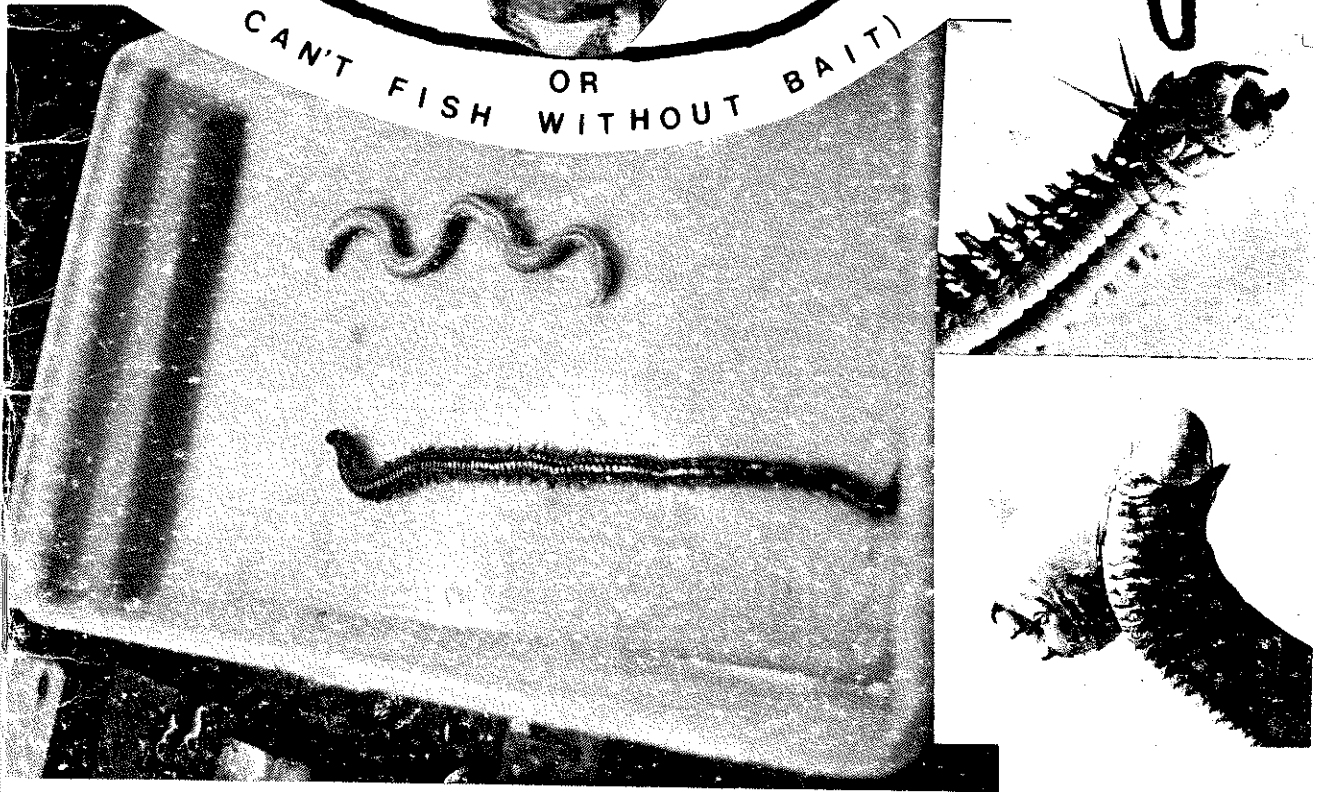


MAINE'S "WORM KING" REMEMBERED  
Ken Stoddard  
(YOU CAN'T FISH OR WITHOUT BAIT)



**MARINE WORMS CAN BITE.** The sandworm has a pair of jaw-like, chitinous teeth; the bloodworm four, needle-sharp hooks. In grasping prey or inflicting a wound, the worms evert a muscular proboscis which bears the teeth at its tip.

by

Ann Stoddard

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## INTRODUCTION

### History of the "Worm King"

The "Worm King" was tall, lanky, young and quite capable of the grueling hours of digging marine worms on the tidal flats along the many fingered juttings of land that form the coastline of the Boothbay Maine Region. He not only dug worms with other diggers, but collected the seaweed in which they're packed. Then he prepared his worms, and those that his digging crew brought into the cellar, for shipment. Both sandworms and bloodworms were shipped separately to expanding markets in New York and Connecticut where he was known for his honesty and reliability. Although it was during the Great Depression of the mid-30s, he had up to one hundred men on his payroll.

Kenneth E. Stoddard, English born on Nov. 11, 1913 as Kenneth Reuben Frank Eli West, was adopted by the Stoddards as an infant. By age 13 he had reached 6'3", had graduated and begun working. In early adulthood, after sowing his wild oats, and laying for months in the hospital -- his legs crushed and suffering a broken back from a motorcycle accident -- he grew up. After a year of recovery, he next became a naturalized citizen, selecting two of his original names - Kenneth Eli - and began a man's work of wresting his income from the coast where he had been raised --- harvesting marine worms in a new industry that had been discovered in the Long Island, New York area.

Ken had learned the job the hard way, working at first for Mafia gangs who came from Boston to dig in this new, lucrative business. Fishermen from Long Island's Peconic Bay had discovered that marine worms worked as well or better than the other baits like clams and mussels, and as the supply of worms dwindled there and were discovered northwards, the marine worm business rapidly expanded up the coast.

Ken's honesty brought about a disagreement with the Mafia that almost cost him his life. He was attacked and beaten over the head with a lead window sash weight that almost cracked his skull wide open. But this treatment only added to his

determination to prove he wasn't to be intimidated by them. He entered therefore as both digger and dealer, establishing his own markets and surpassed his former bosses in business.

As a result of his youth, energy, integrity and capability, and the need for quality bait, his business soon grew to the point that as a successful business during the depression it attracted attention, and the news media reporters were sent to interview and follow him around for a story that gained world-wide attention, with the media responsible for giving him the title the "Worm King."

And thus, largely through his efforts, Maine joined the supply line of marine worm fishing bait on a large scale, an industry that has continued to grow for approximately sixty years. There aren't many "old timers" left (in fact one died while this was being written), who remember this beginning, and therefore this comprehensive combination of information from other articles, interviews, personal recollection and observation, and a variety of stories in "Maine's Worm King Remembered," is a tribute to them and to Kenneth E. Stoddard who died October 2, 1991.

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Chapter I  
Marine Worms - What Are They?

It's strange how most of us on earth think ours is the only civilization, until we delve into other possibilities. The sky, of course, through religious beliefs, has always been fertile ground for dreaming, and dreams of planetary exploration -- the stars (and beyond) have for eons nurtured writers and story tellers' imaginations. But the very earth that we trod upon is greatly ignored. Meredith L. Jones in his article "Complexities in the Substrate" (published in Natural History - May 1963) says (we) "...may be totally oblivious to the tremendous numbers of animals living out their kind of lives beneath the covering layer of the substrate. A frame of window screening, a small quantity of apparently lifeless mud, and a gentle sieving will suffice to open up a vast new world. A single quart of bottom material may contain as many as forty or fifty species of animals, and these may represent more than half of the recognized animal phyla." Worm diggers, however, are quite familiar with that which lays below the surface.

Most fishermen have at one time or another bought, raised or gathered earthworms for use as fresh-water fishing bait. But a different, difficult yet lucrative business is followed by a select group of men and women who harvest and sell marine worms for salt water fishing bait. In the 1990s these marine worms are no longer just sold along the Atlantic coast, but are shipped across country and overseas to countries like France, Spain and Italy. To understand the development of the industry through the actions of men such as the "Worm King" and his fellow diggers requires an understanding of the worms, the worm diggers and circumstances under which they labored.

The term "phylum" (which describes "one of the primary divisions in the animal or vegetable kingdom" according to Webster) covers five classes of worms, or Annelids, three of which most people are familiar with: earthworms (Oligochaeta), leeches (Hirudinea), and marine worms (Polychaeta). Polychaeta (the largest class of phylum Annelida) which have segmented bodies, such as the commonly more recognized earthworm, measures from a fraction of an inch to over twenty feet in length. (Ency. Britannica). Note: per the Dept. of Marine Resources - the 20-ft. worm exists, but it is not a sandworm or bloodworm, but some other species of

worm.) The maximum size in any worm can be attained by holding up one end, whereby they can stretch to a surprising length.

A majority of the Annelids (Polychaeta - marine worms) are oceanic (salt water as opposed to fresh water), burrowing or wandering on the bottom or inhabiting tubes of their own construction. Polychaetes turn over much of the ocean bottom sediments (a necessity in order for them to obtain the circulation needed for their own survival) in much the same way that the earthworm aids the farmer on land by turning over or cultivating the surface soil.

Marine worms also differ from other Annelids (worms) in that they have separate sexes, and they have (but are limited in) the ability to regenerate themselves. This regenerative power is greater in earthworms, and lower yet in leeches. As a child, I was always told that an earthworm, sliced in two with a garden spade, could "regenerate" itself (or grow new parts). It appears this is quite often right - depending on how much or where it is severed. Both species of marine Annelids harvested for bait in Maine (sandworms and bloodworms), are capable of regeneration.

Nereida (formerly known as *Nereis grandis* of New Brunswick, Canada), known now as *Nereis* (or *Neathes*) *virens*, is locally or commonly called sandworm, ragworm, mussel worm or clam worm. (There is another worm on the Pacific Coast that looks like a sandworm, but it is not *Nereis virens*). The sandworm's name has an interesting background. In Webster's, "Nereidid was a sea nymph, one of the daughters of Nereus, a sea god."

National Geographic of June 1946 had a good description. (It) "has a flat appearance, with obvious segments, of which a mature worm will have about two hundred, and their protruding, fleshy appendages are used for propulsion. The proboscis (a trunk or tubular sucking organ) which is partly withdrawn inside the body, has teeth that are saw-shaped pincers for feeding. In rare instances, sandworms have exceeded four feet in length, but normal size runs from 10 to 18 inches. The brilliant colors of the worm are actually due to blood vessels seen through its steel-blue and green skin. Coloring varies with the locality, ranging from vivid orange red, to cloudy black. ... (Those in the Wiscasset area appeared to me a dull, dark pinkish color and reminded me to a

degree in appearance of a centipede.) The sandworm's iridescence and dazzling appearance are the secret of its attraction for fish." This worm is reported from Newfoundland down the east coast to Virginia, and across the Atlantic from Ireland and England to northern France.

The second marine worm being discussed is the Glyceridae: *Rhynchobolus dibranchiata*; *Glycera dibranchiata*, or bloodworm, and misidentified in this same article as *Glycera Americana*. Using the National Geographic's description: The bloodworm's "mouth is armed with four tiny, black, curved 'teeth,' actually jaws, which may fasten onto a finger, creating a sensation of a bee sting and producing a painful swelling in persons allergic to the bite. Bloodworms range from pink to red and have short finlike appendages along the sides, with firm, round, barely visible segments under the smooth skin. They are found in the surface layer of soft mud, in burrows lined with their own mucous secretion." Their average length is 6 - 8". The pink coloration of the bloodworm results from the presence of red blood cells within the coelomic cavity. The bloodworm is constructed of a "fluid filled, double walled cylinder -- the space between the two cylindrical layers is the coelom-cavity" (Complexities in the Substrate by M.L. Jones). In viewing these worms in a Wiscasset, Maine worm cellar, they appeared to me like oversized earthworms, except for the slight fringed appearance along their sides. The bloodworm is reported from Prince Edward Island, south to Florida and the West Indies ...over to the Gulf of Mexico, to Texas and on to the Pacific coast from Mazatlan, Mexico north to lower California.

## Chapter II Marketing, Methods and the Moon

A short "overview" of marine worm digging and markets is presented in the technical report entitled "A Commercial Sampling Program for Sandworms, *Nereis virens* Sars and Bloodworms, *Glycera dibranchiata* Ehlers, Harvested Along the Maine Coast," by Edwin P. Creaser, Jr., David A. Clifford, Michael J. Hogan and David B. Sampson, in April 1983 (employees of the Maine Dept. of Marine Resources.) Further use of their report will be listed only as DMR: "These worms are dug from mud flats by marine worm diggers who are licensed by the State. The wholesale shippers (dealers)



pack and ship their worms to wholesale distributors from whom they have received purchase requests. Wholesale distributors sell their worms to bait shop retailers who divide the shipment into lots of a dozen worms and sell directly to recreational fishermen. The worms are used in recreational fisheries for black-fish, blue-fish, fluke, kingfish, pogy, weakfish, seabass, striped bass, spot, flounder, and smelt on the Atlantic, Gulf and Pacific coasts." (More on Smelt fishing later.)

But before the worms reach the distributors, they must be gathered, and for this information the DMR Report provides another short synopsis. "Based upon 1980 prices, a new digger is prepared to enter the fishery for an outlay of approximately \$70-\$90"... (these were 1980 prices for license, hoe, boots, buckets and perhaps a pair of gloves.) The cost today (1992) of a digger's license is \$43, a dealer \$55, and seaweed gatherers \$10 -- almost four times what it was in 1980, and hoes, boots, buckets and gloves would follow the same price rise. In fact, wormers in 1992 gave the price of \$50 for a bloodworm hoe and \$100 for a sandworm hoe. These hoes are specially built - welded by a hoe maker.

The 1983 article continued "The new digger can quickly recover his initial outlay with a little experience and two or three tides of digging effort. An experienced digger may desire a 14-16' aluminium boat and a 10-25 h.p. motor."

A description of the method of digging marine worms is presented in the magazine "Yankee" (March 1991): He takes a worm digger's stance - feet spread apart, bent over at the waist taking the strain off the back by resting one arm on a knee as the hand holding the hoe reaches down and claws away the mud, peeling back a seven inch chunk along the plane of his reach. "Five swipes of the hoe, five clawed sections of thick mud peeled back and exposed ...(with each swipe straining the shoulder and back). Then he moved his feet forward six inches to keep pace with the reaching hoe." As he moves forward there is a twisting pull by each foot to break the suction of the mud, and when a worm is uncovered, it is flicked quickly into the bucket or box with the free hand. Compared to early fisherman's boots that were tied close with strips of innertube to make moving in the mud easier, modern boots are a great improvement.

The DMR Report gives more basic information on where digging takes place: "A good bloodworm digger will start digging high on the mud flat and follow the receding tide out with a trench measuring approximately 1 m (meter) in width (about 39 inches). When the tide changes, the digger reverses direction and digs ahead of the incoming tide. A bloodworm flat is considered good if the digger can dig one commercial sized worm (average size 19-21 cm relaxed length, or 7½-8½ inches) for each four or five turns of the hoe. Although a good bloodworm digger may dig as long as 5 hrs. on a low-drain tide, 2 to 4 hrs. is the general rule."

"The sandworm digger generally waits until the tide is near the low water mark before he begins digging. He spends the entire tide digging parallel to the shore in the region of the low water mark. A sandworm flat is considered good if the digger can dig one commercial-sized worm (average size 26-27 cm relaxed length, or 10½ inches) for each turn of the hoe. Often the digger may be rewarded with three to four worms per hoe turn. Although a good sandworm digger may dig as long as 3 - 3½ hrs. on a low drain tide, 1½ to 2½ hrs. is the general rule." (A "low-drain tide" is a big tide that recedes 2-3 feet lower than an average low tide, exposing more area for diggers to harvest in. These exceptionally low drain tides are also called "moon tides." Because of the variation in magnitude and time of low tide (low tides occur 52 minutes later each day), diggers keep close track and use tide charts to schedule their work. The family of a worm digger is geared to this constant rotation of schedules, especially during the Spring, Summer and Fall months, when most of the worming is done.

### Chapter III Smelting

There is also a market during the winter months when bloodworms are used for Smelt fishing through the ice. At that time, fishermen in the protective cover of small shanties cut "race" holes through the thick ice, and fish a series of hooks baited with sections of bloodworms. These "race" holes (formerly made by large hand "ice saws", and today quickly achieved by chain saws) are in the form of rectangles approximately a foot wide by the length of the ice shanty, with lines fastened to the ceiling over the long

holed slot. The Smelts are both used for personal consumption, and sold. Merchurochrome is sometimes added to the pieces of bloodworm to enhance their color and make them more visible.

#### Chapter IV Worm Cellars

Before diggers leave the flats, they rinse the worms to rid the pail of accumulated debris, and (during the summer) to keep the worms cool. Warm worms get feisty and start nipping. They rinse them again when dumping them into the trays to be counted. Excess water drains through the sieved bottom of the counting tray. The worms are then carefully placed into seaweed filled boxes. Drier seaweed is preferred for sandworms because they secrete a slime or mucus of their own.

Warren Dorr, an old time dealer from Wiscasset (who died during the writing of this), was interviewed in an article in "Down East" magazine 4/25/71, describing how, after being injured through a fall, he became a dealer. One of his customers from Norfolk, Virginia, bought 10 million bloodworms from him during 1970, when "spots" were running off the Virginia coast. The article "The Wealth Down in Warren's Cellar" described the business. "The cellar is clean. It does not smell. Wooden work tables line all walls...diggers count silently...no talk at all...then write their names on a slip of paper and lay it on top of the worms." (No talking was a necessity because it would have been easy to lose count with the cellar full of other diggers who were also counting their catch). During March 1992 when I visited another dealer at Wiscasset, Maine's "Bait Shop" cellar, only a father and two sons were present - counting, so an occasional lively remark was made and a few questions were answered.

In the article, Dorr spoke of the cost of being a dealer. "Gotta buy 60,000 to 70,000 boxes a year to ship 'em in. Boxes, new cost 13 or 14 cents. Used tomato boxes cost 11 cents. Came to \$9,000 last year (1970) just for boxes. Then we gotta buy a fine type of rockweed to pack worms in, to keep 'em moist and lively. I buy close to 20,000 bags of weed. (Note: a figure that perhaps was meant to read pounds instead of bags, for other dealers

agree that one bag covers 8 to 12 boxes of worms which for 60,000 to 70,000 boxes would average about 7,000 bags of weed). Then I pay a tax of five cents on every 100 worms. Last year that came to about \$8,000 of tax, to pay salaries of men from Weights and Measures." To all this (back in 1971) he added on refrigerator truck costs, insurance to protect against theft at airports (necessary he said after he "lost some 7,500 worms, valued at \$500 one night"). When he shipped to California, the \$35 air-freight cost was paid by the buyer. All of which indicates this multi-million dollar Maine business is nothing to be sneezed at. However, the "harvest has declined from its 1975 peak of 1.6 million pounds" (per "Yankee" 3/91). The "Yankee" article indicated Woods Hole (Marine Biological Lab) had sent for worms, since the supply formerly at their back door no longer existed (but I was told this deficiency existed long before the 1991 article.)

#### Chapter V Spawners

There have been discussions in the past about closing the flats during the spawning season, but the DMR Report and other printed matter, as well as interviews with diggers and dealers, indicates that during April and May prior to spawning in June, "diggers avoid harvesting the fragile bloodworms" and during the sandworm spawning period of March, April and May "sandworm diggers also avoid picking up spawning worms." Diggers and dealers agree spawning bloodworms and sandworms are easily spotted because of changes in color, diameter and the way they feel. A spawner (which is softer and more fragile) will break easily and spoil a batch of those that are firm and in useable condition, so collecting spawners produces a financial loss - not gain, and is avoided.

#### Chapter VI Locating Them

Lee Stoddard, (Ken's oldest son), told me with some large orders his father promised to fill, it was sometimes necessary to dig areas on small tides where many diggers (not on his crew) seldom covered - amongst the rocks and close to ledges where though it was good worming, it was also difficult digging, but by using a

smaller short tined hoe similar to that of a bloodworm hoe, taking shorter strokes and digging shallow rather than the deep thrusts where the mud was flung behind, a digger working carefully between the rocks could harvest 1,000 to 1,200 worms on a tide. Ken had found that the worms hugged the ledged area, yet were seldom found beyond two or three feet from shore until they were again located in the deeper areas. The difficulty here was striking rocks and breaking hoes. Why were they found here among the shore debris? Possibly for the food supply. They were also found beneath mussel beds, however that too was difficult digging due to the sharp broken mussel shells through which they had to dig, edges that could tear your hands up. With the orders Ken had, Lee seldom dug less than 14 tides a week. He also says that by the time his father returned from the war service to find his previously large business gone, Lee was old enough to dig for him, along with a crew diminished to around a dozen or so diggers.

Sandworms, commonly found in "sheltered flats bordering mouths of rivers, estuaries and sounds," are "commercially abundant in the coarse and fine muddy sands near the low water mark," as well as found "under cobbles (small rocks from which cobblestone streets were made) and large rocks along the shores, jetties and piers, in marsh thatch, under or near mussel beds, in gravelly sand and clay, in water soaked wood, and among the roots of decaying marsh grass and eelgrass." (DMR Report) which brings up the subject of the seaweed in which they are packed for shipment.

#### Chapter VII Seaweed

Gathering marine worms is one thing -- packing them to arrive safe and alive is another. Donald Hardwick, one of the old timers, says what they preferred using was the fine weed that grows at the base of marsh grass. (Note: some weed gatherers believe the term used was "eel grass," but eelgrass refers to the light green plant that grows on mud flats or just under the water at low water mark -- Marsh grass grows higher on the flat - usually up on the banks, with the new shoots of the weed which are yellowish in color, considered the best.) Donald Hardwick continued, "When

there's a hard winter with a lot of ice along the shores, breaking ice may tear away some of the weed and carry it away."

According to the DMR, sandworms are packed in "seaweed that is rather dry," (dry weed is evidenced by a dull appearance rather than the glossy look of wetter weed), whereas the bloodworms are packed in "wetter weed." The "weed" used are technically either the "young fine textured shoots of *Ascophyllum nodosum* f. *scorpiodes* or *Ascophyllum machaii*, found growing abundantly in salt and brackish water." Some dealers prefer light colored weed for sandworms, and dark for bloodworms. Too fine a weed is not used, for sandworms are unable to burrow into it, and thus lay balled at the top, which leads to spoilage. *Ulva* (known as sea lettuce) can be used if seaweed is unavailable. Although some dealers prefer the fine Canadian weed, they are reluctant to purchase it because of ill feelings over the Canadian potato market which usurped our formerly vital potato industry in northern Maine.

Talking with a weed gatherer at the "Bait Shop," I was shown the shredding machine where the tangled yellowish brown weed is fed in, chopped up, and extruded. The dealer then places it in his shallow packing boxes and adds the worms which burrow into it.

Seaweed gathering, which was once done by the Worm King himself as part of his operation, has now become a separate industry requiring a license. Frequently the bailed or bagged seaweed has to be spread out to partially dry before packing worms in it. When properly prepared seaweed is used, worms can last up to a week if shipment time requires it. The June '46 National Geographic article reported that one Long Island retail dealer kept his purchased bait alive from ten days to two weeks when placed in an icebox at 38-40°C. Heat is detrimental to worms. Dealers prevent overheating by maintaining cellars at 55°C.

Lee Stoddard tells of the time when a crew of scientists came to the area to determine how long a marine worm could be kept alive, and arrived at the conclusion of one week. Lee says Ken was so mad at the result, he built a number of rigs to run tests of his own, and was able to keep sandworms alive for a month before he finally turned them loose. When the scientists asked

him how he did it, he told them with all their smarts, they could figure it out, and would never tell them. Ken was a true Mainer, with independence and knowledge that came from experience rather than textbook facts, and this was one factor in the antagonism those in the worm industry had with those in the scientific community.

#### Chapter VIII Predators

Commercial sized sandworms avoid direct sunlight, but young sandworms, exposed at mouths of their burrows, are frequently visible and are preyed upon by shore birds, taking a large toll ... (and birds don't have to have a license). Worms that avoid the heat of sunlight are active on dark, damp and foggy nights (one author called "charcoal" nights), and sandworms laying on the surface of the mud are "sniped" or scooped up by diggers wearing head lamps with batteries carried on their belts (similar to miners' lamps). Diggers have to be fast to beat the worms retreating into their burrows when the light shines on them.

#### Chapter IX Shipping

Shipments were once sent by railway express, parcel post or even by personal delivery the day the worms were collected. They now reach their destination by refrigerator truck, bus or air freight. Donald Hardwick reminded me of the story Ken told of a rush order that required driving all the way to New York City, delivering the worms to Grand Central Station, and returning to Maine in one continuous trip. Not being familiar with New York City, they drove randomly until a taxi driver stopped them and said, "Don't know where you're going, but you've already gone through six red lights." Ken paid him to lead them to Grand Central Station. After that, in order to find his way around the city, he carried a compass, and if he became lost, he could always find his way north out of the city's confusion.

## Chapter X Boxing the Bait

According to the DMR Report, packing is accomplished by "placing seaweed in shallow newspaper lined cardboard cartons with lids." "Canned milk cartons have also been used successfully for shipping bloodworms. Each carton contains 250 bloodworms or 125 sandworms" (which in itself speaks of the difference in size of the two types of marine worms). Back in the 30s when the industry was young, people used what they had on hand. Boxes for packing were obtained at grocery, hardware, liquor stores and at the open dumps which were not sectioned off for re-cycling like today. When boxes didn't fit, they were cut over and made to fit. As the industry grew, standard sized boxes were required by law, and they are now obtained directly from the box factory in quantities of 10,000. While visiting the "Bait Shop" in Wiscasset, owner/dealer Dennis Hill showed me the operation, where boxes arrive flat, are put together and stapled with the large heavy duty machines that cost around \$1,000 a few years ago. With the 90s inflation...who knows now. Boxes are lined with newspaper and tied in bundles of 20, and stacked in the loft over the shop. Unsold newspapers for this are bought wholesale from Portland's Press/Herald.

## Chapter XI The "Diggers" Themselves

In listing the tools of the trade, the most important of course is the digger. One Lewiston Journal newspaper article described diggers as "big-shouldered, weather-beaten men with lean bellies." Another said he had a "strong back and quick hands" (quickness due to worms that can move with surprising speed). Alice Larkin's article "Following the Tides" (Down East June '80) described the wormer as one "who once bends his back, doesn't straighten up until the tide drives him," and "with legs straight and bent at the hips, he turns the mud in his search." National Geographic June '46 further lists a description by a "veteran native" as requiring two things -- "a strong back and a weak mind," but this doesn't fairly describe Maine wormers. They are



independent fishermen who are smart enough to keep their freedom. Wormers do stand up to rest their backs, and commune with surrounding nature, but these breaks are short because they're dealing with an ever moving tide which is best described in the saying, "Time and tide wait for no man," (nor women, for women are represented in this trade, but more of this later.)

Harvested worms are put directly into either a plastic or stainless steel bucket, or a rectangular wooden box with a handle that the wormer pushes along the slick mud. (Galvanized buckets are not used due to the chromium plating being poisonous to the worms. Ken told how holding galvanized nails between his lips in later years when he carpentered, created sores on his mouth, indicating a similar poisonous reaction.) The container is filled with seawater to keep the worms from freezing during winter harvesting.

The digger wears flexible rubber boots that fit snugly at the ankles for ease in movement as he twists his heel and ankle to break the suction of the mud he is moving in, a trick young diggers must learn. Ken would tell of the time a young man, interested in learning, went with them. The weather was bitter cold, and the young man had borrowed a pair of newly knit mittens from another digger. In trying to move (not knowing how to release his feet), he fell backwards, sticking both hands and new mittens into the mud. He finally managed to right himself - minus the new mittens.

#### Chapter XII "Honey Pots"

Ken also told me of the sink holes called "honey pots" in the river, where a man - unfamiliar with the terrain could step into one, go beyond the protection of the hip boots, and sink deeper. Ken often carried a long pole or boat oar as a safeguard against this possibility, even though he was familiar with the area.

#### Chapter XIII Mainers' Sense of Humor

Mainers, often thought of as dry and salty - have a great

capacity for humor as well. At one dealer I recently visited, a discussion was going on about worms in general. One digger had heard that Indians made a pudding of them. I added that Ken had spoken of his observation during W.W. II in the South Pacific where he had seen natives scoop up and eat large pink worms indigenous to that area and found in large masses. The National Geographic June '46 article "The Worm Turns" spoke also of a "colorful character" who'd had a bit too much from his bottle, and one night "roasted a sandworm over a fire, then ate it with evident relish. Smacking his lips, he remarked to his cronies, "Tain't bad; tastes just like fish'."

Apparently Mainers also have a lot of gumption, daring and strong stomachs...strong enough to rival the time when college fraternity candidates were subjected (around the 50s) to swallowing goldfish, for Ken's son Lee said when he was a teenager - worming near Morrison, a neighbor and friend of theirs, Morrison asked Lee if he'd pay \$10 to see someone eat a worm. Lee said sure, and Morrison took him over to another nearby digger who said to show the \$10 first - then promptly swallowed one of the worms. "Did the person chew it?" I asked. Says Lee - "I was too surprised to notice...all I know is it went in and didn't come out - and I paid the ten dollars."

#### Chapter XIV Women's Work?

Marine work is generally thought of as done by men, but long before feminism became a vogue, women on the coast were as independent a breed as the men. Margaret Beane had just returned from her job when I arrived at her home where we sat down and talked. She said there were (and over the years had been) a number of women who dug worms alongside their husbands, but Margaret got in it on her own. After holding other jobs following graduation, she went clam digging for the experience - loved it and dug clams for the Townsend boys for the next 18 or 19 years. She was one of the best on the flats. She told of a contest other clam diggers urged her into, against a man considered the best clammer around - the prize was to be a new clam fork. She came in only one peck behind the man. He wouldn't take the prize when a

woman did almost as good as he had. Others who didn't think a woman could beat them on the mud flats vowed if she could - they'd get out of the mud flats and hang up their hoes. She did, and they did.

The following 19 years she spent digging worms during the time when towns were feuding over the flats and rather than buy a license, she bought a small shack in neighboring Woolwich where she said she could "roll out of bed onto the mud flats" it was so close - and unlike many other diggers, she never dug large quantities, but took only quality sized worms - something true conservationists and lovers of nature do.

She was justly proud that when the Conservation Advisory Committee was operating, (a group that Commissioner of Maine's Dept. of Marine Resources, Spencer Apollonio, wanted as a committee to advise him on marine worm industry problems), out of the then 1400 licensed diggers, she was the only woman among the approximately 8 on the committee that represented the state.

"Honey pots" or sink holes are not always visible - they are like the deceptive quicksand was her answer about them. She had reason to know, for she told of the time she was careless and stepped into one, sinking down to her waist. Scared to death, she was able to work her way out of it because she was close enough to shore to lean over to it, and gain leverage. Like Ken, she said many times she'd shoved her oar down into one of them without finding the bottom.

Known as "Johnny," Margaret relates how she got the name. In school, her best friend said because she always wore boy's pants and was a tom-boy, she didn't look like a Margaret, and gave her the name "Johnny," which has stuck all these years. She's still a tom-boy, wears men's pants, has a man's short haircut, but acknowledges most women aren't physically made to withstand the rigors of that type of outdoor life. She retired from worming after the cartilage in her knee tore, putting her on crutches for six weeks and the doctor saying her internal knees showed they'd had a lot of hard work. She realized six weeks this time might be the rest of her life next time - so she hung up her worm hoe. Knees and back problems because of the strain put on

them, and arthritis in the hands because of being in the cold water so much, are difficulties many diggers face, and the price they pay for their freedom -- both men and women.

#### Chapter XV

##### Fog

Donald Hardwick, retired from the worming industry for many years, recalls some of the hardships of the trade. These included fog which could disorient even the homespun diggers, and "tides that never left the rocks" (flats that were never uncovered because of small tides or the wind holding the water in). A story about the fog is related in the National Geographic article. "Lester Paine, one of the oldest hands at the game, straightened up from his arduous digging." Seeing the fog had come up and "everything" looked unfamiliar, he climbed up on a large rock and waited for the dawn when a lobsterman rescued him. It is jokingly spoken of as Lester's rock and when seals in the area bark, "diggers say it is Lester calling for help."

Just as Ken carried a compass to find his way out of large cities, many wormers carry one at night to safeguard getting caught by a fog. Another article tells of a group of diggers caught by fog - with one who found his way to shore, turning his car radio on loud so his fellow diggers could find their way towards the noise.

#### Chapter XVI

##### Income -- Now and Then

Worm diggers are part of the coastal heritage of lobster men, clam diggers, and in the days of the sailing schooner, those who plied the coastal route; hearty men who continually challenged Mother Nature's winter element. But many young college students have also paid their tuition by digging worms during the summer ...bringing home \$2,500 to \$4,000 in previous years.

It is unfortunate that so little record remains about the worm industry during the hard times of the 30s when worm digging provided so many families with their livelihood. Perhaps it was

forgotten because "worming is not glamorous." as some say. And though the income from it is not that great for the digger, it does provide a lifestyle that's free from control (to a degree). In the 1930s diggers received about 90 cents for 100 bloodworms and 65 cents for the same number of sandworms. In 1946 National Geographic shows worms brought about \$7 for 350 (or 2 cents each) which Frank Hammond indicated was the amount given in this area -- \$2 per 100 bloods - \$1.40 for sands. Today's price is 6 cents apiece for sandworms and 12 apiece for bloodworms.

#### Chapter XVII Marine Worms -- Where Are They?

How deep do wormers have to dig? It depends upon whether he's digging for bloodworms or sandworms. Bloodworms are generally found within the first few inches of mud, and they are dug throughout the intertidal zone (between high and low tide). Frequently they are found where fresh water streams flow across intertidal flats. Sandworms are sometimes found as deep as eighteen inches, thus necessitating the removal of a considerable amount of sediment with a long tined hoe. Commercial concentrations of sandworms are naturally obtained at or near the low water mark. The two worms do not get along and can never be packed together. I was told that a large bloodworm would swallow a smaller sandworm - cannibal style. Sandworm diggers often carry a separate container for bloodworms they capture while digging for sandworms.

#### Chapter XVIII Hoes and How to Dig

The hoes can be specialized (smaller for bloodworms -- longer and wider for sandworms), and a number of hoes can be involved - depending on where they plan to dig and what they're digging for. An article in the magazine "Yankee" (March '91) describes it. A "standard" worm digger hoe "had a seven inch handle and six 10" tines (and it was called) a 'baby carriage hoe' when the tines were made of flattened springs from baby carriages." Another was called a "Wiscasset hoe" and had eight narrower tines, used for

digging in rocky mud. Some diggers use one hoe for both kinds of worms. For separate hoes, the "Commonly used form of the blood-worm hoe is constructed from two small spading forks welded together on a V-shaped brace." The "commonly used form of the sandworm hoe" is constructed from parts of three spading forks. One tine from each of two of the large 4-tined spading forks is removed. The two now altered 3 tined forks are welded together to form a six tined fork, with the tines from the extra unused fork, and the two separate tines, welded to and extending the newly formed six tined fork to approximately  $11\frac{1}{2}$  inches, with the now overall width obtained of approximately  $10\frac{1}{2}$  inches. The tines are flattened and gently curved inward to approximately a  $45^\circ$  angle, with the 6 to 9 " handle added. This individually created hoe is the wormer's lifetime companion.

#### Chapter XIX Looking to the Future

The marine worm Conservation Committee asked the DMR to develop a research program for worms, with Edwin Creaser, Jr. adding the sampling aspect during the last three years of the eleven year program. When I asked some worm diggers whether the gathered information had been of benefit, it was apparent most had not availed themselves of it, and it may be appropriate to say some dealers and diggers neither understood nor cared about what was produced. But the fact of the matter is that the data collected is the only record by which the future industry can be compared. Sampling was carried on between April - September from 1973 to 1976 when the scientists would come to the dealers' cellars, take random samplings of each type worm (sand and blood), take them back to their lab where the worms were put into a high saline solution and anesthetized for a short time. They were then measured for length, weighed, and other information was gathered. The Saline Solution used was determined by how many parts salt per thousand parts of water, and in this case it was 31-33%. After reading Mr. Creaser's report, I felt valuable information could have been gained, (for much of the information in the report was obtained from interviewing the diggers) by wormers in general, to

possibly extend or even increase their industry's potential, for during the turbulent times between the DMR officials and the diggers/dealers conservation group who work with them - it was also suggested by Robert Dow, who is now partially retired from DMR, that a study should be done as to the feasibility of developing a cultural system to raise worms much as there are now presently "fish farms", but with the dissolving by its own members of the conservation group - this was never followed through on, and the constant chaffing between industry participants and DMR led to the DMR's transferring their research funds to other marine fields of investigation. However there are two sides to every story, and with as many locally independent and outsiders entering this field, and the strangling effect government already had on all businesses - the old saying "if it ain't broke - don't fix it" probably had a lot to do with steering clear of any government agency, with the least interaction being deemed the best way... government might get even more notions about interfering with the few freedoms still left, and actually the industry had already reached its heyday in 1974 with 1455 diggers. By 1977-78 when the program was terminated, there were only about 1200 diggers, making it evident fewer diggers were entering the fishery, taking some stress off the worm supply.

#### Chapter XX Strikes and Government Control

Even in the marine worm industry, strikes have occurred when diggers felt they were not receiving a big enough slice of the pie for their hard work, long and odd hours, difficult working conditions and inflation. Being unorganized however, some of these strikes were ineffective, and strikers sometimes lost more than they gained in the short run.

Territorial rivalry existed in early years when some towns passed laws prohibiting non-residents from digging within their boundaries. Other towns followed suit. Government over-regulation is not just recent nor distant past. After some of the old timers fought the towns and the legislature for several years, the 40 some laws then on the books were repealed in 1955. The

argument that actually won the case was that marine worms moved (swarmed) from flat to flat, or as an observation by marine biologists stated in a leaflet issued by Robert Dow and Edwin Creaser, Jr. - "marine worms were fully capable of crossing political boundaries," and to support this Mr. Creaser said through visually following them - marine worms had been known to travel a good half mile - therefore no town ordinance could validly pin them down and no one town owned them. An example of this problem was when wormers from Wiscasset and other areas fought West Bath law makers who were trying to charge an additional \$25 license fee for those outside their area. "Maine Attorney General has (had) said it is illegal, that worm diggers, unlike clam diggers, have the right to dig anywhere on the coast." (per Maine Times 9/26/80 article by Lucy L. Martin). Ivan Flye, a Damariscotta digger and shipper since the late 1930s who was in the battle and part of the final victory for an open state policy in 1954, said "That's the best conservation measure because it allows the diggers to move freely where the worms are abundant so they don't deplete the resources in any one area." Digger Gordon James of Wiscasset said, "A good digger has to know where to dig, how to turn the mud. And a good digger knows by the look of the flats whether there's worms or not."

Diggers and dealers alike recognized the danger of excess legislation to their profession. In the 30-40 towns where digging was done, if each town had their own license fee, the diggers' profit would be eaten up in licenses. Fred Peaslee's remark summarized it all. "Either there's an out-of-stater trying to post his property against us, or the town is trying to dip into our pocketbook."

#### Chapter XXI Are the "Flats" a Back Yard?

This statement brings up another problem. The repeal of the laws of 1955 were based in part on the unsubstantiated claim from property owners that the worm flats in front of their property - were theirs. One digger told of a property owner ordering him off the flats because he (the digger) was "digging in the man's 'back



yard'." Frank Hammond tells of the example where a property owner had an old deed that stated his property extended to low water mark, and Ed Creaser says "anyone possessing a Colonion Grant still owns to the low water mark - fortunately few of these exist today." and today, property owners can claim only to high water mark, freeing the shoreline for others.

This problem of trespass was many sided however, for when the industry first started in Maine in the early 1930s, wormers were considerate of property owners, being that they were their neighbors - in an area that was still small in population - before the great influx of "summer people" -- tourists. As more out-of-staters bought shoreline property, friction developed, and unfortunately spitefulness as well, for some diggers began leaving trash on the shoreline, and even when crossing Mainer's property in the middle of the night some wormers were personally noisy, shone lights in windows, had loud car exhausts, and blocked driveways. The good neighbor relationship broke down to the point where wormers, in most cases, had to reach the flats by way of boats. Mainer's resented the restriction of former freedom to travel where they wished, and strangers failed to recognize the free lifestyle that fishermen, clambers, and worm diggers were accustomed to. They raised objections to anyone crossing their property - terming it trespassing - and thus decades of established custom and freedom disappeared.

#### Chapter XXII Ecosystem and Enemies

There are other things to be considered when a fragile ecosystem is involved. For many years, the marine worm has been considered one of Maine's most "valuable earners of 'export dollars' among all marine harvests" (an opinion expressed in 1974 by then Commissioner of Maine's Department of Marine Resources, Spencer Apollonio), yet the almighty dollar may lead to the ultimate destruction of this "valuable industry." Overharvesting had been a concern of Ken Stoddard when he first entered the industry in the early 30s. Though marine worms are known to migrate to other areas, they can tolerate only so much digging pressure or encroachment on their territory, just as the Green Turtle

(*Chelonia midas*) of Florida, which almost reached extinction when their breeding places were replaced by condominiums on the shoreline formerly used as nesting areas. Only at the last moment was this natural resource rescued. But marine bait worms are fighting a two pronged attack. Though one can still dig sandworms high on the flats, and commercial quantities are usually obtained at low water mark, it has been a very long time since sandworms were obtained in commercial quantities (meaning size), and quantities high on the flat. Despite the resilient bloodworm laying 2 to 10 million eggs - depending on the breeding worm's size; and sandworms laying 100,000 to 1,300,000 eggs depending on its size, with survival rate of both down considerably due to natural predators such as shore birds feeding, it is recognized that harvestable marine bait worms are very much on the decrease. The sandworm population is only "saved" by the fact that a substantial portion of it exists below the low tide level where diggers cannot normally reach them. To some extent, this is also true of bloodworms in certain locations, for sandworms can be dredged down to 84 fathoms (504) feet with bloodworms dredged down to 220 fathoms (1320 feet).

But a combination of events can endanger even this resilient product of nature. The second prong of attack is mankind's way of life. Sixty years ago when the marine worm industry first appeared in Maine, the worms had only to contend with the diggers and other natural predators. In 1972 when Maine Yankee Nuclear Power Plant went on line and began discharging its effluent (outflow of water that had been used to cool the nuclear rods), thus emitting a very small amount of radioactive energy, as well as a water temperature higher than the water into which it was discharged, a diffuser was installed. (A diffuser is a pipe filled with tiny holes or perforations through which the contaminated warm water from the plant is slowly mixed with the outside bay water. A temperature limit was established which allowed the outside water temperature to raise no more than 1° to 4° through addition of the plant's water. When the diffuser was installed, according to the explanation by Ed Creaser, the causeway was also removed and the tide went out further - allowing diggers to dig in flats that hadn't been dug since 1950. With worms maturing at a smaller size due possibly to the increased warmth of the vicinity of the discharge; and Frank Hammond from Wiscasset reporting to

have said that because in the last eight years there's been a fair market for worms, thus these increasingly smaller worms had been sold - "putting babies on the hook before they have had a chance to have any," it would seem to indicate the worm population was being exhausted, however there have been recent reports that there is an increase of small sized marine worms - whether due to fewer harvesters or a cycle the worms were going through, or possibly an alternative or adjustment to existing conditions, is not known. It is recognized, of course, that after spawning, the matured bloods and sands always die. It is also recognized commercial sized worms harvested today are claimed to not be as large as worms harvested when the industry was young.

But the nuclear plant is only one item of mankind's interference with the normal production of these worms. Another part of this second prong of attack on marine worms' survival that caused digger/dealer concern was the various towns' sewage plants that are claimed to be mushrooming, with their chlorine discharge invading the worm's territory, possibly killing the algae upon which worms and other marine life feed. Before going on with this, however, to demonstrate the contrariness of government's actions and laws, when Ken and I were to go on a sailing trip back in 1972, it was a new requirement that sailing vessels have a "holding tank" to prevent raw sewage going into the ocean. Yet it was common knowledge that a pumping station in New York where tanks could be emptied supposedly into a treatment plant were simply pumped out, and a short distance away, emptied into the ocean - with no treatment plant in between ... demonstrating why citizens are so frustrated with governments inane demands.

After checking with a local treatment plant regarding the chlorine discharge, the following facts came to light. Twenty to thirty years ago (or back in the 60s and 70s) treatment plants as a common practice were not in existence, and raw sewage from towns where individual septic systems could not be used, poured into the ocean and other waterways. Sewage plants were then constructed and chlorine was used for the decontaminating of the effluent (outpouring), before discharging it into the waterways. As with anything, the amount used and the care with which it was dispersed, was dependent upon the knowledge and integrity of the

operators, and their concern with the environment. Some in the marine industry claim seven times too much chlorine was used. The claim now is that dispersion is better controlled, and there is a demand that all plants in the State of Maine put in a dechlorination system to counteract the chlorine still being discharged into the public's marine waters. The entire thing rests on political cost effectiveness and in these times of depression - we are not likely to see such improvement unless something else is cut from the budget legislators and governor are at odds on. The amount of chlorine is now limited to 1.0 milligrams per liter of water. This can be explained as follows. If you had one million in dollar bills - the amount of chlorine being used would be a \$1 bill. If the new system were in use, there would be no more than .10 cents worth of chlorine out of that \$1 million dollars that would enter the marine waters.

When the sewage treatment official was asked about the "oxidation" system used in Europe that Frank Hammond had spoken of, which protected marine environment, a system that involved using pure liquid oxygen - the "cost" of the process was one of the reasons for not using it. The other reason was the danger for oxygen is highly explosive. A simple explanation of oxidation may be perhaps made by comparing it with the action of Hydrogen Peroxide. Water ( $H_2O$ ) in chemical formula, through the addition of an extra unit of Oxygen - becomes  $H_2O_2$ , or Hydrogen Peroxide. Peroxide, because of this addition of Oxygen, attacks foreign substances - the same as it does dirt that has entered a cut or abrasion - foaming it away, thus exposure to oxygen is a natural method of destroying bacteria, which presents the question of where on its scale of importance does Maine put her environment and citizens' livelihood? With all the corruption we see daily on the television taking place in Washington, D.C., how much goes on in Augusta? And how much of that would pay for safer methods of environmental protection?

Government creating additional problems and costs through its intervention in employment was a subject touched on in a recent (March 1992) Channel 8 discussion/interview with Governor John McKernan. The mountainous Workman's Compensation cost in Maine penalizes small businesses not only making it impossible to profitably hire and expand a business thus creating more working opportunities, but is financially breaking the "system" through

extended coverage that Workman's Comp was not originally intended for, creating additionally costful court cases. and more problems for an already over-burdened legislative body. Frank Hammond had oddly mentioned this problem in our conversation the same day - prior to the Governor's interview - describing how Workman's Comp change in rules had forced him to curtail rather than expand his business because of the red tape involved in hiring practices. McKernan candidly stated much of Maine's financial problems were due to over-regulation.

Douglas Schmall of North Edgecomb - the oldest living former worm digger from this area, spoke of another problem diggers and dealers experienced many years back -- in the early days of IRS auditing, and I remember Ken telling how they made an appointment to audit him. It was at a time when the auditors came to your home - rather than you forced to go to their offices. Ken's record system consisted of small notebooks with recordings of each digger - the amount of worms they brought in, and the amount paid in cash to them. The rest of his records consisted of boxes of receipts all jumbled together. The weather was beautiful the day the man came to the house, chit chatted about fishing, sat down and asked for the records (expecting to see regular orderly records and separated receipts). Ken brought the boxes of receipts, another box of notebooks, and told the inspector to help himself. The man swallowed hard and looked aghast at the huge boxes and hours before him...looked at Ken...looked outside at the sunshine...looked again at the boxes, and running his hands through the receipts said, "Yup -- you've got all your receipts...looks fine...closed the boxes, closed his briefcase, stood up and said he was going fishing -- and that was the end of the audit. A sight different than today.

#### Chapter XXIII Climax

There are a number of problems connected with the marine worm industry, and there is no easy solution. For example - the monetary control through licensing; the pollution of marine water by both citizens and government; the overharvesting; the

territorial jealousy of towns; the trespassing on private property; the standardizing of size of worms and ways to accomplish it; and the retention of freedom that this nation stands for.

Just as worms "inch along", so does the over-regulation of government bureaucracy. When the marine worm business began, there was no licensing - just as there was none for drivers when Ken started to drive in the mid 20s, but fees once established, slowly inched upwards until now permission to drive and to work becomes just one more cut of the "control" pie. Government is garroting its source of income with the strangling rope of bureaucracy drawn ever tighter. When employment is over-balanced by unemployment, and industry is dead, will officials try C.P.R. on a dead industrial corpse? National Geographic's article "The Worm Turns" by Samuel Sandrof in June '46, spoke of the initiation of licensing in 1937 when a resolution was introduced to the Legislature whereby "no person should dig or take blood-worms and sandworms unless granted a license, a condition for such license being residence in the State of Maine for at least five years." It seems only logical that Maine's resources should be reserved for Mainers, but looking at it from the standpoint of economics -- though these licenses undoubtedly seem high to Mainers, commercial fishing licenses in many other coastal states are "out of sight" - thus the requirement for a license was not as much the "fee" as the question of freedom to do and go where fishermen felt it their right in the exercising of their freedom - vs. - common sense in survival of a fragile ecosystem much dependent upon mankind's personal and continual fight between good and evil, between greed and conservation, with greed unfortunately often the winner. This same National Geographic article said, "the wise diggers of Maine are not killing their golden goose," in that they "practised conservation by throwing back undersized worms and refraining from overdigging areas." But this article was in 1946, and as time has shown to our sorrow, the responsibility and honor of 50 years ago is sadly becoming tarnished today. Will the "golden goose" survive as the worm's size decreases?

And how does one determine the size of the worm that is wriggling and stretching? How do you deal with the fact that a worm can be fat or thin depending upon how much fresh water the digger adds to his bucket, for fresh water in low amounts is

absorbed by the worm, expanding it. The problem was discussed many times over the years with no satisfactory solution found, and it is part of the greed problem. If a size is to be determined as a standard, will it be by the recreational fishermen's wants, or by the size the worms mature at?

One item that has not been fully dealt with yet -- pollution. After presenting the side of the claim that chlorine is the bugaboo - it is only fair to tell of an experiment made by Edwin Creaser, Jr. where at the Wiscasset sewage plant, a testing dye was released which made its way to the outlet, surfacing where the outlet pipe fed into a large hole in the Sheepscot River, about 40 feet from shore - and rather than the dye spreading, (at least at this time), it followed a channel close to shore until it finally faded, indicating no overall area was covered by the plant's outflow. It was also noted that around this same hole - sample diggings were taken which produced many young marine worms, showing the chlorine had not killed the worm. Whether it altered the genetics of the worm is apparently not known, however it is generally agreed the worms now are smaller, even when mature. It is also an admitted fact there was no "uniform" dispersion of chlorine in early operation of the plants, nor monitored closely enough, and there was and is a legitimate basis for complaints against the amount of chlorine used.

It was also suggested that neither chlorine nor nuclear outpouring may have been the only responsible culprits for the claimed period of barren years in areas of the Wiscasset flat. There are times when excessive "runoff" overload the sewage plants, triggering a by-pass, therefore making it entirely possible for poisons such as garage sludge; farmer's toxic pesticides; or other producers toxic by-products to have found their way through the over-laden storm sewers and directly into the marine waters, killing or at least temporarily driving the worms away until the toxic material had disappeared.

There is also a possibility of someone having backed a truck up to the river's edge, such as at the gravel area at Sheepscot Falls, and quietly disposing of some toxic material directly into the river. Whatever the cause, all avenues need to be explored.

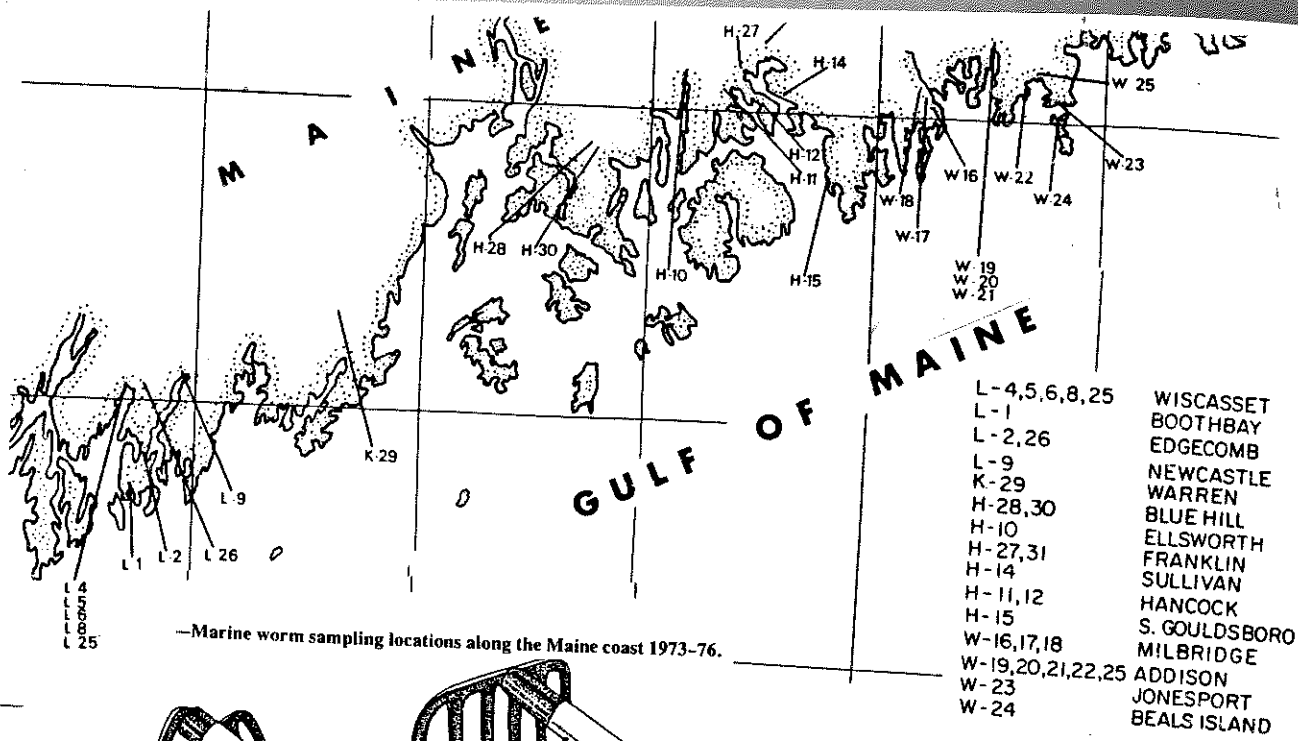
Maine was always known for its "honor" - with Mainers "word as good as their bond." Honor and responsibility are the words and principles Ken taught nationwide to youth during the last few years, demonstrating them through his writings and personal action, as he did in years before in the worm industry.

Diggers, dealers, local and state agencies, the legislature and governor had better start thinking with legitimate concern about the long term prospects of the worming industry, rather than in terms of short-term profits from overdigging; from discharging the cheapest sewage treatment; from allowing what may be dangerous levels of nuclear accumulations; or allowing other dumpage into the coastal waters which may be killing the plant and animal marine life...or perhaps worse, having long term effects on them as well as on those who consume them.

Through the years, Maine's "Worm King" had been forgotten, but will the worming industry (another 20-40 years down the road) likewise be forgotten because harvestable marine worms no longer exist?

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—Marine worm sampling locations along the Maine coast 1973-76.

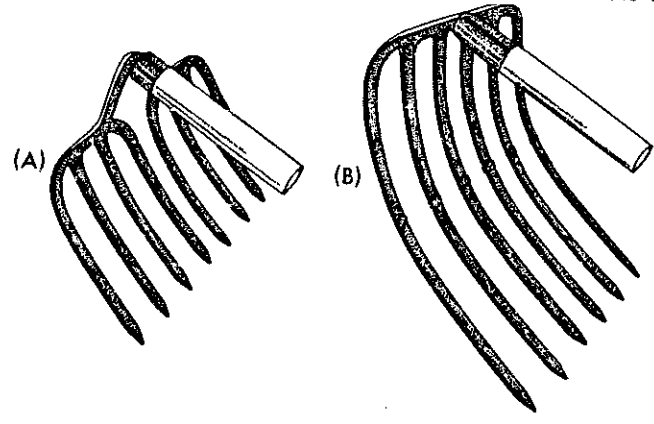
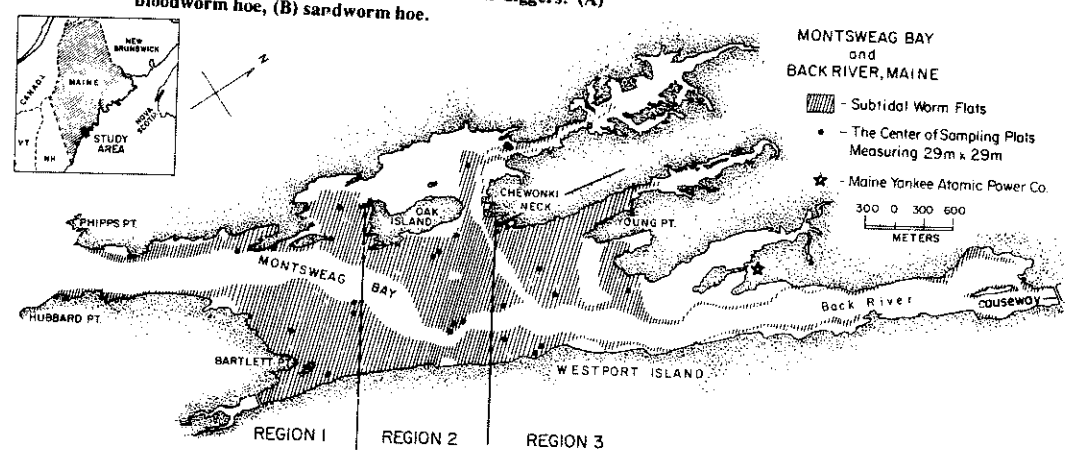


Figure 1.—Marine worm hoes commonly used by commercial diggers: (A) bloodworm hoe, (B) sardworm hoe.

Bloodworms in Montsweag Bay, Maine



Subtidal worm flats, regions, and sampling plots in Montsweag Bay and Back River, Maine.