SOUVENIRS OF LAKE MICHIGAN:

AN INTERDISCIPLINARY TEACHERS WORKSHOP

AT THE ILLINOIS BEACH STATE PARK

by

ILLINOIS DEPARTMENT OF CONSERVATION

submitted to

ILLINOIS COASTAL ZONE MANAGEMENT PROGRAM

STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION

The preparation of this report was financed in part by the National Oceanic and Atmospheric Administration, United States Department of Commerce under the Coastal Zone Management Act of 1972, and in part by the State of Illinois, Department of Transportation, Division of Water Resources.

SEPTEMBER 30, 1978

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INTRODUCTION

One of the prime objectives of the Illinois Department of Conservation is its dedication to the preservation, protection, and enhancement of the natural resources of the State of Illinois. Coincidentally, the Illinois Department of Transportation, through the Illinois Coastal Zone Management Program, has been delegated the responsibility of developing a management plan for the protection and enhancement of one of the most valuable resources of the State - Lake Michigan. Clearly, the similarity of goals provided many opportunities for inter-agency cooperation and planning with respect to this valuable resource for the mutual benefit of the citizens of the State.

In a joint effort to generate a public awareness of the resources of the Illinois Lake Michigan coastal region, the Illinois Department of Conservation and the Illinois Coastal Zone Management Program developed and conducted an interdisciplinary workshop for teachers in Northeastern Illinois. With funds provided by the Illinois Coastal Zone Management Program, the Department of Conservation contracted with a group called "Mobius, Inc.", a trio of science education consultants to develop and conduct this workshop. The workshop, attended by 19 teachers, was held during the last week in June. Three hours of graduate credit from Governors State University was granted to those who successfully achieved the course competencies. The main emphasis of the workshop was to expose teachers to the geologic, sociologic and economic factors and importance of the Illinois Lake Michigan coastal regions and to motivate these teachers to develop and present learning experiences to their students on this coastal region. A multitude of teaching tools and in-field learning experiences were utilized to further this goal.

In response to information generated by a pilot workshop held in the Spring of 1977, the "Souvenirs of Lake Michigan" workshop was designed and implemented. The home base for the workshop was Illinois Beach State Park, a six mile reach of shoreline located near the northern boundary of Illinois. The Department of Conservation in its management of the Park has preserved a major portion of the park in its natural state for the enjoyment of the public. In addition, the park is used by the public for a variety of recreational activities such as interpretative hikes, camping, swimming, etc. The Illinois Coastal Zone Management Program, recognizing the recreational opportunities that the park offers and its unique ecological value, has proposed this area for designation as a Geographic Area of Particular Concern.

Utilizing the techniques and materials of this "Souvenirs of Lake Michigan" workshop, future workshops can be undertaken to impact teachers and assist them in generating student interest in our Great Lakes environment.

CHAPTER I
ORGANIZATIONAL DETAIL

At the inception of the "Souvenirs of Lake Michigan Workshop" various groups, singly or in combination were considered as possible audiences for the workshop. These groups included elementary teachers, secondary teachers, park and recreation district personnel, and Boy and Girl Scout leaders, leaders of community organizations (the League of Women Voters, Jaycees, Lions, Kiwanis), adult education facilitors, and representatives from Lake Michigan related organizations (Salmon Unlimited, Yacht Clubs, Boating Associations).

Criteria for selecting the audience included the following considerations:

1. Multiplier effect that could be expected of the participants,

2. Availability to attend a workshop of a weeks duration,

3. Receptivity to the activities and goals of the workshop,

4. Ability to quickly assimilate impact of workshop goals into existing programs,

5. Ability to be reached through mailings.

"Souvenirs of Lake Michigan" was ultimately designed with teachers of kindergarten through eighth grade in mind. This audience was chosen for its receptivity to new ideas in curriculum and teaching methods, the potential multiplier affect, political neutrality, easy accessibility by mail, and relative freedom to attend a week-long workshop. Elementary teachers were also deemed the group most able to introduce and impact children with Lake Michigan Coastal Region awareness early in their conceptual and affective development. Teachers of secondary education were not specifically sought because of the rigidity of most high school curricula and the highly departmentalized nature of the content of secondary courses of study.

Teachers were chosen as the focus of the course because of the multiplier effect of their contacts. School-age children were the ultimate target of the ideas developed by "Souvenirs of Lake Michigan." However, children are not likely to be reached except through the adults who directly impact and guide their lives. For an opportunity to develop coastal awareness to be presented to children in a school setting, it must first be presented to teachers. It is the teacher who must be provided the chance to become aware of the coastal region before that teacher can be expected to present awareness activities to students. The teacher is the key to change in classroom curricula, attitudes and activities. The teacher must be presented with experiences that bring about intellectual stimulation, awareness of problems and possibilities, and opportunities for attitudinal change before being able to facilitate the same for others.

It is unrealistic to presume that Lake Michigan Coastal Region curriculum would be included in any classroom situation without the personal dynamic involvement of the teacher. "Souvenirs of Lake Michigan" was therefore designed to provide the participating teachers with the widest possible exposure to the geologic, economic and sociologic conditions of the Illinois Lake Michigan coastal region.

The 19 teacher participants of the workshops included teachers from Cook, DuPage, Lake, Will, and McHenry Counties. Their teaching experience included primary, intermediate, junior high and high school. Specialty areas of physical education, special education, biology, earth science and mathematics as well as the self contained classroom were represented. One-fourth of the participants had been involved in the pilot workshop taught in the Spring of 1977. The non-teacher participants in "Souvenirs of Lake Michigan" included a charter fishing boat captain from the Waukegan Charter Boat Association, the CETA funded aide to the Illinois Beach State Park Naturalist and a graduate student in Parks and Recreation from Northeastern Illinois University.

A promotional flyer was prepared by Barbara Pavilonis of Pavisions. The flyer was mailed to schools and school administrators in Cook and Lake Counties in Illinois. The mailing labels were obtained from the Illinois Office of Education by Wayne H. Schimpff, Chief Naturalist of the Illinois Department of Conservation. The actual mailing was done by the Illinois Coastal Zone Management Program offices in Chicago, Illinois.

The conception, promotion, and execution of the workshop were carried out by Mobius; Incorporated, a group of people dedicated to inquiry and the proposition that all things change. "The Chase is the Thing" is their creed. As a team they have presented numerous workshops in elementary science education methods, new developments in science education, Great Lakes ecology, and energy education. Mobius, Incorporated members are Gretchen Hanson, Science Specialist for Avoca School District 37; Carl Bollwinkel, Science Department Chairman for Palatine School District 15: and Larry Small, Science Consultant for Schaumburg School District 54.

Assistance was provided by Wayne Schimpff, Chief Naturalist of the Illinois Department of Conservation; Darrell Johnson, Park Naturalist of Illinois Beach State Park; Donna Christman, Program Manager of the Illinois Coastal Zone Management Program; Peter Wise, Past Chief of the Bureau of Resource Regulation, Illinois Department of Transportation; Jim Kashmier, Liaison and Public Participation Officer of the Illinois Coastal Zone Management Program, and Vicky Wong, Liaison and Public Participation Assistant of the Illinois Coastal Zone Management Program.

Dr. Charles Collinson of the Illinois Geological Survey is to be thanked for presenting an introduction to the geology of the Illinois Lake Michigan Coastal Region as a part of the workshop.

Captain Verne Soballe, Director of the Port of Chicago; George Hanekamp, of the Port of Chicago; Tom Donovan of the office of Chicago Mayor Michael Bilandic; Edward Seniff of the Harbor Pilot Association of the Great Lakes; Captain Tom Gockel of the Waukegan Charter Boat Association, and Linda Wilson,

Assistant Curator of the John G. Shedd Aquarium are to be thanked for their assistance in the execution of the workshop.

Graduate credit for participants was arranged by Dr. John Hockett, Dean of the College of Environmental and Applied Science of Governors State University, Park Forest South, Illinois. The resulting course was entitled: "Ecological Study: Living With the Lake" (#EAS 8500). The competencies for the course include:

Locate and use appropriately natural and manmade features of Illinois Beach State Park.

Recognize and use in non-consumptive ways the physical and biological elements of the coastal environment.

Apply concepts of ecology in determining appropriate human uses for this coastal environment.

Select and develop educational activities appropriate to their students and the coastal environment.

Integrate the use of Illinois Lake Michigan Coastal Region activities into existing curricula in science and other subjects.

Design and implement their own classroom utilization projects for the Illinois Lake Michigan Coastal Region.

Coordination of activities and responsibilities of the various agencies and consultants was managed by Wayne H. Schimpff.

CHAPTER II
WORKSHOP ACTIVITIES

Some philosophical background is necessary for a complete understanding of the design and intent of the workshop activities.

The success of Mobius, Incorporated is based on the synergistic relationship of its members. The design of Mobius, Incorporated endeavors is to facilitate the development of a synergistic experience for all participants through experiences that prompt inquiry, change, wonder, dialog, commitment and commeraderie.

"Souvenirs of Lake Michigan" workshop activities were designed to provide maximum opportunities to examine the geologic, sociologic and economic past, present and future of the Illinois Lake Michigan Coastal Region and to integrate this knowledge into classroom curriculum.

The workshop was divided into two parts: Exploration and Integration.

The first three days of the workshop (Monday through Wednesday, June 26, 27, 28) constituted the exploration phase. Activities during this time were designed to expose the participants to as much of the Illinois Lake Michigan coastline as physically possible. During this exposure geologic, sociologic and economic factors of the Illinois Lake Michigan coastal region were introduced. It was hoped that the participants would be overwhelmed by the amount of information they received about the region, the contrast of uses of the coastline, the resulting impact on the condition of the region, and the possibilities inherent in the region as it presently exists.

The integration phase of the workshop occurred during the final two days (Thursday and Friday, June 29 and 30). The group was provided with a common home base (camping site) and encouraged to reflect, philosophize and to begin to internalize the exposure to the Illinois Lake Michigan coastal region into their own lives and teaching. Because of the interaction of the participants and instructors in the exploration phase, a trust bond had been established that allowed this shift in emphasis to take place.

A large conference room was rented at the Holiday Inn Lodge at Illinois Beach State Park. This room served as headquarters for workshop activities; providing shelter in case of inclement weather, a secure storage area for workshop materials, and a comfortable meeting space for indoor activities.

Monday, June 26

Site: Illinois Beach State Park Nature Center
9:00 a.m. to 4:30 p.m.

Participants gathered at the nature center for an introduction and overview of the activities for the workshop. Care was taken for each instructor and participant to give a personal self-introduction and to raise questions. Students received packets of materials that provided background information

coordinating with the workshop activities. Time was provided for exploring the nature center.

An introductory hike through the Dead River Nature Preserve provided the participants with an initial view of the only remaining natural portion of the Illinois Lake Michigan coastline. Features of the preserve were examined including the native and non-native species of flora, the cyclical nature of the Dead River; the impact of the Easter, 1977 fire, the ridge and swale nature of the land, temperature changes, and local fauna. The hike continued through the park to allow identification of the group camping area and ended at the meeting room at the Lodge.

Following lunch, Dr. Charles Collinson of the Illinois Geological Survey presented an overview of the geology of the Illinois Lake Michigan coastal region. The National Film Board of Canada film "The Rise and Fall of the Great Lakes" was shown. Dr. Collinson then conducted a shoreline tour of the park while discussing the geological formation of the area as well as recent and possible future erosion effects on the shore.

The participants were dismissed after making arrangements for the following day.

Tuesday, June 27

Site: Illinois Lake Michigan Coastline from
Winnetka to Indiana
8:00a.m. to 4:30 p.m.

Participants met at the parking lot of a Junior High School in Wilmette, Illinois. A bus had been chartered for the day. The purpose of the day's activities was to present a wide view of the recreational, residential, commercial and municipal uses of the Illinois Lake Michigan coastal region.

The format of the morning segment of the day was adapted from the "Illinois Coastal Zone Management Program Third Year Project: A Shoreline Tour" developed by the Landmarks Preservation Council and Service.

An interesting feature of this day was the changing weather situation which existed. As the group disembarked at their first stop, Tower Road Beach in Winnetka, Illinois, rain was falling heavily. When the group assembled on the the beach at the foot of the bluff, they were confronted with a heavy fog that was rapidly slipping in across the immaculate, yet deserted, beach. Subsequent stops along the tour saw a shift in the weather from the early thunderstorms to bright sunshine.

Other points of interest in the morning tour included Wayside, the home of social reformer Henry Demarest Lloyd, the Illinois Coastal Zone Management bluff restoration project in Kenilworth, the small boat harbor and the original mouth of the north branch of the Chicago River at Gillson Park in Wilmette, the historic Grosse Point Light House, the Northwestern University land fill area and the Dawes House in Evanston.

During this segment of the day, the historical aspects of communities along the shore, shipping on Lakes and Lake Michigan water use allocation were presented. Erosion patterns and human attempts to thwart erosion were also noted.

The tour continued down Lake Shore Drive to Navy Pier where gracious arrangements had been made by George Hanekamp, of the Port of Chicago. Following a picnic lunch at Navy Pier, the group was put aboard the Great Lakes Harbor Pilot Association boat (courtesy of Captain Edward Seniff) or onto a Chicago Fire Department Rescue boat for the continuation of the tour down the Illinois Lake Michigan Coast and into the Little Calumet River, the Cal-Sag Canal and Lake Calumet. As the by now bright sun shone down, the participants found themselves dealing not only with a change in the weather, but subsequent changes in shore usage: from recreational and residential to the heavily industrial development of the southern end of the Illinois Lake Michigan coast. When possible, points of interest were called to the attention of the group.

This phase of the tour ended at Lake Calumet. After disembarking, the group was received by Max Cohen, Director of Lake Calumet at his office. He discussed the creation, present functioning and future plans for the development of Lake Calumet.

The chartered bus returned the group to Wilmette. The intensity and variety of the day's experience left many of the group attempting, with some difficulty, to resolve and integrate the various forms, functions and faces of the Illinois Lake Michigan coastal region that had been seen during the day.

Wednesday, June 28

Site: 12th Street Beach and John G. Shedd Aquarium
9:30 a.m. to 4:00 p.m.

The activities for day three of "Souvenirs of Lake Michigan" were designed to narrow in on a specific urban coastal site and the learning opportunities available at such a site. Participants met on the steps of the John G. Shedd Aquarium in Chicago. From there the group was led to the 12th Street Beach on the lake side of Miegs Field.

Stream tables were constructed along the beach and used to simulate shore line development, erosion patterns, and the impact of manmade structures on the lake shore. An interesting contrast was presented by the re-creation of age-old wave patterns alongside a modern airfield.

Participants obtained beach sand samples which were poured through graduated sieves. These samples were examined for their origin, composition, deposition patterns and economic importance. Corings of the sand were taken and preserved along with the sievings for comparison with samples to be taken at Illinois Beach State Park.

A picnic lunch was eaten overlooking the Chicago skyline and the Monroe Street Harbor.

The afternoon was spent at the John G. Shedd Aquarium. Linda Wilson, Assistant Curator of Education, discussed the programs the aquarium has to offer both students and teachers. She presented a "behind the scenes" tour and enabled the participants to collect water, flora, and fauna samples from Burnham Harbor adjacent to the aquarium. These samples were brought back to the fresh water laboratory of the aquarium for closer inspection. For many, this was their first experience in collecting such samples or in conducting specific tests.

Thursday, June 29 and Friday, June 30

Site: Illinois Beach State Park

The final two days of the workshop were designed to offer experiences that would encourage the participants to reflect upon what they had seen and experienced in the first three days of the workshop, to think through their own values as applied to the Illinois Lake Michigan Coastal Region, and to begin to internalize the exposure to the region into their own lives and teaching.

The previous highly transient nature of the workshop was changed to a stable site for the remainder of the workshop as the participants were brought together for an intense final 36 hours of contact.

As participants arrived at Illinois Beach State Park Thursday morning, they helped to set up a camping site which was to be headquarters for the group. Four large tents were erected and picnic tables assembled. After establishing camp, a new experience for many, the day's activities got underway.

Dichotomus keys were introduced by way of "The Shoe Game." As proficiency with this type of key was developed, the participants keyed out plants along the shore using a key specifically designed to identify the plants found in the Dead River Nature Preserve.

The concept of transecting an area to recognize patterns of successional development was introduced. Following lunch, the participants worked a 400 meter transect line from the water's edge inland to the first set of black oak trees. Using specifically designed information sheets, records were made every five meters of the soil and air temperature, percentage and composition of vegetation, sand/soil composition, and land slope. By staggering the starting positions of each small group of participants, a complete record was obtained for the entire 400 meter distance.

Sample seivings of the beach sand and corings were also obtained. It should be noted that the enthusiasm and motiviation level of the participants was so high that they worked consistently over a three hour period in the bright sun of a 95 degree day. Excitement reigned at each new discovery - whether that discovery was found at meter three or three hundred ninety-three. When the transect study was completed, participants were given a free period with instructions to be back at the campsite by 5:00 p.m.

"Coast Mime", a land use simulation game, was developed by Mobius, Incorporated for use along the Illinois Lake Michigan coastal region. The intent of "Coast Mime" is to focus on the political, social and economic forces at work when land use regulation legislation is proposed. "Coast Mime" relies heavily upon the device of role playing. As participants assembled at the campsite, they were given specific assignments in the game such as reporters, legislators, and representatives of special interests. The "press party" segment of the game took place in the convivial atmosphere of the campsite as hors' douvres and cool drinks were served. The game was brought to its conclusion prior to dinner.

After dinner had been served and the clean up accomplished, the entire group assembled on the beach for a period of reflection and sharing. Songs from The Great Lakes Songbook and poetry from The Great Lakes Reader were used to initiate discussion. The sharing experiences and thoughts expressed dealt with earlier experiences with Lake Michigan and other bodies of water, individual needs that are filled by involvement with a natural area, and philosophies of education.

The day's activities culminated with a "star party" (observations of the early summer sky) and a "snipe hunt", complete with a hand made snipe.

Friday morning began with a bird hike led by Darrell Johnson. Early Friday morning, Captain Tom Gockel of the Waukegan Charter Boat Association took five of the participants fishing on his charter boat. A successful catch of one steelhead and one chenook delighted the anglers. An early morning downpour sent participants scurrying for the shelter of the conference room at the Lodge. Breakfast was prepared at the campsite, but was served at the conference room.

The morning provided an opportunity to conclude activities begun earlier in the workshop. The transect was compiled and a slide and cassette presentation given on the succession of a natural environment. One participant exclaimed,'Now I see it. The whole world is in a state of succession."

A streamtable equipped with an electrical motor had been set and allowed to run for 24 hours. The resultant formations were compared with those obtained with the stream tables constructed at the 12th Street Beach. The two sets of sand sievings and corings were comparatively examined. A film entitled "Sand" was shown and helped to fill in the gaps of understanding related to sand.

The weather cleared late in the morning, enabling the participants to beachcomb for materials to be used in craft projects. The Great Lakes Craftbook provided detailed instructions for printing, sculptures, mobiles, fish casts, fish prints, sun prints and sand casting. Participants were encouraged to try each of the projects which had been set up in a learning station format.

After lunch the group began the task of integrating in a classroom curriculum what had been experienced in the "Souvenirs of Lake Michigan" workshop. A materials pot pourri was presented by the instructors. The resources and references delineated in the bibliography were shown and their relevance explained.

The culminating activity of the workshop was a brain storming session involving all participants. The group was seated in a circle on the floor. In front of each person was a noisemaker to be used if criticism or limitations were expressed in response to an idea. For approximately an hour, the group was encouraged to express in an open, creative manner any and all ideas related to the possible creation of a curriculum for the study of the Illinois Lake Michigan Coastal Region.

Following the general brainstorming session the participants were divided into groups according to the age of the children they taught (primary, intermediate, jr. high and high school). The groups addressed the questions of what specific content and affective areas should be included for that particular grade level, what conditions existed that might interfere with the implementation of such a curriculum and ways to overcome such difficulties. Written summations of these small group discussions were collected.

In closing the workshop, the participants gathered to hear remarks by Wayne Schimpff, Darrell Johnson, and the Mobius, Incorporated staff. Appreciation for the participants' enthusiasm, willingness, cooperation and insight was expressed. Traditional "Black Tailed Hebron Awards" were presented to each participant in recognition of the valued contribution each individual had made to the workshop.

CHAPTER III
CONCLUSIONS OF WORKSHOP PARTICIPANTS

The culminating activities of the workshop provided participants a forum to express conclusions regarding workshop activities and recommendations for further Lake Michigan educational opportunities.

Participant-written evaluations and verbal commentary gave high praise to the workshop experiences and activities. Cited as especially valuable were the Introductory Walk, Geology Overview, Stream Tables and Sand Studies, Transect Studies, Plant Keying and Identification, Shedd Aquarium, Art Activities, Shoreline and Boat Tour. The actual personal physical involvement with various Lake Michigan coastal region sites seemed to offer the most intellectually challenging experiences.

Suggestions for future Lake Michigan workshops included:

1. Making the reference and materials bibliographies and items available the first day and throughout the workshop.

2. Increase the time allotted for the transect studies.

3. Include a trip through the locks at the mouth of the Chicago River.

4. Increase the narrative given during the boat trip.

5. Create separate workshops for each level of educator.

6. Increase the time allotted to the study of specific content areas.

7. Include more of the political aspects of Coastal Region use.

Ideas and hopes expressed by "Souvenirs of Lake Michigan" participants for further educational opportunities were prolific, creative, and diverse. The ideas are delineated here under the following headings: Development philosophy and methods, specific areas of study, curriculum materials, activities, development of a Lake Michigan Coastal Region Ecology Station, teacher motivation and public awareness.

Development Philosophy and Methods

Philosophical aspects for development of a coastal curriculum were suggested throughout the workshop. Those considerations delineated here represent some but not all of the philisophical elements needed in developing a curriculum.

Activities that are developed for a coastal region curriculum should be based on inquiry -- process teaching techniques. The curriculum should provide open-ended activities that are adaptable for use in differing time allotments and in various subject areas.

The curriculum should recognize existing curricula, supporting the goals of education for the Great Lakes coastal environment. Activities developed for the coastal curriculum should be correlated with, and when possible, included into existing curricula.

Effort should be taken to utilize fully those facilities, sites, personnel, and organizations presently involved with the care and consideration of the Coastal Region.

A group of interested, committed, and competent people need to be trained to serve as generators of ideas, writers, pilot project directors and teachers, evaluators and supporters of the project.

In developing the curriculum and its materials consideration should be given to the following items:

1. Flexibility of approach to accommodate various groups using the curriculum. It should be applicable -- adaptable to those groups not living directly on the shore of Lake Michigan. This may necessitate the development of extensive audio visual materials.

2. Discrepant events should be included to facilitate intellectual growth on the part of the learner.

3. Recognizing the implementation difficulties inherent in any new curriculum, some of the units should be of an elective or mini-course nature.

4. Materials developed for the curriculum should be consistent with the intellectual development of the children for whom it is being written.

Specific Areas of Study

These specifically suggested topic areas to be included in a curriculum developed for the Illinois Lake Michigan Coastal Region and the Great Lakes should not be considered a complete and all-encompassing base from which a curriculum should be developed. These suggestions represent those ideas shared by participants during the closing activities of the "Souvenirs of Lake Michigan Workshop."

1. Ecology of Lake Michigan including flora, fauna, food chains, energy flow in the lake.

2. Geography of Lake Michigan including the physical geography of the region and its implications for human development of the area.

3. Geology of the region, both past and present.

4. Meteorological effects of Lake Michigan on the surrounding land mass.

5. Succession patterns of the coastal region including natural and manmaded successional changes.

7. The condition of the Lake in regard to pollution and erosion.

8. Interdependency of the elements affecting and affected by the ecosystem of Lake Michigan.

9. The economic needs and considerations of the region.

In the Activities section of this chapter, suggested ways to pursue some of these areas of study are proposed. However, not all the topics had correlating activities suggested for them.

Curriculum Materials

Very few curriculum materials directly concerned with the Illinois Lake Michigan coastal region presently exist or are commonly available to teachers. Such materials need to be developed for the successful implementation of all phases of the curriculum.

Curriculum materials would include audio visual materials (films, film strips, overhead transparencies, maps, charts) specific to the Great Lakes and Lake Michigan.

A stream tables unit with directions for constructing equipment should be developed and water quality testing equipment should be made available.

Reading materials for the Great Lakes and Lake Michigan and its Illinois coastal region also need to be developed. These may include "Great Lakes Readers," short books or pamphlets containing related articles on subjects pertinent to a study of the Great Lakes; i.e., shipping, the St. Lawrence Seaway, Indians of the Great Lakes, early settlers.

Monographs could be developed at various levels of difficulty to enhance the spiralling sequence of the curriculum. These one-topic books or pamphlets might cover such ideas as sand, glaciers, harbors.

Simulation activities developed for a Great Lakes Coastal Region could include a land use simulation such as "Coast Mime," food chains, the water cycle.

Suggested Activities

It should be noted that the following suggestions by no means encompass all of the possible activities for a Lake Michigan Coastal Region Curriculum -- rather these suggestions represent those ideas submitted during a idea session following the "Souvenirs of Lake Michigan" workshop.

1. Establish a "Lake Michigan Fair" patterned after "Science Fair" formats. Topics of interest and concern would be researched and presented by students. Local and regional competitions could be held.

2. Develop instructions for establishing and maintaining a fresh water aquarium of Lake Michigan organisms for use in the classroom,

3. Design a unit to simulate shoreline development, erosion patterns and the effects of erosion control measures through the use of easily constructed stream tables,

4. Design an orienteering course(s) for the Illinois Lake Michigan coastal region.

5. Design units for beach studies, These units could be:

   a. Sand studies covering origin, composition and deposition of sand.

   b. Making sand from existing rocks,

   c. The beach in fall, winter, spring, summer,

   d. Sand structures. Such beach studies would serve to legitimize "playing at beach" by establishing the objectives and possible educational outcomes of such "play."

6. Design and help to implement field trips for the high school student. These trips could be offered several times a year and would need to be sufficiently structured in nature to meet with approval from school administrators. Field trip design should include ways and means of freeing high school students and teachers for such trips. (At present the existing high school structure is not as conducive to field trips as is the elementary school). It was suggested that secondary teachers who have successfully overcome these barriers share their methods of establishing and conducting field trips with other teachers.

7. Design a set of value clarification activities regarding the Illinois Lake Michigan coastal region,

8. Establish a "Save the Lake Day," patterned after Earth Day and Sun Day to provide a vehicle to increase awareness of Lake Michigan and its coastal region.

9. Design tests of water quality that include turbidity, chemical analysis and ability to support life,

10. Provide acclimatization activities suitable for the Lake Michigan coastal region,

11. Establish population studies specific to Great Lakes and Lake Michigan. These could begin with familial relationships for the young child and develop into demographic studies of the region and the resulting implications for human and lake ecology,

12. Establish a curriculum for the study of the social aspects of Lake Michigan and its coastal region. This curriculum would include the history of human habitation of the region, the role of the region on the settlement of the nation, the economic importance of the region locally, nationally and internationally. The various uses of the region -- commercial, municipal, recreational, and individual -- would be studied for the interdependency of their nature.

13. Develop a guide of the permanent and migratory birds of the area.

14. Establish a program of political studies for Lake Michigan Coastal Region. This program would consider:

    a. Laws governing the area,

    b. Identifying holders of political power,

    c. Federal, state and International political considerations of the region,

    d. Ownership of Lake Michigan itself, and its surrounding shoreline,

    e. What agencies and individuals control policy making for Lake Michigan and its coastal region,

    f. Lake Calumet as a case study,

    g. Law enforcement in the region,

    h. Water allocations.

15. Develop a program of comparative studies of the five Great Lakes.

16. Design studies of the successional patterns of the region. These studies should be developed for various levels of students. A study of the successional patterns of the Illinois Dunes as seen at Illinois Beach State Park should be developed. Successional studies should include the use of a transect. Designs for several types of transect studies would be prepared with accompanying record sheets and equipment. These transect plans should be done in metric measurement and encompass mapping techniques and mathematical considerations.

It should be noted that recommendations were received for including the time parameters for teaching each unit as an aid to teacher planning. It was also strongly suggested that each unit begin with some type of activity that not only is an attention-getter, but one that creates a need-to-know situation within the learner.

Lake Michigan Coastal Region Ecology Station

The need to create a permanent Lake Michigan Coastal Region Ecology Station was seen as having a high priority by the participants. Developing such an area would provide a center for curriculum development, teacher training, a lending library of audio-visual materials and research data, and a recognized and easily identifiable source of educational resources and expertise for all levels of Illinois Lake Michigan Coastal Region studies. This station could provide for residential and non-residential Lake Michigan environment education experiences at a lake site. The types of activities it offers might include a summer school course for high school students that could be taken in lieu of or in addition to biology, enrichment courses for junior high school students, a site for a Voyage Brigade, and a site for children's studies of the lake. The set of experiences available at the station would be designed to present the interrelationship of the historical, recreational, economic, social and ecological aspects of the Lake. Activities would employ a multi-disciplinary approach. Various experts from the area could be available for presenting classes as well as offering consulting services. A coastal region station could also provide internships for high school and college students in environment studies and education.

Teacher Motivation

Teacher interest and comfort with a particular subject are the keys to the successful presentation of that material to students. To facilitate that interest and comfort with Lake Michigan and its coastal region, an extensive teacher training program needs to be developed. This training could be provided within the "in-service" programs of a school or district through offering a capsulized "Souvenirs of Lake Michigan" Workshop, field trips that offer first hand experience, providing the teachers with a well-developed set of curriculum materials and legitimizing the inclusion of Coastal Region studies by support and encouragement of Boards of Education and the communities. The benefits of such an in-service program would be maximized by the inclusion of all teachers of a school or district in the program. Graduate level courses on Lake Michigan and its coastal region could be offered to teachers to counteract their lack of knowledge and to provide methods for presenting Lake Michigan studies to children. Field courses designed for secondary school teachers could be developed.

One participant in "Souvenirs of Lake Michigan" made the following comments, "We need more courses like this ("Souvenirs of Lake Michigan") that give us something we can relate to our students and to our own lives. Otherwise, to gain additional credit hours to stay current or advance on our pay scale,we end up taking courses like 'advanced parisitology' which has little or no application to our own lives or those of our students."

CHAPTER IV
CONCLUSIONS OF "SOUVENIRS OF LAKE MICHIGAN" INSTRUCTORS

The "Souvenirs of Lake Michigan" Workshop was an overwhelming success in the degree to which the goals of its design were met and the participants were impacted by an awareness of Lake Michigan. The format for the workshop had been developed in careful response to the "Conclusions and Recommendations for Future Workshops" of the pilot workshop held in the Spring of 1971.

For future Lake Michigan workshops an earlier mailing of the promotional flyers is recommended. At least six weeks should be allotted between the mailing and the beginning of the workshop. This particular mailing was directed to principals of schools just at a time (the last two weeks of the school year) when most principals have a tendency to drop such flyers in the wastepaper basket. While a general mailing allowed a diverse audience to participate, a specific audience could be achieved by using the State Office of Education mailing list for a particular type of teacher (science, mathematics, etc.). It would be advisable to include in any future teacher workshop mailing the Illinois Science Teachers Association mailing list for Region I (northeastern Illinois) and the mailing list for the Illinois Environmental Education Association. Governors State University, as the academic credit institution of the workshop, should be asked to promote the workshop through its own publicity and participation channels.

The format, techniques, and materials for "Souvenirs of Lake Michigan" Workshop were considered highly successful and appropriate. At this time there are no recommendations for changing the style or actual execution of the workshop.

"Souvenirs of Lake Michigan" is an attractive, well-designed model on which future workshops could be based. The audience for the Lake Michigan workshops has been primarily elementary teachers. Secondary teachers were not directly sought but experience with the participants would indicate that future teacher workshops should not be restricted to any particular level of teachers. The interaction of elementary and secondary teachers proved to be of benefit to all. A second type of workshop could be designed to include a more detailed exploration of concepts specifically for secondary teachers. This might take the form of an advance course as participation in a general awareness experience is seen as crucial to create the desired awareness in the participants.

"Souvenirs of Lake Michigan" type of workshop could be offered to many types of groups: Park and Recreation District personnel (perhaps through the Illinois Association of Parks and Recreation Districts), community leaders, youth organization leaders, adults involved in adult or continuing education programs, family groups through park and recreation districts or community education programs, and Lake Michigan related organizations. Adaptations could be made in the workshop format to provide the most advantageous experience for each audience. As in all

endeavors designed to bring about attitudinal change, it needs to be recognized that workshops on Lake Michigan regardless of audience are working toward long-term results and implication.

There was some initial disappointment in the number of participants in "Souvenirs of Lake Michigan" when compared to 39 participants in the previous year's pilot project. However, the fewer number of participants was of benefit to the overall success of the workshop. The smaller number of people facilitated greater involvement with the instructors, other participants and the coastal region environment. The degree to which dialog between instructors and participants and among participants was possible is a direct function of the smaller number of people. The element lacking in the previous workshop was that dialog. The types of idea sharing at the end of the workshop was possible due to the size of the group that allowed each person to have direct input into the conclusions and recommendations. Each person became integral to the function and success of the program.

CHAPTER V
SPINOFF BENEFITS OF THE "SOUVENIRS OF LAKE MICHIGAN" WORKSHOP

"Souvenirs of Lake Michigan" was seen by the instructors as a vehicle to bring about changes in individuals on behalf of the Illinois Lake Michigan coastal region. This change was to take place within the consciousness of the participants; in a heightened awareness of the coastal region, its needs and considerations; in the individual's perceptions of being effective in terms of doing something for the region, in the individual's perceptions about children's learning, and in the individual's understanding that as a resident of the region he or she cannot live apart or aside from those elements that impact the region.

"Souvenirs of Lake Michigan" was worth all of the energy, time and resources expended to permit its execution. This statement is made from the personal evaluations of both instructors and participants. The spinoff benefits of the workshop have been overwhelming.

Ninety third grade children at the Aptakisic Tripp School District in Prairie View, Illinois will participate in a week-long unit on Lake Michigan.

Eugene Field School, Chicago is utilizing "Souvenirs of Lake Michigan" materials as part of the "Options in Environment Education" program of the Access to Excellence program of the Chicago Board of Education. Florence Pashkin, principal, has offered her staff and schools as a pilot center should a Great Lakes or Lake Michigan curriculum be developed.

St. Philip of Neri School, 72nd and Jeffery, Chicago is utilizing workshop materials and has also offered to be a pilot school.

Avoca District 37 is utilizing "Souvenirs of Lake Michigan" in the third, fifth, and sixth, grades. What had been "Oceanography" is now Limnology.

Palatine District 54 has made a video cassette program of a fourth grade's trip to Illinois Beach State Park. This cassette has been developed as a teacher in-service training tool to facilitate other class trips to the Lake.

Dr. Stuart Spitzer, Environment Education Coordinator of the Chicago Board of Education, has recommended that "Souvenirs of Lake Michigan" materials be used as the base of Lake Studies to be used at the Environmental Education Awareness site of the South Shore Country Club. Ms. Kay Kandrac, site director, has received the materials and been in contact with Mobius for consultation.

The Illinois Lake Michigan Coastal Region has been selected for use as a case study topic for a film strip series "Environmental Issues"

produced by Projected Learning Program, Reno, Nevada. The film strip is entitled "Coastal Region Usage - Lake Michigan Case Study."

Cheryl Brown and Alice Urbaniak, high school teachers in Chicago, initiated a teacher campout weekend at Illinois Beach State Park. Forty teachers and their families participated.

Workshop materials were given to Linda Wilson, Assistant Curator of Education of the John G. Shedd Aquarium. Aquarium representatives plan to utilize the bibliographies and Great Lakes Reader. The John G. Shedd Aquarium has offered a letter of institutional support for a curriculum development project on Lake Michigan.

Director of the Great Lakes Commission, Dr. A. G. Ballert, contacted Mobius to request workshop materials. Dr. Ballert plans to utilize the materials in a course he teaches on the Great Lakes.

The First Congregational Church in Wilmette instituted a Lake Michigan course in July at its "Family Camp" at Sawyer, Michigan.

The workshop participants have initiated a "reunion" set for mid-January to renew friendships, exchange ideas, and to share again in the glow of involvement generated during the workshop.

Was "Souvenirs of Lake Michigan" worth it? An unequivocal "Yes."

When all the participants had gone home late in the afternoon of June 30, Mobius sat down for a few moments of reflection. Carl Bollwinkel offered a statement that epitomizes the feelings of each member of Mobius.

"I've given hundreds of workshops over the years. If I never do another one at <u>least</u> I can say this one was truly a success - it was good."

CHAPTER VI
RECOMMENDATIONS OF THE STAFF OF "SOUVENIRS OF LAKE MICHIGAN" WORKSHOP

Although millions of people live within the Illinois Lake Michigan Coastal Region, this general populace has extremely limited knowledge of the limnological aspects of the region despite the sociologic, economic, and ecological influence of the region upon the lives of its residents. The impact and significance of the Illinois Coastal area is not recognized by the public.

The creation of a knowledgeable adult citizenry begins with the education of the young to the factual and psychological forces at work in the region. Very little has been or is being done to create an awareness on the part of children to the significance and impact of this unique region upon their lives.

Teachers of kindergarten through high school classes are not prepared to use the Illinois Lake Michigan Coastal Region as a teaching resource primarily because there are very few curriculum materials available that are directly concerned with Great Lakes limnology generally and the Illinois Coastal Region specifically. There has been insufficient effort made to compile and distribute research materials on the Great Lakes and the Illinois Coastal Region to the public and to teachers at pre-college levels. Oceanography is taught in Illinois Lake Michigan Coastal Region schools because there are few teaching resources available for the study of Lake Michigan and Great Lakes Limnology at pre-college levels.

The great overriding human concern for the quality of life demands close examination of the use and misuse of natural resources. One of these resources is the Illinois Lake Michigan coastal region. Lake Michigan and the management of its coastal region influence the quality of life through ecologic, sociologic and economic factors. The resources afforded by the Illinois Lake Michigan coastal region are not being utilized to the ultimate welfare of the ecosystem of which they are a part.

Therefore, it is the recommendation of Mobius that an educational program be developed to provide opportunities for cognitive growth that will promote attitudinal and behavioral change on the part of the residents who are a significant force in the Illinois Lake Michigan coastal region ecosystem.

The primary goal of an educational program for the Illinois Lake Michigan coastal region is the creation of a knowledgeable, thinking, caring adult population, aware of and concerned with the finite nature of their coastal region. This goal must be approached as one that will be long term in nature as well as one that may have few visible signs of success in its initial stages.

The objectives for an Illinois Lake Michigan Coastal Region Curriculum Program are:

1. To research, design and develop an educational curriculum and materials to increase knowledge and understanding of the various aspects of the Illinois Lake Michigan Coastal Region for use with elementary and high school students and continuing education programs for adults.

2. To acquaint teachers with the teaching applications of the Illinois Lake Michigan Coastal Region.

3. To acquaint teachers with compatible usage activities of the various resources of the Illinois Lake Michigan Coastal Region.

4. To familiarize teachers with curriculum materials on the Illinois Coastal Region for use with their classes.

5. To develop comprehensive plans for institutionalizing Illinois Lake Michigan Coastal Region studies through their infusion into existing courses.

The proposed curriculum for the Illinois Lake Michigan Coastal Region would make use of the best educational techniques and research available. The concepts would be approached in a multi-disciplinary manner: offering an integration of social science, science, language arts, mathematics, and the arts.

The mode of learning utilized will be the process inquiry method. The objectives for the curriculum may be grouped into five categories:

1. Skills: for example, manipulative inquiry, investigative, organizational and communicative;

2. Concepts: for example, hypothesis, theoretical, model, taxonomic category;

3. Cognitive abilities: for example, critical thinking, problem solving, application, analysis, synthesis, evaluation, decision-making, creativity;

4. Understanding the nature of science: for example, the multiplicity of scientific methods and the interrelationship between science and technology.

5. Attitudes: for example, curiosity, interest, risk-taking, objectivity, precision, confidence, perseverance, satisfaction, responsibility concensus and collaboration, appreciation, and awareness.

Inquiry process is the preferred method of curriculum design and implementation on the belief that:

I hear . . . . and I forget.

I see . . . . and I remember.

I do . . . . . and I understand. (Ancient Chinese Proverb)

The concept-cognitive content of the curriculum would include the geologic, sociologic, economic, technologic and ecologic aspects of the Illinois Lake Michigan coastal region. These concepts would be incorporated into a spiralling sequence of objectives. A concept may be introduced to a very young child and later developed to increasingly complex levels of understanding. The concepts would be presented at levels compatible with the child's degree of intellectual development.

The topics possible for inclusion under each of the content areas (geology, sociology, economics, technology and ecology) are many and offer a delightful panorama of learning opportunities (A review of suggestions offered by the workshop participants gives some insight of the multitude of topics that might be included in such a curriculum).

Materials and equipment would need to be specifically designed as the curriculum develops. As little or no previous materials now exist for the Illinois Lake Michigan coastal region, the largest part of this curriculum project would be the research and development of teaching materials and equipment.

Learning units would be developed that would require varying lengths of instruction time. These units could be developed for as short a time as one class period to units requiring several weeks for completion.

A variety of learning materials would be included to provide for the differences in schools, teachers, and children's methods of learning . A partial listing of these learning materials might include learning centers, monographs, slide guide sets, field trips (containing a list of procedures and materials to be used in organizing activities before, during and after a field trip - including a list of activities for the bus ride, teacher and student reference materials, charts and diagrams, etc.), field investigations, films, film strips, charts, maps, classroom packets for specific learning concepts, and an awareness packet for each school in the Region.

Mobius specifically recommends that all curriculum materials be prepared with an understanding that the visual appeal of such materials has a considerable role to play in the implementation and actual use of such materials. A visually "uninteresting" format would be difficult to "sell" to administrators and teachers.

Integral to the success of a curriculum project are the methods of teacher training employed on behalf of the project. The implementation process of the program would include a design for the initial training of teachers as well as supportive services for those teachers actively engaged in using the curriculum.

Evaluation objectives and methods to measure student progress would be included in the curriculum materials. Evaluation materials would be included for measuring both the cognitive and affective aspects of the program.

Evaluation of the program itself would be accomplished by consultation with subject area authorities, by field testing of the educational materials followed by revision of the materials and additional field testing.

Curriculum development project of this scope would require a long-term commitment. Such a project could most feasibly be undertaken in steps that would break the project into stages. These stages might be set up on one to three year cycles.

Stage 1 — Part 1 - Curriculum (A Plan for Learning) Development: the design and development of a conceptual framework for:

a. Rationale

b. Philosophy

c. Goals

d. Methodology

e. Materials

f. Evaluation

g. Scope and Sequence of the curriculum for primary through adult education

h. Developmental scheme for dissemination and implementation of the curriculum

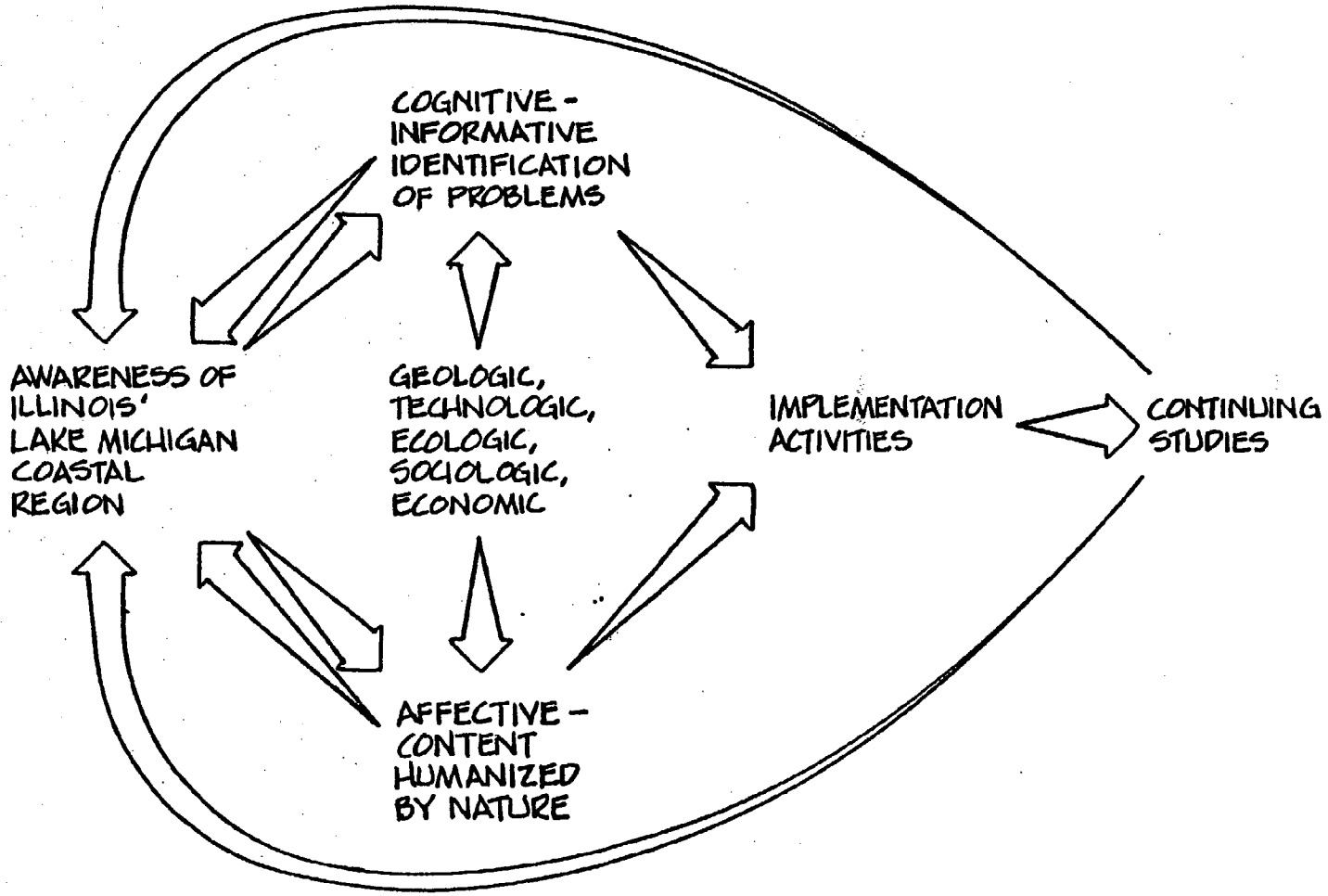
Part 2 - Development of specific pilot modules of materials.

Stage 2 — Part 1 - Further clarification of the components of the conceptual framework through consultations and field testing of developed materials.

Part 2 - Development of additional learning modules for all levels of instruction.

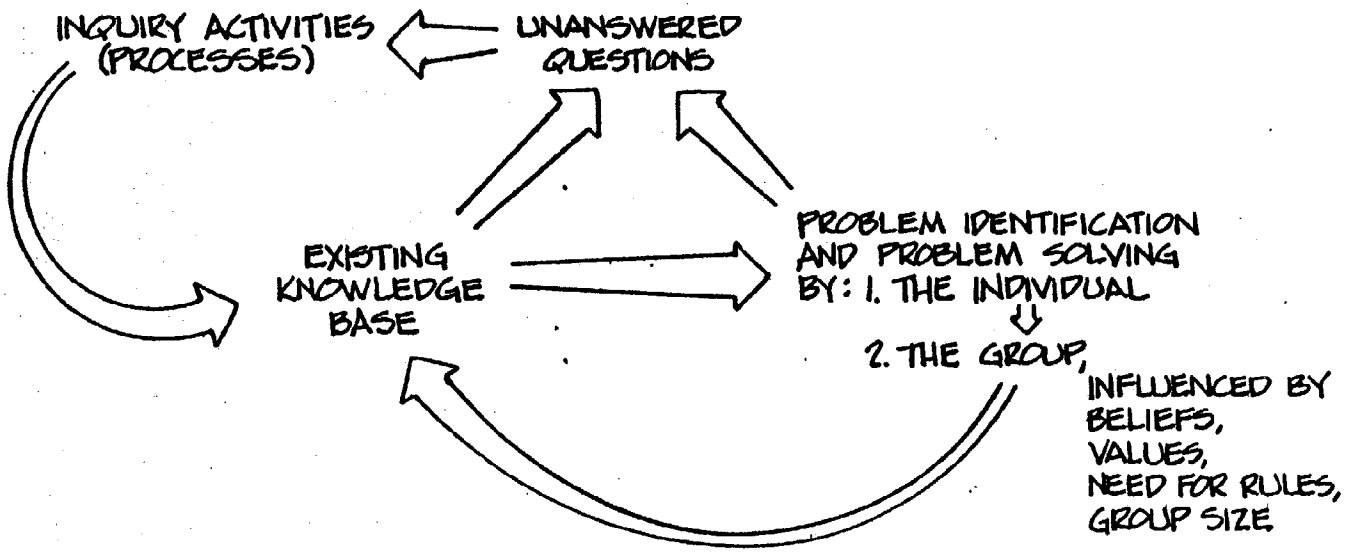
Stage 3 — Creation of an Illinois Lake Michigan Coastal Region Education Center to provide a permanent location for continuing the development of materials and perpetuating Coastal Region education (As the Lake changes so must the curriculum).

SCHEME OF CURRICULUM DESIGN FOR THE ILLINOIS LAKE MICHIGAN COASTAL REGION



MODEL FOR PROCESS INQUIRY LEARNING

THE NATURE OF SCIENCE IS THAT OF:
1. A HUMAN ENTERPRISE
2. A SEARCH FOR KNOWLEDGE
3. A PROBLEM SOLVING ENDEAVOR



AN INDIVIDUAL OR GROUP MAY ENTER AT ANY STAGE OF THIS LEARNING CYCLE, DEPENDING UPON THE SITUATION.

The staff for the Illinois Lake Michigan Coastal Region Curriculum Project should be comprised of educational specialists who are knowledgeable about the region. A part-time consultant staff would offer the necessary expertise in specific content areas.

The conclusions and recommendations regarding the development of a Curriculum for the Illinois Lake Michigan Coastal Region are drawn from the knowledge and experience of Mobius. It is the fervent hope and desire of Mobius to be instrumental in the creation of a curriculum for the Illinois Lake Michigan Coastal Region.

CHAPTER VII
REFERENCE MATERIALS

"SOUVENIRS OF LAKE MICHIGAN"

1. Natural History

Dillard, Annie, Pilgrim of Tinker Creek, Bantam Books, Inc., New York NY, 1975. "A mystical excursion into the natural world."

Downing, Elliot, A Naturalist in the Great Lakes Region, University of Chicago Press, Chicago, IL, 1922. Two chapters dealing with the plants and animals of the Indiana sand dunes but not Illinois Beach State Park.

Hungerford, Harold, Ecology, the Circle of Life, Childrens Press, Chicago, IL, 1971. Book on ecology for upper grade students. Explains succession but does not deal with sand succession.

Komaiko, Jean and Schaeffer, Norma, Doing the Dunes, Dunes Enterprises, Beverly Shores, IN, 1973. This book was first considered a "text" for our course, but was eliminated when we found that, out of 232 pages, 48 concerned science and nature. The book deals with the Indiana dunes, but those 48 pages are still very concise, and an excellent sampling of an environment which sports much of the same flora, fauna, and geology of Illinois Beach State Park. It might be well worth the $2.50 to explore the difference.

Leopold, Luna B., Round River from the Journal of Aldo Leopold, Oxford University Press, New York, NY, 1972. Essays and excerpts from Journals of Aldo Leopold. Information on animal habitats and canoeing from travels across U.S.

Palmer, Laurence E., Fieldbook of Natural History, McGraw-Hill Book Company, New York, NY, 1949. A good pictoral field identification guide without keys.

Steinhacket, Charles with Susan Flader, The Sand County of Aldo Leopold, Sierra Club Book, San Francisco, CA, 1973.

Watts, May Theilgaard, Reading the Landscape: an Adventure in Ecology, Macmillian, New York, NY, 1957. Excellent chapter on Indiana Sand Dunes.

2. Art

Elam, Jane, Photography, Simple and Creative, With and Without a Camera, Van Nostrand Reinhold Company, 1975. Especially exciting and creative ideas for use in making photograms. This book assumes you do not own lots of expensive equipment. $5.95 - worth it!

Escher, Maurits Cornelius, The Graphic Work of M.C. Escher, Ballantine Books, New York, NY, 1967. Exciting graphics, many of Mobius strips.

Radford, Don, Science, Models, and toys, Science 5/13, MacDonald Education, London, England, 1974. Available through "The Science Man", (see sources).

Richards, Roy, Holes, Gaps, and Cavitities, Science 5/13, MacDonald Education, London, England, 1973. Available through "The Science Man", (see sources).

Snead, Stella, Beach Patterns, the World of Sea and Sand, Barre Publishing, Barra, MA, 1975. Available through National Audubon Society, 950 Third Avenue, New York, NY, 10022, 1975. Sale price $2.98; List price $12.95.

3. Botany

Cowles, H.C., The Ecological Relations of the Vegetation on the Sand Dunes of Lake Michigan, Bot. Gaz. 27:95-117, 167-202, 281-308, 361-391, 1899. Data chiefly from the study of dunes in northwestern Indiana and vicinity of Chicago.

Gates, Frank C., The Vegetation of the Beach Area in Northeastern Illinois and Southeastern Wisconsin, Bull. Illinois State Lab. Natural History, 9:255-272, 1912. A thorough study of the physiography, climate, edaphic factors, and plant associations of that area. Species list and bibliography included.

Jones, G.N., Flora of Illinois, Ed. 2, University of Notre Dame Press, South Bend, IN, 1950. Plant identification key for teachers.

Mholenbrock, Robert H., Forest Trees of Illinois, Department of Conservation, Division of Forestry, Springfield, IL, 1973.

Parker, Sheila, Trees, Science 5/13, MacDonald Education, London, England, 1973. Available through "The Science Man", see sources.

Pepoon, H.S., An Annotated Flora of the Chicago Region, Chicago Acadamy of Sciences, Natural History Survey Bulletin No. 8, 554 pp., 1927. Includes material on the flora of Waukegan "moorlands" and ravines, woodlands and littoral of the North Shore.

Voss, John and Eifert, Virginia, Illinois Wild Flowers, Popular Science Series Vol. IV, Illinois State Museum, Springfield, IL, 1967.

Weaver, John E., and Clements, Frederic E., Plant Ecology, McGraw-Hill Book Company, New York, NY, 1938.

4. Geology

_____, Rocks and Charts, Elementary Science Study, Webster Division, McGraw-Hill Book Company, New York, NY, 1969. See sources.

_____, Stream Tables, Elementary Science Study, Webster Division, McGraw-Hill Book Company, New York, NY, 1971. See sources.

_____, Crusty Problems, Intermediate Science Curriculum Study, Silver Burdett, Morristown, NJ, 195 pp., 1972.

Bretz, Harlen, Geology of the Chicago Region, Part I-General. Bulletin 65 Illinois State Geological Survey, Urbana, IL, 61801, 1939, reprinted 1964.

Illinois State Geological Survey, Urbana, IL, 61801, Education Series: Rocks and Minerals of Illinois, No. 1, Guide to the Geologic Map of Illinois, No. 7, Field Book - Pennsylvanian Plant Fossils of Illinois, No. 6, Rock and Mineral Set of Illinois, (one set per school).

de Michele, Vincenzo, The World of Minerals, Orbis Publishing, London, England, 1976. Available from the National Audubon Society, 350 Third Avenue, New York, NY, 10022.

Willman, H.B., Summary of the Geology of the Chicago Area, Circular 460, Illinois State Geological Survey, Urbana, IL, 61801, 1971.

Zim, Herbert and Shaffer, Paul, Rocks and Minerals: A Guide to Familiar Minerals, Gems, Ores, and Rocks, Golden Press, New York, NY, 1957.

5. Zoology

_____, Tracks, Elementary Science Study, Webster Division, McGraw-Hill Book Company, New York, NY, 1971. See sources

Chase, Charles and Chase, Myron, Field Guide to Tracks of North American Wildlife, NASCO, Ft. Atkinson, WI, 1969.

Eddy, Samuel and Hodson, A.D., Taxonomic Keys to the Common Animals of the North Central States, exclusive of worms, insects, and birds, Burgess Publishing Company, Minneapolis, MN, 1961.

Kendeigh, S. Charles, Animal Ecology, Prentice Hall, Inc. Englewood Cliffs, NJ, 1961.

6. Techniques

_____, Material Objects, Science Curriculum Improvement Study, Rand McNally and Company, Chicago, IL, 1970. See Sources.

Collis, Margaret, Using the Environment: Early Explorations, Investigations, Parts I and II; Tackling Problems, Parts I and II; Ways and Means, Science 5/13, MacDonald Education, London, England, 1974.

Fairwell, Kay, OBIS Trial Edition Set I and Set II, Outdoor Biology Instructional Strategies, Lawrence Hall of Science, University of California, Berkley, CA, 94720, 1975.

Hillcourt, William, Outdoor Things To Do, Golden Press, New York, NY, 1975.

Kjellstrom, Bjorn, Be Expert with Map and Compass, the "Orienteering" Handbook, revised, Charles Scribner's Sons, New York, NY, 1975.

Minnesota Environmental Sciences Foundation, Inc., Transect Studies, National Wildlife Federation, Educational Servicing, 1412 16th Street, Washington, DC, 20036, 1972. 24 booklets available such as Shadows, Wind, Nature's Part in Art, Outdoor Fun for Students.

Swan, Malcolm, Tips and Tricks in Outdoor Education, The Interstate Printers and Publishers, Inc., Danville, IL, 61832, 1970.

Wentworth, D.F., Mapping Small Places--Examining Your Environment, Winston Press, 25 Groveland Terrace, Minneapolis, MN, 55403, 1972.

The Illinois Coastal Zone Management Program, Division of Water Resources, Illinois Department of Transportation, Springfield, IL. List of Second Year Publications:

VOLUME I:	LEGAL ANALYSIS
VOLUME II:	COASTAL GEOLOGICAL STUDIES
VOLUME III:	BEACH & BLUFF PROTECTION
VOLUME IV:	COASTAL BIOLOGICAL STUDIES
VOLUME V:	COASTAL USE NEEDS & CAPACITIES
VOLUME VI:	PUBLIC PARTICIPATION

7. Film Strip

Hungerford, Harold, Life in a Sand Dune Succession, 1345 Diversity Parkway, Chicago, IL, 60614.

8. Sources

Forestry Suppliers, Inc.
Box 8397
205 West Rankin Street
Jackson, MS 39204

Rand McNally & Company
P. O. Box 7600
Chicago, IL 60680

The Science Man - Lee M. Jorik
4738 North Harlem
Harwood Heights, IL 60656

Ward's Natural Science Establishment
P. O. Box 1712
3000 East Ridge Road
Rochester, NY 14603

Webster Division
McGraw-Hill Book Company
5940 Touhy
Niles, IL 60648

CHAPTER VIII
CURRICULUM MATERIALS

Curriculum Materials for Souvenirs of Lake Michigan were of two types. The first are materials that had been previously developed by a variety of sources. These materials were researched and compiled as a part of the participant information packet.

The second set of materials are those that were researched, written and compiled specifically for "Souvenirs of Lake Michigan." These materials were created by Mobius, Inc.

Previously existing curriculum materials include:

"A Day at the Beach." Ann McGeady. Winston Churchill School, Palatine, Illinois.

Abrams Planetarium Sky Calendars for June and July, 1978. Abrams Planetarium, Michigan State University, East Lansing, Michigan.

"Introducing the Dichotomous Key In the Middle School." Science and Children. May, 1974.

Show Case of Wild Things - Illinois Beach State Park Nature Preserve.

"Reasons for the Urgent Need to Preserve Illinois Beach State Park." Floyd Swink. Morton Arboretum, Lisle, Illinois.

"Messing About in Science." Science and Children. February, 1965.

Science Notes of the Chicago Academy of Science:

The Indiana Dunes
Design in Nature is Mathematical
Pond Life, Parts 1 and 2
Chicago Ancient Coral Reefs
The Chicagoland Prairie

"Basic Grammar of Track Language." Curious Naturalist Supplement 18-A. Massachusetts Audubon Society.

Project 1: Sun Pictures

Essex Publication of Science Resource Center, School District 15, Palatine, Illinois.

Flow

Spring

Balance

"Introduction to a Pond." Knock the Four Walls Down, Nick Rodes.

"Insight: Suburbs Getting Lake Water Will Feel the Drain." Chicago Daily News.

"Living With The Lake." Illinois Coastal Zone Management Program. (Brochure)

"Living With The Lake." Landmarks Preservation Council and Service. (Map)

"Beaches and the Curving of Waves." Crusty Problems Module of ISCS Level 3. Florida State University.

"Middleboro." A land use simulation game by Mary Keegan of Winnetka Public Schools, Winnetka, Illinois.

U. S. Geological Survey Teacher's Packet Information Sheet.

"Charles Gates Dawes Mansion." The Evanston Historial Society.

"Harmony With The Lake - A Guide to Bluff Stabilization." Illinois Coastal Zone Management Program.

"The Dunesland Heritage of Illinois." Illinois Natural History Survey.

"Development of the Metropolitan Sanitary District of Greater Chicago."

"The Lake." Chicago Magazine, August, 1977.

"Chicago - A Background Report." Chicago Tribune, 1978.

"A Sand County Almanac." Aldo Leopold. Ballantine Books, New York, New York, 1949.

"Living With the Lake." Illinois Department of Transportation. Illinois Department of Transportation, Coastal Zone Management Program, 300 North State Street, Room 1010, Chicago, Illinois 60610, 1972.

"Today's Art." The Flax Company. The Flax Company, Chicago, Illinois 60601, April, 1977. How's and Why's of Watercolor Painting.

"How to Lead a Field Trip." Ward's National Science Establishment, Inc. Ward's National Science Establishment, Inc., Rochester, New York, and Monterey, California, 1970. Price: .25

"Identification of Environmental Education Concepts for Inclusion in an Elementary Curriculum." Delphi Survey Technique, prepared by Sybil Audean Allman, University of Nebraska, May, 1972.

"Reasons for the Urgent Need to Preserve Illinois Beach State Park." Floyd Swink. Floyd Swink, Botanist-Ecologist, Morton Arboretum, Lisle, Illinois.

"A Sound of Thunder." Ray Bradbury. Harold Matson Company, Inc., 1952.

"The Faces of the Great Lakes." Jonathan Ela. Sierra Club, 1977.

"Beach: River of Sand." Encyclopedia Britannica Films, 1965.

"Succession: Communities Chane-Over Time." Carl Bollwinkel. Projected Learning Programs, 1978.

Specifically Designed Materials for Souvenirs of Lake Michigan:

"Coast Mime." A land simulation game specific to the Illinois Lake Michigan Coastal Region.

"Reading Suggestions." An annotated bibliography of readings for children and adults related to the Great Lakes.

"A Key to Some of the Plants Most Commonly Observed in June in the Sandy Areas of Illinois Beach State Park."

"Line Transect Record Sheet."

"Transecting the Dunes."

"Living With the Lake Reader." An anthology of poems, stories and personal reflections of the Great Lakes.

"Living With the Lake Craftbook." A compilation of craft projects using natural objects.

"Living With the Lake Song book." A compilation of songs appropriate to the Great Lakes.

(See appendix of materials)

CHAPTER IX
FINANCIAL REPORT

Funding for "Souvenirs: Living With The Lake" was supplied in the form of a grant of $5,000.00 from the Illinois Coastal Zone Management Program.

The funds were allocated in the following manner:

Planning & Evaluation Time for Workshop	$1,600.00
Reference Materials	643.57
Camping and Materials	416.76
Transportation for Instructors and Field Trips	696.29
Preparation and Editing of Recommendations for Use in Developing Instructional Materials	897.00
Workshop publicity, printing and mailing	599.65
Evaluation preparation, mailing and review	146.73
TOTAL	$5,000.00

CHAPTER X
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Jr. High Life Science

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APPENDIX

The materials specifically designed and developed for the "Souvenirs of Lake Michigan" workshop should not be considered to be in their final form. They were prototypes, developed as pilot materials, to be used, evaluated and further developed.

No effort has been made to secure copywriter permission for the materials included in the Great Lakes Reader and the Great Lakes Song Book. These were compiled for educational purposes as examples of what a person might develop to facilitate cognitive and affective learning regarding the Great Lakes coastal region.

While these materials should not be regarded as finished products, neither should they be regarded as finite in nature. They offer a beginning.

COAST-MIME

Purpose of the Game: To simulate, in an informal atmosphere, the situation which now exists concerning the Illinois Coast use.

Materials: Name tags for each player
Writing materials for note-taking
Enough copies of the "bill" and the "role plays" for players

Players: 2 Reporters, one for each side of the argument (in a classroom, it might be suggested to have 2 for each side.)
11 Representatives, one for each of the 11 shore sectors in the Illinois Coastal Area
1 "Speaker of the House"
9 (or any multiple of 9) to play the various roles (any number will fit here; just keep track of the number of people in each role category.)

Method of Play:
This method is suggested, but please invent variations! This can take from an hour and a half to a few months, depending on how far you want to go with it. Much of the simulation is very contrived; keep this in mind when presenting to the children.

Four basic time periods:

1. The "Press Party" (20 to 30 minutes) (a contrivance!)
   Interested parties who represent all viewpoints attend this gathering. Each person acts his or her role to his or her fullest and tries to mingle with the crowd as much as possible. Those who support a particular position should try to convince the Congressman or Congresswoman, or Press representative that their position is the "right" one. The "Press," depending on their roles, should take notes with which to write their "editorials." People in each "role group" should team together to choose a spokesperson for the hearing. This person will present the group's position to the legislature during the hearing.
2. The "Hearing" (20 to 30 minutes)
   During this time the reporters prepare their "editorials," based on information and quotes gathered from interviews at the "Press Party." Spokespersons will, at this time, present their groups' positions, one at a time, to the legislature.
3. The Reading of the Articles (optional)(10 minutes-no discussion)
   To gain some insight into the possibility of human error, and the power of persuasion in the press, the reporters should now read the "editorials" which they have spent the last period writing. A more effective classroom technique would probably be to have the articles really "published," then distributed before the vote.
4. The Vote (10 to 20 minutes)
   The "Speaker" calls the role, during which the members of the Legislature vote "For,""Against," or "Pass." The Speaker then reads the final tally and announces the fate of the bill.

Tally: 1___ 2___ 3___ 4___ 5___ 6___ 7___ 8___ 9___ 10___ 11___

Reporters_____,_____,_____
_____

Representatives 1._____ 2._____ 3._____

THE ROLES

+1 You work for the Illinois Department of Transportation, and helped to write the "bill" which is in question. From all angles that you have viewed the situation, you can see your plan as the only choice, and the only way to save the shoreline. Convince others of the benefit of the plan.

+2 Your house is just about ready to slide into Lake Michigan. It is an old family estate that has been willed to you. If you had listened to the state 4 years ago, and had taken their advice on planning methods seriously, you would not have your current problem. Convince others to adopt the program.

+3 You are on the board of your city council. You realize that your city could have saved $100,000 in planning fees last year if the CZM plan had been in effect. Your city has, among other things, just shelled out $800,000 for a new sand groin. You were a geology major in college and think that steps like that must be taken in order to save the city's beaches.

-1 You have just paid $2,000,000 for some gorgeous lakefront property on which you intend to build condominiums. You intend to keep the land aesthetically appealing to all, and promise to listen to federal or state "advice" on anti-erosion devices for your land as long as you can use your own money, build your condominiums, and keep the government out of your personal business. You are very opposed to receiving any money from the government, because you think that would surely mean government control over YOU!

-2 You are a Condominium builder with your very own successful company. You also are on the Zoning Board of your municipality. You have recently, with the approval of the rest of the Board, of course, approved one sector of the coast for zoning in the "condominium" category. This will mean a new job for your company, who happens to get most of the contracts on the shoreline for this type of project. See what you can do to change some minds.

-3 You are a construction worker, or the spouse of a construction worker. Your family of 8 children has seen very hard times, especially through the last bitter winter. You (or your spouse) have been laid off for 6 months now, and a new job at a condominium site would mean a return to a decent standard of living for you and your family...new car, stability, food. Convince the opposition to understand the economic facts of life.

=1 You are a taxpayer who is also interested in the conservation of the lakeshore and its natural resources. You realize that new work for people in the area would mean less tax dollars spent for welfare and unemployment, but you also think that the coastline is in need of preservation. Your job is to decide how you feel about the issue, based on what you hear from all sides.

=2You are an environmentalist who would like to see more "teeth" in the law. You would like to see the zone expanded from the boundaries proposed by the bill. You are very disappointed with the "meager" $1.2 million which has been suggested. In addition to money for zoning regulatory boards, you'd like to see money given to help people build the necessary anti-erosion devices. You like the plan, basically, but want it to go farther. By convincing people to vote "against," you might either succeed in killing the bill completely or you might get people to reconsider writing a new one in your favor. By pushing a "for" vote, you may not get everything you want, but you may get "nearer" to your goals. Listen to others and take a position.

=3 You have worked for many years to become the proud owner of a sailboat. The city harbors are filled, and the North Shore Harbors are impossibly crowded. You would like to see a new marina built, but you also know that with that would come the motels, the taco joints, and the souvenir stands. Find the position that benefits you most, and stick by it.

Representatives, cont'd:

4._____ 5._____ 6._____

7._____ 8. _____ 9._____

10._____ 11._____

"Speaker of the House"_____

Roles

+1 _____ +2_____ +3_____

-1_____ -2_____ -3_____

=1_____ =2_____ =3_____

If you have extra people, make sure that you assign roles so that all sides are balanced fairly. If an even number, assign - and + roles. When there is an odd number, assign the "odd man out" as an =role.

STATEMENT OF PROBLEM: Vote "Against" or "For" this bill, whose main purpose is to designate the Lake Michigan shoreline in Illinois as a special regulatory zone.

THE SITUATION: The Illinois shoreline has suffered from shore erosion, bluff erosion, and coastal flooding in recent years. A government survey found that public and private losses from shore erosion in the state from 1972 to 1975 exceeded $25 million.

High water levels have seriously eaten away at the bluffs overlooking the lake at Lake Bluff, Lake Forest, and Highland Park.

At least 17 homes atop those bluffs are in danger of being undercut, according to Coastal Zone Management researchers.

THIS BILL WOULD:

1. Allocate to the Communities within the Zone $1.2 million in annual shore preservation money, which may be used for planning, design, and administration of the project.
2. Require riparian (living on the edge of a body of water) owners to obtain a special building permit for construction or land modification within the zone.
3. Allow municipalities to issue such building permits, but only if the towns are certified* by the state CZM office.
   (*to be "certified," a town must adopt ordinanaces against shore erosion and water pollution, and agree to the plan's general "priorities of land use" along the shore.)
4. Promote zoning for boat marinas, beaches, and other "coastal-dependent" uses over housing or commercial development.
5. Create off-shore spawning areas for trout and salmon.
6. Require "certified" towns to adopt "set-back" ordinances, prohibiting erection of a permanent structure east of a "high risk erosion line," which ranges up to 90 feet landward of the bluff's edge.
7. Fine the owners of such illegal structures up to $1,000 per day.
8. Allow construction in the erosion-prone area only if the builder includes extensive anti-erosion devices along the shore.
9. See that the structures currently in violation of this law not be affected by it, but instead be "grandfathered" in.

Much of the material for the "bill" you see here was obtained from an article by John McCarron, which appeared in the Metro / North section of the Chicago Tribune, Thursday, April 28, 1977. Much of the material for the role plays was also inspired by that article, the Preliminary Draft, November 1976, of the Illinois Coastal Zone Management Program, and the Briar Place Brainstorming sessions.

READING SUGGESTIONS

THE ART AND INDUSTRY OF SANDCASTLES. Jan Adkins. Walker PUblishing Co. 1971. Grades 5-8 and all other readers. 29 pages. Informational. #107

Twenty-nine 11" x 15" hard-cover pages. This unique book cleverly combines the popular seaside occupation of sand castle building with the lives and times of ancient castle dwellers. The handsome monochrome illustrations show the sand castle builder and how and why of castle construction; they help develop a vocabulary and a historical perspective in the process. Thoroughly enjoyable.

THE BEAVER POND. Alvin Tresselt. Lothrop, Lee & Shepard Co. 1970. Grades 1-6. 17 pages. Fiction.

Following the construction of a beaver dam, there is a complex and predictable succession of ecological events. This book tells the story of the history of a beaver pond and meadow. There are about 28 illustrations, most of which are in color.

THE BIGGEST HOUSE IN THE WORLD. Leo Lionni. Pantheon Books, Inc. 1968. Grades K-2. 30 pages. Fiction. #101

A story about a snail and his longing for the "biggest house." Large, colorful pictures should enhance the appeal of this book to the youngest readers.

A BOOK OF SNAILS. Sally Moffet Kellin. Wm. R. Scott, Inc. 1968. Grades 5-6. 48 pages. Informational.

A reference book about snails includes the snail's life cycle and instructions for keeping them as pets in terrariums. Reference is made to why snails may be considered as pests. Black-and-white photographs help to make this book a good selection for high-interest reluctant readers.

CLIMATOLOGY AND WEATHER SERVICES OF THE ST. LAWRENCE SEAWAY AND GREAT LAKES. U. S. Weather Bureau. Technical paper No. 35 1959.

DIRECTORY OF SHIPWRECKS OF THE GREAT LAKES. Karl E. Heden. Bruce Humphries Publishers. Boston. 1966.

ELISABETH AND THE MARSH MYSTERY. Felice Holman. The Macmillan Co. 1966. Lower Intermediate. 49 pages. Fiction.

A mystery story that offers information as well as intrigue. Elisabeth and a friend try to identify strange calls from the marsh. In doing this they learn about bird migration. The facts in this book do not seem dull because humor is maintained through story-telling.

EXPLORING A BROOK: LIFE IN THE RUNNING WATER. Winifred and Cecil Lubell. Parents Magazine Press. 1975. Lower Intermediate. 61 pages. Informational. #114

A one or two-page explanation of the various kinds of plant and animal life found in and near a brook. Pencil sketches illustrate each description.

FISHES. Brian Wildsmith. Franklin Watts, Inc. 1968. Primary. 34 pages. Informational.

A picture book about names given to different groups of fish. Illustrated in shimmering colors. Geared to the primary student but holds aesthetic enchantment for lower intermediate groups.

FISHES. Herbert S. Zim and Hurst H. Shoemaker. The Golden Press. 1955. Middle School and others. 160 pages. Informational.

For the identification of the common fresh and salt water fishes of North America. Species are identified by color pictures. Common and scientific names are given. Useful guide for beginners.

FISHES OF THE GREAT LAKES REGION. Carl Hubbs and Karl Lagler. Bulletin 26 (rev.). Bloomfield Hills, Michigan. Cranbrook Institute of Science, 1958.

FISHING FOR TUNA. Lewis Allison. Melmont Publishers, Inc. 1957. Lower Middle School. 35 pages. Informational. #104, #105

The ships, nets, and procedure of catching tuna are well described. Good monochrome illustrations of tuna and tuna fishing.

FISH IS FISH. Leo Lionni. Pantheon Books, Inc. 1970. Grades K-2. Fiction.

An enchanting story about the way a fish imagines the outside world as described to him by a worldly frog who's seen it. Beautiful illustrations.

FRESHWATER FURY YARNS AND REMINISCENCES OF THE GREATEST STORM IN INLAND NAVIGATION. Frank Barcus. Wayne State University Press, Detroit. 1960.

THE GREAT LAKES READER. Walter Havighurst. New York, New York. The Macmillan Company. 1966.

GEOLOGY OF THE GREAT LAKES. Jack L. Hough. Urbana, Illinois. University of Illinois Press. 1958.

THE GLACIAL LAKES SURROUNDING MICHIGAN. Robert W. Kelly. Lansing, Michigan. Michigan Department of Conservation. December 1960.

GREAT LAKES COUNTRY. Russell McKee. New York, New York. Thomas Y. Crowell Co.

GREAT STEAMBOAT MYSTERY. Richard Scarry. Random House. 1975. Grades K-2. Fiction.

Mr. and Mrs. Pig staged a party on a steamboat and hired two detectives to protect the wedding gifts. Nevertheless, there's a theft and quite a mystery until the clever detectives bring the story to a happy ending. Attractive cartoon illustrations.

GULLS. Sarel Eimerl. Simon and Schuster. 1969. Grades 4-8. 64 pages. Informational. #202

Nature writer Sarel Eimerl describes various members of the gull family, their feeding and hunting habits, and their migratory and courtship behavior. Illustrated with 30 black-and-white photographs. Index included.

HARVEY'S HIDEOUT. Russell Hoban. Scholastic Book Services. 1972. Grades K-3. Fiction. #108

The story of a rivalry between a brother and sister muskrat who soon realize they are lonely and need each other. Good for children with brothers and sisters. Cute brown illustrations.

HIGH WATER AT CATFISH BEND. Ben Lucien Burman. Puffin Books. 1974. Grades 4 and up. 123 pages. Fiction.

Enchanting story of five animals who realize they must forget their personal problems and work together. Their home is the Mississippi flood plains and they are disgusted with the way humans are contolling floods. They unite to do something about it.

LAKE ERIE. Harlan Hatcher. Bobbs Merrill Company.

LAKE HURON. Fred Landon. Bobbs Merrill Company.

LAKE MICHIGAN. Milo M. Quaife. Bobbs Merrill Company.

LAKE ONTARIO. Arthur Pond. Bobbs Merrill Company.

LAKE SUPERIOR. Grace Lee Nute. Bobbs Merrill Company.

THE LAST FREE BIRD. Harris A. Stone. Prentice-Hall, Inc. 1967. All grades. Fiction. #104

A plea to save our environment is made in this picture book for all ages. Beautiful water color illustrations.

LOG TRANSPORTATION IN THE LAKE STATES. W. G. Rector. Glendale, California. A. H. Clark Company. 1953.

LORE OF THE LAKES. Dana Thomas Bowen. Cleveland, Ohio. The Lakeside Printing Company. 1948.

LIFE IN A POND. Carmelita Kipple Robinson, et al. Golden Press. 1967. Primary. 28 pages. Informational. #114

Presents the living things of a pond with labels and a few words of text. Only two pages on plants. The animals represented include common fishes, frogs and toads and their life cycles, snakes, turtles, salamanders, snails, crayfish, insects and birds. Attractively hard-bound.

A MAP IS A PICTURE. Barbara Rinkoff. Thomas Y. Crowell Co. 1965. Upper Elementary School and others. 35 pages. Informational.

Various kinds of maps and charts and their symbols are introduced. This brief experience could lead to many educational experiences.

MARSHES AND MARSH LIFE. Arnold Dobrin. Coward-McCann. 1969. Grades 4-8. 47 pages. Informational.

The author successfully describes marsh life in terms of the effects that seasonal changes and tidal fluctuations have on the marsh's inhabitants. The well written book is illustrated with the author's brilliant watercolors. A strong case is made for marsh conservation.

NORTH, SOUTH, EAST, AND WEST. Franklyn M. Branley. Thomas Y. Crowell Co. 1966. Grades 3 and up. Informational. #105

The useful skill of knowing how to determine directions is dealt with here. Shadows, compasses, and maps are used to help determine north, south, east, and west. Simple, clear illustrations.

PADDLE-TO-THE-SEA. Holling Clancy Holling. Houghton Mifflin Co. 1941. Grades 3-5. Fiction. #110

An excellent book for learning about the flow of water from the snow on the mountaintop to salt water in the ocean. A young Indian boy carves an Indian in a canoe that he places in the snow on a mountain near the Great Lakes. The book traces its voyage to the Atlantic Ocean. Wonderful illustrations.

PIONEERS OF EARLY WATERWAYS. Edith McCall. Childrens Press. 1961. Middle School. 127 pages. Biography.

A collection of storeis about early Americans on the canals and rivers. Includes stories about Davy Crockett, Mike Fink, and Mark Twain. A steamboat race is the climax.

THE POND. Donald and Carol Carrick. The Macmillan Co. 1970. Grades K-2. 33 pages. Informational #114

Contains little science, but the watercolors by artist Donald Carrick are good. They portray pond life in the style of oriental silk screens. The text by Carol Carrick is poetic, but too brief.

POND LIFE: A GUIDE TO COMMON PLANTS AND ANIMALS OF NORTH AMERICAN PONDS AND LAKES. George K. Reid. Golden Press. 1967. Middle School and others. 160 pages. #114 Informational.

Mostly a very usable manual for identification of a wide variety of common plants and animals of fresh water ponds, including birds and mammals. There is a very brief treatment of the physical features of the pond and of aquatic ecosystems, and a bibliography and five-page index. Useful for amateur pond watchers of all ages.

THE RAINBOW BOOK OF NATURE. Donald Culross Peattie. Collins, William & World Publishing Co., Inc. 1957. Grades 3-6. 319 pages. Informational.

This lengthy resource book includes many different aspects of nature: ecosystems; plants and their unique characteristics; animals and their unique characteristics; the effects of temperature and surroundings on plants and animals; and the interactions between species. Factual text and life-like illustrations.

RED FOX AND HIS CANOE. Nathaniel Benchley. Scholastic Book Services. 1973. Grades K-2. 64 pages. Fiction.

A young Indian boy, Red Fox, wants the largest canoe in the world. Who would have guessed all the animals along the river would want to take a ride--all at the same time?

SANDPIPERS. Edith Thacher Hurd. Thomas Y. Crowell Co. 1961. Grades K-2. Informational. #102

Simple but descriptive words make this "Let's Read and Find Out Science Book" a pleasure. The child will surely come away with a clearer understanding of the sandpiper.

SCIENCE ON THE SHORE AND BANKS. Elizabeth K. Cooper. Harcourt, Brace & World, Inc. 1960. Informational.

Useful guide for observing, gathering, and studying various forms of plant and animal wildlife in shallow fresh and salt waters.

THE SECRET THREE. Mildred Myrick. Harper & Row Publishers. 1963. Primary. 64 pages. Fiction. #107

A story about three boys at the beach who form a club with secret signals, coded messages, passwords, and a meeting place. They have a campout on a beach island and explore dunes, shells, grasses, etc.

SEE THROUGH THE LAKE. Millicent Selsam. Harper & Row Publishers. 1958. Lower Intermediate. 48 pages. Informational.

An explanation of lakes--how they are formed, what types of life they support, and the effect of the land around them. A description of specific types of life found at different levels of water is included. Pictures showing clearly what the author is discussing aid in understanding for the young reader.

SHIPS THAT NEVER DIE. Marine Historical Society of Detroit. Detroit, Michigan. 1952.

SHIPWRECKS OF THE LAKES. Dana Thomas Bowen. Cleveland, Ohio The Lakeside Publishing Company. 1952.

"SOME SEA TERMS IN LAND SPEECH". Samuel F. Batchelder. The New England Quarterly (January-October). 1929. pp. 625-653.

A delightful compendium of nautical terms in the U. S. language.

THREE BOYS AND A LIGHTHOUSE. Nan Hayden Agle and Ellen Wilson. Charles Scribner's Sons. 1951. Lower Middle School. 100 pages. #105, #110 Fiction.

A good story with a few black-and-white illustrations about the adventures of three boys who spend a summer helping to tend a lighthouse.

THE TRUE BOOK OF PEBBLES AND SHELLS. Illa Podendorf. Childrens Press. 1954. Primary. 47 pages. Informational. #102

An explanation, with accompanying pictures, of how some of the pebbles and shells that might be found on a beach came to be there. The author identifies for the young reader what the shells look like.

THE TRUE BOOK OF SHIPS AND SEAPORTS. Katharine Carter. Childrens Press. 1963. Primary. 47 pages. Informational. #105, #110

A general descriptive book about different kinds of ships. A brief history of ships and their importance is given. The author closes with a chapter about different kinds of seaports and ways in which people depend on them.

WEATHER OR NOT. Wallene T. Dockery. Abingdon Press. 1976. Grades 4 and others. 32 pages. Fiction.

Young people visit a weather station and are introduced to the basic principles of meteorology and how a weather forecast is made. Fictionalized format contains a lot of information.

THE WHITE PALACE. Mary O'Neill. Thomas Y. Crowell Co. 1966. Lower Intermediate. 48 pages. Fiction (poetic story).

This is an animal fiction story that conveys information to the reader. It is the story of the life cycle of a Chinook salmon. His life begins and he moves into the "white palace." A plot develops and the author's description of the fish's behavior and habitat are credible. Wash drawing illustrations are used in thos book.

YOU CAN MAKE SEASIDE TREASURES. Louis Beetschen. Pinwheel Books. 1971. Middle School and others. 32 pages. Informational. #102

Describes a number of arts and crafts activities that can be done with sand and other items commonly found on beaches. Included are sand molding, making shell necklaces, painting pebbles, building sand castles, and collecting shells. Also includes games to be played at the beach.

AMERICANS AND THE WORLD OF WATER. Harold L. Goodwin (ed.). *University of Delaware Sea Grant College Program.* 1977. Highly recommended!

THE GREAT LAKES READER. Walter Havighurst, New York, New York. The Macmillan Company. 1966.

OF MEN AND MARSHES. Paul L. Errington The Iowa State University Press. 1957. Grades 8-12. 150 pages. Informational. #202, #208

This is a book of memories and philosophy by a man who rose from fur trapper to college professor. It describes marshes all over America, but dwells on the glaciated prairie marshes of the Dakotas. The 23 illustrations are excellent but do not have captions. There is no index. The author's knowledge of marsh ecology makes this a very worthwhile book.

WHO'S MINDING THE SHORE? A CITIZEN'S GUIDE TO COASTAL MANAGEMENT. National Resources Defense Council. National Oceanic and Atmospheric Administration. 1976.

Transecting the Dunes

The sand dunes and ridges of Illinois Beach State Park offer an excellent opportunity for a first hand study of succession as it occurs in sandy area. As one proceeds away from the lake shore, one becomes aware of the variance of vegetation, a variance which appears to be in bands. Each of those bands is representative of a stage of succession with the youngest stage of succession near the water and the oldest stage farthest away.

Although some variance in vegetation is obvious even to the casual observer, the bands of vegetation and the significance of the types and function of the plants in each band become more meaningful if a more careful measurement and identification of plants is made. It is in this interest that a line transect can be used with success as a measuring device for intermediate level elementary students as well as advanced graduate students. By use of the line transect one can determine with accuracy and speed the variance and frequence of plants which in turn are indicative of the successional stage.

In using a line transect one works along a rope which is stretched from waters edge on back into the more mature stages where trees are present. A record is made of all plants and animal signs which are found along the line and are in actual contact with the rope. It is useful to estimate the percentage of the line which is occupied by each type of plant and also the amount of unoccupied space between plants. In order for groups to gather data very rapidly, it is possible for a group to gather data from every fifth meter and still obtain a useful picture of the vegetational variation.

One method of recording data is exemplified on the following sheets. A simple drawing of the general plant form is particularly useful for young students who may be able to do only a minimum of plant identification. Additional data relating to soil conditions, temperature, wind etc. may be gathered at desired intervals which may be at least 5 meters apart.

Separate sheets are provided for the recording of data. The line on the sheet represents the transect line which is marked in meter units. It is important to indicate elevation changes along the transect line by either drawing an elevation line or recording elevation data.

Books with references to using transects:

Ooating, Henry J. 1956. The Study of Plant Communities. W.E. Freeman & Co., San Francisco.

Collis, Margaret. 1974. Using the Environment, 3, Tackling Problems, Part 2. Macdonald Educational. London.

LINE TRANSECT RECORD SHEET

STATION DATA--Station No. _____

Temperature

Air temperature _____

Soil surface temperature _____

Soil temperature 3 cm down _____

Soil temperature 20 cm down _____

Soil

Description : surface

3 cm

20 cm

Soil moisture : surface

3 cm

20 cm

Wind direction

Wind speed

DoI/er
5-4-77

STATION DATA--Station No. _____

Temperature

Air Temperature _____

Soil surface temperature _____

Soil temperature 3 cm down _____

Soil temperature 20 cm down _____

Soil

Description : surface

3 cm

20 cm

Soil moisture : surface

3 cm

20 cm

Wind direction

Wind speed

STATION DATA--Station No. _____

Temperature

Air temperature _____

Soil surface temperature _____

Soil temperature 3 cm down _____

Soil temperature 20 cm down _____

Soil

Description : surface

3 cm

20 cm

Soil moisture : surface

3 cm

20 cm

Wind direction

Wind speed

DoI/er
5-4-77

STATION DATA--Station No. _____

Temperature

Air Temperature _____

Soil surface temperature _____

Soil temperature 3 cm down _____

Soil temperature 20 cm down _____

Soil

Description : surface

3 cm

20 cm

Soil moisture : surface

3 cm

20 cm

Wind direction

Wind speed

"A Key to Some of The Plants Most Commonly Observed in June in the Sandy Areas of Illinois Beach State Park"

1. Plants woody (trees and shrubs)

   2. Trees (having one main woody stem)

      3. Leaves deeply divided or lobed

         4. Leaves with large teeth and bristles on the teeth

            5. Lower branches spreading, bark black and deeply furrowed Black Oak - *Quercus velutina*

            5. Lower branches drooping, bark brown and not as deeply furrowed - Pin Oak - *Quercus paluatris*

         4. Leaves with rounded teeth or lobes and without bristles Bur Oak - *Quercus macrocarpa*

      3. Leaves not deeply divided or lobed, *Populus* sp.

   2. Shrubs and vines (having numerous woody stems)

      6. Stems vine like trailing over ground or climbing, bunches of small white flowers

         7. Leaves toothed, sometimes 3 - lobed Wild Grape - *Vitis* sp.

         7. Leaves formed of 3 distinct leaflets, leaflets often have "thumb" lobes - Poison-ivy - *Rhus radicans*

      6. Stems not vine like and climbing

         8. Leaves needle like (evergreens)

            9. Branches trailing along the ground, usually less than one foot tall - Trailing Juniper - *Juniperus horizontalis*

            9. Branches upright to spreading but usually more than one foot tall - Low Juniper - *Juniperus canadensis*

         8. Leaves blade like, flattened

            10. Branches trailing along the ground, leaves leathery, most berries green in June, red when mature - Bearberry *Arctostaphylos Uva-ursi*

            10. Branches upright

               11. Flowering in late June

                  12. Flowers pink, stems with thorns, some red fruits remaining from previous year Wild Rose - *Rosa* sp.

12. Flowers white, small, in bunches

13. Leaves simple, flowers in bunches at end of present years growth -Inland New Jersey Tea - Ceanothus ovatus

13. Leaves compound, 3 - leaflets, leaflets often have "thumb" lobes Poison ivy - Rhus radicans

11. Fruiting in late June (green)

14. Fruit a one seeded drupe (like a cherry-outer part fleshy and inner part one hard seed)

15. Fruits in clusters of 2 to 4 along branches - Sand Cherry Pruaus pumila

15. Fruits in elongate bunches (raceme) at the end of the Youngest twigs - Chokecherry - Prunus virginians

14. Fruits in a spike (many fruits growing next to each other on one "stem") leaves usually narrow
Willow - Salix sp.

1. Plants herbaceous (not hard woody stems that remain alive year after year)

16. Stems broad, flattened, fleshy, evergreen and bearing spines - prickly pear cactus - Opuntis compressa

16. Stems rounded (or triangular)

17. Stems segmented, grooved, rough to touch, no evident leaves - Horsetail - Equisetum sp.

17. Stems with branches or leaves (leaves may all be at base of stem)

18. Plants grass like with long narrow leaves

19. Flowers with obvious colored petals

20. Petals blue (rarely white) Blue-eyed grass- Sisyrinchium sp.
(not a grass - Iris family)

20. Petals yellow - Stargrass - Hypoxis hirsuta
(not a grass - Ameryllis family)

19. Flowers without obvious colored petals - grasses, hedges or rushes

21. Stems solid (nodes usually not conspicuous)

22. Stem extending many inches beyond flower bunches which branch and spread to one side of stem - Rush Juncus sp.

22. Stem not extending beyond flowers or fruits which are compacted into a "head" or spikelet.

    23. Spikelets of "male" and "female" flowers on distinct, separate short stalks, stems often triangular - Sedge - Carex sp.

    23. Spikelet solitary, terminal, each tiny flower having both "male" and "female" parts - Spike Rush - Eleocharis sp.

21. Stems usually hollow except at the conspicuous nodes - Grasses (the following includes only three of the most conspicuous grasses of the open sand dune area.)

    24. Grass in large bunches, stems with blue tinge - Little Blue Stem - Andropogon scoparius

    24. Grass with one or only a few stems together, sandy spaces between stems, found near open beach

        25. Panicle spike-like (flowers and seeds from last year are bunched tightly together) Beach Grass - Amnophila breviligulata Fern.

        25. Panicle open (flowers and seeds from last year on very tiny branches) - Sand Reed Grass - Calanovilfa longifolia (Hook.) Scribn.

18. Plants not grass like, having broad or divided leaves or if leaves are narrow, they are abundant all along the main stem.

    26. Plants flowering in late June.

        27. Flowers white, small

            28. Petals 3 or 4, stems weak, square or 4-angled, leaves in whorls - Bed Straw - Galium sp.

            28. Petals or petal like structures 5

                29. Leaves opposite (with short leafy shoots in the axils) stems 1 to 4 dm. long - Stiff Sandwort - Arenaria Stricte

                29. Leaves along stem alternate (leaves of the inflorescence may be alternate or opposite) stems 3-10 dm long, with milky sap - Flowering Spurg - Muphorbia corollata

        27. Flowers not white

            30. Flowers pale redpurple, to pink or blue.

                31. Flowers 3 parted, blue to pink Spiderwort - Tradescantia sp.

                31. Flowers 5 parted, red-purple-Downy Phlox - Phlox pilosa

30. Flowers yellow to greenish yellow or greenish white

32. Flowers hanging down from leaf axils, yellowish to greenish white, leaves broad and parallel veined True Solomon's Seal - Polygonatum sp.

32. Flowers terminal, bright yellow

33. Flowers in an umbel, each flower small - Meadow parsnip - Thaspium trifoliatum

33. Flowers not in an umbel

34. Flowers of a composite (daisy like) having both disk and ray flowers

35. Heads few or solitary, basal leaves spatulate to linear, stem leaves similar - Tickseed - Coreopsis lanceolata

35. Heads several to numerous, basal leaves heart shaped, stem leaves divided - Golden Ragwort - Senecio aureus

34. Flowers not of a composite, each flower having 5 petal lobes

36. Petal lobes with teeth-Narrow Leaved Pucoon - Lithospermum incisum

36. Petal lobes entire (no teeth) stem and leaves soft pubescent Hoary Pucoon - Lithospermum canescens

26. Plants not flowering in late June

37. Plants in fruit, berries terminal, leaves parallel veined

38. Berries with dark stripes. numerous leaves, - False Solomon Seal - Smilacina stellata

38. Berries without stripes, few leaves, smaller plants - False Lilly-of-the-valley - Maianthemum canadenoe

37. Plant not in fruit

39. Leaves silver-grey, narrowly divided - Wormwood - Artemisia caudata

39. Leaves otherwise (any one of several hundred different plants)

Materials to help teach the use of keys and grouping by characteristics
From Scinece Curriculum Improvement Study (Rand McNally)
Material Objects Ch 3 p28, Grandmas Button Box
From Elementary Science Study (McGraw-Hill)
Rocks and Charts Unit
Attribute Games and Problems (A-games, People Pieces, Color Cubes)
From Time, Space and Matter (McGraw-Hill) Jr. High
Teacher Folia - Investigation 4

Living With The Lake Reader

CHICAGO

Hog Butcher for the World,
Toolmaker, Stacker of Wheat,
Player with Railroads and the Nation's Freight Handler;
Stormy, husky, brawling,
City of the Big Shoulders:

They tell me you are wicked and I believe them, for I have seen your painted women under the gas lamps luring the farmboys.

And they tell me you are crooked and I answer: Yes, it is true I have seen the gunman kill and go free to kill again.

And they tell me you are brutal and my reply is: On the faces of women and children I have seen the marks of wanton hunger.

And having answered so I turn once more to those who sneer at this my city, and I give them back the sneer and say to them:

Come and show me another city with lifted head singing so proud to be alive and course and strong and cunning.

Flinging magnetic curses amid the toil of piling job on job, here is a tall bold slugger set vivid against the little soft cities;

Fierce as a dog with tongue lapping for action, cunning as a savage pitted against the wilderness,
Bareheaded,
Shoveling,
Wrecking,
Planning,
Building, breaking, rebuilding,

Under the smoke, dust all over his mouth, laughing with white teeth,
Under the terrible burden of destiny laughing as a young man laughs,
Laughing even as an ignorant fighter laughs who has never lost a battle,
Bragging and laughing that under his wrist is the pulse, and under his ribs the heart of the people,

Laughing!

Laughing the stormy, husky, brawling laughter of Youth, half-naked, sweating, proud to be Hog Butcher, Toolmaker, Stacker of Wheat, Player with Railroads, and Freight Handler to the Nation.

"Chicago" from Chicago Poems by Carl Sandburg

CLEAN CURTAINS

New neighbors came to the corner house at Congress and Green Streets.

The look of their clean white curtains was the same as the rim of a nun's bonnet.

One way was an oyster-pail factory, one way they made candy, one way paper boses, strawboard cartons.

The warehouse trucks shook the dust of the ways loose and the wheels whirled dust - there was dust of hoof and wagon wheel and rubber tire - dust of police and fire wagons - dust of the winds that circled at midnight and noon listening to no prayers.

"O mother, I know the heart of you," I sang passing the rim of a nun's bonnet - O white curtains - and people clean as the prayers of Jesus here in the faded ramshackle at Congress and Green.

Dust and the thundering trucks won - the barrages of the street wheels and the lawless wind took their way - was it five weeks or six the little mother, the new neighbors, battled and then took away the white prayers in the windows?

"Clean Curtains" is from Sandburg's Smoke and Steel.

THE COPPERFACES, THE RED MEN

The copperfaces, the red men, handed us tobacco, the weed for the pipe of friendship, also the bah-tah-to, the potato, the spud.

Sunflowers came from Peruvians in Ponchos.

Early Italians taught us of chestnuts, walnuts and peaches being Persian momentos, Siberians finding for us what rye might do, Hindus coming through with the cucumber, Egyptians giving us the onion, the pea, Arabians handing advice with one gift:

"Some like it, some say it's just spinach."

To the Chinese we have given kerosene, bullets, Bibles and they have given us radishes, soy beans, silk, poems, paintings, proverbs, porcelain, egg foo yong, gunpowder, Fourth of July firecrackers, fireworks and labor gangs for the first Pacific railways.

Now we may thank these people or reserve our thanks and speak of them as outsiders and imply the request,

"Would you just as soon get off the earth?"

holding ourselves aloof in pride of distinction waying to ourselves this costs us nothing as though hate has no cost

as though hate ever grew anything worth growing.

Yes we may say this trash is beneath our notice or we may hold them in respect and affection as fellow creepers on a commodious planet saying,

"Yes you too you too are people."

The Copperfaces, the Red Men, from The People, Yes by Carl Sandburg

IT IS A STRANGE THING - TO BE AN AMERICAN

It is a strange thing - to be an American.
It is strange to sleep in the bare stars and to die
On an open land where few bury before us:
(From the new earth the dead return no more).
It is strange to be born of no race and no people.
In the old lands they are many together. They keep
The wise past and the words spoken in common.
They remember the dead with their hands, their mouths dumb.
They answer each other with two words in their meeting.
They live together in small things. They eat
The same dish, their drink is the same and their proverbs.
Their youth is like. They are like in their ways of love.
They are many men. There are always others beside them.
Here it is one man and another and wide
On the darkening hills the faint smoke of the houses.
Here it is one man and the wind in the boughs.

"It Is a Strange Thing - to Be an American" from American Letter by Archibald MacLeish.

ONE WANTS A TELLER IN A TIME LIKE THIS

One's not a man, one's not a woman grown,
To bear enormous business all alone.

One cannot walk this winding street with pride,
Straight-shouldered, tranquil-eyed,
Knowing one knows for sure the way back home.
One wonders if one has a home.

One is not certain if or why or how.
One wants a Teller now: -

Put on your rubbers and you won't catch cold.
Here's hell, there's heaven. Go to Sunday School.
Be patient, time brings all good things - (and cool
Strong balm to calm the burning at the brain?) -
Behold,
Love's true, and triumphs; and God's actual.

"One wants a Teller in a time like this." from Annie Allen
by Gwendolyn Brooks

ON THE BEACH AT NIGHT

On the beach at night,
Stands a child with her father,
Watching the east, the autumn sky.

Up through the darkness,
While ravening clouds, the burial clouds, in black masses spreading,
Lower sullen and fast athwart and down the sky,
Amid a transparent clear belt of ether yet left in the east,
Ascends large and calm the lord-star Jupiter,
And nigh at hand, only a very little above,
Swim the delicate sisters the Pleiades. *
From the beach the child holding the hand of her father,
Those burial clouds that lower victorious soon to devour all,
Watching, silently weeps.

Weep not, child,
Weep not, my darling,
With these kisses let me remove your tears,
The ravening clouds shall not long be victorious;
They shall not long possess the sky,
They devour the stars only in apparition,
Jupiter shall emerge, be patient, watch again another night,
The Pleiades shall emerge,
They are immortal, all those stars both silvery and golden
Shall shine out again,
The great stars and the little ones shall shine out again,
They endure,
The vast immortal suns and the long-enduring pensive moons
shall again shine.

Then dearest child mournest thou only for Jupiter?
Considerest thou alone the burial of the stars?
Something there is
(With my lips soothing thee, adding I whisper,
I give thee the first suggestion, the problem and indirection),
Something there is more immortal even than the stars,
(Many the burials, many the days and nights, passing away,)
Something that shall endure longer even than lustrous Jupiter,
Longer than sun or any revolving satellite,
Or the radiant sisters the Pleiades.

* Pleiades: the cluster of stars called "The Seven Sisters."

"On the Beach at Night" from Leaves of Grass by Walt Whitman

TO MAKE A PRAIRIE

To make a prairie it takes a clover
And one bee -
One clover, and a bee,
And reverie.
The reverie alone will do
If bees are few.

WHEN I HEARD THE LEARN'D ASTRONOMER

When I heard the learn'd astronomer,
When the proofs, the figures, were ranged in columns before me,
When I was shown the charts and diagrams, to add, divide,
and measure them,
When I was sitting heard the astronomer where he lectured with
much applause in the lecture room,
How soon unaccountable I became tired and sick,
Till rising and gliding out I wandered off by myself,
In the mystical moist night air, and from time to time,
Looked up in perfect silence at the stars.

On one dark night at Lac St. Claire
De win' she blo' blo', blo',
An de crew of de wood scow, Julie Plante,
Get scar an' run below.
De win' she blow lak hurricane;
By-n-by she blo' some more;
An' de scow bus' up on Lac St. Claire
Tree acre from de shore.

Sailors' Song

More than a century ago the Chippeway chief Kichiwiski paddled a canoe from Duluth to Buffalo, and then walked on to Washington to attend a Congressional conference on Indian affairs. When the conference was over he walked back to Buffalo, pushed his canoe out of a screen of willows and paddled the 988 miles back to Duluth. He found the lakes a convenient route to travel. They were a highway, unique in the geography of the earth, linking widely separated regions, ready to carry an Indian on an errand or the bulk commerce of the age of steel.

Walter Havighurst
The Long Ships Passing

Off on the lakes the pike-fisher watches and
waits by the hole in the frozen surface,
The stumps stand thick round the clearing, the
squatter strikes deep with his axe.

Walt Whitman
"Song of Myself"

Early the red men gave a name to a river,
the place of the skunk,
the river of the wild onion smell,
Shee-caw-go.

Carl Sandburg
"The Windy City"

Many moons ago, when the Indian people owned all the land from the Manitoulin to the Blue Mountains, tribes lived within a few arrows' flight of one another. There were many wars...Toward the end of the eighteenth century, the son of a powerful tribal chief fell in love with the daughter of another chief, and ran away with her.

The lovers travelled by canoe. Soon the maiden's father assembled his warriors and set off after them...The young lover remembered the Island of the Caves and hurried there to hide his sweetheart...But the maiden's father had also thought of this...The young brave was killed, and the maiden died of a broken heart.

Since that time, Indians have called the island the Island of the Flower Pots, and they claim that the two flower-pot formations are the stone spirits of the young Indian lovers. To them that island is a forbidden place, and they will not set foot on its shore.

Melba Croft
Tall Tales & Collections
of the Georgian Bay

In the late 1800s the catches of sturgeon in each of the major Lakes exceeded a million pounds a year - and these figures do not include the uncounted numbers that were simply killed and not marketed. Old residents of lake fishing ports recall seeing sturgeon piled up on the beaches like cordwood, doused with kerosene, and burned.

James P. Barry
The Fate of the Lakes

Lake Huron rolls, Superior sings in the rooms of her ice water mansion. Old Michigan steams like a young man's dreams; the islands and bays are for sportsmen.
And further below Lake Ontario takes in what Lake Erie can send her, and the iron boats go as the mariners all know with the Gales of November remembered.

The legend lives on from the Chippeway on down of the big lake they called "gitche Gumee."
"Superior," they said, "never gives up her dead when the Gales of November come early!"

Gordon Lightfoot
"The Wreck of the Edmund Fitzgerald"

A second sky spread at the city's feet....

Howard Spencer Fiske
"An Ode to Lake Michigan"

Lake Michigan has always been one of our most treasured assets and we deeply cherish it. We have generally prevented industry from building along the Chicago shore and thereby preserved its value as a source of recreation for the people of Chicago. Virtually all of Chicago's 29 miles of shoreline are devoted to public use including some 30 bathing beaches and eight marinas.

Former Mayor Richard J. Daley

There is no need to review the danger signs we've all seen... the signs on beaches in many areas saying, "No swimming - Polluted". We all remember the recent nuisance of dead alewives, the unseemly sight of weeds and algae along the shore and the massive oil slicks of only last summer.

Former Mayor Richard J. Daley

In some unused lagoon, some nameless bay,
On sluggish, lonesome waters, anchor'd near the shore,
An old, dismasted, gray and batter'd ship, disabled, done,
After free voyages to all the seas of earth, haul'd up at last
and hawser's tight, lies rusting, mouldering.

Walt Whitman
"The Dismantled Ship"

Sport fishing is nearer the heart of the average man than is commercial fishing. Whether he sits on a harbor breakwater fishing for carp or goes out in a powerful boat with complicated equipment in search of trout or walleye, the sport fisherman engages in a personal adventure. Even when he comes back empty handed he has gained something. Perhaps the final sizzle of fish in a pan is the least important part of the sport.

James P. Barry
The Fate of the Lakes

Here were oaks partly clothes in red and brown, a flash of red in the top of the sumach, blueberries and blackberries in red and russet, touches of dogwood, gray aspen, red maple and shad, weird shapes of sour gum, and thousands of red tips of the swamp rose. But the most poetic of all - the foreground carpeted with delicate rose colored grasses, now made more vivid by the brilliant light of dawn and amonst the grasses glistened millions of rosy diamonds, the first frost of the year.

Jens Jensen
The Dunes Dawn

It has been decided to construct and put in operation a new plant to be located on the south shore of Lake Michigan in Calumet Township, Lake County, Indiana, and a large acreage of land has been purchased for that purpose.

Judge Elbert H. Gary
U. S. Steel Corporation
Annual Report

Some Don't Want Dunes In Indiana
(To the Tune of "Back Home Again in Indiana")

Some don't want dunes in Indiana;
Some want steel mills spreading smog
Across the bathing beach, on top of trees,
And killing grogs in bogs!

Some ones get rich in Indiana,
While the people pay the bills!
Take a good last look upon the sunny sand dunes,
For they soon may be leveled by steel mills!

Pat Walsh

First, we have a remarkable example of Dunes, a shifting, moving, living landscape; a natural phenomenon which in itself holds much scientific interest as well as beauty. We have, as a result of the Glaciers many hundreds of years ago, a rare collection of Southern Flora which was deposited here and which can be found no further North; and Northern Flora which was deposited here and which can be found no further South.

Senator Paul Douglas
Speech in Senate,
May 26, 1958

INDIANS

by John Fandel

Margaret mentioned Indians, and I began to think about Indians -
Indians once living where now we are living -
And I thought how little I know about Indians. Oh, I know
What I have heard. Not much, when I think how much
I wonder about them, when a mere mention of them,
Indians, starts me. I think of their wigwams.
I think of canoes. I think of quick arrow. I think
Of things Indian. And still I think of their bright, still
Summers, when these hills and meadows on these hills
Shone in the morning suns before this morning.

LULLABY

by Robert Hillyer

The long canoe
Toward the shadowy shore,
One...two...
Three...four...
The paddle dips,
Turns in the wake,
Pauses, then
Forward again.
Water drips
From the blade to the lake.
Nothing but that,
No sound of wings;
The own and bat
Are velvet things.
No wind awakes,
No fishes leap;
No rabbits creep
Among the brakes.
The long canoe
At the shadowy shore,
One...two...
Three...four...
A murmur now
Under the prow
Where rushes bow
To let us through.
One...two...
Upon the shore,
Thre...four...
Upon the lake,
No one's awake,
No one's awake,
One...two...
No one, not even you.

A strong nor'wester's blowin', Bill!
Hark! don't ye hear it roar now?
Lord help 'em, how I pities them
Unhappy folks on shore now!

The wind's nortwest and a-blowing all night,
See them big seas roll with their bonnets all white!
And far o'er our starb'rd rail
Is half a hundred sail.
Hooray! For a sail down the lakes.

The lake freighter is a specialized ship developed to meet conditions found on these waters. It is quite different from the usual ocean-going cargo ship; when one occasionally sees in a distant salt-water port a lake freighter that somehow has strayed into ocean trade, there still is no questions as to where and how she began her career. The flat sides; wheelhouse in the bows; long, open deck; engine room in the stern - all these are the marks recognized the world over, of the Great Lakes freighter.

James P. Barry
The Fate of the Lakes

And he wore cool cream pants, the Mayor of Gary, and white shoes, and a barber had fixed him up with a shampoo and a shave and he was easy and imperturbable though the government weather bureau thermometer said 96 and children were soaking their heads at bubbling fountains on the street corners.

Carl Sandburg
"The Mayor of Gary"

Am I asking too much? Of any Sunday-morning balloon-man's spring in Chicago, that it fill the wishes of all young men in landlocked bars a little, waiting for their lifelong lives to start?

Or raise the hopes of Sunday-morning sidestreet solitaries all over town, to let them drift slowly and low...toward that wonderful garden where all things are possible? To all those now merely waiting for rain or bread or love or peace with a pinch of the salt of magic in it that will last till the big dark falls.

Nelson Algren

A power-house
in the shape of
a red brick chair
90 feet high

on the seat of which
sit the figures
of two metal
stacks - aluminum -

commanding an area
of squalid shacks
side by side -
from one of which

buff smoke
streams while under
a grey sky
the other remains
passive today -

William Carlos Williams
"Classic Scene"

THE MOSQUITO

by John Updike

On the fine wire of her whine she walked,
Unseen in the ominous bedroom dark.
A traitor to her camouflage, she talked
A thirsty blue streak distinct as a spark.

I was to her a fragrant lake of blood
From which she had to sip a drop or die.
A reservoir, a lavish field of food,
I lay awake, unconscious of my size.

We seemed fair-matched opponents. Soft she dropped
Down like an anchor on her thread of song.
Her nose sank thankfully in; then I slapped
At the sting on my arm, cunning and strong.

A cunning, strong Gargantua, I struck
This lover pinned in the feast of my flesh,
Lulled by my blood, relaxed, half-sated, stuck
Engrossed in the gross rivers of myself.

Success! Without a cry the creature died,
Became a fleck of fluff upon the sheet.
The small welt of remorse subsides as side
By side we, murderer and murdered, sleep.

THE ORB WEAVER

By Robert Francis

Here is the spinner, the orb weaver, devised of jet,
Embossed with sulphur, hanging among the fruits of summer,

Hour after hour serenely sullen, ripening as September ripens,
Plumping like a grape or melon. And in its winding-sheet
The grasshopper.

The art, the craftsmanship, the cunning, the patience, the
Self-control, the waiting, the sudden dart and the needled poison.

I have no quarrel with the spider but with the mind or mood
That made her to thrive in nature and in man's nature.

ODE TO THE AMOEBA

by Arthur Guiterman

Recall from Time's abysmal chasm
That piece of primal protoplasm
The First Amoeba, strangely splendid,
From whom we're all of us descended.
That First Amoeba, weirdly cleve,
Exists today and shall forever,
Because he reproduced by fission;
He split himself, and each division
And subdivision deemed it fitting
To keep on splitting, splitting, splitting;
So, whatsoe'er their billions be,
All, all amoebas still are he.
Zoologists discern his features
In every sort of breathing creatures,
Since all of every living species,
No matter how their breed increases
Or how their ranks have been recruited,
From him alone were evoluted.
King Solomon, the Queen of Sheba
And Hoover sprang from that amoeba;
Columbus, Shakespeare, Darwin, Shelley
Derived from that same bit of jelly.
So famed he is and well-connected,
His statue ought to be erected,
For you and I and William Beebe
Are undeniably amoebae!

SEAGULLS

by Frances Higginson Savage

Two medicos, immaculate in gray
Hold converse on the pilings of the quai.
Each eyes the other with a chilly glance,
As rivals will, of deep malevolence;
Each then propounds his learned diagnosis:
"Ulcer," screams one; the other shrieks, "Cirrhosis!"

Then, since the conference will not agree,
Professionally cool, they fly away.

FISH STORY

by Richard Armour

Count this among my heartfelt wishes:
To hear a fish tale told by fishes
And stand among the fish who doubt
The honor of a fellow trout,
And watch the bulging of their eyes
To hear of imitation flies
And worms with rather droopy looks
Stuck through with hateful, horrid hooks,
And fishermen they fled all day from
(As big as this) and got away from.

ANGLER'S CHOICE

by H. J. Gottlieb

These he cast where the pool lay still
Under a lichened ledge:
Silver Doctor, Olive Quill, Ibis, Lady Beaverkill,
And a Dark Blue Sedge.

These he chose for the stony flat
Spanned by the covered bridge:
Royal Coachman, Cahill, Gnat, March Brown, Little Marryat,
And a Berry Midge.

These he tried in the fading light
Down by the alder thicket:
Yellow Sally, Sandy Mike, Wickham's Fancy, Cocky Knight,
And a real, live cricket.

THE FISHER

by Lyle Glazier

At half past four, mornings in June, he met the sliding
Whispery sound of Four Mile Brook, and liked the tune,
And liked the log road, morning-hushed;
His bare feet liked the dew-soaked ground.

At half past ten, he was headed for hom, having tried
His last last-hole for luck;
The heat and noise of the day had come, but his bones
were cool with the brookside shade,
And his ears kept the whirlpool's silvery suck.

BY THE SWIMMING

by Robert Sward

By the Swimming
The sand was wetter
The farther down you dug; I dug:
My head and ear on top
Of the sand, my hand felt water...
And the lake was blue not watching.
The water was just waiting there
In the sand, like a private lake.
And no one could kick sand
Into my digging, and the water
Kept going through my fingers slow
Like the sand, and the sand was water too.
And then the wind was blowing everyplace,
And the sand smelled like the lake,
Only wetter. It was raining then:
Everybody was making waxpaper noises,
And sandwiches, kicking sand
And running with newspapers on their heads;
And all the sand turned brown and stuck together
Hard: and the sky was lightning, and the sun
Looked down sometimes to see how dark it was
And to make sure the moon wasn't there.
And then we were running: and everybody was under
The hotdog-tent eating things, spitting very mad
And waiting for the sky, and to go home.

CROWS

by David McCord

I like to walk and hear the black crows talk.
I like to lie and watch crows sail the sky.
I like the crow that wants the wind to blow:
I like the one that thinks the wind is fun.
I like to see crows spilling from a tree,
and try to find the top crow left behind.
I like to hear crows caw that spring is near.
I like the great wild clamor of crow hate
Three farms away when owls are out by day.
I like the slow tired homeward-flying crow;
I like the sight of crows for my good night.

BOY WITH FROGS

by Sy Kahn

Under his relentless eye, jarred and jeered,
The small frogs hop and pulse in their
Suddenly glass world.

He, blond and curious, captive and captivated,
Holds in his hands world of water, pebbles, grass
And the power of topsy-turvy and crash.

But he is content to study them a while,
With their delicate legs pressed against the glass,
The futile leaps to freedom and their frantic eyes.

It's a game for a God of course.
Later, the vibrant frogs, still leaping with protest
And life, are forgotten on a shelf. He is out
Wondering about the waterbugs.

DEPOT IN A RIVER TOWN

by Miller Williams

In the depot and the darkened day
the clack of an old pinball machine
demands a curious notice.
More sleeping than not
a satchel faced farmer makes noises.
A sailor circles like a child in church.

In the depot and the darkened day
I surrender my back to the imperative bench,
unlistening hear the emphatic pencil
tap itself on the table.

The little blonde reads
and fingers the cloth of her blouse
like a nun telling beads.

Cracked across after an ancient painting
the face of the woman with children
ignores and ignores.
There is fog at the windows
and the open doors.

Within the ear's rim rises a separate sound.
Wood slapping side slipping water sounds
settle me deep.
I feel again the penny in my pocket
and the slow sleep of the river
wraps me round.

REFLECTIONS ON A GIFT OF WATERMELON PICKLE RECEIVED FROM A FRIEND CALLED FELICITY

by John Tobias

During that summer when unicorns were still possible;
When the purpose of knees was to be skinned;
When shiny horse chestnuts (Hollowed out fitted with straws
crammed with tobacco stolen from butts in family ashtrays)
Were puffed in green lizard silence
While straddling thick branches far above and away
From the softening effects of civilization;

During that summer - which may never have been at all;
But which has become more real than the one that was -
Watermelons ruled.

Thick pink imperial slices melting frigidly on sun-parched tongues
Dribbling from chins; leaving the best part,
The black bullet seeds, to be spit out in rapid fire
Against the sall, against the wind, against each other;

And when the ammunition was spent, there was always another bite:
It was a summer of limitless bites, of hungers quickly felt
and quickly forgotten with the next careless gorging.

The bites are fewer now.
Each one is savored lingeringly, swallowed reluctantly.

But in a jar put up by Felicity, the summer which maybe never was
Has been captured and preserved.
And when we unscrew the lid and slice off a piece
And let it linger on our tongue:
Unicorns become possible again.

WILD GOOSE

by Curtis Heath

He climbs the wind above green clouds of pine,
Honking to hail the gathering migration,
And, arching toward the south, pulls to align
His flight into the great spearhead formation.

He'll find a bayou land of hidden pools,
And bask amid lush fern and water lilly
Far from the frozen world of earth-bound fools
Who, shivering, maintain that geese are silly.

THE MICROSCOPE

by Maxine Kumin

Anton Leeuwenhoek was Dutch.
He sold pincushions, cloth, and such.
The waiting townsfolk fumed and fussed
As Anton's dry goods gathered dust.

He worked, instead of tending store,
At grinding special lenses for
A microscope. Some of the things
He looked at were:

mosquitoes' wings,
the hairs of sheep, the legs of lice,
the skin of people, dogs, and mice;
ox eyes, spiders' spinning gear,
fishes' scales, a little smear
of his own blood,
and best of all,
the unknown, busy, very small
bugs that swim and bump and hop
inside a simple water drop.

Impossible! Most Dutchmen said.
This Anton's crazy in the head.
We ought to ship him off to Spain.
He says he's seen a housefly's brain.
He says the water that we drink
Is full of bugs. He's mad, we think!

They called him dumkopf, which means dope.
That's how we got the microscope.

LOST

by Carl Sandburg

Desolate and lone all night long on the lake
Where fot trails and mist creeps, the whistle of a boat
Calls and cries unendingly, like some lost child
In tears and trouble hunting the harbor's breast
And the harbor's eyes.

UNFOLDING BUD

by Naoshi Koriyama

One is amazed by a water-lily bud, unfolding,
With each passing day, taking on a richer color
And new dimensions.

One is not amazed, at a first glance, by a poem,
Which is as tight-closed as a tiny bud.

Yet one is surprised to see the poem gradually
Unfolding, revealing its rich inner self,
As one reads it again and over again.

TO LOOK AT ANY THING

by John Moffitt

To look at any thing,
If you would know that thing,
You must look at it long:
To look at this green and say
'I have seen spring in these
Woods', will not do - you must
Be the thing you see:
You must be the dark snakes of
Stems and ferny plumes of leaves,
You must enter in
To the small silences between
The leaves,
You must take your time
And touch the very peace
They issue from.

RESUME

by Dorothy Parker

Razors pain you;
Rivers are damp;
Acids stain you;
And drugs cause cramp.
Guns aren't lawful;
Nooses give;
Gas smells awful;
You might as well live.

A VALIDICTORY TO STANDARD OIL OF INDIANA

by David Wagoner

In the darkness east of Chicago, the sky burns over the
plumbers' nightmares
Red and blue, and my hometown lies there loaded with
gasoline.
Registers ring like gas-pumps, pumps like pinballs,
pinballs like broken alarm clocks,
And it's time for morning, but nothing's going to work.
From cat-cracker to candle-shop, from grease-works along
the pipeline,
Over storage tanks like kings on a checkerboard ready
to jump the county,
The word goes out: With refined regrets
We suggest you sleep all day in your houses shaped
like lunch buckets
And don't show up at the automated gates.
Something else will tap the gauges without yawning
And check the valves at the feet of the cooling-towers
without complaining.
Standard Oil is canning my high school classmates
And the ones who fell out of junior high or slipped
in the grades.
What should they do, gassed up in their Tempests and
Comets, raring to go
Somewhere with their wives scowling in front and kids
stuffed in the back,
Past drive-ins jammed like car-lots, trying to find
the beaches
But blocked by freights for hours, stopped dead in
their tracks
Where the rails, as thick as thieves along the lakefront,
Lower their crossing gates to shut the frontier? What
can they think about
As they stare at the side of boxcars for a sign,
And Lake Michigan drains slowly into Lake Huron,
The mills level the Dunes, and the eels go sailing
through the trout,
And mosquitoes inherit the evening, while toads no
bigger than horseflies
Hop crazily after them over the lawns and sidewalks,
and the rainbows fall

Flat in the oil they came from? There are two towns now,
One dark, one going to be dark, divided by cyclone fences;
One papered and cared for like pillboxes and cathedrals,
The other vanishing overnight in the dumps and swamps
like a struck sideshow.
As the Laureate of the Class of '44 - which doesn't know
it has one -
I offer this poem, not from hustings or barricades
Or the rickety stage where George Rogers Clark stood
glued to the wall,
But from another way out, like Barnum's "This Way to
the Egress,"
Which moved the suckers when they'd seen enough, Get
out of town.

THE PICNIC

by John Logan

It is the picnic with Ruth in the spring.
Ruth was third on my list of seven girls
But the first two were gone (Betty) or else
Had someone (Ellen has accepted Doug).
Indian Gully the last day of school;
Girls make the lunches for the boys too.
I wrote a note to Ruth in algebra class
Day before the test. She smiled, and nodded.
We left the cars and walked through the young corn
The shoots green as paint and the leaves like tongues
Trembling. Beyond the fence where we stood
Some wild strawberry flowered by an elm tree
And Jack-in-the-pulpit was olive ripe.
A blackbird fled as I crossed, and showed
A spot of gold or red under its quick wing.
I held the wire for Ruth and watched the whip
Of her long, striped skirt as she followed.
Three feckles blossomed on her thin, white back
Underneath the loop where the blouse buttoned.
We went for our lunch away from the rest,
Stretched in the new grass, our heads close
Over unknown things wrapped up in wax papers.
Ruth tried for the same, I forget what it was,
And our hands were together. She laughed,
And a breeze caught the edge of her little
Collar and the edge of her brown, loose hair
That touched my cheek. I turned my face
into the gentle fall. I saw how sweet it smelled.
She didn't move her head or take her hand.
I felt a soft caving in my stomach
As at the top of the highest slide
When I had been a child, but was not afraid,
And idd not know why my eyes moved with wet
As I brushed her cheek with my lips and brushed
Her lips with my own lips. She said to me
Jack, Jack, different than I had ever heard,
Because she wasn't calling me, I think,
Or telling me. She used my name to
Talk in another way I wanted to know.
She laughed again and then she took her hand;
I gave her what we both had touched - can't
Remember when it was, and we ate the lunch.
Afterward we walked in the small, cool creek
Our shoes off, her skirt hitched, and she smiling,
My pants folled, and then we climbed up the high
Side of Indian Gully and looked
Where we had been, our hands together again.

It was then some bright thing came in my eyes,
Starting at the back of them and flowing
Suddenly through my head and down my arms
And stomach and my bare legs that seemed not
To stop in feet, not to feel the red earth
Of the Gully, as though we hung in a
Touch of birds. There was a word in my throat
With the feeling and I knew the first time
What it meant and I said, it's beautiful.
Yes, she said, and I felt the sound and word
In my hand join the sound and word in hers
As in one name said, or in one cupped hand.
We put back on our shoes and socks and we
Sat in the grass awhile, crossleged, under
A blowing tree, not saying anything.
And Ruth played with shells she found in the creek,
As I watched. Her small wrist which was so sweet
To me turned by her breast and the shells dropped
Green, white blue, easily into her lap,
Passing light through themselves. She gave the pale
Shells to me, and got up and touched her hips
With her light hands, and we walked down slowly
To play the school games with the others.

THE STONE

by Paul Blackburn

The stone found me in bright sunlight
around 9th and Stuyvesant Streets and
found, if not a friend, at
least a travelling companion.

Kicking, we crossed
Third Avenue, then Cooper Square,
avoiding the traffic in our oblique and
random way, a cab almost got him, and I had
to wait a few seconds, crowding
in from the triangular portion edged about
with signs, safety island, crossed
Lafayette, him catching between the cobbles,
then with a judicious blow
from the toes of my foot (right), well, a
soccer kick aiming for height, we cleared
the curb and turned left down Lafette,
that long block,
with a wide sidewalk and plenty of room to maneuver
in over metal cellar doorways or swinging
out toward the curb edge. The low worn
curb at 4th was a cinch to make, and
at Great Jones Street the driveway into a
gas station promised no impediment. But
then he rolled suddenly to the right
as though following an old gentleman in a long
coat, and at the same time I was addressed
by a painter I know and his girl on their way
to Washington Square, and as I looked up to
answer,
I heard the small sound. He had fallen
in his run, into water gathered in a sunken
plate which they lift to tighten or loosen
something to do with the city water supply I think,
and sank out of sight.

I splke to Simeon and Dee
about a loft it turned out he hadn't gotten, but
felt so desolate at having lost him they didn't
stay long, I looked at the puddle, explained
he'd come all the way from beyond Cooper Square,
they hurried away.

I supplise I could have used my hands, picked him
out and continued, he'd have been dry by the time
we got home, but just as I decided to abandon him
the sun disappeared.

I continued on down Bleecker finally,
a warm front moving in from the west, the
cirrus clotting into alto-cumulus, sun seeping through
as the front thickened, but not shining, the air turned
cool, and there were pigeons
circling
over the buildings at
West Broadway, and over them a gull, a
young man with a beard and torn army jacket walked
a big mutt on a short leash teaching him to heel.
The mutt was fine, trotting alongside, nuzzling
lightly at his master's chino pants, the young
man smiled, the dog smiled too, and on they went.

They had each other.

I had left him there in the puddle, our game
over, no fair using hands I had told myself.
Not that he could have smiled.
The sun gone in.
He had been shaped like a drunken pyramid,
irregularly triangular.

I liked him.

AN AMERICAN HERCULES

By James Stevens

The Northwestern lumber camps gave American folklore the fabulous hero of tall tales, Paul Bunyan. James Stevens worked for many months in lumber camps in Washington, Oregon, and Idaho before retelling the best stories about the giant logger in his book PAUL BUNYAN. In "An American Hercules" Mr. Stevens has written especially for "Adventures in American Literature" an account of the way the Paul Bunyan legend developed, giving as an example of the stories a hitherto unrecorded yarn of typical flavor. Picture the proper setting for the tale, as Mr. Stevens describes it in the introduction to his book:

"A Paul Bunyan bunkhouse service is a glory to hear, when it is spontaneous and in a proper setting; preferably around a big heated stove in the winter, when the wind is howing through crackling boughs outside and the pungent smell of steaming wool drifts down from the drying lines above the stove. When a vasy spirit of the woods really moves the meeting, a noble and expansive ecstasy of the soal is exhibited."

Draw up your chair, stranger.

Paul Bunyan, the mythical hero of the lumberjacks, is the supreme figure of American folklore. Paul was a Herculean logger who combed his beard with a young pine tree; who skidded his timber with Babe the Blue Ox, a creature so vast that he measured forty-two ax handles and a plug of chewing tobacco between the horns; who operated a camp cookhouse where the flapjack griddle was greased by twenty-four Arabs - imported from the Sahara Desert because they could stand the heat - skating to and fro with slabs of bacon strapped to their feet; who tamed the Mississippi when it was young and wild by building river corrals and driving the river through their gates (the Great Lakes remain as evidence of this feat); who ruled the American country in the period when it was only a timberland. This epoch, according to the best authorities, began with the Winter of the Blue Snow and ended with the Spring the Rain Came Up from China.

Here, indeed, is a full-bodied myth. The Paul Bunyan stories have been told in American logging camps since 1840. They are unquestionably of Canadian origin. There was a Paul Bunyan who won fame in the Papineau Rebellion of 1837. There is no evidence that the beginnings of the stories are beyond him. The other materials and characters of the myth were developed out of the magic of bunkhouse nights; when the workday in the woods, or on the iced road, or on the drive, was done; when

the camp men, isolated from all life but that of the woods, had no other outlet for their fancies than the creation of romances about their own life.

Thus Paul Bunyan; Babe the Blue Ox; Johnny Inkslinger, the timekeeper who figured with a fountain pen fed by hose lines from twenty-four barrels of ink; Hels Helson, the Big Swede and bull of the woods, who muddied the Missouri River forever with one spring bath; and many smaller characters - such as Hot Biscuit Slim, the cook; Shanty Boy, the bard; and Big Ole, the blacksmith - have been celebrated in logging camps from Bangor, Maine, to Portland, Oregon. The tall tale, the "whopper", is not confined, of course, to the lumber camps. It appears with the earliest accounts of the Appalachian pioneers. It is forever present in the best writings of Mark Twain. Other mythical heroes have won a certain fame, such as Tony Beaver of the Virginia mountains and Pecos Bill, the Southwestern vaquero who once straddled a cyclone and rode it to the finish. But the myth of Paul Bunyan stands alone, possessing, as it does, its own time, place and people.

The storeis are told in this manner.

Supper is over in the logging camp, and the after-supper period of smoking and quiet is also done. A murmur of talk about the day's work rises from the gang around the heating stove. There is a strong smell of steaming wool from the drying lines. Blue pipe smoke drifts through the mellow light of the Rochester burners. A gust of frosty air blows in whenever the bunkhouse door is opened. Some logger ventures the opinion that this will be the hardest winter this part of the country has ever known. Weather talk runs on until someone states soleumnly that "the weather ain't what she used to be. Gettin' old now, the weather is. Take the Year of the Two Winters, in Paul Bunyan's time. Yes, sir. Then. That year two winters come all at once. - "

Then there is a contest to see who can tell the tallest tale about cold weather in the day of Paul Bunyan.

Or is it a summer night, and the loggers are circuling a smudge fire outside the bunkhouse. Mosquitoes swarm up from the swamp below camp. So mosquito stories are in order. Any man is free to invent new Paul Bunyan yarns himself, or he can repeat the stories heard from other bards. Occasionally some bard is so inspired that his creation is never forgotten, and becomes a permanent addition to the Paul Bunyan myth. Such is the story of the mammoth mosquitoes and their amazing experiences with Bum and Bill, Paul Bunyan's battling bees.

Here is the story.

It was in the Year of the Dry Summer that Paul Bunyan's loggers first encountered mosquitoes. That was the season Paul Bunyan invented thunder. Day after day, week after week, month after month, the great hero-leader os the loggers toiled through experiments with all the sounds he could imagine.

Just as cows, pigs, dogs, hens, and ducks could be called, so could clouds be called, thought Paul Bunyan. Seventeen thousand various kinds of calls the great logger tried that summer before he hit on the sound of thunder. Then his labors were rewarded. Paul Bunyan had not thundered once before a stray cloud rolled up from the west. He thundered on, and by midnight so many clouds had gathered that the Dry Summer ended in a downpour that was a deluge instead of a rain. Ever since that parched season the weather has used the thunder which Paul Bunyan invented for it.

But Paul Bunyan had other troubles during this wretched summer. Time and again he had to quit his important labor of trying out sounds that would call up clouds, and attend to small bothers, some of all these troubles was the invasion of mosquitos.

The mammoth mosquitoes came from the Tall Wolf country. There the tribe had experienced a devastating famine. For the larger it grew, the smaller became the tribe of tall wolves, the mammoth mosquitos' natural prey. Eventually the last tall wolf was gone, and only a small company of female mosquitoes was left from the once vast and powerful insect tribe. These females were forced by hunger into migration. They were ready to fall and perish from exhaustion when they reached Paul Bunyan's loggers, who, stripped to the waist, were at work even on this, the hottest of the Dry Summer's days.

Paul Bunyan was afar from his loggers at the moment, pondering deeply on the problem of calling up the clouds. He failed to notice when the ring of axes and the drone of sawx were hushed. Not until agonizing yells arose from his loggers did the hero-leader realize that a new trouble had come to camp. Then he saw that his men were struggling for their lives all through the timber five miles away. Two strides and one leap, and Paul Bunyan was on the scene of battle.

Many of his loggers were already white and fait from the loss of blood, and the otherw were hacking desperately with their axes at the dodging, diving mosquitoes. Two of the mammoth winged females were sprawled lifelessly over some pine logs. Others had paused in the fight to bind up their split bills. The battle raged on.

Paul Bunyan was so stirred with wrath at the sight that he unloosed a yell of astonishment and anger. The loggers, of course, were all lifted off their feet and then hurled to the ground by the force of that cyclonic voice; and the mammoth mosquitos instantly took advantage of this and plunged on the loggers with bloodthirsty hums. Each one held down seven or more men at once and prepared to feast.

For a moment Paul Bunyan was in a panic. He thought of smashing the mosquitos with smacks of his hand but that would have crushed the loggers underneath. With a mighty effort, the great logger collected his wits. He had to think fast, and he did. Paul Bunyan was that kind of man. And at once he acted.

What he did was to call for Babe the Blue Ox, whose ears were so far from his muzzle that he couldn't hear himself snort. As he approached, Babe saw what was needed for the emergency. He did not wait for orders. Without even a glance at Paul, the Blue Ox did a squads rightabout, halted, straightened out his tail, and began to flirt the mosquitoes off the prone loggers with swishes of his huge tail brush. In one minute every frustrated mosquito was humming angrily in the air and the saved loggers were galloping for the protection of the bunkhouses. There they remained. All night the ravenous mammoth mosquitos maintained a deafening and ominous hum over the bunkhouses. Paul Bunyan listened. He figured and planned, the ideas for sounds to call clouds forgotten for the moment. At dawn Paul Bunyan had a satisfying idea. He called for Johnny Inkslinger, his timekeeper and man of science.

"Johnny," said Paul, "you need a vacation."

"Yes, sir, Mr. Bunya," said Johnny, but not very enthusiastically; for if there was anything he hated it was to leave his figures, his grand fountain pen and ink barrels.

"A vacation," Paul Bunyan repeated firmly. "So a vacation you shall take. A hunting vacation, Johnny. I'm going to send you bee hunting."

"MMr. Bunyan", said Johnny Inkslingger, "I am a good hunter and I like to hung. Why, once I found a moose who had died of old age, found his moldering bones, I did, and I tracked him to his birthplace. How's that for hunting, Mr. Bunyan?" said Johnny proudly. But then he looked doubtful. "I don't know about hunting bees, though, Mr. Bunyan."

"You msut not only hunt bees, Johnny. YOu must trap 'em and tame 'em."

"Now, Mr. Bunyan, that's asking a lot," protested Johnny Inkslinger. "I never did claim to be a bee trapper, or a bee tamer, either. Why pick on me, Mr. Bunyan?"

"Don't question orders, Johnny," said Paul Bunyan, kindly but sternly. "You pack up now for a vacation in the Mastodonic Clover country. Once there, hunt, trap, and tame the two fightingest, savagest, irritablest, cantankerousest bees you can find. Then trot 'em home to camp."

"Trot 'em, Mr. Bunyan?"

"Trot 'em, Johnny. Trot the bees."

"Yes, sir," said Johnny; and with a will, for he was sentimental about obeying orders.

When Johnny INkslinger was sent by Paul Bunyan to do anything, he did it.

So he wasn't a day in the Mastodonic Clover country until he had hunted down, trapped, and tamed - as nearly as two such fighting, savage, irritable and cantankerous bees can be tamed - the two famous battling bees, Bum and Bill. Johnny tamed the two bees so that they allowed him to chain their wings to their bodies. They also trusted him with their stingers, which he put in his knapsack. Then Johnny Inkslinger put calked boots on the bees' hind feet, trotted them out of the clover country, trotted them all the way to camp, just as Paul Bunyan had ordered.

Paul Bunyan had a great hive ready for the two warrior. When their wings were unchained, Bum and Bill took off their calked boots, stretched their legs, ate a hearty meal of lump sugar, and turned in for a refreshing sleep. The next morning they buzzed for their stingers at sunup and showed in other ways that they were eager for battle. Paul Bunyan himself led them to the woods, for Johnny Inkslinger insisted on getting back to his figures at once.

Logging had been continued under the tail of Babe the Blue Ox. For three days he had been swishing the ravenous mammoth mosquitoes away from the loggers. He was so tail-weary that he welcomed Bum and Bill, the battling bees, with a joyful moo that shivered the timber for miles. The bees answered with buzzes of rage, and it required all of Paul Bunyan's bee-taming art to convince the fighting bees that Babe was a friend and not the enemy. Bum and Bill were still buzzing suspicion when they sighted the actual foe. Then, with a battle cry that sounded like the rasping roar of a band saw, Bum and Bill lit out in a beeline and charged in an irresistable attack. In seventeen seconds the bodies of seventeen mammoth mosquitoes crashed down into the timber, shattering scores of great pines into splinters. A thunderous hum of fear sounded from the survivors. They flew off in a panic. Pursued and pursuers vanished in the haze of the Dry Summer, which smothered the forest. Soon the hums of fear and the buzzes of rage were only faint murmurs among the far trees. Paul Bunyan's teeth shone through his beard in a smile of triumph.

"Yay, Babe!" he commanded the Blue Ox.

The logging went on.

Paul Bunyan brushed his hands and praised the saints that this mosquito trouble had been so easily ended. Then he returned to his great task of trying out sounds which would call up clouds. The labor engrossed the great logger to such a degree that the mosquito invasion vanished from his thoughts. He also forgot the two big battling bees who had driven the invaders from the logging camp. But Johnny Inkslinger did not forget. Often he raised his head fromhis books and held his fountain pen poised in the air, while the hose lines from the ink barrels gushed an inky flood to the office floor. This Johnny Inkslinger did not notice in such moments, for he was remembering his grand success as a bee hunter, a bee trapper, and a bee tamer. It was one of the proudest memories of his life.

And often Johnny Inkslinger wondered what had become of the bees he had tamed, what had happened to the female mammoth mosquitos Bum and Bill had driven from the camp. Weeks had passed, and still there was not a hum from the mosquitoes or a buzz from the bees.

Then, during such a moment of wondering and remembering, Johnny Inkslinger heard a sound from the distance that was nothing but a buzz-hum. He ran out of the office and peered into the heat haze. A small, dark cloud seemed to be moving toward the camp. Johnny watched and waited. The cloud grew larger. As it approached the loggers in the woods, Johnny saw that the cloud was a vast swarm of giant insects. They hovered over the

loggers for an instant, then dived without circling. And again agonizing yells rolled up from the timber and smote Paul Bunyan's ears.

"What's happened down there?" Paul Bunyan shouted.

"The mosquitoes have come back!" said Johnny Inkslinger.

"It's a new kind, then," said Paul Bunyan, coming on the run and calling Babe the Blue Ox. "Look at 'em. They're bees!"

They're mosquitoes," said Johnny. "Look at their bills!"

"But look at their stingers!"

"Sure enough," said Johnny Inkslinger, almost dumb with astonishment. "Why-why-Mr. Bunyan-they-"

"Look at 'em!" yelled Paul Bunyan. "Why, they got bills in front and stingers behind, and they're getting the loggers going and coming! You know what's happened? Those two bees have married the mosquitoes, that's what! And these are the offspring! Bills in front and stingers behind! Yay, Babe!"

And on Paul galloped with Babe the Blue Ox, who soon got his tail brush to working and let the loggers escape to the bunkhouses. One would stick his bill under one side of a shake on a bunkhouse roof, and his stinger under the other side; and then he would flap his wings until he had ripped off the shake; and the loggers would have to stand guard with pike poles and peavies to keep the savage insects from coming at them through the ripped roofs. Paul Bunyan saw that he needed to act quick. So he spent another night in figuring and palnning. And, just as usual, he had a grand idea at daylight. He called for Johnny Inkslinger.

"Johnny," said Paul Bunyan, "we are going to carry sugar."

"Yes, Mr. Bunyan."

"We are going to throw some rafts together, Johnny, and then we are going to load the rafts with all the sugar in camp. After that we are going to rope the rafts together and have Babe the Blue Ox tow the shole raft fleets out into the middle of Lake Michigan."

Johnny Inkslinger never batted an eye. He knew the great logger too well to think that any of his ideas were foolish. So Johnny went to work without a word; and by noon the rafts were built, loaded, and roped together. Paul hitched Babe to the head raft of the fleet.

"Yay, Babe," he commanded.

And the Blue Ox bowed his neck , lumbered off, and straight to the center of Lake MIchigan he towed the raftloads of sugar. Johnny Inkslinger stayed on shore. He watched and waited. Soon he saw all the mosquito-bees flying out over the lake after the rafts. Then Johnny INkslinger realized what Paul Bunyan was up to.

"Oh, ain't he got a brain, though?" said Johnny Inkslinger worshipfully. "Oh, but ain't Paul Bunyan got a brain?"

And a brain Paul Bunyan certainly had. For he had figured that the bee blood in the hybrid insects would send them after the sugar. And he figured that their mosquito blood would make them fill their stomachs till they were stuffed. And Paul Bunyan knew the weight of sugar...

Sure enough, the mosquito-bees glutted themselves on sugar till they could hardly fly. Then Paul Bunyan started Babe on a run for the shore. The stuffed insects tried to follow. But lower and lower they flew; and soon, with anguished buzz-hums they all sank into the waters of the great lake; and that was the last of them.

The camp of Paul Bunyan was never again troubled by mammoth mosquitoes, or by mammoth mosquito-bees, either. Bum and Bill at last returned to camp, and gave every appearance of being ashamed of themselves. Paul Bunyan did not reproach them, but gave them a home in a furnished hive; and thereafter Bum and Bill occupied themselves solely with making honey for the loggers' flapjacks. Their fighting days were done.

History does not state the fate of the female mammoth mosquitos. Some authorities advance the idea that they flew to Asia. They point to the elephant to prove their contention. The elephant, they assert, is descended from the mammoth mosquito of Paul Bunyan's time. Other authorities ridicule this idea, asserting that the elephant is too small to be a descendant of the mammoth mosquito.

All such ideas and contentions are guesswork, however. And guesswork has no place in the history of Paul Bunyan.

Living With The Lake Craftbook

HOW TO PRINT FISH

Buy a fish that interests you at a fish store or the fish counter of a supermarket. The ink you will use can be washed off with cold water, and the fish can be eaten when you have finished printing it.

Make certain the head and tail are left on the fish. If the fish is cleaned, or has its insides removed, at the store, ask the clerk to make only a small slit in its body. It will be easier to control the shape of the fish if the slit is small.

At an art supply shop ask for a pad of newsprint. Newsprint comes in large sheets, is inexpensive and prints well. Another paper that makes good prints is shelf paper. It comes in rolls. You can find it in a supermarket.

Rice paper makes an especially good print. When you want to keep a print, use this special paper. It is more expensive than the others. Buy a few sheets large enough to take a print of the entire fish. For many centuries people in the island country of Japan have used rice paper to make fish prints. Some of those prints are so beautiful they are in museums.

Wash the fish with a mild soapy solution. This removes the fish's surface slime which protects it from disease. Dry the fish thoroughly, all the time looking at it carefully. Study the parts of the fish you wish to capture on your print. Look at its shape, the size and placement of the fins, the pattern of the scales, and the shape of the head.

Stuff pieces of cotton or tissue in the cavity from which its organs were taken and in its mouth. This will keep any liquid still on the inside from leaking out.

The gills, or openings behind the head, may also leak. Put some cotton or tissue in them at the same time. Look for a tiny vent, or hole, near the tail and plug it too.

A flat fish is easiest to print. If yours is plump, you may have to roll up some paper and place it under the fish to keep it from slipping while you are printing it. Spead out the fins and the tail. They are collapsible, like an old-fashioned fan.

Roll the ink across the surface of the fish, running the roller from the head to the tail. Otherwise, you may disturb the position of the scales. Take some extra time to see that the head is inked completely, as well as the fins and tail.

How to Print a Fish

Lay the paper over the fish and begin to explore all of the fish's surface with your fingers. Run your fingers around its head, over the pattern of scales, and along each fin, capturing as many details as possible. Lift your print and examine it. You may be surprised by its wonderful detail.

Continue making prints, using more or less ink and more or less rubbing, until you get results that particularly satisfy you. Then try making a print with the rice paper.

After printing your fish a number of times you may find that its scales have become clogged with ink. Then, instead of getting a print of the scales, you may be getting only more ink. If this happens, wash off the ink and dry and stuff the fish once again.

Don't forget, when you are finished printing, wash off all the ink. The fish can then be cooked and eaten.

Some Common Fish That Can Be Printed:

Trout of all kinds
Cod
Pollack
Flounder
Shad
Herring
Mackerel
Skate
Catfish
Bass
Snapper
Porgy

THE SIDE OF THE ROAD

The intricate design you see here is the web of an orb-weaving spider. This spider is a member of a community of plants and animals that lives in grassy areas along the sides of roads.

Roads are more than tar, concrete, and speed limits. They have borders which are filled with stands of colorful roadside flowers. The flowers attract nectar-seeking insects. Small birds and animals come to feed on the insects and later on the seeds of the flowers.

This narrow band of roadside life is a rich area for collecting and observing.

ORB-WEAVING SPIDERS

Spiders build structures that interest both scientists and artists. Fortunately for all of us who delight in spider webs, the world's largest family of spiders is also that which builds orb webs. Not all spiders build webs.

Some of the best times to enjoy webs are early mornings, when they are covered with dew, after summer showers, or on foggy days. Droplets of moisture glisten on the lines of the web. But spider webs are worth watching at any time. If you watch the web closely you may get a glimpse of its builder.

Many orb-weaving spiders roll up in a leaf nearby, hiding from the insects on which they prey. A direct line from the hub of the web to the hidden spider transmits vibrations made by insects caught in the web.

Some spider watchers suggest cutting a part of the web gently with a blade of grass, then waiting silently. The spider might come out and repair it before your very eyes! But remain still. Spiders are very shy creatures and will flee from any movement.

It takes approximately an hour for a spider to build one of nature's more complicated wonders. A lot of web building is done at night. The spider's thousands of tiny spinnerets provide the silk from which the web is constructed.

The spider starts by making a bridge. Usually a line is blown out from the spinneret and attaches itself to another point. The spider then walks across this bridge and drops a second line, anchoring it firmly. Now it returns to what will be the center, or hub, of the web. Radial threads, those stretching from the center outward, are carried from the hub to the bridge.

Orb-Weaving Spiders

When the orb weaver begins to make the spirals, those lines linking one radial thread to another, its leg touches the previous spiral before beginning a new round. In that way the spider measures the distance between spirals.

This is only a temporary spiral. When it is finished, the spider reverses itself. It eats the old spiral as it proceeds toward the center and puts a more closely spaced one in its place. This gives the web greater strength.

Spiders work hard at keeping the web in repair. Some part of it needs to be mended daily. Spiderlings know instinctively how to build webs. Researchers have found, however, that their ability to make webs improves with experience.

SPIDER PICTURES

Spider pictures are easy to make and are a reminder of the times you spent spider watching.

Buy a small can of black spray paint such as Rustoleum or any other brand that does not contain the spray propellant known as florocarbon or Freon. You will find a list of the can's contents on the label. Many scientists believe that fluorocarbons are harmful to the environment.

You will also need a piece of mat board or stiff paper such as oak tag on which to collect your spider picture. Carry some old newspapers to protect the surrounding plants from the spray paint.

Spider webs are abundant in the fields along the roads. When you find an attractive one, examine it carefully. Locate the lines that anchor the web to the surrounding vegetation. They are called guidelines. You will need to know where they are later.

Hold the newspaper behind the web. It is useful to have a helper to hold the paper for you.

Start spraying paint at the center of the web, moving outward around the spirals. In this way you will not miss any of the lines. When the lines are completely covered, move the newspaper to the opposite side and spray again. Spraying both sides will help to adhere the web to the board.

Hold the stiff paper or board firmly. Look for the guidelines and loosen or cut them. Move the paper upright toward the web, with one hand behind it for support, capturing the web on the paper as you move. Allow it to dry for ten minutes before touching.

WEAVING

Weaving is very simple. In the early days of civilization, people wove useful objects from natural materials.

Touching things is a special way of experiencing them. It is not a way we express ourselves very often. The roughness, the softness, the different lines and rhythms of objects that you can feel through your fingers and hands are very satisfying.

You can find a variety of things along the roadside to weave into patterns. Grasses of different kinds weave very well. They are tough yet supple. You will also find other natural objects which accent the grasses, like the soft gauzy texture of a bird's feather, a twig covered with lichen, or a dried seed pod. Collect many different objects for your weaving project.

MAKING A LOOM

Weaving is done on a loom of some sort. The loom is simply an old board with tiny nails tacked at both ends and strung with string. To make a loom then, you will need a board, nails, and some string or heavy thread.

You can arrange the nails across the loom in a straight line, or stagger them. They are easier to string if you line them up. Tack them firmly into the board.

Tie the string around a nail at a lower corner of the board. Run it up the board to the nail directly above it. Lead the string over to the next nail, and then down the board. Loop it around the nail at the bottom, then over to the next nail and up again.

Follow this pattern, pulling the string tightly, until you reach the last nail. Tie the string around the last nail to hold it in place. Once the loom is strung, you are ready to weave it with the grasses and other materials you have gathered.

Choose the grass with which you want to start. Move it over the first string, under the next, over and under, until you reach the opposite side. If the grass is long enough, fold it back and return it, over and under, to the starting point.

If you began your first row by pushing the stem over the first string and under the next, begin your second row in just the opposite way - push the stem of your grass or other plant under the first string and over the second. By alternating your weave, you will find that it holds together better; it will be a firmer fit. Continue alternating the rows until you reach the bottom of your loom.

Hangings can have many patterns. Some of the materials can be repeated many times, like the chorus of a song. Others, such as a feather, are used as an accent. Some of the thread that is used in stringing the loom can be woven in to add a constrasting color. Other pieces of string or yarn can be woven in, too.

As you add more materials and different patterns, your weaving will take on a life of its own. It will become a pleasing object to hang on your wall. It will express to your friends your eye for design and your special sense of touch.

LIGHT WINDOW PICTURES

Flowers from bossoming trees or cultivated gardens are colorful, and often larger than wild flowers. They have been bred to produce these showy flowers. Press cultivated flowers as you would wild ones. You can use them in much the same way for stationery, notecards, bookmarks, and place mats. But these splendid flowers are particularly effective in light window pictures.

HOW TO MAKE LIGHT WINDOW PICTURES

Light shining through a plant vividly reveals the structure of the flower and the leaves. Mounting plants to hang in windows as light pictures is a good way to study their structure.

To make light window pictures, you need contact paper, colored construction paper, scissors, paste, string, and your pressed flowers and leaves. You also need a special paper called rice paper which you can buy in an art supply store.

The size of your light picture will depend on the size of the flowers and leaves you have collected. Cut the contact paper and the rice paper to the proper size for the finished picture. Six inches by ten inches should be about right, though you might want to vary it a little.

Lay the flowers and the leaves down on the contact paper. Keep a margin of about an inch around the edge of the contact paper. This will give you space to add a frame. Lay the rice paper over the flowers and contact paper. Press with your fingers around the flowers and leaves.

Select two sheets of construction paper. With a ruler and pencil, make a margin on each sheet an inch from the edge on all sides. Cut out the part inside the margin. Now you have a frame. Glue a frame to each side of the light picture. Put a thread through a tiny hole at the top and hang your picture in a window.

PEBBLES AND SAND

Beaches composed of rocks are on their way to becoming beaches of pebbles and sand. There has not yet been time for the sea to grind them down. The sea is taking its own time.

Every grain of sand you see on the beach has had a long history. Sand was once part of a large slab of rock. Waves and ice fractured the rock. Glaciers ground the rocky pieces into pebbles. The sea rolled the pebbles against one another, rounding and polishing them.

Pebbles that are flattened and smoothed by the sea's violent movement are collectors' items. Their patterns glisten in the water, their rounded edges are cool and soothing to the touch. We can almost feel the restless ocean through the pebbles.

Day after day the sea hurls the pebbles against larger rocks or against one another. It finally grinds them into fine sand. The largest grains are measured in hundredths of an inch, the smallest in thousandths of an inch.

We can tell the kinds of rocks from which the sand came by its color. Dark gray sand beaches come from slate, and red sand beaches from sandstone. The glittering white beaches most of us know were ground from quartz.

No grain of sand remains in any one place for long. It is at the mercy of the wind. If you return in December to a beach you visited in June, it is not the same. The beach and its outlying sandbars have shifted. Wind and water keep sand always on the move.

HOW TO MAKE A SPORE PRINT

Choose a fresh mushroom with a flat cap. An old dried mushroom will have already dropped its spores. Cut off the stem close to the cap. Put the cap flat on a sheet of paper. Cover the cap with a jar for three or four hours. Remove the jar and the cap carefully.

You will find the spores have dropped into a fascinating design on the paper. Each species of mushroom makes a design of its own. Some spores are white, others are brown. If you use colored paper you will get an interesting contrast in your spore print. Spray the finished print with a fixative so that it will not smear. You can buy fixative at a hobby shop.

SHORES

There are several kinds of shores, but nearly all of them are rock. It is the size of the rock particles that makes the difference. Rock breaks down into boulders, pebbles, sand, or mud.

Rocky shores draped with seaweeds provide homes for mussels, barnacles, snails, sea urchins, and starfish, clinging among the ledges. Shores strewn with pebbles or boulders give little shelter for living things. Sandy shores hide worms, moon shells, and clams beneath their surface. Muddy shores, protected from the full force of storm waves, have rich stands of sea plants.

The picture here is of a printing of weathered driftwood. Parts of old trees, boats, crates or wharves drift on the sea. They are washed in salt water and pounded by wind-driven waves on rocky and sandy shores.

Look for driftwood along the shore. Its shape broken and twisted, its interior pitted with insect holes, and its surface grooved and smoothed by salt, sand, and wind, driftwood becomes a reflection of nature's harsh forces. It tells us something about life on the open beaches.

PRINTING DRIFTWOOD

Lay the wood out in front of you. Look at its grain, which is the pattern made by its tissues. Run your fingers lightly over the markings left on the once living wood by water and weather. What you see and feel now, you will record in your driftwood print.

Assemble your brayer, ink, a pane of glass, paper, and the pieces of driftwood you have chosen to print.

Ink the glass with the brayer. The ink is the right consistency when the glass begins to sound sticky. Run the inked brayer back and forth over the surface of a piece of driftwood, making certain that it is thoroughly inked.

Lay the printing paper on top of the wood. Run your hand firmly over it. With your fingertips, follow the grain of the wood beneath the paper, as you felt for the fish scales and leaf veins in your earlier prints. Pressing the paper into all of the wood's hollows and patterns enables you to transfer its variety to your paper.

Take several prints of the same piece of wood. Each will be different from the previous one because of the varying amounts of ink on the wood. Or make prints of several pieces of wood on the same paper, contrasting their textures. Mount your favorite prints on construction paper or mat board.

DRIFTWOOD SCULPTURES

Driftwood is often collected by dealers, who sell it to crafts people. The crafts people make lamp bases and other useful objects from the wood. Molded and decorated by nature - sand, wind, and salt water - this wood is pleasing to work with and display for others to admire.

On a visit to the beach you may find a piece of driftwood you would like to keep. Take it home and make a driftwood sculpture.

Nature, of course, has already sculptured it for you. All you have to do is display it. Look over your piece of driftwood. Turn it this way and that, finding the position in which it looks best. Then choose a flattened piece of driftwood for a base. Hammer a small nail through the bottom of the base into the driftwood to anchor it in place. You can also apply Elmer's glue for added strength.

Your mounted driftwood sculpture makes an attractive ornament for a bookshelf or desk.

HOW TO MAKE A MOBILE

In making a mobile you will see once more the driftwood's grain and the complex rhythms that the sea and weather have worn into its surface.

Collect screw eyes, thread or nylon fishing line, a nail, a hammer, and a number of pieces of driftwood. You can buy small screw eyes in a hardware store.

A mobile is a study of form in motion. You can make a mobile of as many units as you have time and space for.

Divide your driftwood into two piles. Use pieces that are long and slender as bars or crosspieces. The other pieces may be of a variety of sizes, shapes, and textures. They will be hung from the bars.

Plan or design your mobile before you fasten the pieces into place. Lay out the driftwood on the table. Begin the construction at the bottom and work up to the top. Arrange the bars and the smaller pieces, which will hang from screw eyes set in the bars. As you work, you may find that you want to make some changes in your design.

Find the best place to insert a screw eye in the bottom bar. Sometimes the wood is very hard. To start a hole for the screw eye, first tap a nail part of the way into the wood with a hammer. Then remove the nail, and it will be easy to screw in the eye the rest of the way. Put a screw eye in each of the smaller pieces you plan to hang fromthis bar.

Hold the bar over a smaller piece, turning the two pieces to find the best angle at which they should be hung and their proper distance apart. Then tie the thread through the bar's screw eye, and fasten it to the screw eye in the piece below. If you are hanging a second piece from this bar, go through the same steps.

Look at the mobile pictured here. You will see that there are two pieces hanging from the bottom bar. One is chunky, the other much narrower. They make a nice contrast.

Now you are ready to attach this unit to the bar above it. Before you fix the screw eye on the top of the lower bar, you must find the point at which it balances. Wrap a string around the bar. The point at which the string holds the bar and its two hanging pieces in perfect balance is the point at which to insert the screw eye.

Make this point with a pencil.

How to Make a Mobile

Insert the screw eye at that point. Attach the bar by thread to a screw eye inserted at any point in the bar above. It can be attached near one end of the bar, and another hanging can be attached at the opposite end.

To hang the second bar to the longer one above it, use the string once more. Wrap the string around the second bar. Find the point at which the string balances the bar. Mark it and insert a screw eye in its top.

Follow these steps until you have assembled all parts of your mobile. Fasten a screw eye on the top bar, and tie a long thread to it. Hold up the mobile by this thread. If you have followed the above steps carefully, all the bars and smaller pieces will be in balance.

Hang your mobile from a hook, a light fixture, or some other point on the ceiling. The whole construction will turn slowly, displaying the shapes and patterns created by wind and water and calling back the sense of life you felt at the edge of the sea.

You can also make a mobile with sea shells. You will not need screw eyes. Look for shells with tiny holes through which you can run the thread. Or carefully tap holes in the shells with a small nail and a hammer. Follow the same steps that you did in making the driftwood mobile.

HOW TO MAKE PEBBLE HOT PLATES

Starting a collection of surf-polished pebbles and adding to it on every visit to the beach can be an entertaining hobby. The pebbles in themselves are natural treasures. You may want to take some of the most interesting ones from your collection and display them.

This is a long-range project. It will take you five days to make a pebble hot plate.

Choose pebbles with a flat surface. Choose them also for their color, texture, and size. Besides pebbles you will need a package of plain gelatin, a cake pan, plaster of Paris, a glass acrylic medium, and a square piece of felt.

Plain gelatin is sold at grocery stores in packages containing several packets. You will need only half a packet for this project. A layer-cake pan with sloping sides is best because you will be able to remove the hardened plaster of Paris from it more easily. Buy the plaster of Paris in a hardware store. Buy the glass acrylic medium in an art supply store. You can buy the square of felt, which you apply to the bottom of the hot plate, at the sewing supply counter of a department store, dry goods store, or fabric store.

FIRST DAY. Grease the cake pan lightly with cooking oil to keep the plaster of Paris from sticking to it when it dries. Mix one half a packet of gelatin, following the instructions on the box. Pour a thin layer (less than one-eighth inch), into the pan.

Lay out your pebbles in a design on the table. Then transfer them in the same design to the bottom of the cake pan. The flattest side of the stones should be laid face down, because the side facing the pan's bottom will be the top of your hot plate. Put the pan, with the pebbles and gelatin, in the refrigerator overnight.

At this point you might ask, "Why gelatin?" The answer is that the gelatin forms a platform for the pebbles. Without the gelatin, the plaster of Paris which you will pour over the pebbles would be completely hidden by it.

How to Make a Pebble Hot Plate

SECOND DAY - Mix the plaster of Paris, following the directions on the box. Pour it over the pebbles, making sure they are all covered. Set the pan aside for a day and let the plaster harden.

THIRD DAY - Turn over the pan, tap it lightly, and carefully remove the pebble hot plate. Parts of the gelatin will stick to the top of the plate. Wash it off gently with warm water. Pat it dry with a towel and set the plate aside for two days to let it dry thoroughly.

FIFTH DAY - Cover the bottom of the hot plate with the gloss acrylic medium. Lay the felt over it and trim the edges. Turn the plate over again and rub the stones with baby oil to make them glisten, just as they did in the water. Apply a coat of any dark paint to the rim.

To add a professional touch to your hot plate, apply the gloss acrylic medium to its top and sides. This will give it a lasting finish. It seals the plaster, helps the stones to keep their luster, and makes the hot plate easier to clean.

You will find the finished hot plate well worth the effort you put into making it.

HOW TO MAKE SAND PAINTINGS

Grains of sand mixed with dry tempera will give you a bright, sparkling painting.

Collect a jar of sand. You will also need dry tempera paint, Elmer's glue, paper cups, and a stiff background such as cardboard or mat board. Buy the dry tempera at an art supply store.

Set out one paper cup for each color you plan to use in your painting. Put a quarter of a cup of sand in each. Then put a different color tempera in each cup. The more tempera you put in, the brighter your color will be. Mix the sand and tempera well.

Make a sketch of your picture on the background board. Let us say that you have decided to paint a flower. Draw the outline of the flowers and its leaves. If you want to make the petals yellow, apply glue to each of the petals. Then pour the mixture of sand and yellow tempera over the glue. The mixture will stick only to the petals where you have applied the glue.

Stand the board on its side and tap it to knock off the excess sand. If you want to make the center of the flower orange, brush on some glue. Then pour the mixture of sand and orange tempera over the glue. Again, stand the board on its side and tap off the excess sand. If the leaves are to be green, brush glue on them, then add the mixture of sand and green tempera.

When you have added all the colors, set the painting aside to dry. Tap off whatever excess sand still clings to the surface.

SEASHORE ANIMALS

Seashore animals have no backbones. They breathe, eat, grow, and reproduce in the sea. Often what you see on the beach are only parts of these animals that spent their lives in the ocean. The bottom halves of jingle shells or the circular plates of sand dollars are reminders of the sea's teeming life.

The building blocks of this life are microscopic plankton. These tiny plants and animals provide nourishment for mussels, barnacles, clams, oysters, sand dollars, and many other creatures, which strain the plankton from the water. These plankton strainers, in turn, nourish larger starfish, whelks, crabs, and moon snails.

It is often possible to watch some of these animals at the edge of the tide line on rocky shores. Creatures live in pools left behind by the tide or cling to rocks, covered and protected by curtains of seaweed. Here you can watch a barnacle swing its hairy legs, beating its tiny cilia in search of food.

USING FLOTSAM AND JETSAM

Shore Collage

Stone, shell, and driftwood collages combine the materials you find on the beach in a handsome composition. Use a weathered driftwood board for a background. Lay out your dried seaweeds, broken shells, parts of animals, and polished stones. Combine them and glue them to the board in a design that will express the life and forces of the shore.

Shore Sculpture

Many objects you find on the shore are interesting enough to be mounted alone. A flat piece of driftwood as a base, a nail, and some Elmer's glue will help you display your treasures. Follow the same steps described for driftwood sculpture.

Living With The Lake Songbook

This song book was compiled with the help of

Stephanie Bollwinkel

Ray Hanson

Laura Woodworth.

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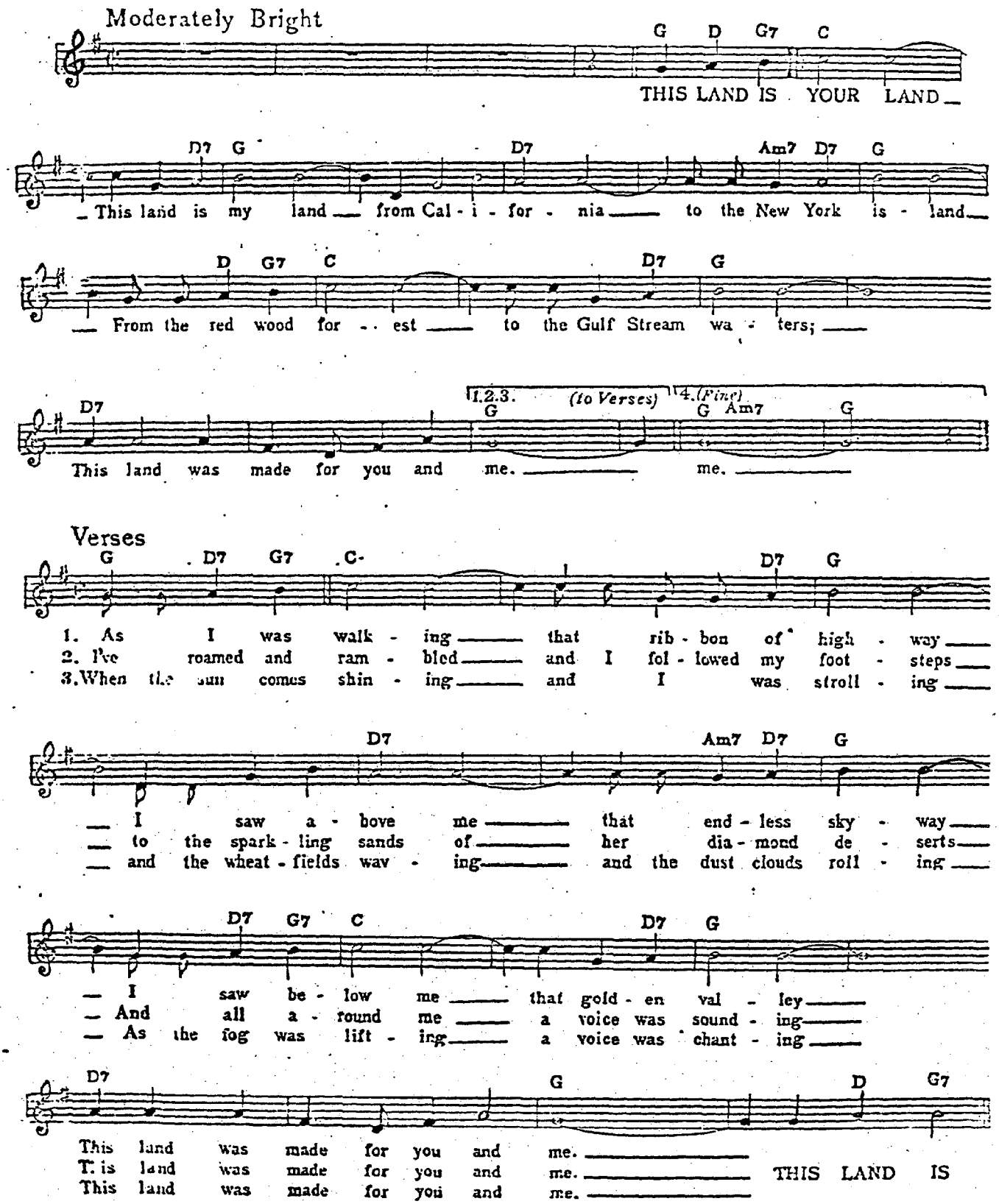
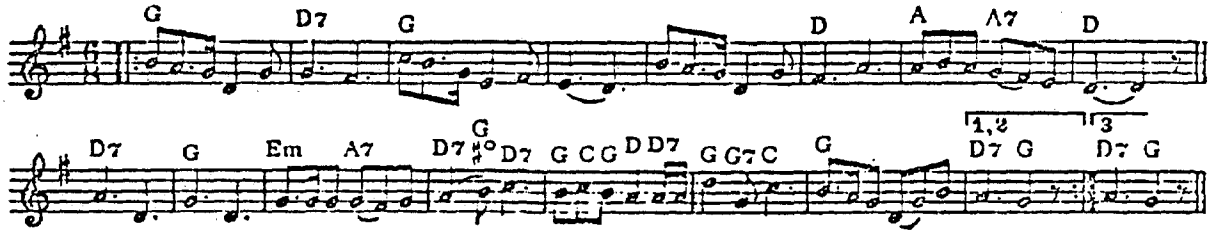
This Land Is Your Land



"Where great whales come sailing by, sail and sail with unshut eye."—ARNOLD

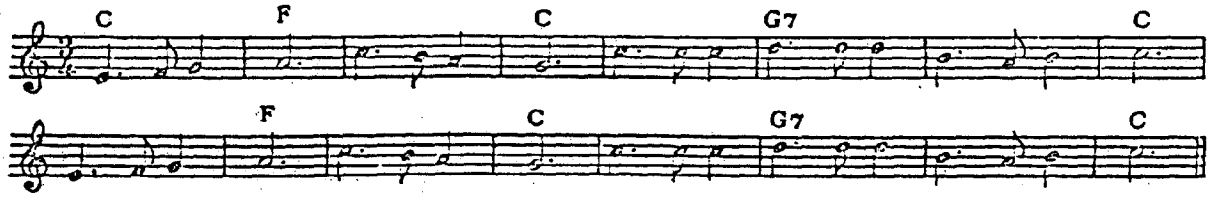
BEAUTIFUL ISLE OF SOMEWHERE



Somewhere the sun is shining,
Somewhere the song-birds dwell.
Hush, then, thy sad repining,
God lives and all is well.
Somewhere, somewhere,
Beautiful Isle of Somewhere.
Land of the true,
Where we live anew,
Beautiful Isle of Somewhere.

Somewhere my love lies waiting,
Somewhere my love is true.
There'll be no hesitating,
Once I am safe with you.
Somewhere, somewhere,
Beautiful Isle of Somewhere.
We'll find out rest,
We'll be heaven blest,
Beautiful Isle of Somewhere.

BEAUTIFUL SEA



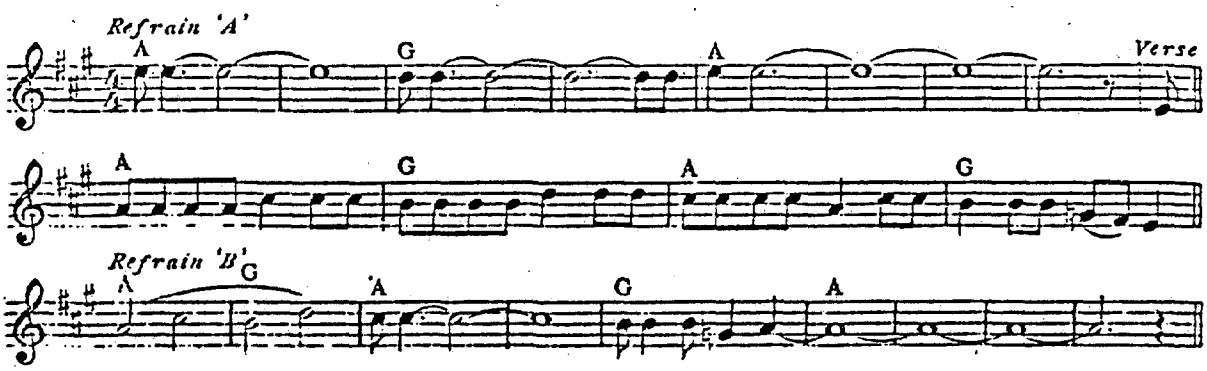
Beautiful sea, Beautiful sea,
Oh, how I love on thy bosom to roam.
Foaming and free, foaming and free,
There is my resting place,
There is my home.

Wonderful sea, Wonderful sea,
Oh, all the joy that you bring to me.
Beautiful sea, beautiful sea,
Someday I will sleep
In the beautiful sea.

" All the rivers run into the sea, yet the sea is not full."—BIBLE

RIVER COME DOWN

BY RICHARD WEISSMAN AND JOHN PHILLIPS



Refrain 'A':
River, river,
She come down.

My gal's across the river. (Three times)
Won't you come over?

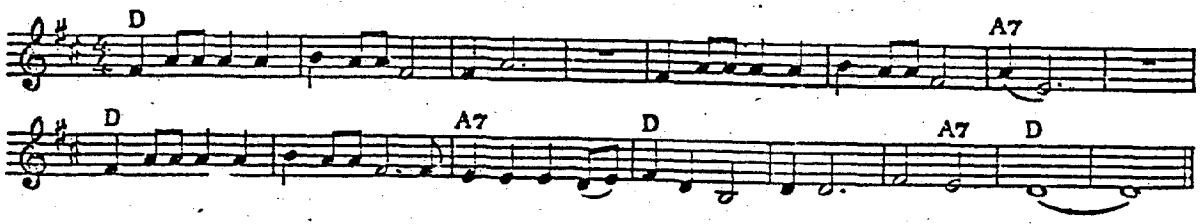
Refrain 'B':
Ooh—— Hannah——
Won't you come over——

Build a raft of bamboo. (Three times)
And float across the river.
(Refrain 'B')

We dance on the bankside. (Three times)
So glad you come over.
(Refrain 'B')

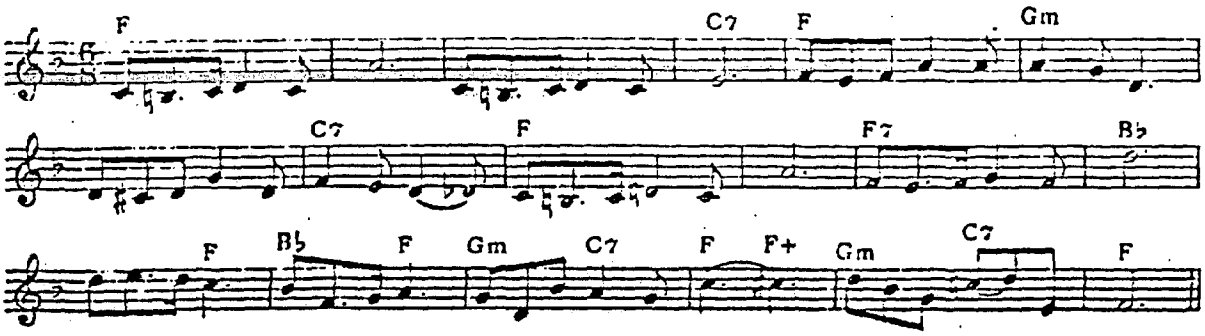
Floatin' 'cross the river. (Three times)
See her come over.
(Refrain 'B')

CRAWDAD SONG



You get a line, and I'll get a pole,
Honey.
You get a line, and I'll get a pole,
Babe.
You get a line and I'll get a pole,
We'll go down to the crawdad hole,
Honey, Baby mine.

ON SILVER WATERS

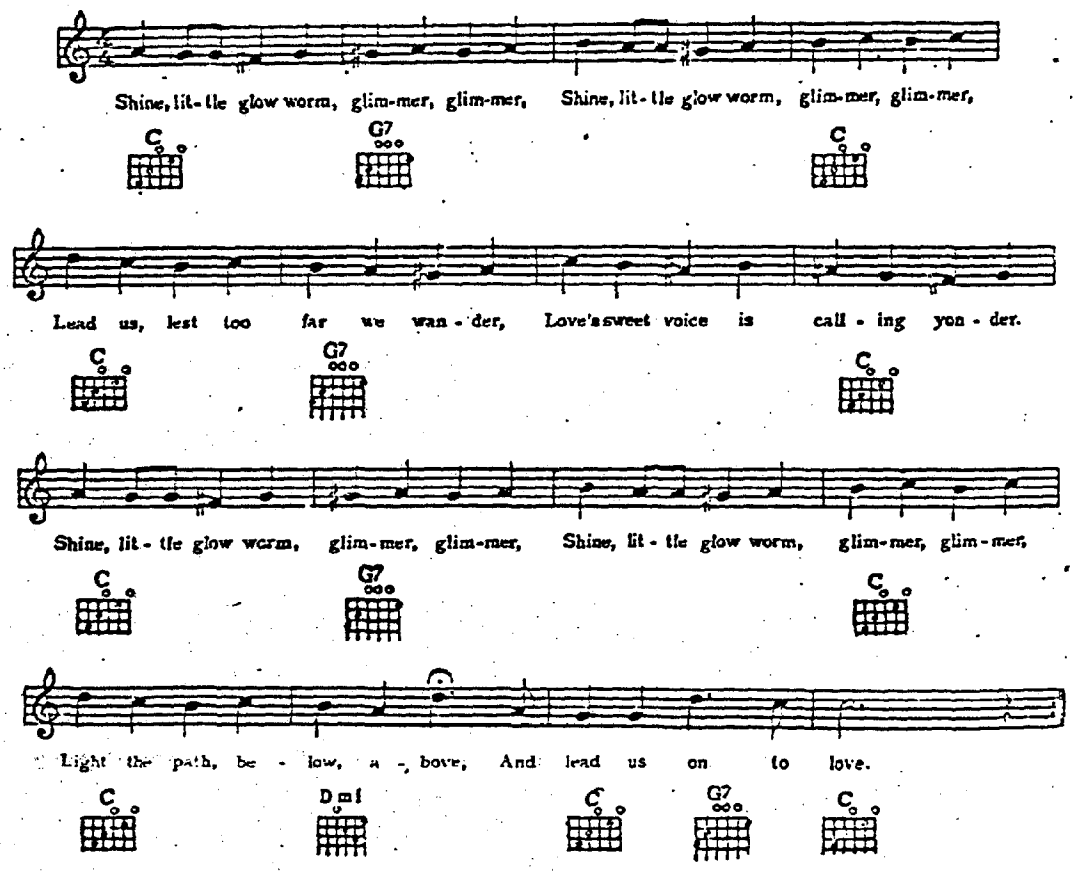


Over the foam we glide,
Borne on the rippling tide,
Under the dreamy, summer skies,
Watching the mist around us rise.
What though the world be wide,
Love's golden star will guide.
Drifting along,
Glad is our song,
While we are side by side,
While we are side by side.

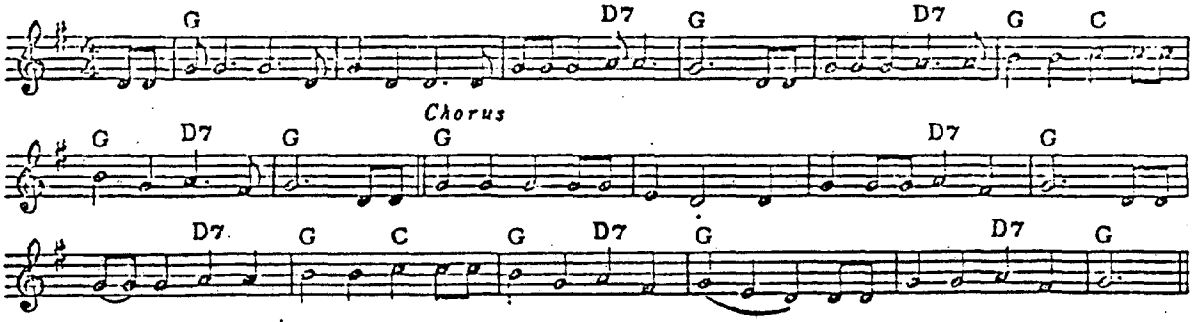
The Glow Worm

By L. C. Robinson and P. Lincke

Moderately bright



E-R-I-E CANAL



It was forty miles from Albany,
Forget it I never shall,
What a terrible storm we had that night
On the E-R-I-E Canal.

Chorus:
Oh, the E-R-I-E was a-risin',
The gin was a-gettin' low,
And I scarcely think we'll get a drink
'Til we get to Buffalo,
'Til we get to Buffalo.

We were loaded down with barley,
Chuck up full of rye,
And the captain, he looked down at me
With his goddam wicked eye.

The captain, he came up on deck
With a spy glass in his hand,
And the fog, it was so goshdarned thick,
That he couldn't spy the land.

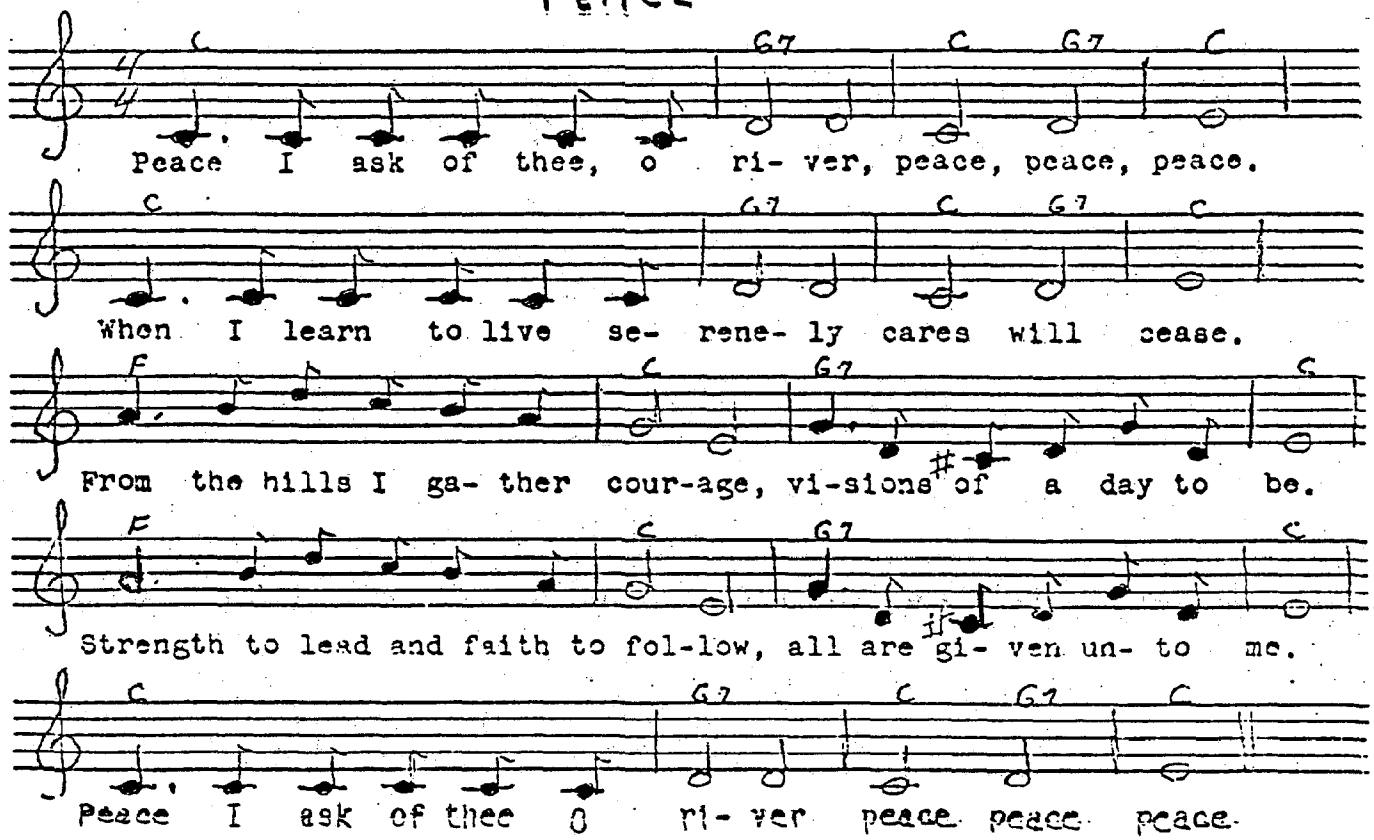
Two days out from Syracuse
The vessel struck a shoal,
And we like to all been foundered,
On a chunk of Lackawanna coal.

We hollered to the captain,
On the towpath treadin' dirt;
He pumped on board and stopped the leak,
With his old red flannel shirt.

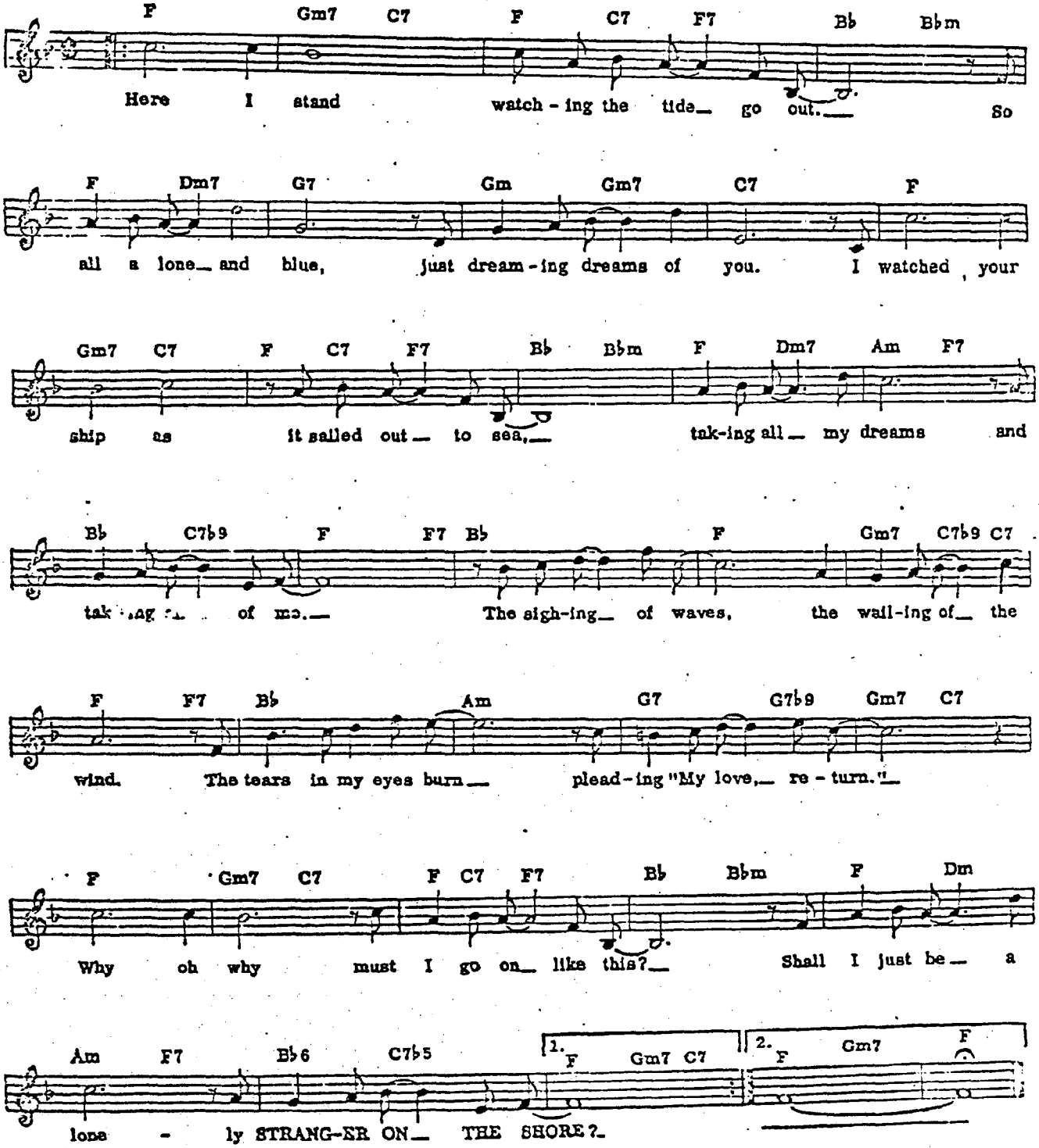
The cook, she was a grand old gal,
She had a ragged dress.
We hoisted her upon the mast,
As a signal of distress.

The captain he got married,
The cook, she went to jail.
And I'm the only son of a gun
That's left to tell the tale.

PEACE



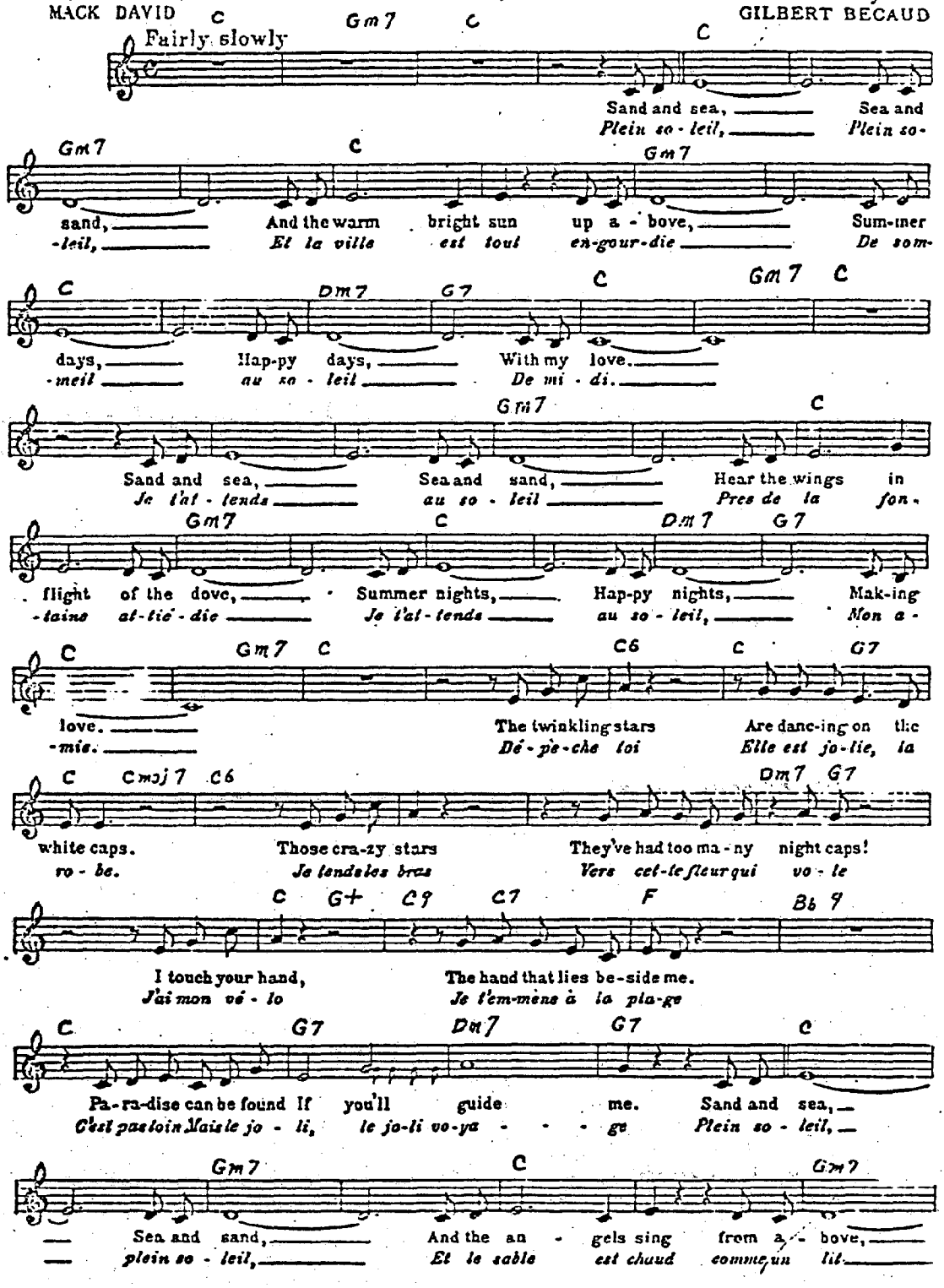
STRANGER ON THE SHORE



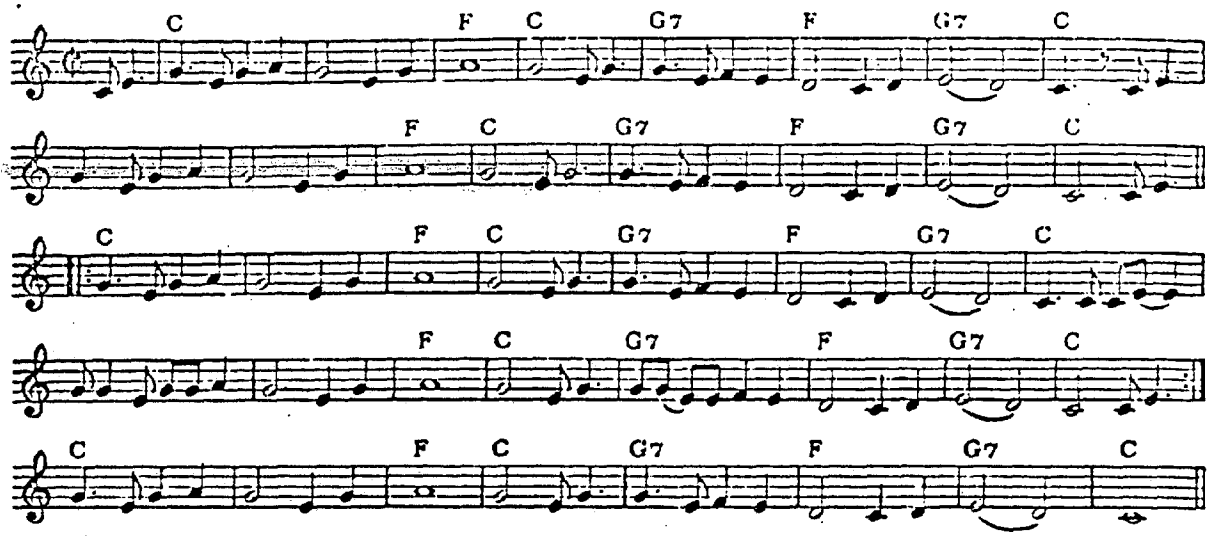
SAND AND SEA
(PLEIN SOLEIL)

Original French Words by
MAURICE VIDALIN
English Words by
MACK DAVID

Music by
GILBERT BECAUD



MICHAEL, ROW THE BOAT



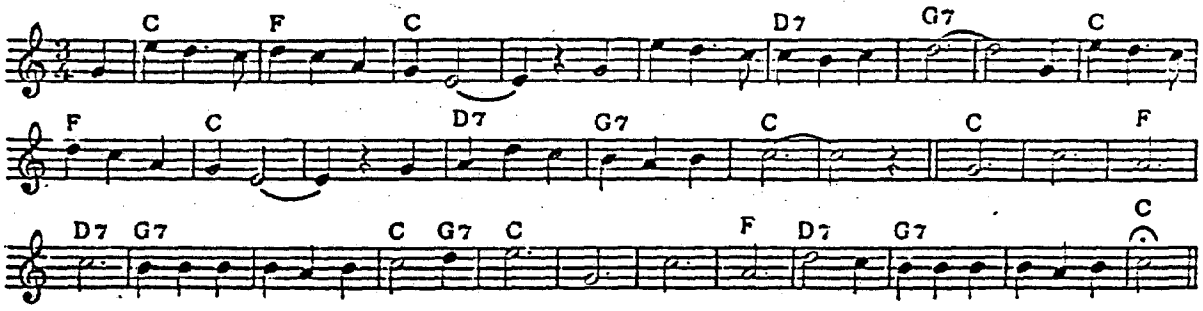
Michael, row the boat ashore, hallelujah.
Michael row the boat ashore, hallelujah.
Sister, help to trim the sail, hallelujah.
Sister, help to trim the sail, hallelujah.

Michael, row the boat ashore, hallelujah,
Michael, row the boat ashore, hallelujah.
The river Jordan is chilly and cold, hallelujah,
Chills the body, but not the soul, hallelujah.

Michael, row the boat ashore, hallelujah,
Michael, row the boat ashore, hallelujah.
The river Jordan is chilly and cold, hallelujah,
Chills the body, but not the soul, hallelujah.

Michael, row the boat ashore, hallelujah,
Michael, row the boat ashore, hallelujah.

MY BONNIE



My bonnie lies over the ocean,
My bonnie lies over the sea;
My bonnie lies over the ocean,
Oh, bring back my bonnie to me.
Bring back, bring back,
Bring back my Bonnie to me, to me;
Bring back, bring back,
Oh, bring back my Bonnie to me.

Last night as I lay on my pillow,
Last night as I slept on my bed,
Last night as I lay on my pillow,
I dreamed that my Bonnie was wed.
Bring back, etc.

Frog Went A-Courtin'

Moderately fast ♩= 112

F C7 F

Frog went a - court - in' and he did ride, ___ M - hm,

C7

Frog went a - court - in' and he did ride, ___ M - hm,

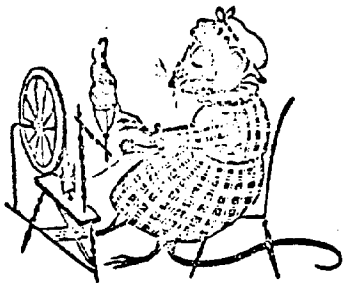
F

Frog went a - court - in' and he did ride, ___

Bb C7 F

Sword and pis - tol by his side, ___ M - hm.

2. Rode right up to Miss Mouse's door, M-hm,
Rode right up to Miss Mouse's door, M-hm,
Rode right up to Miss Mouse's door,
Gave three raps and a very loud roar, M-hm.



3. Said he, "Miss Mouse, are you within?" M-hm, etc.
"Yes, kind sir, I sit and spin, M-hm."

4. He took Miss Mousie on his knee,
Said, "Miss Mouse, will you marry me?"

5. "Without my Uncle Rat's consent,
I wouldn't marry the President."

6. Uncle Rat he laughed and shook his fat sides,
To think his niece would be a bride.

7. Uncle Rat went a-running down to town
To buy his niece a wedding gown.

8. "Where shall the wedding supper be?"
"Way down yonder in the hollow tree."

9. "What shall the wedding supper be?"
"A fried mosquito and a black-eyed pea."

10. First to come in was a flying moth,
She laid out the table cloth.

11. Next to come in a Juney bug,
Carrying a water jug.

12. Next to come in was a bumberly bee,
Set his fiddle on his knee.

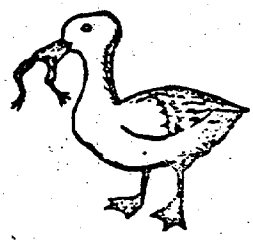
13. Next to come in was a broken-backed flea,
Danced a jig with the bumberly bee.

14. Next to come in was Missus Cow,
Tried to dance but didn't know how.

15. Next to come in was a little black tick,
Ate so much it made him sick.

16. Next to come in was Doctor Fly,
Said Mister Tick would surely die.

17. Next to come in was a big black snake,
Ate up all the wedding cake.



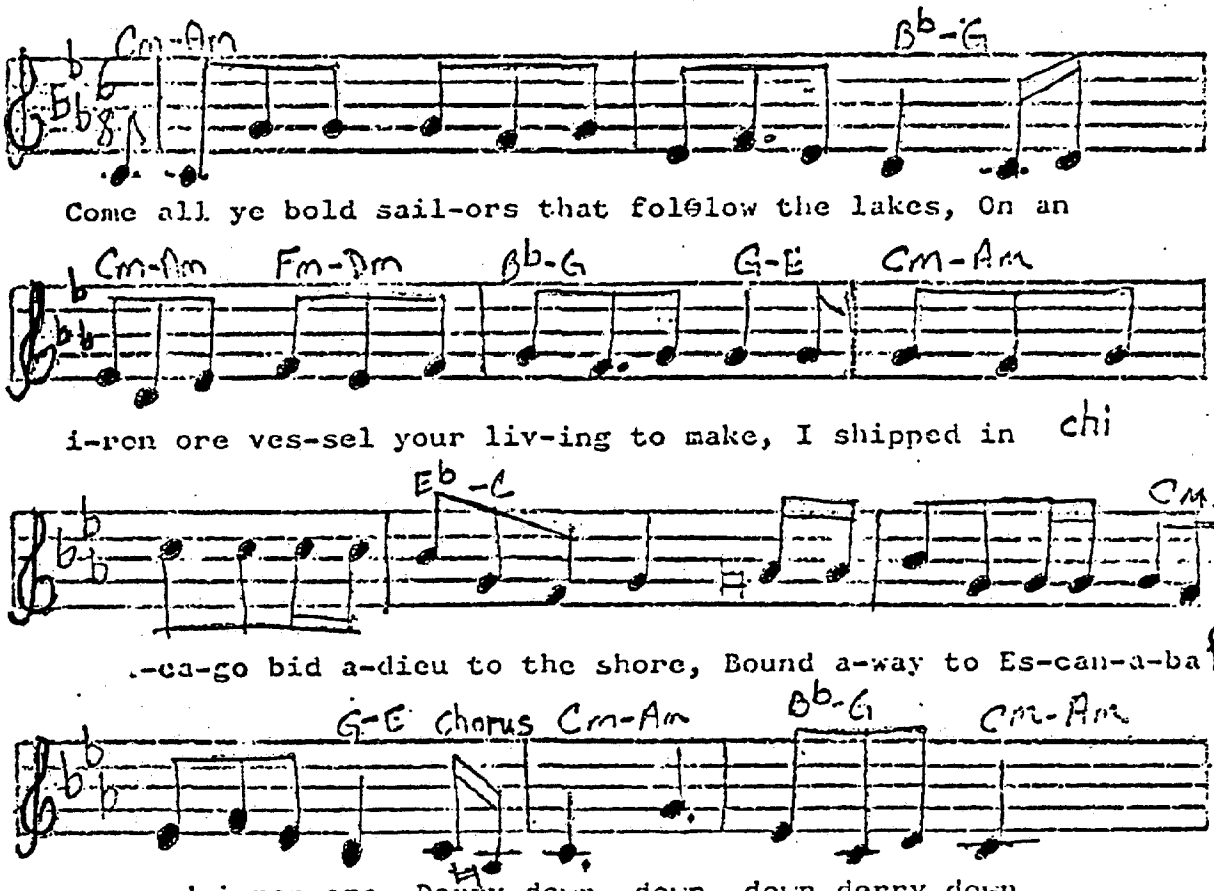
18. Next to come in was an old gray cat,
She swallowed the mouse and ate up the rat.

19. Mister Frog went a-hopping over the brook,
A lily-white duck came and swallowed him up.

20. Little piece of cornbread lying on the shelf,
If you want any more you can sing it yourself.

RED IRON ORE

Ballards and Songs of
the Sahnty Boys.
Virginia, Wisconsin



Laura T. Woodworth

Come all ye bold sailors that follow the lakes
On an iron ore vessel your living to make
I shipped in Chicago bid adieu to the shore
Bound away to Escanaba for red iron ore
Derry Down, down, down, derry down.

Next morning we hove up along the Exile
And soon was made fast to an iron ore pile
They lowered their chutes and like thunder did roar
They spouted into us that red iron ore

Some sailors took shovels, while others got spades
And some took wheelbarrows, each man to his trade
We looked like red devils, our fingers got sore
We cursed Escanaba and that damned iron ore.

The tug Escanaba towed up out of the Minch
The Roberts, she thought she'd left us in a pinch
And as she passed by us, she bid us goodbye
Saying we'll meet you in Cleveland next 4th of July.

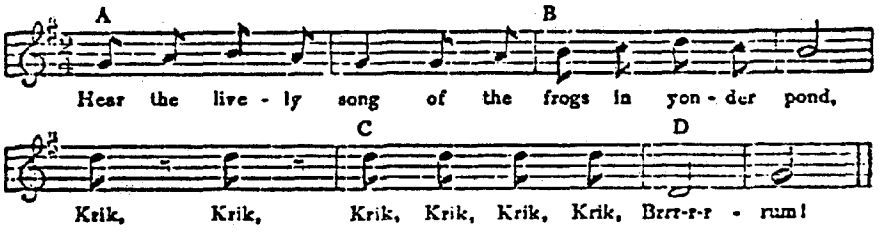
Through Old Louise Island it blew fresh breeze
We made the Foxes, the Beavers, the Skilligalees,
We flew by the Minch for to show her the way
And she never hove in sight till we were off Thunder Bay

Across Saginaw Bay the Roberts did ride
With dark and deep water rolling over her side
We went through North Passage - O Lord how it blew
And all round the Dummy the fleet followed too

Now the Robert's in Cleveland, made fast stem and stern
And over the bottle we'll spin a big yarn
But Captain Harvey Shannon had ought to stand treat
For getting to Cleveland ahead of the fleet.

Frog Round

FOUR-PART ROUND



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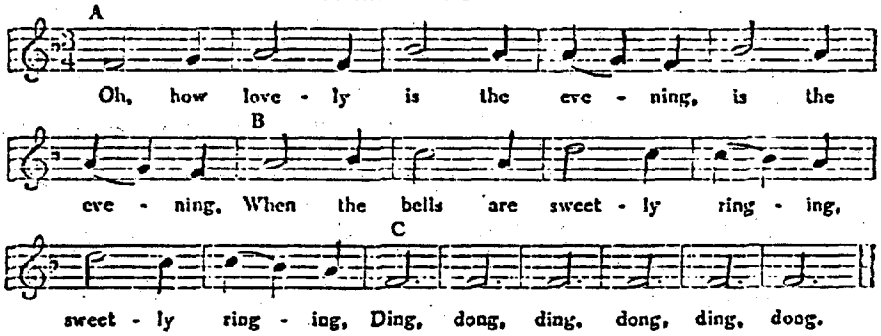
Lovely Evening

THREE-PART ROUND



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