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IDENTIFIERS *Whales

ABSTRACT

This multidisciplinary unit deals with whales, whaling lore and history, and the interaction of the whale with the complex marine ecosystem. It seeks to teach adaptation of marine organisms. It portrays the concept that man is part of the marine ecosystem and man's activities can deplete and degrade marine ecosystems, endangering the survival of species and affecting marine habitats. The unit is targeted at grade level 4, 5, or 6, but may be adapted for K-12. It requires a minimum of 15 classroom hours or may be expanded to a full year's program. (RE)

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ED164354

Northern New England Marine Education Project

College of Education
University of Maine at Orono
Orono, Maine

A Maine - New Hampshire Sea Grant Project

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WHALE MULTI-DISCIPLINARY STUDIES

A Marine Education Infusion Unit

SF 026 343

Northern New England Marine Education Project

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Acknowledgements

This unit was prepared and trial tested in schools in Maine and New Hampshire during spring 1978. Each of the units in this Marine Education Program were trial tested in a minimum of five classrooms and were revised as a result of suggestions by the cooperating teachers. Parts of these units and much of our working philosophy was derived from project C.O.A.S.T. developed at the University of Delaware and we gratefully acknowledge the leadership of Dr. Robert Stegner, director of project C.O.A.S.T. These materials were trial tested under the supervision of former assistant director Dr. Les Picker and were written by graduate students in education at the University of Maine (Orono) and cooperating teachers in the schools of Union, Maine; Freeport, Maine; and Hampton, New Hampshire. We call these units - trial units - because we hope you will try them in your classroom and modify them to suit your situation.

John W. Butzow
Project Director
January 1979

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NORTHERN NEW ENGLAND MARINE EDUCATION PROJECT

ANNOTATED LIST OF INFUSION UNITS: K-8

Trial Edition A

- K Clams and Other Critters: a unit on shells (living and non-living). Includes crafts, science, language arts, home economics, math and other areas (Butzow and Jones)
- K & 1 Marine Art: art and craft activities to be used in many subject areas (Picker)
- 2 The Aquarium: revolves around a freshwater aquarium setup. Language arts, math, science, art and others (Kilfoyle)
- 3 The Beaver: a study of the history, economics and natural history of the beaver. Social studies, language arts, music, arts, crafts, science, math (DiSilvestro)
- 4 The Lobster: explores the economics, history, biology, literature of the lobster. Home economics, art, crafts, science, social studies, literature. (Kilfoyle)
- 5 Whales and Whaling: a complete study of the history, biology and economics of whales and whaling. Language arts, music, math, science, social studies, arts, crafts, industrial arts. (Picker, Carkin)
- 6 Our Heritage of Ships: surveys the development of ships, with emphasis on New England. Science, art, music, crafts, literature, language arts, social studies. (Glueck, Butzow)
- 7 Ships, Shipping and Waterways: explores ships and seaways today, with emphasis on New England. Social studies with excursions into science, arts. (Glueck, Butzow)
- 8 Coastal Indians of Northern New England: three part approach to Indian studies, culminating in an "Indian Day or Evening." Independent study suggested for Part II. Language arts, library science, music, art, crafts, social studies, marine science, industrial arts. (Picker, DiSilvestro)

Units are available from:
Northern New England Marine Education Project
Shibles Hall, College of Education
University of Maine at Orono
Orono, Maine 04469

TITLE: Whale Multi-Disciplinary Studies

CONCEPTS: 3. Marine organisms interact in complex ecosystems.

3.2 Marine organisms are adapted to their environments in different ways.

3.21 Marine organisms are adapted developmentally, structurally, functionally, and behaviorally to their environment.

CONCEPTS: 4. Man is part of the marine ecosystem.

(people affects

on whales through whaling)

4.2 Man's activities may deplete and degrade marine ecosystems (endangering species)

4.21 Exploitation of marine and coastal environment can cause depletion of many marine species and degradation of habitats.

GRADE LEVEL: 4, 5, 6 (may be adapted for K-12)

SUBJECTS: Language Arts, Music, Math, Art, History and

Social Studies, Science, Dance, and Woodworking

CLASS PERIODS: Minimum of 15 hours; maximum of 1 year

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Nathan Lipfert, Cathy Ramsdell, Wayne Robbins, Gale Ward.

EDITOR: Harry H. Dresser, Jr.

LIST OF APPENDICES

- A - General Whale Sheet (Grid Activity); Whale Shapes and Sizes Compared
- B - Whales & Whaling Crossword Puzzles
- C - Sailor's Language Pre-test
- D - Using Whaling Expressions
- E - 19th Centure Maritime Vocabulary
- F - Whale Poetry
- G - Ship's Stores List.
- H - Whaleman's Pay
- I - Whale Reinforcement Game
- J - Whale Bingo
- K - Songs in Whaling Unit

Suggested Background Reading for All Teachers;

Whales; Their Story published by the:

Vancouver Public Aquarium Association
Stanley Park, P. O. Box 3232
Vancouver, B. C., Canada V6B 3XB

History/Language Arts/ Social Studies Teachers:

Whaling by John Leavitt, Former Associate Curator Mystic Seaport

Whalemen and Whaleships of Maine by Kenneth Martin, Harpswell Press,
Brunswick, Maine

Moby Dick by Herman Melville (classic comicbook)

International Whaling Comm. and Related Activities by NOAA

The Story of Yankee Whaling (American Heritage book)

Music/Dance Teachers:

Roll and Go, album guidebook

Whale and Porpoise Voices, guidebook from Woods Hole Oceanographic
Institute

GHFMS Newsletter

Songs of American Sailormen by Johanna Colcord.

Songs of the Humpback Whale) Whale sounds albums by
Deep Voices) Dr. Roger S. Payne

Songs of Yankee Whaling, Jacket cover, Sung by Bill Bonyun & Chorus

Songs the Whalersmen Sang by Gail Hunnington

Art Teachers:

There's a Sound in the Sea by Tamar Griggs

Shape and Comparison Chart of Whales by General Whale

Science Teachers:

College of the Atlantic Whale Sighting Report 76 & 77

Oceans (July-August 77) Volume 10, #4 issue on Whales

A Field Guide to the Whales and Seals of the Gulf of Maine by the College of the Atlantic

Project Jonah Whale, Role Playing booklet

Math Teachers:

The Whalebook by the Endangered Species Products

Note:

A number of the exercises in this unit require material which is not generally available locally. Therefore, we suggest that the teacher order these materials well in advance of the proposed teaching date.

LESSON (ART)

Objectives:

1. To develop an understanding of the actual shapes and sizes of the different whales.
2. To create whale scrimshaw from plastic bottles.
3. To create a whale mobile.
4. To appreciate the streamlined shapes of whales.

Procedure:

1. Have students design a U. S. government postage stamp illustrating whales. Have them develop a conservation oriented statement for the whales. Students should use appropriate drawing, scale, price, U. S. government postage lingo, perforated edges, adhesive and so on. Award some Tony Mallin Whale stamps for the winners.

"Save Our Whales"

Order Whale Stamps From:
 Tony Mallin
 6351 N. Oakley Avenue
 Chicago, IL 60659

2. Make a 92 foot Great Blue Whale using grids on the school playground. If the school property is in a wooded area, use surveyors tape to mark off the grids. If it is paved, use chalk to mark off the grids. As a variation, show scale drawings of other whales. (See General Whale instruction sheet) (Appendix A)
3. Draw, color or paint whales on poster board or as a diorama. Identify whales or show/describe whaling scenes. Send to U. S. government agencies, New England Aquarium, etc. Have more able students draw whales to scale on poster board.

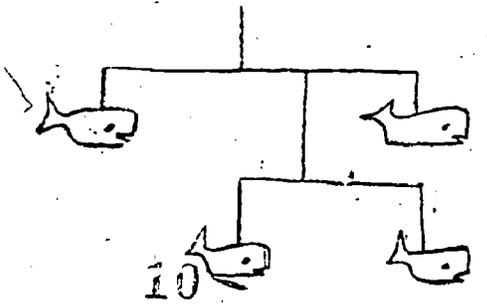
- 4. Complete hand sanding, minor carving (eye), and staining of rough cut sperm whales. Available at about 50¢ each from:

Mr. Doug Brann
 89 West Main Street
 Yarmouth, ME
 (207) 846-5329

- 5. Try allowing students to soap carve a whale using an exacto knife and single edge razor blade.
- 6. Taking a potato, cut in half, cut out a miniature whale by leaving it as a high spot that will leave an impression when inked and can be printed like a stamp. Have some students cut out a square in the center of the whale, which will leave an uninked space in the center of the printed whale. This was similar to the whale stamps of whaling captains that entered how many barrels of oil were obtained from a whale into his ship's log.



- 7. Using salt clay (flour, salt, water) or modeling clay, create some whales and fire them in a kiln.
- 8. Make a whale mobile using blue mussel shells, wire, paper, sticks (or dowels), and paint. Cut out a whale tail (flukes) from construction paper, and glue to the narrow end of the mussel shell. Using wire, fashion a spout and attach to the top side of the shell. Paint in an eye and mouth with black paint. Recreate more shell whales, drill a fine hole in each and attach wire or nylon gut in equal lengths to each shell, then attach to the dowels.



9. Have several small groups of students recreate Benjamin Russell's and Purrington's Sea Panorama of a Whaling Voyage Around the World. This panorama was painted on four bolts of cloth (8½ feet high and 1275 feet long) and is now on display at the New Bedford Whaling Museum. Obtain a small bolt of paper (from a local paper mill or newspaper). Subdivide it (without cutting) and let small groups of students make their own diorama, etc.
10. Within the Treasure Hunt program, Mr. Nick Dean tells students how, when he was 15, he shipped out to sea, on the last working schooner "Blue Dolphin" out of Boothbay Harbor. He saw whaling operations in Newfoundland and became acquainted with Robert Lewis Stevenson's grandson--who was a whale inspector for the International Whaling Commission. Mr. Dean tells what a child had to do for jobs aboard ship: both on and off duty. He tells of the wreck of the "Essex"; and tells of how a sperm whale rammed a Polar Whaling Co. catcher boat and how it barely made it to shore before sinking. Mr. Dean then tells how scrimshaw is made and supplies children with an imitation whale tooth (plastic) and tells them how to create scrimshaw. He supplies tools & ink. His techniques are exactly the same as were done in whaling times. Children then stain the grooves, and wipe off the excess ink. (The cost is \$25 per session--20 to 25 students. This is just part of the Treasure Hunt program. Contact Nick Dean at 207/633-7929 or Bill Bonyun at 207/882-7921 for more information. Naomi Michelson 207/882-6679, Westport, Maine, should be contacted for booking this program.

LESSON (LANGUAGE ARTS)

Objectives:

1. Whaling is an important aspect of our (New England) cultural heritage.
2. Herman Melville's Moby Dick is an important New England whaling classic focusing on the life of a whalerman.
3. A student can participate in political action in the proper fashion by writing a letter about whales to a senator or political person in a whaling nation.

Procedures:

1. Using proper letter and envelop format, have students write a letter (factually based, argumentative, or a letter from a whale) to a government representative--ours or foreign. Supply recent addresses (perhaps one to the President of the U.S.)
2. Write a position paper: for or against Japanese/Russian whaling.
3. Write a paper on what it would be like to be a whale for a day (be sure to see "music" section first).
4. Read the class the Moby Dick Classic comicbook (Classics Illustrated, Number 5, 101 Fifth Ave., N.Y., N.Y. 10003) It is adapted for young readers by Felix Sutton. For slow (or poor vision) readers, obtain the taped version:

Moby Dick The Whale: Introduction)	Available from:
15 4728000 500 813 TE989 (06))	
and)	Recording for the Blind
Moby Dick, The White Whale: Afterward)	215 East 58th Street
New American Library 1961 Signet Classic)	New York, N.Y. 10022
04 4728000 500 813 TE989 (06))	

5. Introduce: John Tabor's Ride*, a short children's book (literature) and discuss how folk tales pass along orally. Follow this by playing

*John Tabor's Ride, Blair Lent. Little, Brown & Co., 1966.

the song "Hang on, John" by Gordon Bok (Folk-Legacy Records, Inc., FS1-44). Discuss the differences between the song and book.

6. Obtain Prime Resource Center (Portland, Me.) movie on Robert McCloskey and his making of "Burt Dow, Deep Water Man". Show to classes and read book aloud. Ask students to describe: What is a dory, gun'l, sou'wester, double-ender, tiller, blubber, keel, bilge, sediment?

Ask students to use & describe these nautical or whaling expressions: stave us in (related to stove boat), from prow to propeller, leeward side, proper name for a whale's tail (flukes), "Thar She Blows" (sighting of a whale), a school of something refers to fish so what is a group of whales (pod or gam).

Ask kids to compare real whales to McCloskey's whales: Questions: Do they float on top? Do they come in colors? What's the purpose of a spout? Should they spout 3 times for Burt Dow?

7. Complete the whaling crossword puzzles and discuss whaling procedures and vocabulary. (Appendix B)
8. Give the pre-test on Sailor or Whaler Language then discuss the meanings of each. (Appendix C) Fill in the blanks to the worksheet, "Using Whaling Expressions". (Appendix D)
9. Develop a panel discussion of two teams or even three: International Whaling Comm., Japanese/Russian Whalers & Fisheries, and whale conservationists.
10. Look into whaling vocabulary to see what has been carried over and used today like:
 - gurry--blood, scales, flesh, organs, undesirable things from whaling
 - gam--to talk, trade stories, etc. (Appendix E)

11. List materials needed to make an expedition for whaling. What is bought, what are the costs, what is used on modern whaling voyages? How are they different?

12. Poetry: Read to classes:

- The Sea Wolf by Violet McDougal
- Sea Fever by John Masefield
- The Creatures Choir by Gaztaldt

Have students write their own creative expression poem about whales or the romanticism about whaling.

13. Discuss "When a Whale Came to My Town". Questions to ask: What made the whale beach itself over and over again? What was done to help the whale? Did it help? Do whale beachings occur very often?

14. Read "A Whale for the Killing" by Farley Mowatt. Published in an abridged version in Reader's Digest, Feb 1973.

LESSON (MATH)

Objectives:

1. To understand the types of supplies and their costs of a whaling voyage: both past and present and to be able to comprehend how expensive such a voyage is.
2. To relate the speeds of sound in water vs. that in air, so that one can see how sound travels quicker and farther under water (bioacoustics).
3. To compare and demonstrate the immense size and weight of whales.

Procedures:

1. The teacher says to the class: "Imagine that you are the captain of a sailing ship. You must make a list of supplies with quantities and prices that you will need for a whaling voyage for one year." Help students by using the teacher copy and giving them ideas of items vs.

cost. If time allows, compare with the supplies and prices needed for a whaling voyage in 1977. Write to several whaling companies in Japan and ask for a ship stores list for a typical whaling vessel and maybe a factory ship. Nippon Suisan, Harou Nakai, President; 2-6-2 Ohtemach 1; Chiyoda-Ku, Tokyo, Japan; Taiyo Fisheries; Kenkichi Nakabe, President; Shimmaru Bldg.; 1 Marunouchi; Chiyoda-Ku, Tokyo, Japan; Kyokuyo; Motoo Morihara, President; Chiyoda Bldg.; 2-1-2 Marunouchi, Chiyoda-Ku, Tokyo, Japan. See how long they stay out. Are the whales brought back in or processed at sea? Call Nathan Lipfert, Bath Marine Museum, (207/443-6311) for specifics on ship stores list, number of crew on board, etc.

2. Using the "Whalebook" from Endangered Species Productions
P. O. Box 472
Prudential Center Station
Boston, Mass. 02116

Compare the number of whales alive during the great whaling era to the number of whales alive now. Try bar graphs for 4th or 5th grade, and line graphs of whales killed during whaling era compared to present.

3. Have younger classes demonstrate the sizes of whales by drawing out their shape (check Art activity on drawing blue whale) and filling the shape in with students' cars, etc. Try marking them out in metric.

(Appendix A)

4. Using percents, see how much a whale gains in weight per day and multiply to find a year's growth in weight. What percent in body weight do they gain per day, per month, per year?
5. Compare the size or weight of a whale to a group of kids. Compare the size or weight of a blue whale's tongue (size of a VW) to X number of kids. How many kids would it take?

6. For communication, compare the distance sound travels and the time it takes through air and water? Whales can communicate 200 miles in distance. Sound travels about four and a half times faster in water (4,750 ft./sec.) than in air (1,100 ft./sec.). Using $D = R \text{ times } T$, how long would it take sound to travel 200 miles?
7. Teach scale concepts through drawings of various whales.
8. If your school is planning on going Whale Watching with the College of the Atlantic, Bar Harbor, Maine, in the spring or fall, you may want to do some navigational, compass bearing, distance, or depth exercises with your classes before leaving. The reason is that COA students constantly plot on a chart the ship's position and any whale sightings. If kids know how to read a chart they are apt to keep an eye on it while under sail.
9. Work with percents of money that were received by the owner of the ship, captains of a ship, and seamen. Graph the results. (Appendix K)

LESSON (MUSIC, DANCE)

Objectives:

1. Students should realize that sea shanteys were important in the operation of sailors' and whalers' jobs in the great whaling era.
2. Students can compare the physiological actions of whales to dance type movements with or without music.
3. Students should realize the complexity of a whale song and may try to imitate it with their voices.
4. Students should understand the complexity of whale communication and echolocation by doing an experiment-type game.

Procedures: (Note: It is suggested that before doing this section, you pre-listen to the songs listed. The ways they can be used are wide and varied. Many are accompanied by whale sounds in the background.

1. Sea shanties were work songs. As ballads, they were long and involved stories for entertainment. "A shanty was as necessary as a fife and drum to soldiers". "To heave on a line without a shanty was like trying to dance without music." Shanties, or chanties, or chanteys, or shanteys came from the french word "Chantez" which was an imperative order "to sing".

One excellent action song is from the "Around the World in Dance" album AR-542 from Educational Activities, Inc., Freeport, N.Y.

SAILOR HORNPIPE

Students sit on the floor in a semi-circle and sing along with the song. At various points students must imitate work as if they were working aboard ship. The words are as follows:

Slap, slap, slap (legs)

Clap, clap, clap (hands) CHORUS (repeat 2 times)

Row, row, row, row (imitate rowing)

Sway--left, right, left, right for 14 times then cross your arms at your chest and shout "YO-HO-HO".

VERSES

Second) Pull in the anchor (imitate pulling rope). Chorus.

Third) Coil rope around arm. (wrap rope around arm) Chorus.

Fourth) Hoist sails. (pull rope down lifting sails) Chorus.

Fifth) Sight whales. (look left to right through eyeglass) Chorus.

2. The entire Treasure Hunt program can be arranged for your school. Treasure Hunt involves 3 people: Bill Bonyun (sings sea shanties), Bill Glennon (is a playwright and storyteller), and Nick Dean (shows how to make scrimshaw and involves students in making scrimshaw). Their program runs \$25 a session of about 25 kids for 1 man or a total of \$75 for all three for a session. Treasure Hunt is listed under the Outreach Program, Maine State Commission on the Arts and Humanities. Applications can be received from Betty Smith, M.S.C.A.H., State House, Augusta, Maine 04333. Generally they will give a matching grant (provided you have enough students/teachers involved) and better yet, they could give an "In-kind match" of more money. Inquire about an "Artists in the School Program" grant comprising of a cooperative deal of several schools working together on a program.

3. Play some whale sounds music, such as:

Songs of the Humpback Whale and
Deep Voices by Dr. Roger Payne

Discuss Dr. Payne's work with underwater recordings. Read "Dolphins: The Smartest Animals" in National Geographic World, May 1977, which focuses on echolocation.

If possible, have your local Navy recruiter order the movie from the Office of the Oceanographer of the Navy:

Search for the Whale, MN-11492
Sounds in the Sea, MN-10409

4. Have students try to make noises holding their breath, with mouth closed. This is to simulate the way a whale makes his sounds under water--holding his breathe; creating voices in his throat without inhaling or exhaling air like we do.

5. Make up a kazoo orchestra to simulate humpback whale songs. Did you know that a whale makes a new song each and every year?
6. Listen to and sing along with Gordon Bok's songs (Camden). Available on Folk-Legacy records.
7. Listen to and sing along with Judy Collin's "Amazing Grace" album, Side 1, cut. 7--'Farewell to Tarwathie' (5:13 min.).
8. Listen to Country Joe McDonald's "Paradise with an Ocean View"; anti-whale killing song, Fantasy records F-9495, \$5.97.
9. Utilize tape of whaling songs included with unit. Pre-listen, first!
10. Using Roger Payne's records of whale sounds, try the following: (These modern dance exercises utilize a child's body movement in learning.)
 - a. Have students take their hands and have them imitate moving their nose back to the back of their neck. Have them imitate diving, surfacing and breathing, and diving again. When can one breathe easiest?
 - b. Have students put their arms up in front of them with palms together. Open the palms and breathe. Close them, hold breath and dive down. Keep palms together so as to not let water get in. Have all students hold their breath until the first person loses it, and all must come up to the surface, spread palms open, and exhale.
 - c. Using about 12 students, have them form a circle--all holding hands. Take four other students and have them enter the circle and hold hands--all facing out. The center kids simulate the air being breathed by the whale. The outer ring simulates the operation of the blowhole. Have the center (air) kids squat then have the outer ring (blowhole) close in around them. Then say the whale must dive,

and later come up for air. When he comes up, the outer ring (blowhole) spreads apart and the center kids hop up (simulating the blow of a whale or his exhaled breath). Be sure to explain that a whale's breath is not water but hot air and water vapor (like a warm breath in the winter).

LESSON (SCIENCE)

Objectives:

1. To expose students to the College of the Atlantic's Whale Sighting Network and its operation.
2. To involve students in slide show whale watching, searching for field marks to identify species of whales.
3. To involve students in role-playing getting the feeling of what it would be like to be a whale using Project Jonah materials.

NOTE TO TEACHER: See #2 in this section first.

Procedures:

1. Using the Project Jonah Whale Guidebook*, have the students try the following role playing activities:
 - a. All read and try to pretend that you are a whale.
 - b. Breathing like a whale to simulate taking a gulp of air, holding one's breath and diving, surfacing to exhale (blow) and resume breathing.
 - c. Dolphins see under water by sending out clicks and listening for the returning echos. This is called echolocation. Have students draw two dots on a piece of paper (one is two and one half inches in diameter, the other is two and one quarter in diameter). Have

*Order from Project Jonah, Box 476, Bolinas, CA 94924

the card held 35 yards away and see if students can tell the difference between the two dots. A marine mammal can tell the difference between two balls of the sizes given using only sound. Dolphin trainers have found out that dolphins can pick from the bottom of a pool the difference between a penny and a dime.

Have two students find a reading selection and at a given signal, each should start reading the story to each other. Neither should stop reading until time is given. Ask if they could hear their friends story and tell about it. While we have difficulty talking and listening with comprehension at the same time, the whale uses its ability to do this nearly continually in echolocation.

- d. Whales and dolphins live in a world of sounds, just like we live in a world of light. Whales make high-pitched clicks to find their way through the dark waters, and squeaks, groans and whistles to communicate with their friends. A scientist named Dr. Roger Payne has done studies in whale sounds and even recorded two albums with whale songs. Play selections from the two albums: "Songs of the Humpback Whale" and "Deep Voices" and discuss the information on the album jackets.

Questions:

Songs of the Humpback Whale

- 1) What do you feel caused Dr. Payne to go into whale study?
- 2) What did he want to accomplish as a result of the dead porpoise encounter?
- 3) Where did Payne record the whale sounds?
- 4) How were they recorded?
- 5) What other sounds could be heard under water?

Deep Voices

- 1) Where do the royalties from the whale records go?
- 2) What startling discovery did Mrs. Payne make?
- 3) What things do humpbacks do upon the approach of a boat?
- 4) Explain what is meant by social sounds?
- 5) Why can't whale voices be heard over long distances?
- 6) Where were the right whales studied? What was life like there?
- 7) What sorts of noises are made by right whales?

e. Finish reading the Project Jonah booklet.

2. Before beginning the unit, order the Whale & Seal Slide Show from the College of the Atlantic. Write to:

Ms. Cathy Ramsdell - Allied Whale
College of the Atlantic
Bar Harbor, Maine 04609
(207) 288-5015

The only charge made for the program is the postal charge. Also ask for some whale sighting reports (form 751); no charge is made for samples of these reports. The slide show and narration (cassette tape) by Steve Katona is fantastic--all aspects are covered. When showing the slide show, make sure that students have the study guide sheet and whale sighting form. Blanks should be filled in accordingly as the show progresses. Try to limit the number of field marks observed and whales classified to a "WHALE-A-DAY". (Retention is better). If your budget allows, purchase a quantity of "A Field Guide to the Whales and Seals of the Gulf of Maine" written by Steve Katona, David Richardson, and Robin Hazard; and beautifully illustrated by John Quinn and D. D. Tyler. The "Field Guide" is available from the College of the Atlantic

for \$4.30, tax and postage included. Collectively, the slide show, field guides, and whale sighting reports is a unit in itself.

3. After finishing the above, try the Whale Bingo game or Whale Reinforcement game.

Whale Bingo (Appendix Q)

This game is designed to test the ability of students to rapidly identify exact field marks of whale species in the Gulf of Maine. The whale sighting form has been dissected and reprinted in a scrambled order with 5 columns W-H-A-L-E. Students are given about 15 beans or paper squares. The teacher calls off general whale features (example: flukes of a humpback) and students are to mark it with a bean, etc. After calling a series of features, someone will come up with a Bingo (better yet, a whale). The teacher is to check the row or column or diagonal for validity. The quicker the items are called off, the better.

Whale Reinforcement (Appendix L)

This game is closely designed to recall information presented in the Whales & Seals Slide Show worksheet. In advance of the game, write the following game chart on the blackboard:

W	H	A	L	E
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8

<u>Blackboard</u>	
Team A	Team B
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

Select two team captains or divide up the class yourself into two teams. Teams should be seated in two lines perpendicular to the blackboard. Team A; person #1 selects a letter/number question. The low numbers are easy questions, higher numbers are more difficult questions. He or she has 15 seconds to answer the question. If answered correctly, Team A gets that number of points and that question is erased from the board. If answered incorrectly, Team B gets a chance to select a question to answer. When each team member has had an opportunity to answer a question, return to the beginning of the team for another round.

As a variation, try a college bowl version allowing team conferences and answers. Set a pre-determined time limit.

4. Teachers sincerely interested in whale watching should read "A Whale-watcher's Diary" published in August 77 (Blair & Ketchum's Country Journal; Vol. 4, No. 8, Aug. 1977), as well as the annual whale sighting report, published annually by the College of the Atlantic. Each year the COA and Connecticut Cetacean Society takes whale enthusiasts on a Whale Watching cruise. The COA leaves Portsmouth and the CCS leaves a port north of Boston. The cruise homes in on the Jeffrey's Ledge area or inner Cape Cod region. The COA charges \$10.00 per student and \$15.00 per adult. Trips leave Portsmouth Harbor at about 8:30 A.M. on a Saturday and returns after 4:00 P.M. Other cruises are offered by Al Avellar on the Dolphin III out of Provincetown in spring or fall.

Students should be well versed on whales in general, the whale sighting form, and the navigational chart of the area. It is wise to read up on whale species sighted on prior trips and their field marks. BRING A CAMERA & SEA SICKNESS PILLS. Food may be purchased on board or you can bring a bagged lunch.

LESSON (SOCIAL STUDIES AND HISTORY)

Objectives:

1. There was minor whaling activity going on on the coast of Maine. Students should realize that none were very profitable or long lived.
2. Students should understand that whaling for Massachusetts and Long Island, N. Y. was a big business where whole towns worked cooperatively and successfully in the whaling trade.
3. Students are to cooperatively sing and act out sea shanteys in the operation of a Yankee Clipper.

Procedures:

1. The teacher should acquire the slide program on Maine Whaling produced and researched by Nathan Lipfert of the Bath Marine Museum. A tour of the Museum, with the slide show included would be an excellent field trip. Reservations should be made two weeks in advance at 1-207-443-5311.

Mr. Peabody, of the Bath Marine Museum suggests that school groups first be given a slide orientation presentation at the Winter Street Building. Following this orientation, he suggests that the students tour the three floors of the Winter Street Building and the two floors of the Sewall House. The entire session requires 1 1/2 - 2 hours.

Based on these suggestions, the cost is 45¢/person (adults and students) for groups of 25 or less, and 40¢/person for groups exceeding 25.

2. Read and discuss the article from Downeast Magazine by Kenneth R. Martin ("Voyage of Maine Whaleships", Downeast Magazine, Vol. XVIII, No. 8, May 1972.) Discuss the Downeast article, "Luthor Maddox, Fabulous Whale" and how Mr. Maddox monopolized on a dead whale. ("Luthor Maddox, Fabulous Whale", Downeast Magazine, Vol. XXIV, No. 4, Nov., 1977)

3. Have students research back issues of National Geographic. Refer to the National Geographic Index, 1947-1976. Some sample articles are: March 1976--"At Home with Right Whales" by Roger Payne; December 1976--"Imperiled Giants" and "Exploring the Lives of Whales". There is a supplemental chart of "Whales of the World" with the December 1976 issue of National Geographic.

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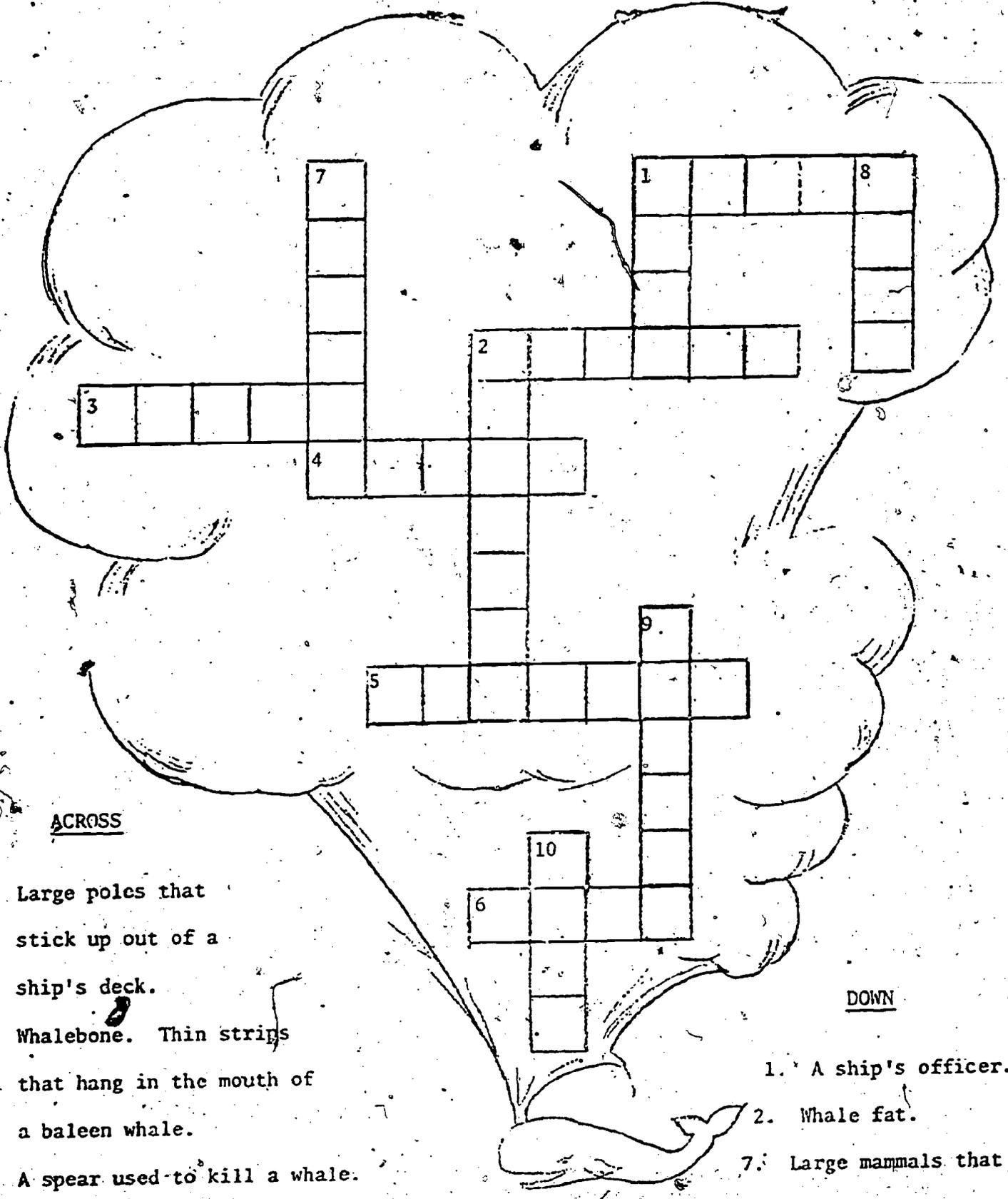
World by National Geographic, Dolphins: The Smartest Animals. National Geographic Society, 17th and M Streets, N.W., Washington, D.C. 20036, May 1977.

ACROSS

1. Large poles that stick up out of a ship's deck.
2. Whalebone. Thin strips that hang in the mouth of a baleen whale.
3. A spear used to kill a whale.
4. A geyser of vapor that comes from a whale when he breathes out.
5. A large hook used to catch a whale.
6. A sailor's personal belongings.

DOWN

1. A ship's officer.
2. Whale fat.
7. Large mammals that live in the sea.
8. A large boat with 3 masts.
9. A man who makes barrels.
10. A floor on a ship.



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ACROSS

- 2. Near or toward the stern of a vessel.
- 3. A thin strip of a horny substance found in the upper jaws of certain types of whales.
- 4. A sailor's personal belongings.
- 6. A blacksmith's hearth used to heat metal.
- 8. The science of directing a ship from one place to another.
- 10. The body of a ship exclusive of masts, yards, sails, rigging and deckhouses.
- 11. Ship's bathroom.
- 12. The left side of a ship when facing forward.
- 13. The broad horizontal tail of a whale.
- 15. A person who supplies equipment and provisions to ships.
- 16. An instrument used to measure the angle between a heavenly body and the horizon.
- 17. A blacksmith who fashions metal fittings and equipment for ships.
- 20. A place where barrels and casks are made.
- 24. A strip of blubber cut from the blanket piece about six inches wide and two feet long.
- 25. The harbor.
- 26. The "backbone" of the ship running from bow to stern along the bottom of the hull.
- 30. The art of carving or engraving whales' teeth.
- 34. A large square-rigged vessel with 3 or more masts.
- 35. A carved figure on ship's bow.
- 36. The front or forward part of a ship or boat.

DOWN

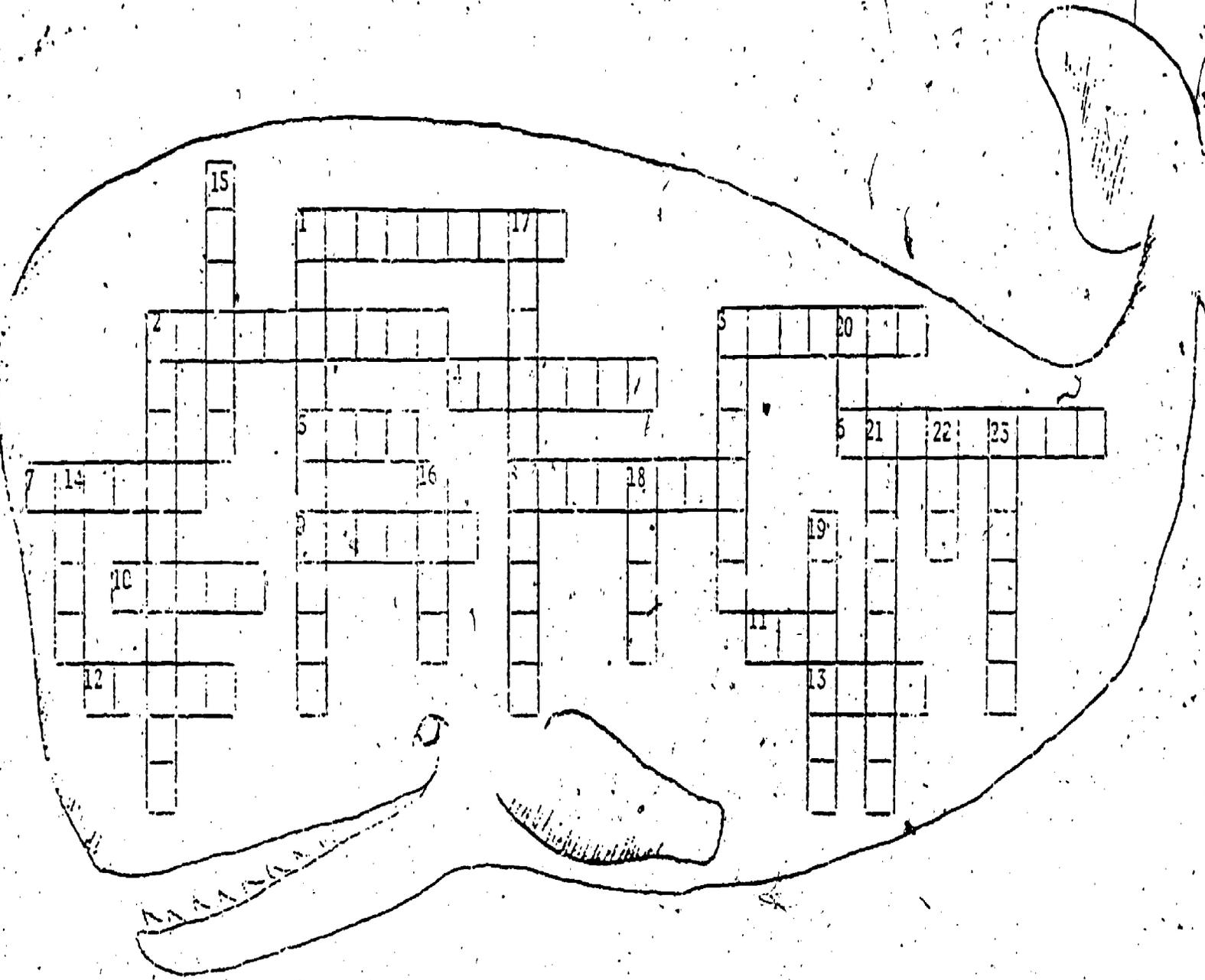
- 1. A thick layer of fat between the skin and muscle of a whale from which oil is obtained.
- 2. A substance used in making perfume and found in a sperm whale.
- 5. A whaleman's term for a whale's dive.
- 7. A ship's kitchen.
- 9. A person learning a trade or art.
- 11. The boatsteerer. He is in charge of catching the whale.
- 13. Crew's living quarters.
- 14. An inn or small hotel where alcoholic drinks are served as well as food.
- 17. A waxy substance found in the head of a sperm whale and used in candle making.
- 18. The right side of a ship when facing forward.
- 19. Plant fiber used to make rope.
- 21. Fibers of tarred hemp used for caulking seams.
- 22. To fill spaces between planks on a wooden ship.
- 23. A person on a whaleship who watches for whales.
- 27. A tool used to kill a whale.
- 28. A contract or agreement signed by all hands when shipping out (being hired).
- 29. One who steers a vessel.
- 31. A flag on a long pole stuck into a dead whale if a boat must leave it. It makes the whale easy to relocate.
- 32. Line, wire, chain, etc., used to support a ship's masts and handle the sails.
- 33. A nautical measure equal to six feet.

ACROSS

1. The art of carving whale teeth.
2. A carved figure on a ship's bow.
3. Whale fat
4. A tool used to catch a whale.
5. A ship's officer.
6. A small boat used for chasing whales.
7. The broad tail of a whale.
8. To direct a ship's course.
9. A man who makes barrels.
10. A long metal spear used for killing whales.
11. Near or toward the stern of a vessel.
12. A portion of the ship's company on duty at a given time to run the ship.
13. A plant fiber used in making rope.

DOWN

1. A waxy product found in the sperm whale's head and used to make candles.
2. The crew's living quarters in the forward part of the ship.
3. Whalebone. Strips found in the upper jaw of the right whale.
14. Rope.
15. One who installs rigging.
16. A floor on a ship.
17. A person learning a trade.
18. A sailor's personal belongings.
19. A nautical measure equal to six feet.
20. The front part of a ship.
21. One who steers a vessel.
22. A written record of a ship's cruise.
23. A wooden container.



ACROSS

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- The art of carving whale teeth.
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- Stear or toward the stern of a vessel.
- A portion of the ship's company on duty at a given time to run the ship.
- A fiber used in making rope.
- 1. A waxy product found in the sperm whale's head and used to make candles.
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Answer Sheet

ACROSS

Page 29

1. Masts
2. Baleen
3. Lance
4. Spout
5. Harpoon
6. Gear

Page 31

2. Aft
3. Baleen
4. Gear
6. Forge
8. Navigation
10. Hull
11. Head
12. Port
13. Fjukes
15. Chandler
16. Sextant
17. Shipsmith
20. Cooperage
24. Horsepiece
25. Port
26. Keel
30. Scrimshaw
34. Ship
35. Figurehead
36. Bow

Page 35

1. Scrimshaw
2. Figurehead
3. Blubber
4. Harpoon
5. Mate
6. Whaleboat
7. Flukes
8. Navigate
9. Cooper
10. Lance
11. Aft
12. Watch
13. Hemp

DOWN

1. Mate
2. Blubber
7. Whales
8. Ship
9. Cooper
10. Deck

1. Blubber
2. Ambergris
5. Sound
7. Galley
9. Apprentice
11. Harpooner
13. Forecastle
14. Tavern
17. Spermaceti
18. Starboard
19. Hemp
21. Oakum
22. Caulk
23. Lookout
27. Lance
28. Articles
29. Helmsman
31. Waif
32. Rigging
33. Fathom

1. Spermaceti
2. Forecastle
3. Baleen
14. Line
15. Rigger
16. Deck
17. Apprentice
18. Gear
19. Fathom
20. Bow
21. Helmsman
22. Log
23. Barrel

APPENDIX C

SAILOR'S LANGUAGE

Landlubbers - keep out

Rate yourself: check off those sentences which you understand.

- | | |
|------------------|--------------------|
| 5 right answers | mess boy |
| 10 right answers | seaman first class |
| 15 right answers | harpooner |
| 20 right answers | boat steerer |
| 25 right answers | mate |
| 30 right answers | captain |

- 1. Thar she blows.
- 2. Where away?
- 3. Man the capstan and weigh the anchor.
- 4. More whales blowing off our port quarter.
- 5. Avast. All hands topside.
- 6. Swing the boat out on the davits - bowfirst.
- 7. Now stow your gear on the fo'c'sle.
- 8. Lay your irons fore and aft.
- 9. Royals visible on the horizon, Sir.
- 10. Square-rigged, did you say?
- 11. Where is she? To windward or to lee?
- 12. Just abaft of the port beam on the horizon.
- 13. A sperm whale is showing his flukes dead ahead.
- 14. Aye, Aye, Sir.
- 15. Luff her up, before we have a stove boat.
- 16. Sound the bilge.
- 17. First boat. Man your oars and head off before the wind.
- 18. I think we nudged the whale just below the water line.
- 19. Did it crack the seams?
- 20. Break out the oakum and caulking irons.
- 21. All hands on deck; man the pumps.
- 22. Get in the lee there and keep your glass trained on that first boat.
- 23. Boat steerers get below - use the captain's companionway.
- 24. He's sounding--cut the line!
- 25. Irons are fast in boat number one, Sir.
- 26. There they go on a Nantucket Sleighride.
- 27. His chimney's afire.
- 28. Lively there or you'll get keel-hauled.
- 29. Hoist the blanket-piece aboard.
- 30. Shake out your fore, main, and mizzen courses.

SAILOR'S LANGUAGE

1. The lookout sights the spout of a whale. "Thar she blows" alerts the Captain.
2. The Captain is asking the direction in which the spout(s) were sighted.
3. Because whales are in the vicinity, the Captain orders the anchor lowered. The crew weigh (lower) the anchor using the capstan (windlass).
4. Additional spouts are sighted behind the ship, slightly to the left.
5. The Captain orders all the crew to the deck.
6. He orders a whaleboat hung on davits lowered into the water, bow first (front first).
7. The crew is ordered to place their belongings in their quarters, the forecabin (fo'c'sle) located below decks in the bow of the ship.
8. In the whaleboat, the harpoons (irons) are placed lengthwise (fore and aft).
9. A crewman signals the Captain that the topmost sails (royals) of a vessel are seen on the horizon.
10. The vessel may be a square-rigged vessel (a vessel with square sails on all masts).
11. The Captain asks if the square-rigger is approaching them on the side of the ship the wind is blowing or to lee (the side opposite the wind).
12. The response is that the ship is approaching on their left, slightly behind the mid-section of the ship.
13. A sperm whale is showing his tail (flukes) dead ahead (straight ahead).
14. Yes, sir.
15. Let the wind out of the sails (by loosening the sheet) before the boat is crushed by the whale (stove in).
16. "Measure the water seepage in the cargo hold."
17. The crew of the first boat are ordered to row with the wind behind them.
18. The bottom of the boat has touched the whale.

19. Are the boards on the sides or bottom of the boat damaged or separated (cracked seams)?
20. Oakum is hemp fibers from old rope untwisted and picked apart. The caulkers coat the hemp with hot tar and use the caulking iron to drive the oakum into the seams of a vessel.
21. The entire crew is summoned to the deck; the bilge must be pumped.
22. Get to the side of the ship opposite the wind and watch the whale-boat through the spyglass.
23. A boat steerer is a harpooner, an officer. The boat steerers have been ordered below decks and have been told to use the stairs (companionway) leading into the Captain's cabin.
24. The whale is diving (sounding); the rope attached to the harpoon must be cut so the boat and crew are not dragged underwater.
25. In the first whaleboat, the harpoons (irons) are caught in the whale (fast).
26. A harpooned whale might "tow" the boat and crew through the water (Nantucket sleigh ride).
27. When the whale's lungs are punctured with the killing lance, blood spurts from the blowhole. The mate yells, "his chimney's afire."
28. More quickly or you will be punished or dragged under the ship lengthwise along the keel (keel-hauled).
29. Hoist aboard the long strip of blubber (blanket piece) cut from the whale's carcass.
30. Unfurl the sails (courses) on all three masts, the fore, main and mizen masts.

APPENDIX D

USING WHALING EXPRESSIONS

To become a harpooner on any whaler, you should be able to fill in the blanks to complete the voyage.

The l called from the c n, "thar she b , a s whale!"

"Where away?" asks the c .

"On the s bow," he answered.

We lowered the w and set sail for the p of whales. We could see their black f splashing in the waves. One whale s , swimming beneath the boat, and then surfaced at our w .

I stood in the b , aiming the h at the huge whale. Suddenly, I darted my i into his b . The whale sounded, hauling the boat behind him, and we zoomed through the waves on a N .

bow
blows
blubber
captain
crow's nest
flukes
harpoon
iron

lookout
Nantucket sleighride
pod
sounded
sperm
starboard
waterline
whaleboat

APPENDIX E

NINETEENTH CENTURY MARITIME GLOSSARY

- abaft - Aft of.
- aft - An adverb indicating direction or position, near or toward the stern of a vessel.
- after - An adjective indicating the furthest aft of one or more objects.
- ambergris - A substance found in the bowels of diseased sperm whales.
- amidships - The middle portion of a vessel, i.e., the point of intersection of two lines, one drawn stem to stern, the other across the beam or widest part of the ship: may also be called "midships."
- anchor - A heavy piece of iron with two large palms or hooks that grip the sea bottom used to hold a vessel in place.
- apothecary - A person who made and sold medicines: a pharmacist.
- apprentice - A person learning a trade or art. In return for instruction the apprentice agrees to work for his master for a certain time for little or no pay.
- articles - A contract or agreement signed by all hands when shipping (being hired); also called the ship's articles of shipping articles.
- bailing - The process of removing sperm oil and spermaceti from the cavity on the head of a sperm whale. Or, removing water from a small boat by hand using a small scoop or similar utensil.
- baleen - Whalebone. Thin strips of a horny substance similar to fingernails in texture. They are found in large quantities in the upper jaws of baleen whales and are used to strain small animals called plankton, the whale's food, from the water.
- barrel - A container with a flat, circular top and bottom and curved sides usually made of wooden staves held together with hoops. A cask. Or, a measure of whale oil equal to 31.5 gallons.
- becalmed - Unable to move due to a lack of wind (calm).

- Bible leaves** - Blubber sliced so that the skin remains intact, thus resembling the pages or leaves of a book.
- blanket piece** - One of the large pieces of blubber, from twelve to fifteen feet long and five to six feet wide, cut from the whale in the initial cutting-in process.
- block and tackle** - A combination of line and two or more large pulleys used for lifting heavy or difficult-to-move objects.
- blubber** - A thick layer of fat between the skin and muscle of a whale from which oil is obtained.
- board** - To go or bring on to a vessel.
- boat-header** - The man who steers the boat when chasing a whale and afterwards kills it. He is usually one of the mates of the ship.
- boiling** - Trying out or rendering oil from the whale's blubber.
- bow** - The front or forward part of a ship or boat.
- cabin** - A small room for the ship's officers or passengers.
- case** - The upper half of the forehead of a sperm whale containing a reservoir of liquid sperm oil and spermaceti.
- cask** - A barrel-like container made in different sizes and used on ships to store supplies and cargo such as whale oil, molasses or flour.
- cast loose** - To let go, as a rope or line.
- caulk** - To fill spaces between planks on a wooden ship or boat with oakum or cotton to prevent water leaking through.
- chandler** - A person who supplies equipment and provisions to ships.
- chandlery** - A store where ship's equipment and provisions may be purchased.
- coasting trade** - Trade between ports along the coast.
- cooler** - A copper or galvanized metal tank carried on deck near the try works of a whaler into which the hot whale oil was ladled before it was put in casks. Frequently two larger coolers were carried in the blubber room.
- cooper** - One who makes barrels, casks, tubs, and items of similar construction.
- cooperage** - A place where barrels, casks, and tubs are manufactured.

- craft - An occupation requiring a great deal of manual or artistic skill, such as coopering. Or, a collective term for all types of vessels.
- craftsman - A workman skilled in a particular craft.
- curio - An unusual or strange object.
- cutting-in - Removing blubber from a whale.
- cutting spade - A wide, flat, long-handled chisel-shaped implement used in cutting blubber from a whale.
- cutting stage - A platform extending from the side of a whaleship where the officers stood while cutting blubber from a whale.
- cutting tackle - A large block and tackle on a whaler used in boarding blubber and lowering it through the main hatch.
- deck - A horizontal surface or floor that is a major part of the ship's structure running the entire length of the ship.
- deckhouse - A small house built on the main deck.
- dory - A small, flat-bottomed, open rowboat used by fishermen for setting their trawl lines on the open sea.
- fathom - A nautical measure equal to six feet.
- figurehead - A carved figure on a ship's bow.
- fittings - Fixtures and hardware aboard ship, usually made of iron, steel, or bronze.
- fitting out - The process of equipping a vessel to go to sea.
- flukes - The broad horizontal tail of a whale.
- forecastle (fo'c'sle) - The forwardmost part of a ship. Or, the crew's living quarters in the forward part of a ship. Pronounced "fok'sl."
- foremast - The forwardmost mast on a ship.
- foremast hands - The ship's crew distinct from the officers and petty officers.
- forge - A blacksmith's hearth used to heat metal. It contains coal and coke through which air is forced to produce a hot flame. Or, to form or shape metal by heating and hammering.
- forward - At or in the direction of the bow.

foul weather - Bad weather.

foul-weather gear - Bad weather clothing.

galley-- A ship's kitchen.

gear - The collective term for ship's equipment. Or, a sailor's personal belongings. Or, in a whaleboat outfit, all equipment except harpoons, lance, and boat spade.

gimbal - A system of rings or hoops so attached to one another as to allow a suspended object such as a ship's compass or light to remain level regardless of which way the ship moves.

Grand Banks - A large, relatively shallow area in the North Atlantic off Newfoundland used extensively for fishing.

harness cask - A barrel used for soaking salt-meat in fresh water to extract the salt.

harpoon - A spear-like instrument with a barbed head used for fastening onto whales or large fish to capture them.

harpooner - The boatsteerer. After he throws the harpoon, he changes places with the mate and steers the boat while the mate (boat-header) kills the whale.

hatch - An opening in the deck allowing access to a vessel's interior.

head - The entire forward part of a ship. Or, a ship's bathroom.

hearth - The floor of a fireplace.

helmsman - One who steers a vessel.

hemp - A plant fiber used in making rope. Manila hemp is the highest quality hemp fiber for ropemaking.

hold - A large compartment below deck used for storing cargo or provisions.

horsepiece - A strip of blubber cut from the blanket piece about six inches wide and two feet long.

hull - The body of a ship exclusive of masts, yards, sails, rigging, and deckhouses.

junk - The wedge-shaped lower half of a sperm whale's forehead.

- journeyman - A man who has learned his craft but works for another person.
- keel - The "backbone" of the ship running from bow to stern along the bottom of the hull.
- lance - A long metal spear with a sharp tip used for killing whales.
- light weather - Gentle breeze.
- line - Rope.
- locker - A small room, closet, or cupboard used for storing ship's gear.
- loft - A large room in the upper stories of a building.
- logbook - The official record of a voyage.
- lookout - A person who watches for any dangerous objects in the ship's way such as a reef or other ships; but especially for shales when aboard a whaler. He is usually stationed at the masthead on a whaling ship.
- lower away - To let something down gradually, especially cargo into a ship's hold or a ship's boats into the water.
- mainmast - The second mast from the bow of any vessel with three or more masts.
- mammal - A warm-blooded vertebrate that gives milk to its young.
- mast - A large pole or spar of round wood or metal set upright in a vessel to support other spars and portions of the rigging.
- masthead - The uppermost part of the mast.
- mate - A ship's officer.
- mince - To slice blubber, being careful to leave the skin intact.
- mizzenmast - The after mast of a three-masted ship or the third mast from the bow of any multi-masted vessel.
- mulled ale - Ale that has been spiced and heated, especially with a hot poker.
- Nantucket Sleigh Ride - The term used by whalers to describe a boat being towed through the water by a whale.

- sextant - An instrument used to measure angles. In navigation, the sextant is usually used to measure the angle between a heavenly body and the horizon.
- ship - In the days of sail, a square-rigged sailing vessel with three or more masts. Or, any large sea-going vessel suitable for navigation.
- shipsmith - A blacksmith who fashions metal fittings and equipment for ships.
- shipwright - One who builds or repairs ships.
- shoal - A shallow area of water. Or, a shoal of whales is a school or pod of whales.
- shook - Staves of one barrel bundled together for storage.
- sound - To measure the depth of the water. Also, the whalemens' term for a whale's diving.
- spar - A round timber used for masts, yards, booms, etc.
- spermaceti - A fatty substance contained in the oil of a sperm whale, especially in the head, which becomes a waxy, white solid on exposure to the air. It is used in preparing candles and cosmetics.
- sperm whale - A large species of toothed whale that has a distinct square-headed shape with its jaw located underneath the head.
- spout - A geyser of vapor thrown up by a whale when it exhales.
- starboard - The right side of a vessel when facing forward.
- starboard watch - One of two watches aboard a ship, usually headed by the second mate.
- stateroom - a passenger's or officer's living quarters.
- staves - Long narrow curved pieces of wood which make up the sides of a barrel.
- stern - The aftermost part of a vessel.
- steward - A person in charge of domestic affairs aboard a ship for officers and passengers. He serves food, cleans the officers' cabin, etc.
- stow - To put away or store.

- tavern - An inn or small hotel where alcoholic drinks are served as well as food.
- tiller - A lever attached to a rudder used to move it in order to steer the ship.
- try out - To render. To heat whale blubber resulting in whale oil.
- try-pot - A large kettle used for trying out blubber.
- try works - A large brick structure built on the main deck of a whale-ship, containing one or more try-pots used to render whale oil.
- waif - A flag on a long pole stuck into a dead whale if a boat must leave it. It makes the whale easy to relocate.
- watch - A portion of the ship's company on duty at a given time to run the ship.
- whale - An aquatic mammal that superficially resembles a large fish. The largest whale is the largest animal known to have lived on earth.
- whaleboat - A small open boat, from 28 to 30 feet long, used for chasing whales.
- whale oil - Oil extracted from the blubber of all whales except sperm whales.
- wheel - A round frame with spokes used for steering ships. The wheel was linked to the tiller so that when it was turned, the tiller moved.
- widow's walk - A railed observation platform built on top of a house near the coast.
- yard - A long horizontal spar set at right angles to the mast and keel used for supporting sails.

Definitions derived from:

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APPENDIX F

WHALE POETRY

The Creatures Choir, Gaztaldt

What could hold me,
Lord,
except your ocean?
My inordinate size
must obviously be
a devine joke,
but am I
perhaps
rather ridiculous,
like a blown-up blubber toy?
I am a peaceful leviathan,
on a strict diet,
a waterspout
on my nose.
My sole problem
is to choose between water and air;
but,
hunted for my mollifying oil,
I dread the whalers
who mercilessly chase me
with their iron harpoons.
I never asked
for such yards of flesh,
and where can I hide
from the lust of man?
Lord,
if only some fortunate plunge
would let me come up into
Your eternal peace.

Amen

The Creatures Choir by Gaztaldt translated by Rumer Godden, 1962. He also did "Prayers from the Ark."

SEA FEVER

I must go down to the seas again, to the lonely sea and the sky,
And all I ask is a tall ship and a star to steer her by.
And the wheel's kick and the wind's song and the white sail's shaking
And a gray mist on the sea's face and a gray dawn breaking.

I must go down to the seas again, for the call of the running tide
Is a wild call and a clear call that may not be denied;
And all I ask is a windy day with the white clouds flying,
and the flung spray and the blown spume, and the seagulls crying.

I must go down to the seas again to the vagrant gypsy life,
To the gull's way and the whale's way where the wind's like a whetted
knife;
And all I ask is a merry yarn from a laughing fellow-rover,
And a quiet sleep and a sweet dream when the long trick's over.

John Masefield

England, 1878-1967

Poet Laureate

THE SEA WOLF

by Violet McDougal

The fishermen say, when your catch is done
 And you're sculling in with the tide,
 You must take great care that the Sea Wolf's share
 Is tossed to him overside.

They say that the Sea Wolf rides, by day,
 Unseen on the crested waves,
 And the sea mists rise from his cold green eyes
 When he comes from his salt sea caves.

The fishermen say, when it storms at night
 And the great seas bellow and roar,
 That the Sea Wolf rides on the plunging tides,
 And you hear his howl at the door.

And you must throw open your door at once,
 And fling your catch to the waves,
 Till he drags his share to his cold sea lair,
 Straight down to his salt sea caves.

Then the storm will pass, and the still stars shine,
 In pease--so the fishermen say--
 But the Sea Wolf waits by the cold Sea Gates
 For the dawn of another day.

APPENDIX G

SHIP SUPPLIES

TYPICAL COST OF WHALING VOYAGE
(including outfitting and original cost of ship)

List of the Principal Articles Required to Outfit a Vessel for a Voyage in Sperm Whaling, To-gether with the Amount of Each Article and the Cost According to the Prices Which Prevailed on January 1, 1844.

<u>ARTICLE</u>	<u>AMOUNT</u>	<u>PRICE</u>	<u>COST</u>
Oil Casks	2,800 Bbls.	\$ 1.25	\$ 3,500.00
Beef & Pork	240 Bbls.	8.50	2,040.00
Flour	220 Bbls.	5.25	1,155.00
Corn	75 Bushels	.55	41.25
Beans & Peas	14 Bushels	1.25	17.50
Corn Meal	5 Bbls.	3.50	17.50
Tobacco	2,500 Lbs.	.11	275.00
Rice	1,200 Lbs.	.035	42.00
Potatoes	150 Bushels	.35	52.50
Cheese	800 Lbs.	.07	56.00
Butter	900 Lbs.	.13	117.00
Dried Apples	600 Lbs.	.04	24.00
Vinegar	10 Bbls.	3.50	35.00
Cod Fish	800 Lbs.	.03	24.00
Molasses	1,600 Gals	.27	432.00
Tea, Black	250 Lbs.	.35	87.50
Tea, Hyson	20 Lbs.	.60	12.00
Raisins	200 Lbs.	.05	10.00
Sugar	1,000 Lbs.	.075	75.00
Coffee	1,000 Lbs.	.08	80.00
Duck, Heavy	60 Pieces	18.00	1,080.00
Duck, Light	36 Pieces	8.00	288.00
Tar	20 Bbls.	2.25	45.00
Whale Boats	6 Boats	60.00	360.00
Oars	7 Sets	8.50	59.50
Boards	4,000 Feet	20.00	80.00
Nails, Composition	700 Lbs.	.22	154.00
Copper, Sheathing	8,500 Lbs.	.21	1,785.00
Cordage	8,500 Lbs.	.10	850.00
Tow Lines	3,000 Lbs.	.12	360.00
Try Pots	3 Pots	60.00	180.00
Cloth	6,000 Yards	.09	540.00
Iron, Whaling Crafts	4,000 Lbs.	.15	600.00
Clothing, Ready-Made			2,800.00
Labor in Port			2,500.00
TOTAL COST OF OUTFIT			19,774.75
COST OF A TYPICAL VESSEL			<u>31,224.72</u>
COMBINED COST OF VESSEL AND OUTFIT			\$ 50,999.47

From: The American Whaleman by Elmo Paul Hohman

APPENDIX H

Whaleman's Pay

The "Golden Era" of whaling, c. 1845-55, saw pay levels for officers and men which were little short of robbery by the owners. As late as 1854 when whaleships were bringing in an average of \$16,000 a year each, captains were paid on an average 1/18 or about \$900 a year.

Owners were taking 25 to 30 percent a year clear profit on their investments and added to it by sheer robbery of the men who worked their ships. Result of one seaman's four-year voyage in 1849:

Sailor's share in money	<u>\$262.25</u>
Less: Fitting, shipping, medicine chests	10.00
10% discount on share	26.22
3% insurance on share	7.86
Money advanced for voyage	70.00
Interest on same	16.80
Cash advanced on voyage	30.00
Interest on same @ 1%/month	7.20
Clothing drawn	<u>40.00</u>
	<u>\$ 208.08</u>
Amount paid at end of voyage	\$ 54.17

APPENDIX I

WHALE REINFORCEMENT GAME

W

1. Who was supposedly swallowed by a whale? Jonah
2. What institution does the greatest cetacean study in the Gulf of Maine? College of the Atlantic
3. What is the name for the tail on a whale? flukes
4. What do the flukes do? steer and push the whale
5. What is the only toothed whale to get big? sperm
6. Name the whale to have a melon shaped head, jet black with pointed fins? pilot whale
7. Give four field marks for a sperm whale? blunt forehead, thin narrow jaw, no dorsal fin, spout is tipped to the left and forward
8. Explain what and why large groups of pilot whales have become beached? Large groups have been beached due to one leader pilot leading them ashore maybe due to parasites in the inner ear destroying their echolocation.

H

1. Do whales hurt people or boats? No
2. For years, large whales have been represented as being dangerous. yes
3. What group of whales use echolocation to hunt their prey? toothed whales
4. Explain breaching. Whales leaping out of the water for fun or signal
5. What are the boundaries to the Gulf of Maine? Cape Sable, N.S. and Cape Cod, Mass.
6. Give four field marks to a pilot whale? long arched dorsal fin, blunt forehead, gray anchor on chest, pointed flippers, black
7. The progression from 100 tons of plankton to 10 tons of krill to 1 ton of weight gain for a whale is called? energy pyramid

8. What are the four field marks to a humpback whale? white flippers, bumps on head, saw toothed edges on flukes, serrated edge on flippers, low bushy spout

A

1. Carotene is the substance that baleen is made of. no
2. What has been conducted on Mt. Desert Rock? a whale watch
3. What is the most common large baleen whale in the Gulf of Maine? finback
4. Explain spyhopping. Whales lifting their heads out of the water to look forward
5. What whale can be identified by his pointed snout and white patch on the flipper? Mink whale
6. Explain how the baleen of a finback whale is asymmetrical. On the right side half of the baleen is black/half white, the other side is all dark.
7. Name the two families of whales and explain how they eat? Baleen whales eat krill by straining sea water through their baleen. Toothed whales eat fish or squid singly by using echolocation.
8. What is the body's process of creating and giving off energy to keep warm? basil metabolism

L

1. What type of area is good for attracting whales? a good fishing area
2. In terms of whales, what is important about July, August and September? peak times for whale watching
3. How many cetaceans in the Gulf of Maine? 21
4. What are the white patches on the head of a right whale? callosities or callous patches
5. What whale has white flippers with a serrated leading edge? Humpback
6. The game hello, hello, hello was an exercise in learning what about whales? echolocation

- 7. How can whale scientists learn about the timing of migration, the abundance of certain types of whales and places where whales can be seen? by the use of whale sighting forms
- 8. Explain the purpose of vertical grooves? They are channels under the mouth that allow the floor of the mouth to stretch while taking a gulp of water.

E

- 1. Way back in history, whales looked more like what? dinosaurs
- 2. What is unusual about a right whale's blow? It is "V" shaped.
- 3. How many common cetaceans are there in the Gulf of Maine? 12
- 4. Name three foods of a killer whale? seabirds, fish, seals or small whales
- 5. What is the name to the order of whales, porpoises and dolphins? Cetacea
- 6. What is the most common toothed whale in the Gulf of Maine? Harbor porpoise
- 7. Give four reasons why the right whale was the right whale to hunt? They were slow, fat, yielded much oil, floated after being killed, they had lots of baleen.
- 8. What's the difference between a dolphin and a porpoise? dolphin - pointed teeth with a beak
porpoise - flattened teeth with a blunt forehead

W

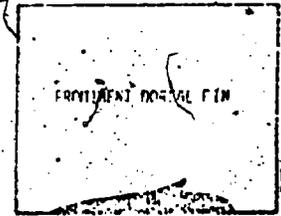
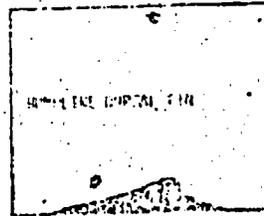
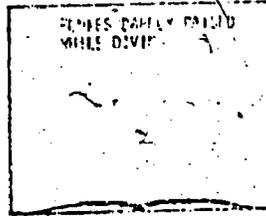
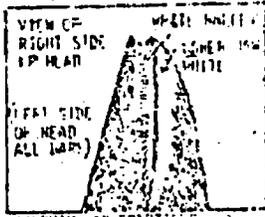
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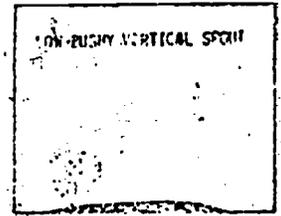
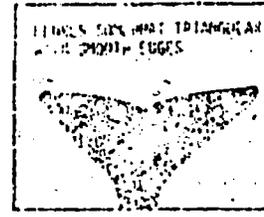
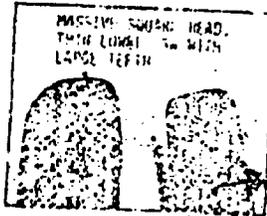
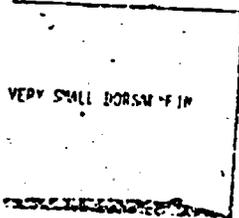
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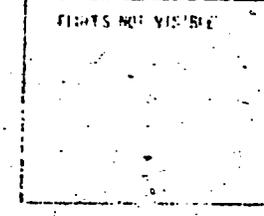
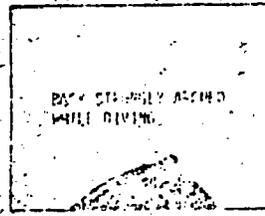
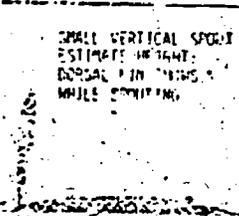
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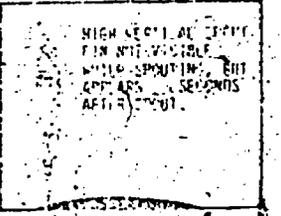
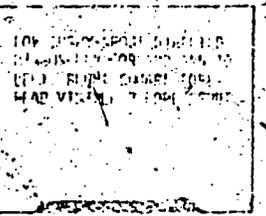
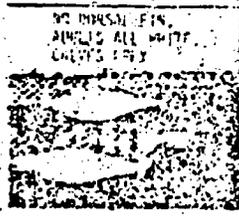
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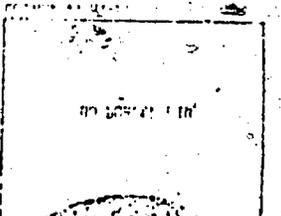
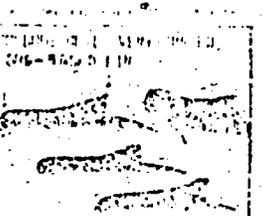
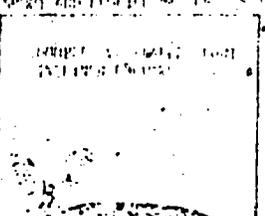
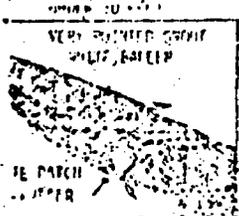
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65/66

APPENDIX K

SONGS IN WHALING UNIT

(numbers refer to start of song on a Sony cassette recorder)

SIDE 1

- 000 - Save the Whale (Joe MacDonald)
- 100 - To the Last Whale (Crosby and Nash)
 - 1. Critical Mass
 - 2. Wind on Water
- 205 - Farewell to Tarwaithe (Judy Collins)
- 284 - Baby Blue Whale (Joe MacDonald)
- 325 - Ballad of the Greenland Whalers (Mitchell Trio)
- 368 - Mister Eneos (Gordon Bok)
- 416 - Hang On, John (Gordon Bok)

SIDE 2

- 000 - Songs of the Humpback Whale (9:00 minutes)
(actual recordings of a single whale)

HANG ON, JOHN (John Taylor) Copyright 1972 by Bob Stuart.
(Sung by Gordon Bok, Folk-Legacy Records, Inc. FS1-44)

John Taylor left his native home;
After the whalefish he did go.
Round the Atlantic coast and around Cape Horn,
To the South Seas where the whalefish blow.

Hang on, John; soon you'll see your native shore.
Hang on, John; you'll see Nantucket shores once more.

Well, his boat was sunk, and his luck being gone,
On a rocky island he made his home.
And he prayed and he hoped, and he dreamed in vain
For a ship to carry him home again.

Hang on, John; soon you'll see your native shore
Hang on, John; you'll see Nantucket shores once more.

An old man come walking along the beach,
Harpoon in hand and a shining face:
"I come from my home on the rolling sea
To carry you back to your native place."

Hang on, John; soon you'll see your native shore
Hang on, John; you'll see Nantucket shores once more.

So they sang and rowed and they sang and sailed
Until they spied them a newborn whale.
The old man harpooned him in the back,
And out to sea they hauled their slack.

Hang on, John; soon you'll see your native shore
Hang on, John; you'll see Nantucket shores once more.

They had not been sailing but a month or more
When "Land Ho!" was the old man's happy word,
And John saw the cliffs rising from the beach,
Heard the cry of Nantucket birds.

Hang on, John; soon you'll see your native shore
Hang on, John; you'll see Nantucket shores once more.

But they never stopped when they reached dry ground,
But they hauled their slack into John's home town,
And John got off at his own front door,
And he never saw the old man, or the whale, any more.

Hang on, John; soon you'll see your native shore
Hang on, John; you'll see Nantucket shores once more.

MISTER¹ ENEOS (The Cold South Georgia Ground)
 (Sung by Gordon Bok, Folk-Legacy Records, Inc. FS1-44)

A true story, taken from a smooth-log of the last sailing whaler to go out of New Bedford: the Daisy, brig (R.C. Murphy, A Logbook for Grace.)

Practically verbatim, this is the ship's carpenter's account (as reported by Mr. Murphy) of the drowning of 4th mate Anton Eneos off South America, on a voyage to South Georgia, an island in the latitude of Cape Horn.

The refrain here, the melody and some of the phrasing, are mine. (played on the 12-string)

Clew up your royals and topsails;
 Haul your headsails down.
 For you'll never see the whale no more
 Or the cold South Georgia Ground.

It was March 29, 1910,
 The little brig Daisy did sail;
 The morning was clear and the sea was down,
 And we raised a great pod of whale.

The captain had three of the boats lowered down,
 And in them the mates (they) did go:
 There was Mr. Dalomba and Mr. Alves,
 And Mr. Eneos also.²

Clew up your royals and topsails;
 Haul your headsails down.
 For you'll never see the whale no more
 Or the cold South Georgia Ground.

Now the whales did rise a mile from the ship,
 And the other two mates made their kill,
 But Mr. Eneos was caught in the pod
 Where the whales were lying still.

Mr. Eneos stood still in the bow
 And he had his lance in his hand,
 But the whale he had harpooned³ would not break away
 And would neither sound or run.

It struck at the boat, and lifted her high,
 And the men fell out over the stern
 And we saw the flukes come crashing down
 Where Mr. Eneos had been.

The captain had the stern boat lowered away,
And we searched where the whales did sound.⁴
Five men we gathered from out the sea;
But Mr. Eneös was gone.

Clew up your royals and topsails;
Haul your headsails down.
For you'll never see the whale no more
Or the cold South Georgia Ground!

- ¹ All mates of sailing vessels are traditionally called "Mister."
- ² The first mate, too, Mr. Almeida, if I remember correctly.
- ³ The whale his boatsteerer had harpooned, actually.
- ⁴ Sound = to get deeper, or to dive.

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