.

In the fall the young Atlantic menhaden begin to move out of the northern estuaries first, then from those to the south. In some years all seem to leave for the ocean, in others a few or many spend the winter in estuaries from Chesapeake Bay to Cape Canaveral. Hundreds of thousands have been seen in one winter or another in such waters as Maryland's Patuxent River, the first big Chesapeake Bay western shore river north of the Potomac. Others have been seen in or sampled from North Carolina creeks and sounds. Why they stay when they stay is not known.

Adult Atlantic menhaden, which can be as long as 450 millimeters (eighteen inches) and weigh up to 1,800 grams (four pounds) but average half that, follow the warming water, the fifteen- to twenty-degree Celsius (fifty-nine to sixty-eight Fahrenheit) water temperatures moving northward with the sun. In April and May, or even earlier after mild winters, schools returning from their offshore winter sanctuary appear, first off Florida, Georgia, and the Carolinas. Then they are found off the mouths of Chesapeake and Delaware Bays, and along New Jersey and Long Island by late May and early June. During July they appear in the Gulf of Maine, and even in the Bay of Fundy. However, abundance north

of Cape Cod has been variable for a century, as the Maine industry found out during the late nineteenth century.

During their first three years, at least in the Chesapeake Bay region, Atlantic bunkers seem to grow about 7.5 millimeters (three-tenths of an inch) or more a month. There are uncertainties. Because spawning can occur in any month, two fish with scales showing the same number of annuli or age rings may be a year different in actual age, and size measurements must allow for this possibility. Growth rates probably vary in different areas, and a fish may be in one area its first season, another the second. Further, growth in Atlantic menhaden is limited to the April-November period, and larvae spawned in the fall might not metamorphose until April, along with February's spawn.

Those three years are often the life span of the Atlantic bunker, and then only for lucky ones escaping all hazards. During the fishery's productive years from 1950 to 1962, federal scientists found from studies of more than 116,000 fish that six- and seven-year-old menhaden were caught frequently, eight- to ten-year-olds were uncommon. Only one twelve-year-old was discovered. In the late 1970s one- and two-year-olds made up the bulk of the catch, likely because there were fewer seniors.

It may be asked why bunkers—and herring, mullet, tuna, and many others—school so densely, why they make themselves into such easy targets for all whose hands, teeth, claws, or beaks are against them. One student of the schooling phenomenon, Dr. Evelyn Shaw of Woods Hole Oceanographic Institution, concluded wryly in 1962, "Study of the schooling of fishes has asked more questions than it has answered."

Among theories offered is one that large numbers might "confuse" a predator and when a school exceeds a certain number, it cannot be decimated. But predators school too, and bluefish among them seem perfectly content to miss one bunker but slice the next in two and a dozen more beyond, however many escape or only lose a bite-size piece. The blue, as George Brown Goode's correspondent noted so long ago, seems to enjoy killing as much as eating—possibly more so.

Another suggestion is that schooling helps find food, although only the fish on the periphery of a school can see or otherwise sense food ahead or to the side. Social or school feeding may promote rapid growth of the young, or schooling may be mainly to make reproduction more certain. But Dr. Shaw also found schools of some species "either all male or all female!" She wound up suggesting consideration of hydrodynamics: The mass movement may make it easier for each fish to move forward. "The attainment of maximum efficiency may dictate an optimum fish-to-fish distance in the school," she added.

Others have come with other findings. One student discovered in 1963 that if he played a recording of porpoise calls, the bunkers formed a tight mill by crowding together in frenzy. The milling was suggested as a possible defense against noisy predators, although it would seem to help the porpoise grab even more.

A number of attempts have been made to find out what sounds, smells, flavors, temperatures, or sights affect menhaden. The fish seem to react in frenzy to sound fields up to twenty thousand cycles per second, but can become accustomed and calm down somewhat. The past practice of fish boat captains to try to "spook" schools they couldn't handle by steering "all rung up" through them to keep a competitor from getting them has been noted, and indeed an industry code now forbids this! Efforts have been made to concentrate fish caught in the purse seine near the fish pump hose mouth with strong electrical fields. Schools have been enclosed and held in air-bubble curtains for as long as ten hours.

□ □ □

The Gulf of Mexico's many *Brevoortia patronus* and fewer *B. gunteri* or fine-scale menhaden and *B. smithi* or yellow-fin are little different in biology or habits from the Atlantic's *B. tyrannus*. The yellow-fin is found in the Gulf east of the Mississippi River delta, the fine-scale west of the delta. They look alike

and can be told apart only if you count the number of vertebrae.

The most important differences are in rate of maturity and life span. The Gulf menhaden is an adult in a year or less, and not many live past three even when missed by predators and fishermen. Sampling and magnetic tagging indicate that the one- and two-year-olds make up more than ninety-five percent of the total weight of catch, with one-year-olds averaging sixty-three percent, two-year-olds thirty-four percent, three-year-olds only 2.6 percent.

The fish usually enter the fishery—are caught in volume—as one-year-olds about 120 millimeters (five inches) long. Two-year-olds get to be as much as 190 millimeters (7.5 inches), three-year-olds to 215 millimeters (8.5 inches). The largest sampled was 247 millimeters (ten inches) long and weighed 296 grams (ten ounces).

Thus *patronus* is a smaller fish than *tyrannus*. A ten-year survey showed little annual size variation for each age group, but did uncover geographical variations. The mean age tended to be higher in the central area of the Gulf Coast, from Empire to

Intracoastal City, Louisiana, and lowest in western Louisiana and Texas areas. Mean lengths and weights of all ages also tended to be greater in the central area, since mean ages were greater and catches included more and larger fish.

Spawning habits are similar, except that Atlantic menhaden spawn where they happen to be when ready, mostly between November and April. Gulf menhaden spawn between October and April, up to sixty miles offshore west of the Mississippi River delta, inshore off Florida, Alabama, and Mississippi. A one-year-old female lays an estimated twenty-two thousand eggs, a three-year-old that plus one hundred thousand.

As with Atlantic menhaden, Gulf larvae depend on currents and winds to carry them into estuaries such as Mobile Bay, Mississippi Sound, Lake Pontchartrain, the Mississippi River delta, and the dozens of sounds, bays, inlets, bayous, and rivers of Louisiana and Texas shores. An estimate is that there may be from ten to twenty billion juvenile menhaden, five to six months old, in these estuaries at any one time, but the behavioral patterns are not too well known yet.

II. Guidance From Outer Space

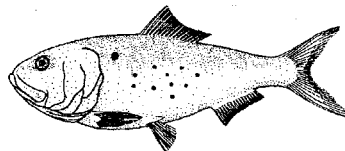
It is fitting that the nation's oldest may be one of the first fisheries to make use of the space age, reaching to outer space to guide captains, in time, to fishing grounds and, more important, to guide the industry in keeping the fish from being overtaxed.

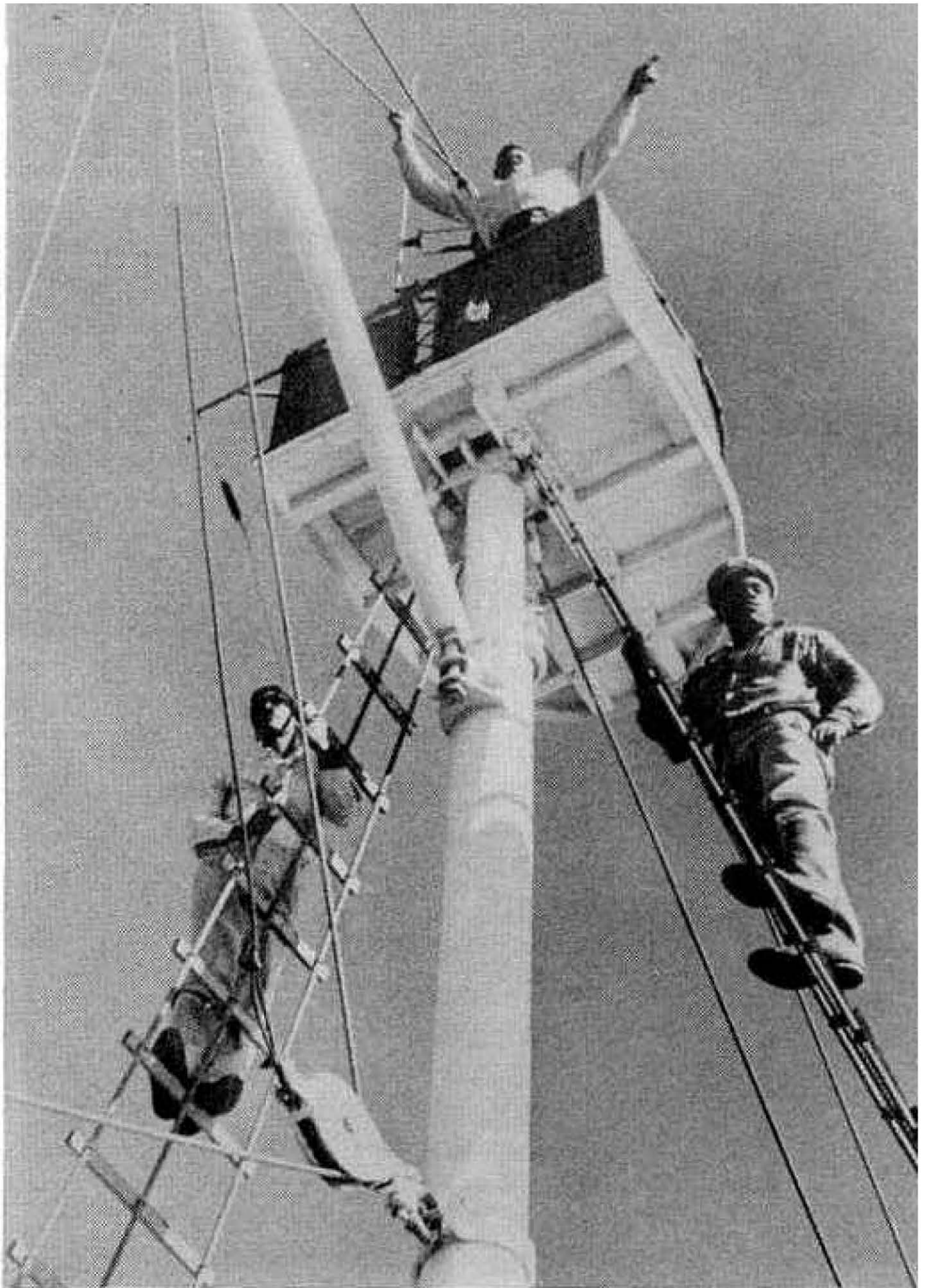
A logical extension of the work of the spotter pilot has come in what scientists call remote sensing, or seeing—at least learning—what is invisible or just too distant for the eye, for the immediate purpose of catching the fish, for the more leisurely task of predicting where the fish can be expected to be a day, a week, or a season ahead, and to detect conditions that determine whether there will be any fish at all.

The spotter pilot for the menhaden fishery has been himself a remote sensor. He sees from hundreds of feet in the air what the captains cannot see from their crowsnests. He surveys in a few minutes wide areas which they cannot cruise in hours or even days. He can tell the captains the distant water is too muddy or too rough to be worth their time, or good enough to spend the fuel to get to.

But remote sensing for space and marine scientists now reaches far beyond the eye. Your eye sees differences in radiation being reflected from objects and sends these perceptions electronically to your brain to be

The captain points to a school while the mate and striker hang in the ratlines of one of Harvey Smith's fish boats out of Beaufort, North Carolina. Martha Loftin collection, Hampton Marine Museum, Beaufort.





identified and classified according to memory—what you know from experience or teaching. Yet your eye can see only a very narrow range of the electromagnetic spectrum, the thin frequency band between ultra-violet and infra-red. Beyond ultra-violet is the x-ray band. Beyond infra-red are the microwave and radio wave bands.

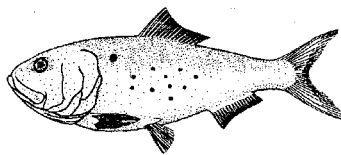
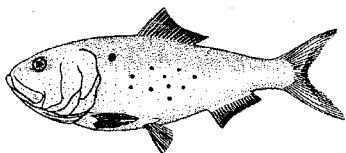
Remote sensors look into both invisible and visible bands and tell on recording instruments what they see, not necessarily actual objects, but factors that make for the existence of the objects—whether fish at sea or forests ashore. As one writer,

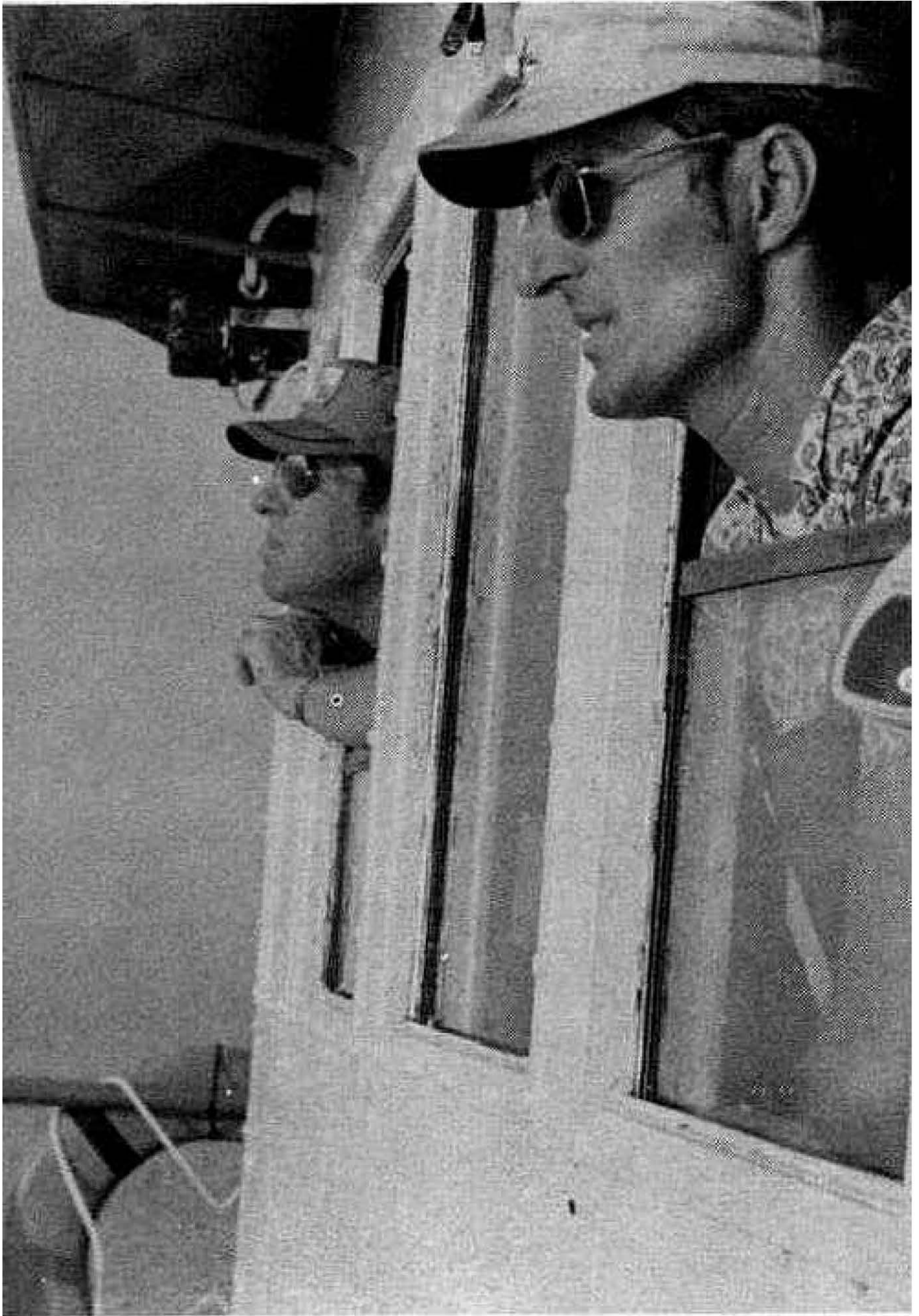
Lieutenant Scott C. Sollers, remote sensing specialist and staff ecologist in the office of the Chief of Engineers, puts it, this makes it possible for a remote sensor on a satellite to define “the dynamics of nature in somewhat the same fashion that time sequence photography captures the slow unfolding of a flower petal or the gradual swell of a germinating seed.”

Remote sensing for fishery data has taken two forms, the first direct from aircraft using low light level image intensifiers and aerial photography. The use of lasers is also being investigated. The fish-finding image

Pilot Eugene Robinson (left) and Captain Kenneth Davis do some remote sensing from the wheelhouse windows of the *John W. Dempster, Jr.*

Captain Meredith Robbins of the *Atlantic Queen* sits in the door of the wheelhouse to watch the ocean off Chincoteague, Virginia, for whips and the color of fish.







intensifiers, developed from night vision devices for military aircraft, amplify bioluminescence—phosphorescence—caused in the water by agitation exciting certain plankton, mainly the dinoflagellates. Fish swimming through the plankton provide the agitation, and the glow outlines their bodies. The intensifiers go far beyond the familiar glow to be seen under the right conditions when an oar is pushed through the water. They amplify light too faint for the eye. A television camera with an intensifier tube amplifying light up to 120 thousand times has been used from aircraft at one thousand meters (3,300 feet) altitude and flying at 185 kilometers (115 miles) an hour during the dark of the moon.

Zapata Haynie Corporation, the largest menhaden fishing company, already is using this concept. The parent Zapata Corporation formed a remote sensing group in 1971 for its Gulf of Mexico operations, and has expanded it to include locating new fishing grounds in international waters along with immediate tasks of fish spotting, day or night, estimating fishery populations and determining migration routes and schedules and feeding habits, and developing other environmental information. The system is also suggested as potentially useful in law enforcement and search for violators of customs, pollution control, and fish and wildlife laws.

The system in use in the late 1970's was made up of an optical-mechanical scanner for detection of fish schools at night, an infrared sensor for sea surface temperature measurements, and necessary data processing and recording requirement.

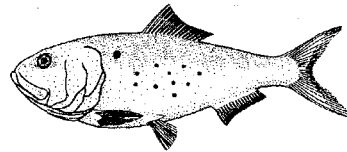
In fish spotting the system takes advantage of the daily cycle of some species, such as sardines, anchovies, and mackerel, of rising to surface waters at night and descending for refuge from predators in daylight. The bioluminescence during their nightly movements enables the system to follow them much as spotter pilots follow menhaden during the day by direct "eyeballing" of schools.

Zapata uses two survey aircraft, one operating directly for its Zapata Fisheries Development Corporation, one for its anchovy fishery off Baja California. Each carries a low-

light-level camera in a pod under the fuselage. The sensors automatically scan the water below, reaching out forty-five degrees on both sides of the flight path from as high as ten thousand feet. At eight thousand feet the sensors scan paths more than three miles wide. The system also includes television monitors and videotape units to record the scanned regions, with luminous areas picked up by the cameras displayed on cockpit screens. Data recorded include flight position, altitude, air speed (150 knots or more), water temperature, and the pilot's comments.

The survey planes, used for day or night spotting, can circle a particular point,

A modern spotter plane cruising over the Gulf of Mexico for Zapata Haynie Corp. Zapata Haynie photo.

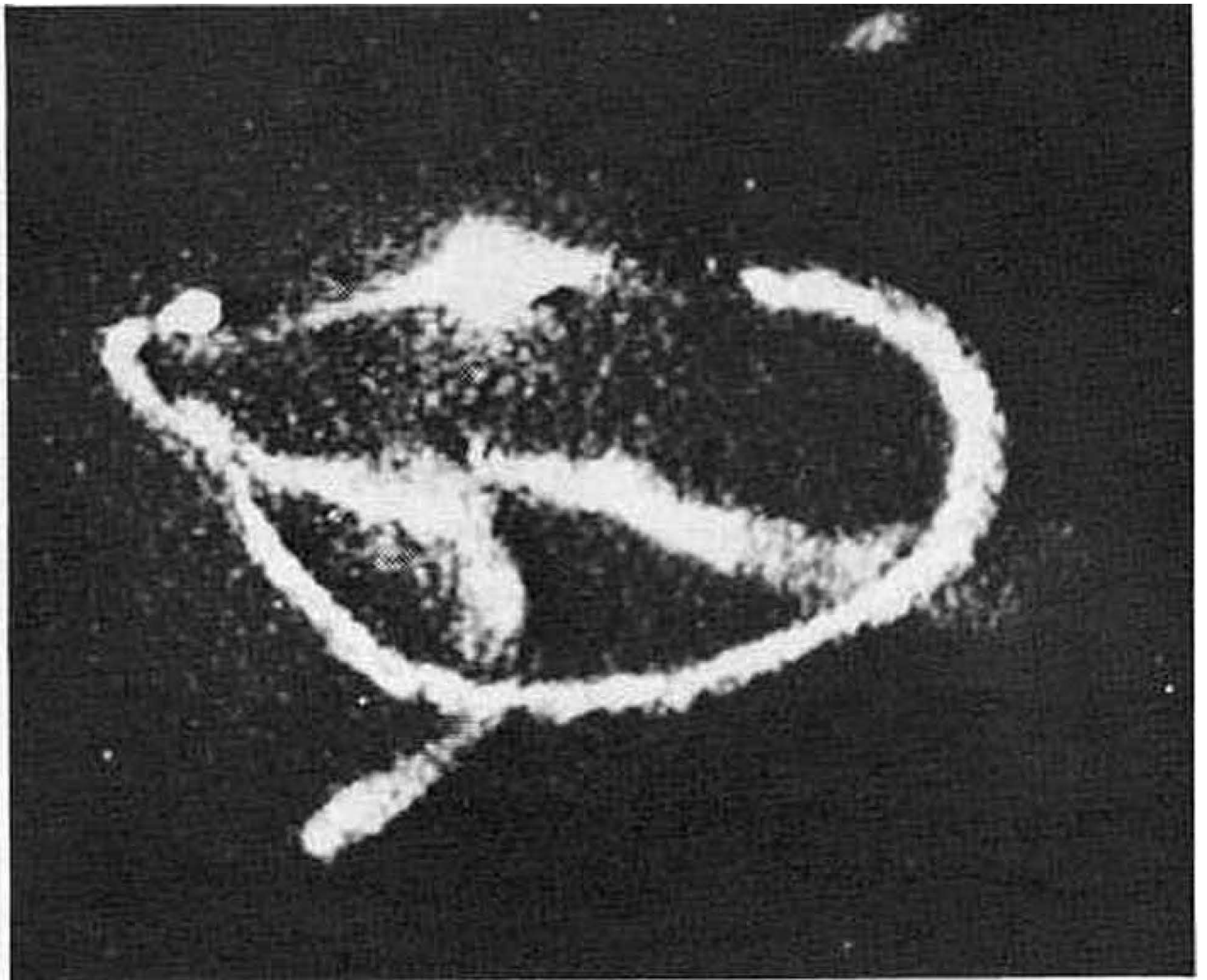


with the pilot rotating the camera to cover an area up to ninety degrees on either side. Thus a fish boat can be guided efficiently to a school under watch, and the video information can be transmitted to give the captains an electronic view of what the camera sees from six to eight thousand feet.

The developing system has had tangible products already, including information adequate to encourage the company to go ahead in the joint venture with Mexican interests, Pesquera Zapata, to establish the anchovy fishery out of Ensenada, Baja California, in 1974. Monthly flights were made over a tracking pattern extending fifty miles offshore at ten-mile intervals from San Diego south and east 250 miles. The survey







data indicated the distribution and migratory patterns of the anchovies, schooling characteristics, and other factors telling how productive the fishery might be. A test fishing program followed, and a factory was built ashore and a fleet of five new boats developed.

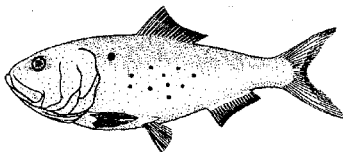
For the menhaden fishery itself the system has provided direct fish spotting and resource surveys for the Zapata Haynie Gulf fleet since 1971 and made possible research on additional fish stocks there. In 1973 the system was used for a study of migratory

patterns and schooling characteristics of menhaden along the Atlantic Coast. Data indicated the location and route of small schools before they gathered together to move into Chesapeake Bay.

In other fishery experiments, aerial photography, using extremely high speed film in four clustered cameras with special filters for green, red, infra-red, and blue spectral regions, has located, identified, and surveyed giant bluefin tuna at depths of ten to fifteen meters (thirty-three to fifty feet) off the Bahama Islands. Another test off the California coast was made to help work out techniques to count and determine the size of porpoises.

Laboratory and computer experiments with high powered laser systems indicate they too might find, count, and identify fish as deep as sixteen meters (fifty feet) within a seventy-five-foot swath from a 1,700-meter (5,200 feet) altitude. The laser power reflected by the fish to the airborne detector varies according to the original power of the laser, wind speed and direction, the radius and angle of the beam, the depth of the fish, the condition of the water, and the aircraft speed.

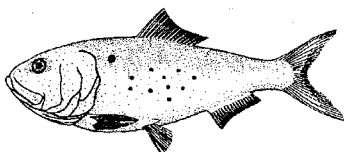
What remote sensing with airborne image intensifiers can see: Three anchovy schools and the seiner (extreme left) show bioluminescent glows to a Zapata Fisheries Development Corporation plane's sensors at 6,500-foot altitude, off Baja California. The schools are about to join to form one T-shaped school. Zapata photo.



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What appears to be the most productive effort in remote sensing has been from two satellites 494 miles above the earth. Menhaden and their industrial cousin, thread herring, have been the subjects, and the scene has been the Mississippi and Louisiana waters of the Gulf of Mexico.

The work has been carried out experimentally since 1972 by the National Marine Fisheries Service, the National Aeronautics and Space Administration, and the National Fish Meal and Oil Association, with cooperation of the menhaden companies and later with Mississippi and Louisiana state agencies and several oil companies joining. By



The anchovy seiner is paying out the seine towline, about halfway back to the seine skiff. Part of the school apparently has escaped. Zapata photo.

1977 it had reached a point where in one test the captains found menhaden concentrated in "high probability areas" discovered twenty-one hours earlier by satellite sensors. Success was claimed for the tests, but scientists cautioned that "more research in bio-environmental relationships is essential... before indirect remote sensing can achieve its true potential."

The investigations have been conducted with two identical satellites, LANDSAT-1, launched in 1972, and LANDSAT-2, in 1975, in circular, sun-synchronous, near-polar orbits. Both circle the earth every 103 minutes, with fourteen orbits a day, and repeat each orbit every eighteen days. Aboard each is a "multispectral scanner" which measures the intensity of radiation in four regimes of the electro-magnetic spectrum.

The first experiment was intended to demonstrate the potential of satellite-acquired information for predicting the distribution and abundance of Gulf menhaden in an 8,760-square-kilometer (5,202 square-mile) rectangle in the north central Gulf during the mid-April to October fishing season. The limited scope experiment indicated that density level images from the red channel of the satellite sensor not only told where the fish were, but also told two important factors in their distribution: water turbidity—how much suspended matter was in it to affect the fish—and its depth. Thus, over this big area, the satellite could pass back information, every eighteen days at least (cloud conditions permitting) on where fish were likely to be found, and on sections where the water was either too muddy or too deep or too shallow for fishing.

In the spring of 1975 the second experiment, the LANDSAT menhaden and thread herring resources investigation, was started. Thread herring were added as similar to menhaden in behavior and also a resource still little used. Some scientists think these "hairy backs" might yield even greater harvests than menhaden, although in the late 1970's the thread herring catch for reduction to meal, oil, and solubles was only about one percent of that of menhaden. During the 1960's, when the menhaden catch was low in many areas, the federal Bureau of Commercial

Fisheries and its successor National Marine Fisheries Service did considerable investigation of the potential of thread herring, which is also found along the Atlantic Coast, as an alternative to maintain the fish meal and oil supply. However, for the new experiment, the schools were elsewhere and little data was obtained.

Again, the menhaden satellite experiment was conducted with the premise that fish gather or move or disappear according to the presence or absence of certain conditions, biological and oceanographic, that they like or dislike. This might include, as well as turbidity and depth, surface water temperatures, salinity, amount of chlorophyll as an indication of plankton, and water color. Except for temperature and salinity, these factors could all be measured by the multispectral scanners aboard LANDSAT on its passes over the study areas, one off the coast of Mississippi, the other off Louisiana.

In both experiments oceanographic information was collected from the fish boats at the sites of successful sets and compared over time and between study areas on an assumption that if menhaden were caught in the same kind of water with respect to one or more factors, the factor always consistent probably was affecting fish distribution. It was found that water color, turbidity, and chlorophyll concentrations determined from the fish boats were similar at sites of successful fishing in both study areas, while those for salinity and temperature were not.

With water color, turbidity, and chlorophyll thus also measurable from the satellite, the next step was to determine if water preferred by menhaden could be recognized from space. This was logical since agricultural and forested lands ashore already had been classified in detail by data from the same LANDSAT.

The "pattern recognition technique" called for first analyzing data to identify land, water, and clouds. Locations of menhaden schools, as reported by fish boat captains and spotter pilots, were translated into the LANDSAT coordinate reference system, much as a navigator would log, "sighted such a school at such latitude and longitude."

Then "radiance values"—what the scanner saw—in each of the spectral channels involved were put through a computer, and the data were classified into high and low probability fishing areas. Where radiance values were close to actual fishing results would define a high probability area: where they were at variance, there should have been few or no schools. The computer analysis showed that almost ninety percent of all known fish reports during three satellite coverage periods fell into the LANDSAT infrared "high probability" fishing areas.

While the results were promising, doubts remained in the minds of fishermen and scientists about how well satellites could help locate fish. Thus a new test was made, with LANDSAT data used in near "real time" to aid fishermen tactically. Inspection of data showed that the satellite-inferred high probability areas generally remained intact only for twenty-four hours. So, analyzed LANDSAT data would have to be in the captains' hands within that time. Data received at the Goddard Space Flight Center in Maryland had to be pre-processed, recorded on magnetic tapes, and sent by commercial airliner to New Orleans, where a driver rushed them to the NASA computer complex in Slidell, Louisiana, to be combined with fishery data, analyzed, and classified into low and high probability areas—all within twenty-four hours.

About twenty-one hours after LANDSAT passed over the study area, a fishing prediction chart derived from satellite data was ready for distribution, by radio and telephone via spotter pilots and fleet managers. First reports showed that menhaden were concentrated in the high probability areas, and subsequent plots of actual set locations on the prediction charts showed that LANDSAT had done its job.

But one major limitation was left: LANDSAT made one pass over a specific area only every eighteen days. Fishing goes on daily.

An effort was made to use another satellite, the geo-stationary GEOS, which does not move with respect to a given earth location. This satellite shows cloud formations pictured on television weather shows. The results showed promise, but the dynamic range of the

GEOS sensor was found inadequate for fish distribution prediction.

However, a new satellite intended specifically for marine work—SEASAT-A—launched in June 1978 from Vandenberg Air Force Base in California, carried five dedicated ocean sensors. They include a radar scatterometer which scientists hoped might make it possible to monitor synoptically—give a general summary view of—surface ocean circulation. It is designed to measure surface wind speeds, as an earlier model from the satellite Skylab had done within plus or minus two meters (6.5 feet) per second and twenty degrees in angle. Wind stresses on the water then can be converted into measurements of surface water movement—currents—since winds are a main factor in development.

No immediate menhaden project was involved. However, Andrew J. Kemmerer, director of the National Fisheries Engineering Laboratory at Bay St. Louis, Mississippi, explained that the data might make possible a basis for months-ahead forecasts of yield of menhaden and other species, including shrimp and groundfish. These, making up ninety percent of the catch in the northern Gulf, spawn offshore and depend on surface currents to take their eggs and larvae into nursing grounds—the bays, sounds, inlets, rivers, bayous, and creeks, with their salt marshes and other marine vegetation and rich food producing capabilities.

"Unfavorable current regimes during critical spawning periods thus could significantly affect the number of eggs and larvae reaching the estuaries," Kemmerer said. "If not many make it, then obviously recruitment and ultimately yield will be affected." He reported that studies at the NMFS laboratory at Beaufort, North Carolina, had shown that more than sixty percent of the annual fluctuation in recruitment (number of young surviving to reach an age of one year, when they enter the fishery) of Atlantic menhaden "could be explained based on surface current patterns and knowledge of the size of spawning stock."

SEASAT-A thus can't help the eggs and larvae against unfavorable currents, but it may tell fishing industries, including menhaden, what the prospects are for another season.

SEASAT-A also carried a radar altimeter and synthetic aperture radar, a microwave radiometer, and a visible and infrared radiometer. All but the latter were expected to penetrate clouds. The synthetic aperture radar may help find out if fishing vessel surveillance can be achieved from space in enforcement of conservation laws—including our two-hundred-mile limit now policed by the Coast Guard from ships and airplanes—and in management of a fishery.

Field tests with the NMFS, NASA, and Coast Guard over Georges Bank in the northwest Atlantic and the Bering Sea off Alaska in 1976 with several aircraft-carried prototype radar systems indicated that under certain conditions the synthetic aperture radar could possibly detect fishing vessels, telling their size and the shape of their superstructures, and giving course and speed.

SEASAT-A, for which an operational system is considered possible by 1985, is intended to give fishermen, among other users, what they need to know in near “real time”—very soon after observation from the satellite. To find out how this could be done, SEASAT-A’s operation was to be studied by scientific teams for six months or so after launching. Then the data was to be given daily to a selected set of commercial users, including three in West Coast fisheries. Also to be provided were daily forecasts, drawing on SEASAT-A and other data, up to seventy-two hours ahead of sea surface temperatures, wave heights, winds, and if possible, ice conditions.

D. R. Montgomery, SEASAT-A coordinator for the commercial users’ program at the Caltech Jet Propulsion Laboratory, Pasadena, California, emphasized that the immediate program was experimental, not operational, and intended “to find out what we can do now.”

An economic assessment, prepared with a 1985 date in mind for an operational system, projects annual benefits to ocean fishing at from four to thirty million dollars through the year 2000, based on 1975 dollars.

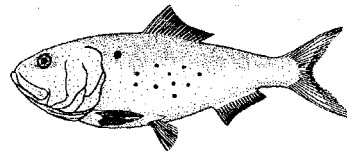
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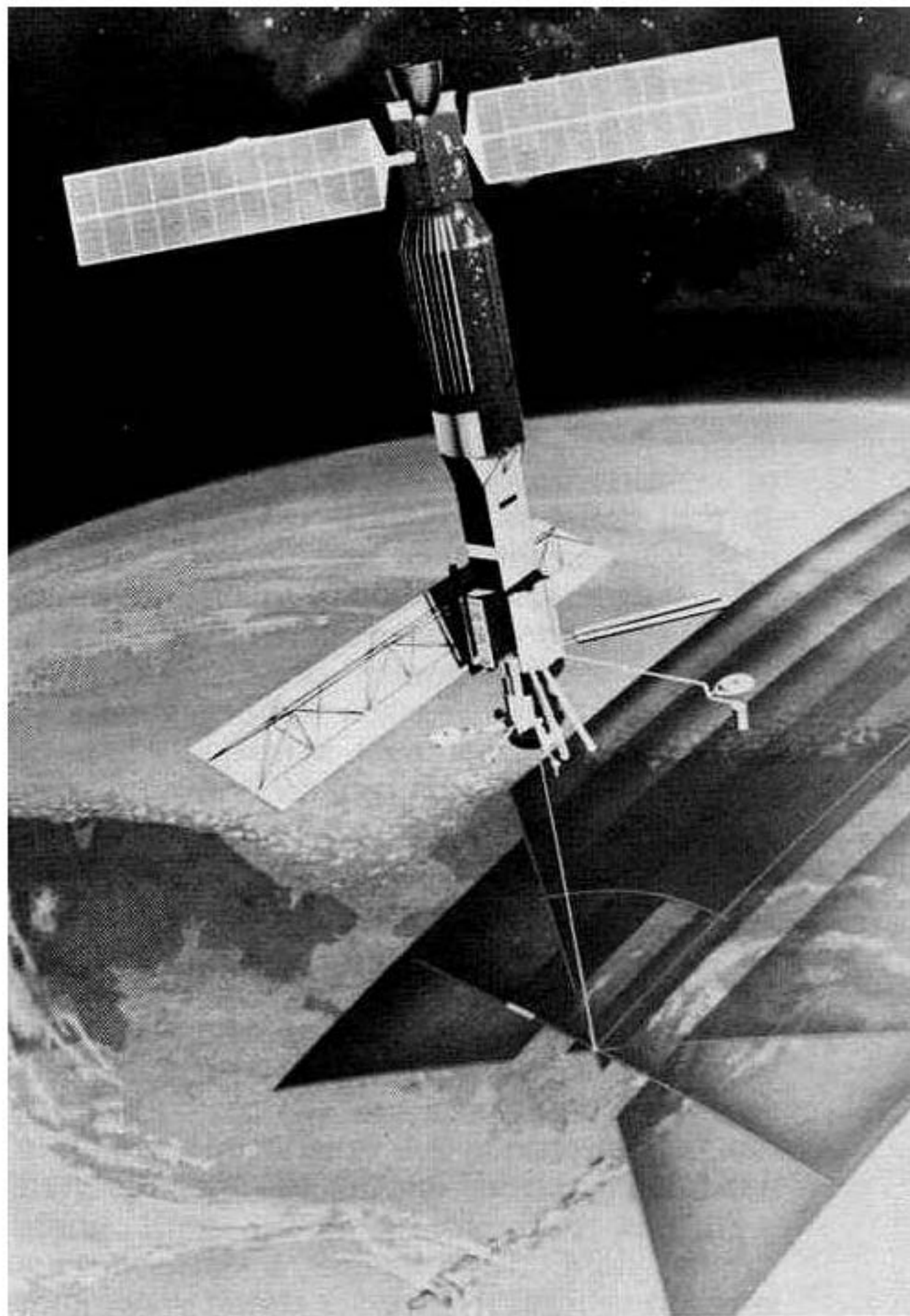
As with any new tool, the first questions are how to use it both for more

efficient fishing and for conservation of the resource. Of these, the more important is how to make sure that the benefits will last, forever if possible. It is conceivable that in time remote sensing will be so refined that captains can literally “plug in” each morning on a passing satellite and, just as a ship captain far at sea can get an instant position fix, get a “read-out” telling within a close distance where the fish are and how many they are. If so, it will take good conservation habits to keep fishermen from making a mad race to the best spots, with every last fish pumped aboard with no more thought than “if I don’t get them somebody else will.”

Menhaden have been and may

SEASAT-A on a pass over Alaska. NASA photo.





continue to be a renewable resource, like forests and farm products. But the bunkers are rarely seen now "purpling the waters" as Professor Samuel Latham Mitchill, the great nineteenth century naturalist and statesman, saw them off "Montock Point" almost any time he looked.

Thus the real service of the satellites and remote sensing will be in discovering developing conditions before they become critical, conditions that affect the supply of menhaden and other fish: the ocean currents carrying eggs and larvae to the estuaries to live or out to sea to be lost; the presence or absence

of food, of silt or other suspended foreign particles in the water, and possibly even of poisons driving fish away or killing them. With such information, menhaden and other fishing companies and their captains and the fishery and marine resources agencies ashore can decide how to run their affairs so that fish will be there abundantly next year, or if that is not possible, to let up pressure and give them a chance to come back.

(NOTE: SEASAT-A suddenly went silent in November 1978 and was written off as a loss. Data transmitted prior to the malfunction was considered valuable even though incomplete.)

III. Whither the Bunker?

The *Munnawhattea*ûg...*marsbancker* ...fat-back ...bug-fish ...pogy ...bunker... has changed not a bit in the three and one-half centuries we have known it. The evolutionary time span is too short, in Nature's measure, for the menhaden to be anything now but the oily, bony, fecund creature we have always known, and nobody has tried to change it with selective breeding, cross breeding, or other device of genetics.

What we do with menhaden has changed from manuring—spreading on fields or digging into gardens—to specialized, sophisticated processing to get out of the fish all possible good for the industry, its feed mill, and foreign oil buyers, and in time with more enlightenment in government regulation, for humanity at large.

The industry seems stabilized, if not permanently at least for the foreseeable future. It would take an adventurous man to try to start up a new menhaden enterprise, and he would have to have disposable millions of dollars for land, capital equipment, and a fleet, more millions to meet federal, state, and local environmental and zoning requirements, and even more millions to lose until he "got the hang of it."

The resource—the fish stock—may be on the way to stabilization. Management plans in existence on the Gulf of Mexico and in preparation on the Atlantic Coast, aided by long-range forecasts based on remote sensing from satellites, may make it possible for the

industry to know better what to count on and thus avoid the wild swings between feast and famine of the nineteenth century and so much of the twentieth. In time the industry and governments may be able to stop destruction of estuaries and wetlands so vital to the early life of the menhaden, although this may depend more on who shouts the louder—concerned ecologists or promoters with easy access to complaisant politicians and profitable scorn for "do-good environmentalists."

Ashore or afloat, spectacular changes in technology seem unlikely, at least in this century, though far from impossible. Fish boats and purse boats are mechanized, even automated, now; likewise factories. There will be continual refinements to increase efficiency and cut costs—at least keep costs from doing worse than keeping pace with inflation that Washington seems unable to stop, or uninterested in stopping.

A major technological advance that has intrigued experimenters and theorists for years, and so far unproductively, would be catching fish without the purse seine. The purse seine has served well in its nearly two centuries (twenty-three centuries if we read Aristotle correctly), but even the power block and power hoist leave the technique less than fully efficient. So far the thinking has been along lines of electronic fish herding—surrounding a school with high energy microwave bands to bunch it tightly as the net

does now. It does not seem feasible yet, but neither did the purse seine to the nineteenth century New England mackerel fishermen, for two score years.

Possibly the factories may see the greatest changes in the rest of the twentieth century. Industry research laboratories are always looking for new uses for fish meal, oil, and solubles (assuming, as possibly we should not, that these are the only products ever to be made from the bunker). In recent years the oil has found a new market in the pharmaceutical industry as an ingredient of culture mediums for antibiotics. Other new uses are to be expected, with the greatest potential in human consumption—food. (Menhaden oil already goes into oleomargarine, but in other countries. Not allowed here!) Demographers and politicians argue over whether we will be able to feed the billions of people coming along. Yet, as contented as we are, at least in this country, we are not feeding the people we have.

We are unlikely to return to Mark Catesby's eighteenth century appraisal of the fat-back as "an excellent Sweet Fish" for the gourmet. However, marine protein concentrates offer a means of improving nutrition worldwide, and they can be made from menhaden as well as any fish, perhaps better because of the high protein content. The Federal Food and Drug Administration, for reasons that may be clear in Washington, allows production of protein concentrate from menhaden—in one-pound packages! If enlightenment ever penetrates Washington to make possible bulk sales, the industry may find it desirable to convert much factory equipment. This could call for different types of factories, completely sanitary and designed to extract more fat and leave less moisture, in the next twenty or thirty years.

Meanwhile the industry looks toward making fish meal useful to a wider range of food animals. Most of it now is used as a protein additive to broiler feed, with some going into hog feed. Since fish meal is no longer merely ground fish scrap, once spread in the

sun, to the delight of flies, to dry and be sold as guano for farm fields, the industry would like to see today's refined product in feed for calves and beef cattle. Stock raisers have been reluctant in a belief that the iron content would darken the meat, particularly of calves where light color in veal is an essential at the retail meat counter. However, recent tests with calves are described as favorable, and it may be that fish meal can compete with soybeans here as in the poultry industry.

The menhaden industry can expect "normal" problems within itself. The odor problem has not been overcome everywhere, although what comes out of the stacks now is far from what used to darken house paint and tarnish silver. There are still, and likely always will be, occasional conflicts with other users of navigable waters and with other fishermen. As noted earlier, no fisherman, sport or commercial, is a model of forbearance.

The industry will always have to contend with temptation afloat—to pursue a school of bunkers into closed waters. This temptation is the same as in many other endeavor: "get while the getting is good." There is little reward for the captain who says, "Skip it, we don't go there." People ashore call up when they're mad, but not when they see a fish boat turn away from the creek jumping with fish. Still, every lapse, every refusal to turn away, sends someone running to the state capital to demand restrictions. There, again, whoever shouts the loudest gets what he wants.

Thus the now mature menhaden fishery and industry head for the twenty-first century with their future, as far as they can control it themselves, looking good, possibly profitable enough to enable them to contend with economic and political forces beyond their or anyone's control. If no one gets wildly rich on bunkers, as many a man has in the past, at least everyone seems likely to get along, barring such natural disasters as long-time failure of the resource, or man-made disasters such as war or economic depression.

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