Telescope

25¢

VOL. 4 NOVEMBER 1955 NO. 11

HELEN MAC LEOD II. UNDER SAIL
(Now the Anna S.Piggott)

Telescope

J. E. Johnston, Editor

PUBLISHED BY
GREAT LAKES MODEL SHIPBUILDERS' GUILD
BELLE ISLE DETROIT 7, MICHIGAN

R. H. Davison, Associate Editor

MEMBERSHIP $3.00 SUBSCRIPTION $2.50

Supported in part by the Detroit Historical Society.

EDITORIAL.

Nominations and Elections:

Organizations such as the Great Lakes Model Shipbuilders' Guild, in which no member receives any compensation for his efforts, find it hard to come by officers, living near head quarters, who are both willing and able to serve. Foreseeing possibility of the election of an officer living in Buffalo, or southern California,steps were taken one year ago to transfer to the Board of Directors the responsibility for the election of the three officers: President, Vice President, and Secretary-Treasurer. It is also the Board's responsibility to nominate for seats on the Board, such persons as will signify, in writing, their ability and willingness to serve as members of the Board. This willingness and ability means that they can come to Detroit, to sit in on a meeting, when called.

There has been some adverse criticism of other organizations operating in this manner so this is an invitation to any and all members to express their views. Any nominee must, according to the by-laws, state in writing that he is willing and able to serve. As is too ofetn the case a few members are carrying the burden of duties connected with carrying one the work of the Guild. New blood is always welcome here as it is in most organizations. Many of our best officer material resides outside, and far from Detroit. We would like to have them in the midst of those of us who are trying to carry one the work of the Guild.

You will soon be receiving ballots for the election of offecers for the year 1956. On the ballot you find many familiar names, most of whom had to be urged to serve. You will find on the ballot a space for writing in the name of anyone whom you wish to have serve, either as a Director, or as an officer. Feel free to express your wishes. At least it will give us something to think about next year, if they are not elected this year. Remember, however, that before you write in a name get the written statement of that person that they can, and will, serve.

New and/or ammended by-laws are being considered by a committee. Your suggest--ions are solicited. As of now our members and associate members number about two-nundred twenty-nine, scattered through some twenty-eight states. We have outgrown our old by-laws, and certain sections of our constitution, all of which must have early attention. You are a member. Express your views,--now.

Another problem will be presented to you on a seperate ballot having to do with membership dues. Details will appear upon the ballot.

OUR YOUTH TRAINING PROGRAM

Get the boy's interest and you can win his respect. Given his respect you can develop his character. Develop that and you will make a man of him.

There is no higher calling than teaching but today's mass-production methods are inadequate to the needs. The most obvious result of conventional teaching methods is lack of interest, lack of respect, and lack of character. We are schooling our children but we are not educating them. We are only graduating them; like we mark test tubes, to show how much has been poured into them. Too often we get out of them even less than we put in.

Noting the lackadaisical approach to life, and the job at hand, by the college graduates of today, one cannot avoid the conclusion that something very important is missing from their education. There is so little genuine enthusiasm; so little zest for achievement. Equally conspicuous by its absence is respect for authority,or even an understanding of what it is and why we must have it.

Discipline is becoming an obsolete word, vaguely thought of, if at all,as something imposed from above and to be avoided at all costs. "Self-discipline" may as well be left out of future dictionaries unless its true meaning is to be learned better than it has in our generation.

Throughout our present-day industrial civilization there is a cry for real leaders. They are scarcer than you think, and are needed all down the line - not just at the top. There will never be an over-supply, for the more of them we have the more happiness we will have, on the job, in the home and on the street. Born leaders are almost non-existant. Some leaders develop so rapidly they create the impression of having always been as they are, but there is an old and true saying that he who has not learned to take orders can never learn to give them. This brings us to our Youth Training Program which has been slowly evolving over the past five years at the Museum of Great Lakes History.

TRAINING UNDER SAIL

Although sailing vessels have passed out as cargo carriers, the principal maritime nations, wise in the ways of men,still use them for training young men for the sea.

Off for her maiden voyage.

There is a very good reason for this,tho the trainees will never earn their living under sail. Wind and wave, like time, wait for no man, and a ship must be handled with a keen sense of timing. During a maneuver orders must be given at the right instant, and obeyed instantly, or the consequences may be calamitous. A premature order, or a belated one may be had, but an order not carried out,properly and promptly can cause the maneuver to fail.

Snugged down in the harbor.

Fitting out,---1955

From the captain on down to the ordinary seaman, everyone must know his job, and be willing and able to time his action to a split second. This means drilling at the stations, and drilling again until the job is performed almost automatically. There is no time for thinking a thing out after the order is given.

Drilling at one station is not enough, for each man must have an understanding of the tasks of the others,so that the timing may be effective. The trainee must be rotated on the stations until he becomes proficient on all of them. Some men are just naturally faster than others, but he who is the faster must still time his own movements with all the rest and not do his part prematurely. That would be bad and is not teamwork, and nowhere in the world of work is teamwork more important than on shipboard.

The proper care of equipment must be learned. When something breaks, is lost or damaged there is no shop around the corner. The item must be repaired, reconditioned, or done without. Learning to splice rope is a must,and it teaches other things than just splicing rope. It teaches one to conserve materials.

A disorderly deck or cabin, or a dirty one is unbearable. Neatness and orderliness become a habit. Space is limited and there is no place for anything except in the place assigned to it. After each maneuver every line must be properly coiled and put where it can be readily used when needed again. Thinking ahead becomes very essential and eventually habitual.

Even the mastery of correct terminology helps develop good habits, for there must be a correct name for everything on board ship, and it must always be called by its right name. Careful choosing of words becomes ingrained for life.

PILOTING

Piloting involves knowing (not guessing) what is to be expected along a given route between two points, and constant checking to make sure that the course is safe, and the ship on it. It is excellent memory training, and its mastery gives one a very definite feeling of self-confidence which carries over into other pursuits. Piloting is employed when in sight of land or at least in sight of aids to navigation such as light houses, bouys, and beacons. The watchword of pilots is "CAUTION", but the elements being what they are, courage is an important element in the work.

Piloting develops interest in geography, and one who learns to love charts i s likely to extend his studies far beyond the limits of his travels, always discovering new lands. It naturally follows that he will want to know more and more of far places and peoples, and this leads to an interest in history.

DEAD RECKONING

Dead reckoning is employed by navigators when out of sight of land and unable to make use of celestial bodies for the finding of the ship's position. The problems may be solved by plotting on the chart the courses and distances traveled. For short distances this method is adequate, or the method called "Plane Sailing" may be used. However, there are two factors entering into the problem which can be learned only on board ship. These are the wind and the currents. The former causes leeway, which is the drift of the ship off of the course being steered by the compass. Accuracy in judging leeway comes only with practice at sea.

"Set" is the direction in which a current flows. "Drift" is the current's rate of flow, or velocity. Coastal charts show information on known currents, but elsewhere they must be learned by actual observation or estimated from the direction and velocity of the wind. Dead reckoning is not an exact science but it is a fine means of developing judgement.

CELESTIAL NAVIGATION

Celestial navigation on the Great Lakes is neither practicable or necessary since its practice requires a clear and unobstructed true horizon, but it hurts no one to have at least a basic understanding of it. Perhaps nothing is more conducive to real thinking, and like the other methods mentioned above, there is a certain symbolism contained therein which will serve elsewhere in life.

He who lives for long under the stars, learns much of that which is not in books. But he does not scorn books, for there is so much about the mechanics of the universe in books and available when wanted. Professors, and class work are good, but they must be taken by schedule, and not when the mind is ready for them. Books become friends who speak only when the mind is ready for them,and so, the student of navigation learns to love books.

Gradually, as the marvels of the universe are revealed, one becomes accustomed to "walking with God." One woman, who was critical of the study of astronomy became humble when she learned that she was every day boiling her eggs by the movement of the stars. A railroad man who was proud of the accuracy of his watch, which he believed superior to any timing device ever developed became very silent when he found that his watch was set by the stars. There was a farmer of my acquaintance who ridiculed the science of astronomy until it was pointed out to him that the corner stakes on his property could not have been correctly set had it not been for the very useful science of astronomy. And so one may see that there is much more to training under sail than appears on the surface to the uninitiated.

SUMMARY

Add to the above advantages those which are to be gained by participating an outdoor activity like sailing and you have a combination that is hard to beat. There is just the right opportunity for friendly competition among the trainees, and a fine chance to match wits with the elements in group action. The successful trainee will value, for life, the experience in which he came to be known as "A good shipmate."

End.

MUSEUM NOTES

From the number of inquiries being received there is wide-spread and very sincere interest in the immediate future of the Museum of Great Lakes History, so we will try to give the latest information.

Beginning as soon as possible after the seventh of December space in the Hall of History, in the main building of Detroit Historical Museum, will be made available, as needed, for the materials which we have displayed, in the past, on the "J.T.Wing". The operation will be a major one in the main, but one which will in no way prevent our continuing the work we have been doing during the past six years. In some ways it will enable us to display many of our best items,--which have had to remain in storage most of the time because of the dampness within the old schooner.

Some of our best models were assembled, by good craftsmen, with glues not intended for exposure to much dampness.These for the first time will join the fleet.

Then, there are our fine contemporary oils of famous Great Lakes steamers and sailing vessels. These constitute a most crediatable collection, second in number to the great holdings of the Canada S.S. Company, and of equal quality.

For the first time we will be able to display our blue prints, with the models which have been constructed,by members of the Guild, from these plans. Also, there will be ample opportunity to tell of the services we render to the community,other than those which are obvious to the casual visitor. Such activities are seldom heard of but the constitute a major part of our work, and they go on, behind the scenes,day and night, seven days per week year in and year out. They include such things as loans of exhibit materials; to schools, churches, social groups, commercial houses, radio and television studios in Detroit; answering inquiries from various communities throughout the whole Gt. Lakes region; the supplying of speakers to non-profit organizations, and many another never coming to the attention of the general public.

THE ANNA S.PIGGOTT

The Huron Boat "Anna S.Piggott" has had a varied career. In 1925 she began life in the Lake Huron fisheries, out of Bayfield, Ontario, a worthy successor to Helen Mac Leod I. She was launched as Helen Mac Leod II, and under that name was known from Kettle Point to the upper end of the rockbound Georgian Bay. She fought storm after storm, and always came home under her own power and canvas. She was one of the last of the commercial fishing boats built to operate under sail, and though she carried an auxiliary motor she could hold her own in most anything that Lake Huron could throw at her.

Yachting Magazine, April, 1942, quotes her builder, Louis H. MacLeod, regarding details of her construction: "Keel 30 feet long, 10" wide, and 7" thick, made of red beech. Length of boat over all, 36' beam 10', carrying her sides pretty well down, 3' 6" draft without centerboard, over 6' with it lowered. Angle irons were bent to patterns and fitted three feet apart, then the planking was bolted on to them and afterwards steamed oak frames were bent in 6" apart. Planking is cypress,1 1/8" thick; gunwale, white oak, 2" x 2"; wale strake, white oak 2" x 2". Stem and sternpost are 4" thick and 12" wide."

The draft of this model, it should be noted, is greater than that of the "yawl boat type."

Her depth of hold was very slight; only 23" at the main mast, and increasing from that point forward. There was a solid bulwark around the deck, and at least in her later days as a fisherman she had a pilot house between the masts. There was no other deck house.

Her masts are spruce poles, cut from the woods, as are her gaffs and booms.They were originally of about the same length with the fore appearing taller, chiefly because of the drag, or slope of her keel when afloat. Only token shrouds were used and they came down to the deck near the masts instead of leading out to the rails. This was done to facilitate the handling of nets. The nets could be passed along the sides, outside of the shrouds. Perhaps the shrouds were intended to prevent the masts being unstepped in a heavy beam sea.

Bayfield, Ontario, was her home port and while there was ample depth of water in the river, the entrance was never too good for even the Helen and her likes. Centerboards were the rule, and even these were not too comfortable on the bar when the wind was fresh, or stronger, out of the west.

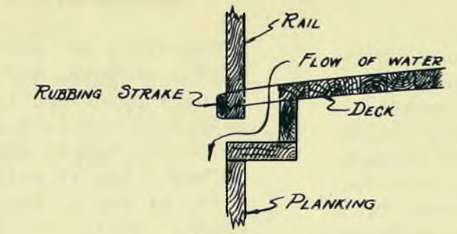
By 1950 the Helen MacLeod II, was well worn and weary of well doing. While she could have been repaired by Louis MacLeod at Bayfield, the cost would have been more than the profits from commercial fishing justified. She was sold to John F. Miller, of Grosse Pointe, Michigan, and Loudon of Fair Haven, on Lake St. Clair. While they had some plans for reconditioning the boat for their own use, the principal objective was her preservation as a Great Lakes type of small craft.

Mr. Wilson sold his interest to Miller, who offered the boat to the Museum o f Great Lakes History at a nominal price. After much debate the purchase was approved and the museum acquired the Helen as an exhibit item. The museum took possession at a boat yard near the mouth of the Clinton River. Later inspection indicated that the little ship could be put back into service and possibly used as a training unit in the museum's Youth Program.

A campaign for the necessary funds was begun at once, the first donation coming from Dr. and Mrs. O'Keefe, of Saginaw. Funds came in slowly and in small amounts while many little expenses crept into the picture, keeping the fund at too low a level to warrant attempting a repair job.

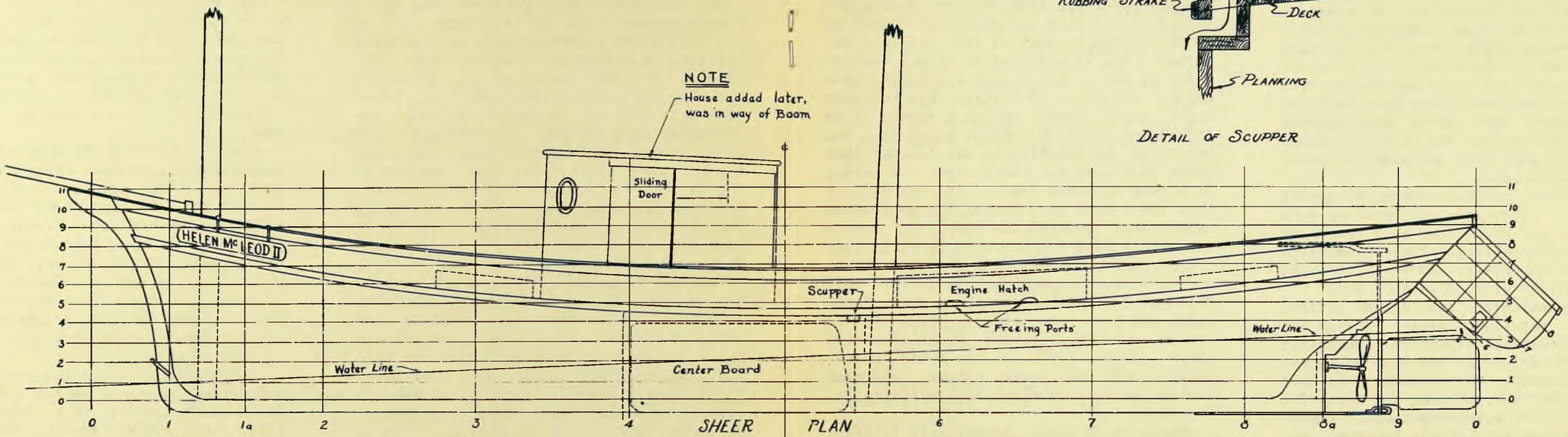
The following is a list of donors:

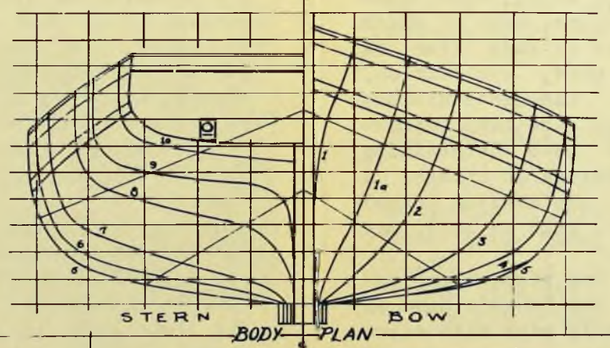
Dr. & Mrs. O'Keefe	$ 6.00
Anonymous.	15.00
Daniel Wells, Detroit.	5.00
W. J. Bender	10.00
Ferndale Woman's Club.	5.00
Admiral Fisheries, Detroit	15.00
The "Yachtswomen".	5.00
Women's Nat'l. Merchant Marine Organization, Detroit.	10.00
J. Kozloff, (Fisheries), Detroit . .	10.00



DETAIL OF SCUPPER

NOTE
House added later, was in way of Boom





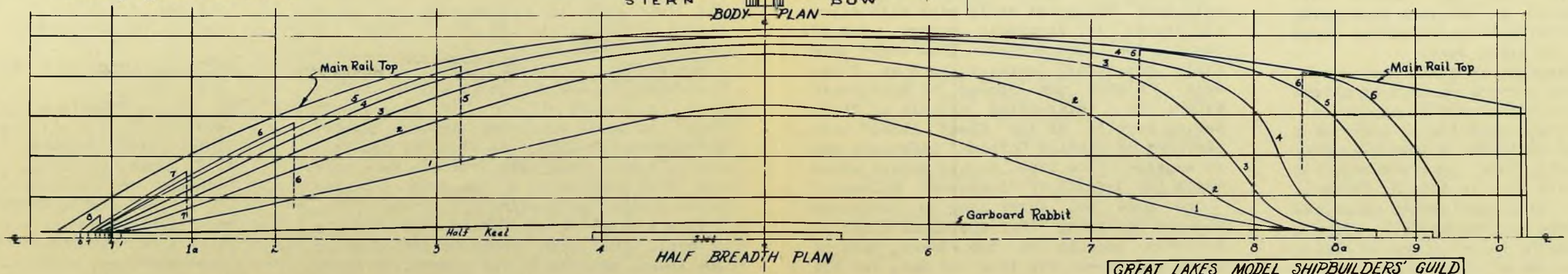
Scale ½" = 1'-0"

Built..Bayfield, Ont. 1930
L.O.A. 36' x Beam 10', x Draft 3'4"
Keel 7"x10" Red Beach . Centerboard 5'-7½"x2'-3½"x2".
Planking Cypress and White Oak

Gt. Lakes HURON BOAT

"Helen McLeod II" of Bayfield

From Lines taken off actual vessel
June 3, 1955 at Det. Hist. Museum
by Loudon G. Wilson



GREAT LAKES MODEL SHIPBUILDERS' GUILD BELLE ISLE DETROIT 7, MICHIGAN	
DRWN BY Loudon G. Wilson	DATE 8-2-55
TRCD BY James B. Jones	CHK'D BY Capt J.E. Johnston

Those were the principal donations during the first twelve months.Minor expenses ate into the fund faster than it grew.

At this point Mr.Grant H.Piggott, Chairman of the Board of the J. T. Wing Company came into the picture with a check for $400.00, partly his own donation and part of it coming from the Wilmot Wheeler Foundation. There were other small amounts of money derived from the sale of donated items, and a post card was made, showing the Helen under sail.

The post card project yielded no profit to speak of. They were intended to sell at 10¢, or as much more as a purchaser might feel like paying. There are still about 500 of the first, and only, thousand printed still on hand. Probably more.

Time was passing,and nothing was getting done on the repairs. Winter storage was paid by the museum. Rails were purchased for a marine railway at the museum, to cut out storage costs, but no money was ever forthcoming for underpinning and a car for hauling out. The going was tough. Everyone approved the idea of the Program, but funds were something else.

While the picture looked dark, the passing of Mr. Piggott's wife made things much darker for him, but out of his grief came the final solution of the problem of getting a boat for the Program's activities.

As a memorial to Anna Stone Piggott he offered to underwrite the entire cost of completing the restoration of the boat, with the understanding that she be renamed for Mrs. Piggott.

After much delay the boat was delivered, with just enough time left before cold weather to finish a complete re-rigging job, and take her out under canvas three or four times, on trial runs.

At this writing she is again hauled out, and will go into service as a part of the Youth Training Program next summer.

Mr. Piggott has contributed everything except the bare hull: New sails, new Gray engine, and all that goes with it, t o the tune of more than $4,000.00. There is much yet to be done and further donations are in order from all who believe, with us that our program is to be of great value to the young people of this area.

ANOTHER LITTLE JOURNEY

Traveling by auto on the Jackson-Eaton Rapids Highway, M-50, one comes upon a new sign.It proclaims that "Rouse's Bookhouse-Religious Supplies and Michigania" may be found two blocks west,at 4885 West Street.

There, one is welcomed by either Howard, Ruth, or one of their teen-age daughters--Edith, Mary, or Dorothy. This business began eight years ago as a result of an 1872 Eaton County Directory found on a local dump. In checking it was learned that there were only two known copies -- making it a rare saleable item. It was decided that there must be a market for such books before they reached the dump. So with a ten dollar bill and one room in their residence,business began on a part-time basis.

Says Howard Rouse,"Everyone in the book business is willing to share their knowledge and help you along. From Ernest Wesson, of Ohio, Forest Sweet of Battle Creek, Colton Storm, at Ann Arbor, Esther Loughin of the State Library, and many others, we have received much valuable information."

"Michigan History is our main interest in rare books, including state, town,township, and county histories, many of which we have on our shelves at this time, as well as biographies, maps, and fiction." Among the rarities are: Lanmann's History of Michigan, with map; the Leopoldinen-Stiftung Berichte for 1846 (containing letters from Father Baraga at L'Anse; a history in German(after the English Travel Series by Astley, 1757, with an early map of the "Seas of Canada."

Naturally, we asked for items along our lines of research, and the Rouse's came up with such things as early maps with mileage charts for steamboat routes, and of course, the Lakes Series. Then there were early missionary journies such as Pitezels' "Lights and Shades of Missionary Life"; an interesting article of "Life Saving Service on the Great Lakes" with sketches of Captain Dobbins' Lifeboat; and an excerpt from 1860 Senate Report which gives the hazards of "Steamboat Mailmen."

One does not tarry long in "Bookhouse" without realizing that the Rouse's are in business because of two loves, both of which are true: The love of God, and the love of good books. A warm welcome, a pot of good coffee, and a good book talk await all callers.

OF BOOKS AND AUTHORS

MICHIGANIA

LIGHTS AND SHADES OF MISSIONARY LIFE, by Rev. J.Pitezel, deals with missionary life in the Upper Peninsula from 1843 on. The descriptions are dramatic and good.

Of special interest to lovers of Lakes lore is the account of a voyage in a large bark canoe (bought for $20.00) from the Soo to the Kewawnon Mission, (L'Anse).

Six people, with the following goods are listed as the burden of this frail craft:

1 Tent
4 Barrels of Flour
1 Barrel of Pork (in sacks)
1 Keg of Butter
1 Keg of Lard
1 Box of Candles
1 Box of Soap
1 Small Cheese
100 Pounds of Sugar

The above items, plus all the baggage of the passengers gives an idea of the size of the canoe.

How little we realize today the price paid by those early missionaries for the foundation of our religion!

The Rouse's.....

THE LAKE ERIE SIDEWHEEL STEAMERS

OF FRANK E. KIRBY

By Gordon P. Bugbee.
Great Lakes Model Shipbuilders' Guild.....
$1.50

For sale at:
The Old Detroit Shop, 5401 Woodward, Detroit 2, Michigan
Doubleday Bookshop, Penobscot Bldg., Detroit 26, Michigan
Arnold Book Shop, Traverse City,Mich.
Ellison Book Shop, Lansing, Michigan
Howard Rouse, Michigania, R.F.D. No. 2, Eaton Rapids, Michigan
Hobby Harbor, 22 N. Third Street, Columbus, Ohio
Northland Publications, De Tour, Mich.

Here is a book which all lovers of Great Lakes ships should have. Frank E. Kirby was Michigan's great naval architect in his time and his name still is on the tongue of all who are in the know regarding such things.

The work is the Guild's first attempt at publishing, other than TELESCOPE, and it has, without any advance publicity, sold remarkably well, both through our own shop and other outlets. The book is a masterpiece of condensation, containing four sections:

1 The Influence of History upon Design
2 The Influence of Space upon Design
3 The Influence of Engineering upon Design
4 The Influence of Esthetics upon Design

There are five half-tone and twelve pen and ink illustrations, fully clarifying the text which is the result, boiled down, of long and tedious research. Mr. Bugbee has done a masterful piece of work. He is a student in the Harvard School of Architecture, and when at home in Grosse Pointe Michigan, mightily to the efforts of all organizations interested in Lake lore.

Reviews of the book will appear in the Free Press, the Cleveland Plain Dealer, Michigan History, published by the Michigan Historical Commission, and Inland Seas published by the Great Lakes Historical Society of Cleveland.

COMING OUT SOON

THE LOG MARKS OF MUSKEGON COUNTY

A compilation of approximately 187 log marks supplied by Mr. Louis Torrent of Muskegon, Michigan. A short explanatory section by Mr. Torrent tells how and why these marks were used back in the days of the great log drives on the Michigan rivers.

Since log drives, and rafting were one phase of water transportation this subject comes within our province. Like the cattle brands of the West, these marks were used to identify the property of various own-

ers. The lumber cargoes of the fabulous fleet of Lakes schooners of the past century had their beginnings back in the interior. The countless millions of sawed logs were rolled into the streams during the winter months, and with the coming of the spring thaw were "driven" down to the mills on or near the open lakes, making one of our most spectacular American scenes.

In no other pioneer activity was there more need for physical endurance, and courage, or more specialized skill in such tasks as preventing, or braking, log jams.

The marks themselves are interesting, and it is hoped that this initial work on the subject will bring to light the stories of how the designs came to be adopted. They are of infinite variety, with seldom any resemblance, one to the other. Some are simply geometric designs. Others are pictorial: a man on a gallows; a pistol, an office high stool; a circular saw; a cross cut saw; a fish, a cant hook, and so on.

Behind each of these symbols of ownership there must lie some related story. In the future we may come by these stories. It is our hope that scions of the great lumber barons, seeing this preliminary work will report to us what they may know of the origin of the mark related to their ancestors. Certainly there is some revelant story connected with the mark showing a man hanging on a gallows. What is it?

WANDERINGS
by
John T. Nevill

In the early days of TELESCOPE we had a lot to say about the dearth of good books on the Great Lakes scene. Since then some good books have come off the press and the most recent, John T. Nevill's "Wanderings" ranks high.Read it and you will understand why people have come from far places to live, and die, in the North Peninsular of Michigan. Such people as Doctor Harry and Emily Dare Werner,his wife, who has penned so many North Country gems in verse, and Lou Dowell of Alger County, "The Grand Guy of Grand Marais," came to see and remained to live useful lives of culture and refinement, as did Father Piret. "Barefoot" Dave (Sudgen) seems to have stayed for the sheer joy of living the free life and to drink in all the beauty of the wild lands. Finn Charlie appears to have come to drink not only the beauty of the land but anything else potable, and developed a way of life which interferred the least with his objectives.

Most of the characters in "Wanderings" have passed on to their rewards, if any, but will still live with us because of Nevill's ability to make them live. Not many of them are nautical characters, but while ours is the nautical scene we feel that there must be a good background in every picture, even pictures of ships. The ships which plow through our inland waters serve men, and in turn are served by men. These men have loves which encompass many things besides women, including dogs, cats and even chickens, and these "characters," too, walk across Nevill's stage, against a backdrop of pines, firs, cedars, and snow. If you can read about Smokie, the cat, and not shed a tear; if you can follow Pugsy, the game cock and not admire valor; if you can peep into Finn Charlie's lunch bag and not feel disgust, or any of the forty-four stories in "Wanderings," without having your emotions disturbed, then don't get the book. It will be a waste of the $3.00 Northland Publications, of De Tour,Michigan asks for this entertaining collection of U. P. Stories. But if you want to know what we meant, some years ago, by good books on the Great Lakes scene, order it today.

NORTHLAND PUBLICATIONS
De Tour,Mich.
$ 3.00

THE ANNA S.PIGGOTT (Concluded)

There are some finishing touches yet to be put on, and there will be gasoline and oil to be purchased. A compass is needed and a few other items to be supplied.

Not to be forgotten are the contributions of labor performed by the members of Girl Mariner Ship No. 52, who made an excellent job of preparing the boat for the boat yard, and otherwise helping in those early, trying days. A finer group of young Americans have never been gotten together. They have outgrown the group and some are now mothers, but one of these fine days there is going to be at least one commemorative cruise for them in the little ship they gave so much towards.

The end.

By Joseph E. Johnston
(Concluded)

While the principal objective of the early steamboats on the Lakes was speedy and dependable service, it was not long before competition made it necessary to attract passengers as well as to transport them. Each new steamer excelled its predecessors in luxury and beauty, and in the race for supremacy the purpose became comfort and pleasure.

Though the circumstances were favorable for steamers the fact that they were special purpose boats made necessary another special type for carrying cargoes, so while steamers multiplied, sailing craft continued to be more numerous. Some square-rigged vessels were built, and while they were well suited for running down the Lakes ahead of the westerly winds, they were too difficult to work back to westward, and required much larger crews. Schooners proved to be the most economical in the long run.

The principal advantage of the sailing vessel was her large carrying capacity. The entire space below decks could be utilized for the stowage of cargo, while the steamers had to sacrifice space for engines and boilers and still more space for cord wood for fuel. For passengers, express, and mail the fast steamer running on a schedule could make money, even though the cost of engines and boilers was high and a constant flow of wood to the fires was necessary and costly. Ten men could sail a three-mast schooner, while steamers required much larger and higher-paid crews. The production of marine steam engines has always been a highly-skilled, slow, and costly process. Up until 1840, it would have required the worlds entire marine engine production to meet the needs of the Great Lakes, if cargo steamers had been attempted.

In 1838, the screw propeller for steam vessels was patented. Two years later, the sloop "Vandalia" was equipped with this type of propulsion, becoming the first propeller-driven commercial vessel in the world. In the "Vandalia" the huge beam-type engines and the cumbersome side wheels were eliminated and a small upright engine was placed far back in the stern in space least desirable for stowing cargo. In spite of these advantages propellers did not bring a sudden end to the use of side wheels; however, seventeen years later there were one hundred thirty-five propellers and only one hundred seven side wheel steamers. At the same time there were more than a thousand vessels under sail on the Lakes.

When the Erie Canal was opened in 1825 settlers poured into the Great Lakes Basin. By 1835, farming rather than trapping began to be the principal activity in the region and farm products moved eastward in increasing volume. The money for those commodities made better homes possible, and towns rapidly increased in number and population. A tremendous demand for lumber developed and the lumbering industry got under way. For many years, lumber was the predominant cargo and in order to meet the demand for its transportation, a new type of sailing vessel was developed.

The deep-draft sailing vessels could not sail into all the shallow bays and rivers where the sawmills located.

er which flourished from the time of building of good wharves until the railroads, and later the highway trucks, took away the business. The package freighter was particularly suited to the tideless Lakes where the variation of water levels is slight. Given the right height of wharf, cargo could be trucked right in through their sides and most of it stowed on the main deck. These ships were propeller-driven steamers of moderate draft designed for general cargo. They survived as long as they did because they could handle small shipments and serve those ports which were late getting railroad service. Severely crippled by railroads, they were finished by the motor truck, and so another special type passed.

When the old wooden lumber schooners failed to meet the requirements of the iron ore trade the designers turned to steel hulls, and in 1882, the "Onoko" was launched. Her draft and beam were limited by the locks at Sault Ste Marie through which all ore shipments from Lake Superior must pass, so, to get the maximum carrying capacity she was very long for her width as judged by her contemporaries. From that day to this, though the locks have been enlarged time and again the ore ships continue to be long and relatively narrow. The schooner "Nancy" mentioned earlier was three and one-half times longer than her width; the ore carrier Wilfred Sykes, of 1950 is about nine times as long as she is wide.

Ore ships are bulk carriers. That is, cargo is loaded into them in bulk instead of being packaged in boxes, barrels, or bales. The principal bulk cargoes are iron ore, grain, limestone, and coal. All can be loaded into a vessel by gravity so cargo-handling equipment common on ocean cargo vessels is not only not needed for loading, but would be in the way. It was soon learned that unloading equipment installed on the docks could be more efficient than any that could be devised at the time for installation on board ship. Consequently, the great terminal ports were equipped with the necessary machines for expediting the discharge of bulk cargoes. With the major ports of discharge equipped with dock machinery, cargo booms vanished from American vessels of the Lakes. Still there were places where it was desirable to unload coal but where it was not feasible to erect costly dock equipment.

Engineers went to work on the problem and by 1908, the steamer "Wyandotte" came out equipped for unloading herself. Here was a typical bulk carrier with something added, and while the hull of a self unloader is the same as that of any other bulk carrier they are generally referred to simply as self unloaders by the installation of the proper machinery.

Bulk carriers in the iron ore trade cannot have their entire hulls filled with that commodity, because of its great weight. An inner hull, or trough, free of obstructing structural members is built down the middle of the hull. There is head room between the bottom of this trough and tank tops below, and ample space between its sides and the sides of the ship for roomy passageways.

The designers were compelled to return to lighter drafts and so came into being the typical Great Lakes Lumber schooner. These new ships were equipped with centerboards which could be pulled up into a slot in the bottom when entering shallow water and when running before the wind, and could be lowered down below the almost keelless bottom when working to windward in deep water, to prevent slipping off sideways. Many of these lumber schooners were fitted with a yard arm on the foremast to carry a huge square sail to catch all of the wind when running before it. Above this yard, they usually carried a triangular topsail known as a raffee, and this sail was a strictly Great Lakes wrinkle, never used at sea.

Another distinguishing feature of the Great Lakes centerboarder was the distribution of its canvas. Ocean schooners, drawing more aft than forward require the center of their sail area well aft in order to maintain the necessary balance between that and the lateral resistance to drift, which is determined by the underwater profile. The Great Lakes lumber schooner drew the same at both ends because that was necessary for great carrying capacity in shallow water. With the centerboard located between the fore and main masts and lowered for use the center of lateral resistance was well forward, making it necessary that the cen - ter of the whole sail area also be well forward. They consequently carried a large foresail and a small mizzen, while the conventional deep-water ocean schooner had her largest sail on the last mast aft, where she is deeper in the water.

Another visible feature of the Lakes lumber schooner was her straighter profile of hull. Not having the deep keel of the ocean schooner strength was gained by straight, perpendicular sides. Usually the lakers were nearly flat-bottomed, but that does not show in a picture of the vessel under sail.

With the passing of lumber as the predominant cargo of Lakes vessels, iron ore began replacing it in the same role. Many of the old lumber schooners went into the ore trade, often with disastrous results . Iron ore is very heavy and some of the larger lumps that went down the chutes at the loading docks went right on through the bottom of the schooner. There was need of a special type of vessel for this heavy stuff.

Even before the lumber trade passed, steam entered the field. The production of marine engines was catching up. First came the steam tugs which towed the schooners through the rivers connecting the Lakes. Later it was the lumber hooker which took on a load, then towed one or more barges which quite often were simply the hulls of old schooners. When the lumbering industry moved on west to the Pacific Coast it took with it the lumber hooker and they disappeared from the Lakes. No type of Great Lakes vessel so well met the challenge of the sea, and for several decades steamers of that type moved the bulk of the lumber of the Pacific Northwest. The only change made was the moving of the pilot house from the bow back to a point just forward of the funnel.

A contemporary of the lumber hooker was the package freight-

When converted into self unloaders endless conveyor systems are installed below the bottom of the troughs. Hoppers feed the cargo by gravity onto these belts which move it along to some form of elevator, which in turn deposits it on the conveyor in a gigantic boom that finally drops it on the stock pile ashore.

These names are selected at random with the intention of obtaining data on vessels built approximately twenty years apart. Had the designers rested on their laurels on having built the "Onoko," and had progress stopped at that point, it would take more than sixteen ships to carry the same amount of ore now carried by the "Wilfred Sykes." This estimate includes the extra time required at the docks and working through locks, and takes into consideration the difference in speed of the two vessels.

There were other types of vessels upon the Great Lakes but they were not of any particular significance. Their contributions to the advancement of the area were not important. There were the whalebacks, certainly unique, but had they never been built the story would be the same. Passenger steamers came and went but after the coming of the railroads they did not greatly affect life in the region but instead became more in nature of recreational facilities than basic economic factors.

The growth in size and increase in carrying capacity of the bulk carriers of the Great Lakes is indicated in the following table:

Name of Vessel	Built	Lgth.	Brdth.	Dpth.	Carrying Capacity
Onoko	1882	302'	x 39'	x 25'	3,000 tons
Superior City	1898	430	50	28	7,000
Harry Coulby	1927	630	65	33	14,000
Wilfred Sykes	1950	678	70	37	21,500