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THE
NAUTICAL MAGAZINE

AND

Naval Chronicle.

JANUARY, 1858.

A LIGHTHOUSE TOUR OF LAKE SUPERIOR.—By *Captain Mac-*
hinnon, R.N.

Uncle Sam is very particular! Uncle Sam is very jealous about his shipping paying more light dues than are justified by circumstances! and, as Uncle Sam provides all the necessary means for defraying the expence of lighting his coasts, why perhaps Uncle Sam is right! It appears that Uncle Sam, at the beginning of the year A.D. 1857 was not quite satisfied with the working of his lighthouses on Lake Superior, and therefore determined to reorganize the whole system. To do this effectually, he appointed two officers from the United States service.

The first of them was Capt. G. H. Scott, of the U.S.N., who was directed to inspect the lighthouses; and the second was First-Lieut. W. F. Smith, of the Topographical Engineers, who was directed to superintend construction, and all mechanical works connected with that department. This officer being armed with full powers to superintend the prodigious extent of lake coast and tributaries, extending from the city of Detroit through Lakes Huron, Michigan; Winnebago, and Superior, found the distance so enormous (being upwards of 4,000 miles) that he considered it necessary to charter a commodious steam vessel to enable him to master his work in the required time. The good steady going vessel *Michigan* was therefore taken for this purpose. She was something under 700 tons burthen, with an average speed of ten knots. Having selected the necessary staff of surveyors, artificers, and lampists, and being ready for the service of

Lake Superior, the author of these lines was honoured with an invitation to join in this interesting trip. His narrative, therefore, will commence on Lake Winnebago, where he received notice to join the *Michigan* at Mackinac.

In the service to which the author belongs an officer always feels proud on seeing that his best endeavours were always relied on to be strictly and zealously carried out in any position in which they were directed. And it is but justice to assert that in the whole course of his experience, a greater amount of zeal and attention, a greater regard for the interest of their departments, as well as of their country, was never displayed than that which animated these able, persevering, and most energetic officers, Capt. Scott and Lieut. Smith, in this their arduous and harassing duty around the shore of Lake Superior. It may appear presumptuous in a British officer to make such an assertion, but in recording his observations the liberty will perhaps be permitted of paying this tribute to the character of those officers.

The people of the United States have in this district a young country before them, and some of course are busy in the process of city making, which is not the simple and easy operation generally believed. No place, however well selected, can become immediately a flourishing town, a centre of business. Several requisites are absolutely necessary to effect this object, and the utmost care must be taken, if a sound healthy growth is looked for, to discourage the fever of such speculation as now burns furiously through some towns on Lake Superior.

The first requisite is a good natural point of land, a point not likely to be damaged or overwhelmed by the progress of the surrounding country. The second is a facility for emigration: either by lake, river, or road. The third is an influx of an industrious, settling population; not pre-emptors who speculate. The fourth is political influence to attract the public improvements; and, lastly, considerable capital, which may be locked up for years without interest. Such are the materials required for city making.

If these requisites are attended to, success will follow, and such success that the wildest imagination can hardly anticipate or realize. A person having adopted such measures in reference to the island at the outlet of Lake Winnebago, may confidently leave it to the judgment of the whole United States to say whether he is not justified in saying this with reference to Lake Superior.

One evening we were quietly enjoying a mild specimen of the leaf in front of an old log house absolutely enveloped in vines and creepers. The sun had just disappeared, and the moon was rising over the low point of land that forms the southern outlet of Lake Winnebago. The river formed by this point was rapidly hastening towards the water power at the rate of five miles an hour, producing an inclined plane of glittering crystal, glancing in the moonlight ray. The Italian sky still retained the gorgeous colouring of the departed sun: whilst the murmurs of the rippling water, as it curved around the point, was softly contrasted with the rustling of the woodcocks' wings as they

sought their undisturbed home in the natural copses of plum trees or wild vines, sacred as yet from the invasion of the sportsman.

Lost in admiration of this delicious scene, it was not until the exclamation was repeated from the bowery log house, "Here is the post. Letters for you, Captain," that the reality became evident. The expected summons to join the *Michigan* had arrived; and it was necessary to take immediate steps to depart for Mackinac. The following morning having proceeded to the State canal at Menasha, and awaited the arrival of the first steamboat bound up Lake Winnebago to Fond-du-Lac, the author started the next morning from thence on the newly opened railway for Milwaukee, in high spirits, as the train moved at respectable speed through the glorious prairies, recently gained from a wild desert, but now teeming with an active and intelligent population.

Four hours took us to Milwaukee, where we had the good fortune to get on board a comfortable propeller, the *Galena*, and started immediately for our destination. After stopping at various points on Lake Michigan, we arrived at Mackinac, and took up our quarters at the comfortable hotel of Mr. Franks, the Mission house.

After a short stay we had the satisfaction of seeing the *Michigan* arrive, and speedily took possession of one of her cabins; and at 11h. p.m., on the 9th of August, 1857, we started on our way to Lake Superior. At five o'clock on the following morning we lay to off Detour to inspect the lighthouse; and this being concluded, we proceeded up to the Sault St. Marie River, arriving at the canal connecting Lake Huron with Lake Superior at five o'clock a.m.

This canal, to avoid the Sault St. Marie, is nearly one mile in length, of solid masonry, twenty-five feet high, ten feet thick at the base. The gates are each forty feet wide, and there are three of them. The canal is 100 feet wide at the top of the water, and 115 feet at the top of the banks. The depth is twelve feet. This is a solid and substantial structure, and highly creditable to the engineer. The rapids of the Sault St. Marie are remarkably picturesque, presenting a very animated appearance as they are navigated by the numerous Indian birch bark canoes, constantly engaged in fishing, while they are tost to and fro in the boiling waters, dancing like bubbles on the impetuous rapids. From the entrance of the Sault St. Marie River to the canal we passed numerous rugged looking islands; the blasted trunks of trees; the rocky and barren heights, and the desolate appearance of the surrounding country, forming a scene of savage wildness difficult to describe. An hour took the good ship *Michigan* through the canal. The machinery was then put in motion, and she rapidly glided into the clear and deep waters of Tahcuamenon Bay, the entrance of Lake Superior.

About four miles brought us to Round Island, on which is situated an American light, which does good service to both American and Canadian navigation. In fact, the British trade ought to be deeply thankful to Brother Jonathan for his liberality in lighting the coast so thoroughly. The lighthouse on Round Island is similar to all

others on Lake Superior, being a plain unpretending stone and brick house, with a Fresnel light. These lighthouses are attended, according to their size and importance, by one, two, or three keepers, with a regular salary of 350 dollars per annum. In so remote a country it must be difficult at all times to secure the services of thoroughly competent men. But Uncle Sam is wise, and entrusts the supervision of these important works to the two officers already alluded to, who thoroughly understand their business.

Lying to off Round Island, the officers abovementioned landed and commenced an examination of the details of the lighthouse. This examination is very carefully conducted, and copious notes taken for the information of the Bureau. After several hours of minute supervision, during which the attacks of mosquitos were incessant and most provoking, the officers returned on board, and the vessel sought shelter for the night.

Fortunately we had, as temporary captain, an experienced superior pilot in Captain Reed. This fresh water veteran is yet a young man, and in appearance the very opposite to Old English ideas of the pilots with grizzly locks, and ready for a dangerous almost unknown and arctic sea. It was extremely amusing to see this young ancient pilot take charge of the *Michigan* and her pilotage with the greatest confidence and skill. His method of making her snug for the night was new to us. It was a simple process enough, although quite opposed to general usages on the ocean. "I guess I'll make her fast to Wheeskey Point," said our veteran, and no sooner said than done. After sundry twangs of the engine bell, denoting "a tarn ahead and a tarn astarn," we were safely fast to a wooden pier built on a remarkable tongue of land or natural breakwater, extending a considerable distance from the main land.

American steamers have a regular watchman, who takes charge of the vessel after the work is done and the ship secure. This is a very good custom, as it enables all hands to get a good night's rest. Gradually the brilliant lights illuminating the whole length of the *Michigan* were extinguished, and the good ship lay snugly, and I may say safely hugging the friendly wharf, although in an open sea more exposed, save from tide and swell, than if lashed to the Eddystone Lighthouse.

At daylight on the 11th we cast off from Wheeskey Point; and, after inspecting the lighthouse on Iroquoise Point, we stood along the coast to Whitefish Point. Here a number of half-breeds were employed in taking whitefish and lake trout. Several of these people had emigrated from Red River, and were splendid specimens of the genus homo. Those of us not professionally occupied, strolled into the sandy undulating plains of Whitefish Point in search of game. We were rewarded by a few pigeons, and saw traces of deer, which a half-breed pronounced to be those of the reindeer. While waiting here for a boat to return on board, the *Michigan* having run her nose gently on the beach, an accident happened to the author that had well nigh proved fatal. With gun in hand he had sought rest in a

flat bottomed boat that was hauled up high and dry. The gun was leaning against the side of this boat, nearly upright, and as he was raising it and stepping out to embark in the approaching boat, one of the cocks struck the gunwale, just raising it sufficiently to effect its going off. The charge rushed by his ear, just singeing his hair, and rendering him perfectly deaf for the remainder of the day. It was a narrow escape, and the only thing under Providence that saved his life, was the habitual precaution, acquired from long practice, of never drawing the muzzle of a gun towards the person.

As soon as the necessary duties were performed at White Fish Point Lighthouse, the *Michigan* stood on along the coast. Towards midnight, having run our distance, we lay by. At daylight we stood in towards Grand Island, and soon made the celebrated pictured cliffs at the southern entrance of the bay. These cliffs are perpendicular, and marked with Indian symbols; as the fog hung like a mantle over them, they presented a grand and imposing appearance. Standing along the coast, across the harbour* of Grand Island Jonathan has not been long in discovering a good and secure place, the site of a future city, and it is fixed on accordingly. This paper city as yet is in progress of survey, and most probably will hereafter become—taking into consideration the rapid progress of the West—a place of considerable importance.

On a prominent point of the island is the lighthouse, for which our cautious (rather a rare quality) captain appeared to have a wholesome respect by stopping the engine at a safe distance. We then proceeded to land on a natural pier of sandstone rock. At the foot of an inclined railway, at the base of the cliff, we were met by the lighthouse keeper, and, with instruments, &c., were soon transported by its means to the top, 150 feet above the level of the lake.

At the extreme edge of the point stands a huge projecting sandstone rock, through which the action of the sea has excavated a passage, forming a natural arched tunnel. Our boat's crew, in the exuberance of their spirits, tried this natural channel and discovered a passage with ten feet of water in it, and in which the shrill sound of the steam whistle of the *Michigan* caused a remarkable and prolonged echo. The sound reverberated from the cliffs and high land, and was prolonged and repeated on all sides for several seconds. The view from the summit of the island well repays the visitor, and was remarkable from the exquisite clearness and purity of the air and water of the lake. A luxuriant vegetation, grass especially, clothed the surface of table land, whilst plentiful supplies of strawberries and

* In Captain (now Admiral) Bayfield's survey of this lake, published in three sheets, a work remarkable not only for its accuracy of execution but also for the geological information which it contains, it is stated that the cliffs of Grand Island (of sandstone) are 400 feet high, while those of the adjacent coast are but 300. And these cliffs are broken by the waves into picturesque caverns, pillars, and arches of immense dimensions.—Ed.

raspberries rewarded those who were inclined to scramble through the intricate thickets.

After the necessary investigation of the lighthouse had been completed (and it was impossible not to admire the extraordinary care and attention to the most minute details bestowed by the officers upon this important subject of lighting Lake Superior), we descended the cliff as best we could, reembarking in our boat from the stone pier wharf of Nature's own formation, and returned to the vessel. Onwards we immediately went, and in four hours entered Iron Bay; at the bottom of which lies the town of Marquette, where the Chocolate River falls into Lake Superior. At this point commences the great mineral district of Lake Superior.

Marquette is a city of four years' growth, and since the construction of the Sault Saint Marie canal it has advanced rapidly. There are three substantial and considerable piers extending into the bay; alongside of which were lying eleven large schooners and one propeller, loading with iron ore. A railroad, already completed some twelve miles, a tramway of sixteen, and a plank road connect each of these piers with the iron mountains.

The iron ore is said to contain from fifty to eighty per cent of the best and toughest iron in the world; and the mountains, from which the railways and roads transfer it for shipment, contain an inexhaustible supply. The production obtained with the present limited means amounts to about 200 tons a day. The cliffs of this wonderful ore are blasted with the greatest facility, and it is asserted that several hundred tons are detached at a single explosion. The cars are then loaded and run down an inclined plane to the piers, where they are dumped into the vessels' holds. The railway is being rapidly extended to the state line of Wisconsin, where it is to meet the Lake Winnebago road, now in rapid progress of construction. When this is completed—which will be in about three years—Marquette will have direct railroad communication with New York and the Atlantic seaboard. Beautiful marble rocks crop out into the harbour, and a fine variety of superior hone stone abounds in the neighbourhood.

The whole population of the county amounts to about 2,000, one half of whom are claimed by the city of Marquette. As the major part of the remainder are employed in the mines, there is literally no agricultural population. In spite of this drawback to material prosperity, there is still a look of substantial wealth about Marquette that promises a speedy and permanent growth. It is unusual in the far West to find a point which possesses such obvious advantages for speculation. The best town lots, fronting the harbour, are held at from 2,000 to 3,000 dollars (£400 to £600) each. The back and inferior lots, downwards to 250 dollars (£50). The population bear unmistakable signs of the healthful climate. All sorts of vegetables grow to great perfection, and the usual grain crops, except Indian corn, likewise flourish. We feel confident that the popular accounts of the severity of the climate of Lake Superior are very much exaggerated, and that the climate of this part of the lake, 46° 35' N., is,

on the whole, not more severe than the climate of the North of England.*

Iron-Bay, like most parts of Superior, abounds with exquisite fish: white fish, lake trout, and herrings in canoe loads were constantly alongside. One lake trout, measured for curiosity's sake, was 4ft. 10in. in length, and 65lbs. in weight. The visit of the *Michigan* was welcomed by the city people, from whom the officers in command received complimentary visits, including of course the principal inhabitants, who kindly furnished us with their news and current information of the place. Amongst them must be specially mentioned three ladies of Marquette, whose unreserved manner and delightful *naiveté* was charming to us rough voyagers. The total absence of all ceremony and etiquette on the occasion that such wild regions fully justify no doubt contributed much to render their lively manner and conversation still more charming. The summer clime of the lake, along with their own inclination, rendered bonnets quite superfluous, and all punctilious ceremony being naturally banished from their thoughts, we four desolate bachelors of the *Michigan* were highly gratified on seeing our fair friends, *sans ceremonie* as if out of their own drawing-rooms, walk on board. Seating themselves in rocking-chairs in her saloon, while they kept them in full motion, corresponding with the vivacity of their conversation, the music of their voices gave speed to the wings of time, when suddenly an unearthly howl—the steam-whistle of the *Michigan*—penetrated our inmost senses and abruptly terminated an interval of "joys too brief."

The spell was broken, leaving a picture on memory's tablet for retrospect in future years, with other scenes of sunny hours that occur in the chequered journey of life. In a few minutes the ladies were wending their way homewards while the *Michigan* was hastening on her course for Kewaiwona-ning,—a good illustration of the respect which the authorities on board of her entertained for the value of the maxim that declares duty is paramount to pleasure. The real meaning of Kewaiwona-ning is Portage River, the term *portage* (French) being applied generally to any place where canoe navigation is interrupted, obliging the canoe to be carried on land. Thus there is a canoe route across this isthmus, partly by water, but a portage from the lake is necessary to get into or out of it on each side of the isthmus; and thus the danger from rough weather in rounding the point in canoes is avoided.

At daylight on the 12th we had arrived at our destination, and immediately communicated with the lighthouse. Portage River is connected with several small lakes extending to within a few hundred yards of the portage on the opposite side of Point Kewaiwona. A short canal will cut this vast metallic point in two. Thus, as it were, Nature has prepared the way for man to obtain with facility the

* But the Editor of this Journal has seen the thermometer at 17° below zero in the winter of 1816-17 at Fort William, on the North shore.

astounding treasures now lying hid in this marvellous Point Kewaiwona. It is asserted, and that too with every appearance of truth, that this singular formation protruding into the lake like a gigantic "finger of warning," is composed of a vast concentration of mineral treasure surpassing belief. As we are about to proceed round this point, examining various lighthouses and harbours, we will endeavour to sketch out some interesting particulars bearing on this subject.

In estimating the value of the mineral regions of Lake Superior, it must be borne in mind that under present circumstances the miners are labouring under serious disadvantages. They have not only immense distances to bring supplies and necessaries of life, but during seven months in the year they are totally cut off from the rest of the world. Thus, they are obliged to secure all they want at least seven months in advance. Having hardly any agricultural population, nearly all their meat and vegetables are transported at heavy cost. Some few of the larger miners have farms in cultivation, which in some degree ameliorate their condition. But when the majority have to import hay for winter use at from 30 to 40 dollars a ton (£6 to £8), with every other article at proportionate prices, it requires an exceedingly rich yield to pay expenses and dividends. As soon, however, as this lake is tapped by the railroads through Wisconsin, there will be an immediate equalization of prices and labour, which will have the effect of stimulating the mineral districts to an extent difficult to calculate. It is for this reason that it is right to record the present value of town lots. These towns will mainly depend for their progress on the goodness of the harbours on which they are planted, and the probable chances of early railway accommodation. Once let the idea of minerals in their vicinity be proved in addition to the abovementioned advantages, and an influx of capital and population that will astonish even the sanguine speculators accustomed to the rapid and marvellous growth of western cities, is sure to follow.

At the eastern extremity of Kewaiwona Point, is Manitou Island, composed of a curious conglomerate rock. At the lighthouse on this point we found the keeper, a Frenchman and his son, who appeared delighted with the appearance of visitors. While the inspection of the light establishment was going on, the curious conglomerate rocks and pebbly beaches were occupying our attention. After heavy gales it appears that large quantities of shingle are cast up by the violent surf from the lake, and frequently agates of considerable value are secured by the lightkeepers. Our boat's crew were at once smitten with the desire of becoming suddenly rich, and spread themselves about to secure some of these precious waifs; but on coming on board they brought a heap of trash, for with them all prettily marked stones rose at once to a considerable premium.

Passing round Kewaiwona Point, three hours steaming through a shifting and occasionally dense fog, brought us to the entrance of Copper Harbour. This harbour is an exceedingly good one when a vessel is once in it; but is of difficult and dangerous access. It is formed by a shallow bay, across which a rocky spit stretches nearly

from one side to the other. The entrance left by it is narrow, and rendered particularly dangerous by several rocks awash, and slightly above the surface.

The town of Copper Harbour is some ten years old, and, including several mines, has a population of about one thousand. One only of these mines appears to be in a flourishing condition, and it is a curious fact that it is owned in Paris (France). We were informed that the whole amount of ore raised to the surface hardly paid expenses. But when we look at the terrible difficulties of transporting this ore for shipment, added to the present tightness of the money market and causes previously mentioned, the ultimate prospects of this place cannot but be considered as good. In land there appears to be little or no speculation: town lots in the best situations are held at 400 dollars; inferior positions, 150 dollars; (£80 to £30).

Being detained by thick fogs, we determined to visit the mine previously alluded to, called the Clark mine, and started accordingly in a mud wagon, the distance being three miles. Never in any part of America was there such a tangled growth of trees and underbrush. To clear this land, which had recently been sold at Government price, namely 125 dollars, the charge was 30 dollars (£6) an acre. This could not be considered a high price for such herculean labour. Vast rocks and stony ridges bounded the road on all sides, and it was difficult to believe such a rugged and apparently barren surface could support such prodigious trees and undergrowth. On arriving at the shaft we were received in a courteous manner by the superintendent and chief engineer—both Frenchmen—from whom the following particulars were obtained.

The mine has been worked about three years. The present shaft is sunk to the depth of eighty-eight feet. Present expenditure about 100,000 dollars (£20,000), but is only considered a commencement. Large heaps of copper were pointed out to us which were divided into three portions: first were lumps of pure, say 85 to 95 per cent, copper; then barrel stuff, composed of pieces up to forty or fifty pounds; lastly, stamped stuff, or pieces of rock in which native copper abounded in detached lumps and flakes, which are stamped or crushed before shipment to the port for smelting. Seeing so many rich specimens of comparatively pure copper before us, we were surprised to hear that the general results were not above two and a half per cent from the whole mass. It was expected that no dividend would be earned without a considerable further outlay and a delay of three years!

To the northward, on the side of a precipitous ridge, the miners were excavating deep trenches, in hopes of hitting the vein in another and richer portion. These particulars of the Clark mine are mentioned as it was universally considered the most prosperous in the neighbourhood.

The following morning (August 13th, 1857,) we arrived at Eagle Harbour, a dangerous entrance, and contracted space when inside. It is a small village, totally dependant upon the mines in the vicinity.

In this neighbourhood the weather is subject to sudden and violent changes, very similar to those occurring off long capes and points of land putting out into the sea. Fish are abundant, and were hauled in alongside of the wharf in considerable numbers. The population of the town does not exceed 250, and they subsist entirely on the mines and a little fishing. The town lands have but little fixed value.

After a few hours' stay we stood along the coast to Eagle River, passing the celebrated cliff mines.

(To be continued.)

THE DESTRUCTIVE AGENCY OF LIGHTNING.—No. II.—*Sacred Edifices and other important Public Buildings Burned or Partially Destroyed by Lightning.*

The destructive operation of the electrical discharge in setting fire to sacred structures and other buildings is very especially worthy of record. The following collection of some very remarkable instances, chronologically arranged, whilst possessing great public interest, may not be at the same time without considerable value in promoting our future inquiries into the nature and operation of the fearful agency of lightning.

1417.—Lightning struck the beautiful spire of the church of St. Mark, at Venice, set fire to the wood work in its construction and totally destroyed it.

1489, *August 12th.*—The same occurrence again took place, the spire having been rebuilt. The electrical discharge again assailed the carpentry of the tower, and again totally destroyed it by fire.

1745, *April 23rd.*—The church of St. Mark again struck by lightning, and the spire (now built of stone) shivered in pieces; causing an expenditure of £3000 in repair.

1755.—Lightning fell on the celebrated Eddystone lighthouse, built by Rudyerd in 1709, and set it on fire.

1759, *July 27th.*—Lightning fell on the cathedral of Strasburgh and set the roof on fire, which burned violently, so that the whole structure narrowly escaped total destruction.

1760, *April 25th.*—The fine church of Notre Dame de Ham was struck three times by lightning during the night. The third discharge set the building on fire, and the whole structure was finally destroyed.

Of sacred edifices burned by lightning in the olden time the following may be enumerated:—

The monastery of Canterbury: twice burned.

The abbey of Croyland: twice.

The abbey of Peterborough: twice set on fire.

The abbey of St. Mary, in Yorkshire: burned.

The abbey of Norwich: destroyed.

The abbey of Worcester: set on fire.

The abbey of Gloucester: burned.

The abbey of St. Mary in Southwark; partially destroyed.

The church abbey of Beverley: burned.

1822, *September 15th.*—On the night of Sunday a heavy discharge of atmospheric electricity fell on the beautiful cathedral at Rouen, and set it on fire; the whole structure was eventually destroyed. This was one of the most costly and beautiful specimens of Gothic architecture ever seen.

1843, *April 26th.*—During a hail storm, a heavy thunder cloud passed over the venerable and handsome old church of Exton, in Rutlandshire, and sent forth a terrific flash of lightning. The electrical discharge fell on the tower, destroyed the spire, and set fire to the church, which caused its nearly total destruction.

1844, *March 12th.*—A severe thunderstorm passed over the town of Donai, in France. The electrical discharge struck the steeple of the church of Fressan and set it on fire. The whole structure narrowly escaped total destruction.

1850, *April.*—The beautiful cathedral of Saragossa, in Spain, struck by lightning during divine service. The dome set on fire and the cathedral partially destroyed.

1853, *February 23rd.*—Lightning fell during a snow storm on the magnificent structure of the cathedral at Lincoln, and set fire to the carpentry of one of the pinnacles of the great tower. The boards and timbers were soon in a complete blaze, and the whole of this gorgeous building narrowly escaped destruction. The occurrence fortunately occurred during the day time—about 3h. p.m.—or the cathedral would have probably been burned.

1857, *May 6th.*—The steeple of Wesborough church, Sussex, set on fire by lightning.

1857, *August 15th.*—Buckland chapel at Portsmouth struck by the electrical discharge and set on fire.

A German writer states that within thirty-three years he finds records of the towers of 386 churches struck by lightning, and 121 bell-ringers killed. In December, 1805, the churches of St. Martin (*a vetré*), of d'Ebré of Croiselles, of d'Etrelles, were struck in the same storm and the towers destroyed. In July, 1807, a thunderstorm overspread Guerche, when no less than ten churches and other buildings were struck by lightning and damaged within a radius of a league. In January, 1815, a thunderstorm pervaded the space between the North Sea and the Rhenish provinces, twelve steeples were struck by lightning and many of them set on fire.

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A LIGHTHOUSE TOUR OF LAKE SUPERIOR.—By Captain Mackinnon, R.N.

(Continued from page 10.)

Thirty large masses of native copper were lying on the wharf waiting for shipment. Selecting six of these, the most convenient to examine, we noted the weight as follows:—65 cwt. 50 lbs.; 74 cwt.; 41 cwt. 60 lbs.; 43 cwt. 35 lbs.; 16 cwt. 50 lbs.; 66 cwt. These fine specimens varied from 70 to 95 per cent. of pure metal.

We were rewarded for a walk of a mile up a steep hill, by seeing several incipient shafts, just commenced. As we continued our way, cursorily examining the loose earth thrown up by the operation of ditching the sides of the road, numerous small pieces of copper were observed lying about, varying in size from something above a pin's head to an ounce in weight. A careful examination would no doubt prove remunerative.

As we were thus engaged, an explosion, somewhere near us, attracted our attention; and turning aside, several men were seen engaged in sinking a shaft. It appeared on inquiry that they had been at this work about two months, and had actually excavated about twenty feet into the bowels of the earth! No great depth was this certainly, yet it was sufficient to undermine the trap rock and expose to the light of day the vein-stone, intersected, in all directions, with copper, presenting a curious appearance! Here were small knobs of virgin copper half exposed; there again were layers squeezed flat like paper; then there were rough and shapeless nuggets; peas, beans, and, in fact, every imaginable fantastic form!

It is easy to make acquaintance in a new country, and we were very soon engaged in confidential conversation with the intelligent foreman of the works,—an Englishman from Nottingham,—who informed us that the average yield was 14 per cent.; that silver is constantly found imbedded in the masses; and several instances of "junks," exceeding seven pounds in weight, have been discovered. We soon learnt from our very civil new friend that this mine was paying its way satisfactorily; and he was glad to tell us the important fact that his wife had joined him from England, after three years' separation. This information was imparted to us with evident satisfaction; but our curiosity was rather directed to the specimens with which he presented us; so, congratulating him on his happiness, we continued our walk in search of other information.

Labour to any extent may be procured in the mineral districts; but with few exceptions the workmen dissipate their earnings recklessly. Large sums have been secured by speculation, which after all is mere gambling. The imagination is strongly excited by the strangely shaped prodigious masses of pure mineral; and thus the desire for

sudden gain has directed an enormous amount of speculation to Lake Superior.

There are more mines at work here, remarkable for being ill chose, than for being productive. In fact, to insure success requires more time, capital, and judgment, than is generally to be found. Many mines, hastily opened, are as hastily abandoned, when a more judicious and careful course might have turned out profitable. Still, under more favourable circumstances many thus forsaken mines will hereafter be reopened by cautious adventurers, who will no doubt reap a rich harvest from previous outlay.

The next point in our tour was Ontonogon,—the heart of the minerals,—from whence large exports are made.

On reaching the wharf, a collection, consisting of forty large pieces of native copper, and fifty barrels more of it from Adventure mine, first attracted our notice.

A chance selection of eight pieces, gave the following results:—5,580, 3,661, 4,843, 4,157, 298, 5,990, 500, 527 hundred weights each, 70 per cent. pure copper. The shape of these specimens were quite different from those previously remarked. They were irregular in shape, jagged, and angular; curious legs extended outwards, as if the fused metal had been forced through these legs into moulds.

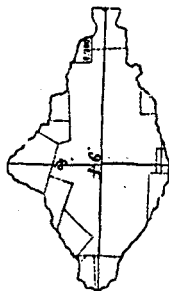
The mine now before us is *par excellence* the great mine of Lake Superior. So enormous are the results obtained from it that they seem fabulous, and it is not surprising that a *furor* has been created all over the world to follow the enterprising example and strive for similar results.

The Minnesota mine, the most celebrated in the world, at this time, August, 1857, stands as follows:—

Cost (total) to Stockholders, dollars 66,000, equal to £13,200.		
Shares at present prices, each doll. 175. In all dollars 3,500,000 equal to £700,000.		
There has been set off from the original location and distributed to the stockholders, five other mines, the stock of which is worth at current rates	Doll.	£.
The Minnesota mine has made four dividends, amounting to	1,300,000	260,000
	680,000	136,000
Total returns of value to the original stockholders . .	5,480,000	1,096,000
Deducting the original outlay	66,000	13,200
	<hr/>	<hr/>
There remains the prodigious clear profits as follows	5,414,000	1,082,800

This marvellous unheard of profit, is the true source of the feverish excitement and rapid progress of Lake Superior.

The Minnesota contains at this moment the most extraordinary mass of metal in the world. The following particulars obtained with some difficulty, may be relied on.



The huge mass represented in the sketch was discovered in February, 1857. The vein of contact, close to which this mass lay concealed, was situated between conglomerate and overlying trap. In exploring this vein the miners had nearly passed a joint or protuberance which barely extended into the vein. Fortunately it did not escape observation, but was thought to be a small detached piece. On following this protuberance it led to this monstrous mass.

The length is 46 feet; breadth, 18 feet; greatest thickness, 8 feet 2 inches. Its weight is calculated to be something under 500 tons. 200

tons—90 per cent of copper—have been already cut off in pieces varying from $2\frac{1}{4}$ to 4 tons. Forty men have been employed cutting it into transportable pieces, and it is calculated that the same force will be required for six months more to hew it into marketable pieces.

It appears that Cornish men have entire charge of this Herculean labour. Their process consists in one skilful man directing a long cold chisel in a slanting position. Two others, with the heaviest hammers, continually strike the chisel, which is guided so as to cut out a narrow ribbon. The groove once commenced is steadily continued until the huge junk of copper is separated and ready for removal.* The ribbons or chips are packed in barrels, and already amount to nine tons!

.When first the wondering miners laid bare a portion of this huge ingot it was reposing at an angle of 45° . After various ineffectual attempts to move it, they at last succeeded in raising the lower end by a charge containing 775lbs. of blasting powder.

This mine raised in 1856 1,864 tons of copper, the purity of which was 73 per cent. In 1857 it is calculated to take out 2,300 tons of a greater purity!

The total produce of copper from the mineral range is about 6,000 tons, about an average purity of 70 per cent.

The Ontonogon district contains a population of about 3,300; of which 1,200 reside in the town. There is no agricultural population. When the railway now in progress connects this part of Lake Superior with Lake Winnebago and the eastern seaboard, great prosperity may be reasonably looked for by those concerned in this mine. There does not appear to be any undue speculation in city making at this point, the choice city lots being held at about 700 dollars (£140), inferior down to 100 dollars (£40).

After our inspection of this interesting locality, at daylight on the following morning we anchored off Le Pointe Light, and, the visit of duty being over, we went to the little village of La Pointe. This is one of the oldest settlements in the country, dating back as far as

* See dotted lines on drawing, which show the cuttings.

1756. It is chiefly inhabited by half-breeds, and is supported by the fish and fur trades. On attempting to purchase live stock for our cabin table, we soon learnt that the few turkeys and geese that were wandering about had lately been imported for breeding from the South. A few farms are cultivated on this island, but not sufficient to supply the population.

Twelve miles South of La Pointe, in the magnificent harbour of Long Island Bay, is a great paper city called Asland. As we did not visit it we will not attempt any description further than that the situation is highly lauded by competent authority. Its population is said to be about 300 persons, and the city plot 160 acres!

As wood for fuel was scarce, the steamer was moved over the bay to the mainland, and secured to the wharf of the magnificent—on paper—city of Bayfield. We insert a description of this city, taken from the map, on which is carefully marked out 2,720 lots, which may be bought from 500 dollars (£100) to 100 dollars (£20):—

Remarks.—This city is situated on the southern shore of Lake Superior, in Le Point County, Wisconsin, about eighty miles East of the town of Superior, and directly opposite La Pointe on Maddaline Island, from which it is separated by a channel two miles wide, with an average depth of sixty feet. This channel is so inclosed by a group of islands—the Apostles—that it is protected from winds in all directions, making it one of the safest and most commodious harbours in the world, &c.

“The surface upon which the town stands is most admirably adapted to health, convenience, and beauty, &c.

“The grounds are so laid out that *all* the avenues and ten of the eighteen streets terminate on the bay, &c.”

So much for one side of the story, now for the other. This city of Bayfield has no single present advantage to make the land on which it stands worth a cent an acre. There is not a single person employed solely in agricultural pursuits in the county, and yet a body of 400 persons have been induced to erect substantial houses, wharfs, &c., and establish a weekly paper—the *Bayfield Mercury*. It is no risk of opinion to prognosticate that ten years hence, if not deserted, it will not contain half its present population. Even should it contain so many they will have to seek a precarious living by fishing and lumbering. But let us analyze this paper city and reduce it to actual fact:—There are 140 blocks, containing 2,720 lots and covering an area of nearly a square mile. Take the minimum price asked for these lots—namely 100 dollars (£20)—and it appears that the proprietors actually demand for this densely wooded, sandy soil a money value equivalent to 272,000 dollars (£54,200) if they were to realise the full price named, five times this large sum. What adds to the absurdity of the case is the fact that of the square mile (640 acres) on which this paper city reposes in solemn and primeval solitude, there is not fifty acres cleared,—thus increasing the expense of the unfortunate settlers—if any such are ever found—to nearly the prime cost of land. Truly, Brother Jonathan knows a thing or two, but it may

be well doubted if he will succeed in victimizing many more of his countrymen. It is right to say *many more* as it is currently reported that numerous sales of these lots have been effected in the eastern states.

In the afternoon we were favoured with a visit from the Chief of an Indian tribe of the Chippeways, Non-ga-nop, which, interpreted, means the Orator. His manner was dignified, such, indeed, as became his station, and he expressed through the interpreter his regret at not being able to converse in the English language. It was most interesting to us to see him take his departure in a birch-bark canoe loaded to the gunwale with all his household goods, including his squaw, four children, furniture, and two dogs, all of whom remained perfectly still, tightly packed amongst the goods and chattels, intently watching the steamer. This chief is a very influential personage amongst the wild men of Lake Superior, and had lately been the instrument in concluding a treaty with the United States Government for the sale of vast tracts of mineral lands.

Two young Canadian ladies also came on board here to take a passage to Superior city. They joined our bachelor party in the saloon during the evening, and commenced a steady gallop in rocking chairs whilst intently watching us. Three of the party left the saloon, leaving "the General"—a confirmed bachelor—alone. No sooner did this happen than the youngest stopped her gallop and addressed the General, with an insinuating smile, as follows:—"General, How do you sell your candy?" This attack entirely upset the General's gravity, who could not contain himself. The Canadian appeared considerably astonished and started off again in full career. She appeared to think that the *Michigan* contained a cabin full of candy.

Towards sunset, having concluded our business, the vessel's head was turned West and we carefully threaded our way amongst the numerous islands of the Apostles towards the city of Superior.

(To be continued.)

THE LEVIATHAN OF THE THAMES.

At length there seem to be fair hopes, before these lines go forth to the world, of seeing the *Leviathan* actually in her own element, where she is to realise one of the greatest experiments perhaps, both commercial and nautical, that has ever been made by this country. We may, therefore, venture to allude to her as a *great fait accompli*, and now add our wishes to those of her owners, projector, and builder that all their anticipations may be verified. As to expressing any opinion on the result of the experiment commercially, we have no right to one; and nautically, although we might look at her with

A LIGHTHOUSE TOUR OF LAKE SUPERIOR.—By *Captain Mackinnon, R.N.*

(Concluded from page 86).

The wind being fair and the distance short, we ran it too soon, and in consequence were obliged to lay by for several hours and to endure the unpleasant rolling of the vessel, which with the creaking of doors kept us awake until daylight. We then ran through the intricate passage between sandbanks into the harbour of the celebrated city of Superior.

It cannot be denied this embryo city is one of the finest geographical points in the interior of America. At the further extreme of the great internal water communication of the country, it must hereafter become such a thoroughfare by rail and water that the world has never seen in the interior of a great continent. With a healthy and bracing climate, fertile soil, and inexhaustible mineral riches, it will outvie all other inland cities in America. Added to this it will have—with certain unimportant improvements—a spacious and perfect basin for a harbour. Three rivers discharge their waters into this harbour: each of which is capable of being improved sufficiently to enable vessels to ascend them to considerable distances. Minnesota and Wisconsin each extend a natural arm-like pier, or barrier of sand, to inclose this commodious haven. To these prodigious natural advantages we may add a powerful combination, composed of leading politicians and capitalists, who are bonded together to expedite and insure its rapid progress!

And what is the end of this irresistible combination of advantages? Let us explain the probable result.

A powerful company being formed, they first introduce the unusual custom of laying off the proposed town site (3,500 acres) into lots 25 feet frontage and 120 deep. This, let it be observed, nearly one-third the usual size. In addition, 1,500 acres are laid out in blocks of undivided lots; making a total of 5,000 acres introduced into the market under the auspices of this company. This in truth is sufficient to surfeit the most extravagant town-makers, even in this wonderful town-growing country, and would perhaps be justified in a few years by the gradual growth of the place.

Other speculators, however, thought it as well to hang a peg upon the mighty prestige of such wealth, talent, and sagacity, and accordingly determined to have a finger in the pie. In they flocked in shoals and began to preempt land,—not, be it noted, to settle and improve, but merely to speculate and sell at a great advance. This fever continued to such an extent that the city grew—on paper—to cover the whole mainland bordering on the harbour to the extent of nearly if not quite seven miles, besides the barren sandy spit forming the harbour itself.

It will hardly be credited that this city of Superior is at this moment covering nearly if not quite an area of 15,000 acres!

On the faith of the names directing the original company, who are firmly believed to have been actuated by a fair commercial spirit, this enormous tract of land, divided into literally countless lots, was advertised to the public of America and England as a splendid speculation, and it may be broadly asserted that so gigantic a bubble was never before presented to the world.

Preemptions have likewise been made on every foot of ground for miles along the North coast—the coast of Minnesota—by a lower class of speculators; who clear perhaps an acre, or less, to secure the right, and then quietly await a real settling purchaser.

In this vast extent of ground there is not 100 acres of land in cultivation. The inhabitants obtain all the common necessities of life from the East by steamboats, even to cabbages and onions. There is not an atom of trade of any kind in this “bogus city” of 2,000 inhabitants, but the vicious activity excited by an idle population squandering the temporary profits of inflated speculation in real estate. Every man who has bought land since the foundation of the city, some three years ago, fancies himself rich because his lots are nominally three, or more, times the price he paid. Let any one try to realise and see the immediate downfall of this baseless fabric. A generation thirty years hence, when the majority of us will have passed away, the value of these 15,000 acres will not equal that now demanded.

The lots situated on Second Street, the supposed choice location, at present are valued and sold for 1,000 dollars (£200). Take these lots, 25 feet frontage and 120 deep, at this price. Nine such lots, allowing space for streets, will cover an acre, making the enormous sum of 9,000 dollars (£1,800) per acre,—these said acres, be it understood, that three years ago cost the company $1\frac{1}{4}$ dollar (5s.).

The price of all the necessities of life is proportioned to this vicious and anomalous state of excitement. Labour at Californian prices; and expended not in useful and productive work, but in improving imaginary roads and avenues, visionary (at present) railway depots, and other improvements that it will take years to bring into utility and profit.

The greatest trade carried on is that of selling land, and there can be no doubt that numerous victims from all the States of America, besides England and Europe, have invested large sums of money in swelling this vast delusion. It is with this money that the fortunate sellers are luxuriating in trotting horses, yachts, and champagne. But there is not a single person engaged in the real business of advancing the true interests of a city! A frightful collapse must take place, and all who are not prepared by getting out must be content to see their property valueless for the present.

Hereafter, at an indefinite period, no doubt it will take a new start, when the present speculative race are swept away. But it is impossible for any city to grow in a steady and healthy manner under the fever heat of extravagant and reckless speculation. Man proposes

and *le bon Dieu* disposes, and the very pains and skill taken by this powerful combination have been defeated by the overwhelming weight of its own power. It has attracted the attention of all the wild speculators in America; whose unwelcome assistance has for a time destroyed one of the best considered and well arranged plans of the present day! The great national cry, "Go ahead," has here been carried to excess, and, as sometimes happens in these United States, "Go ahead" tumbles head over heels. Brother Jonathan is not the man to be put out by this little error. He will pick himself up, shake his feathers, laugh at his own exploits, and then be ready to go ahead with a little more caution. Success to you, Brother Jonathan! Your go ahead qualities deserve admiration when kept within proper bounds.

Having completed the necessary business connected with the new lighthouse building on Minnesota point, at the entrance of the harbour, the good ship *Michigan* commenced her return along the North coast of Lake Superior to the Sault St. Marie. A run of fifty-six miles brought us to the first harbour on the N.W. coast, where another incipient town (Beaver Harbour) is struggling into existence.

It is situated on the N.W. shore, fifty-six miles from Superior, at the entrance of Arnica or Beaver River. The plot of town is laid out round the bay, quite open to the S.E., with the exception of a small island, which map makers are pleased to call "a natural break-water fifteen feet high," protecting about one-fifth of the bay.

The aspirations of the proprietors are modest, compared to the usual expectations of this town-making district. It is divided into 144 shares, of about 12 or 14 lots, each lot being 60 feet by 150. The shares are valued at 300 dollars (£60). Considering that the population consists of fifty persons, it has, for a Lake Superior town, a considerable quantity of land cleared and cultivated—namely, forty acres; thus contrasting favourably with several other of these new cities.

Whilst the officers were settling the site of a new lighthouse, to be immediately erected, we strolled along the beach in search of agates, which abounded. The beach was covered with small and inferior specimens; but ample evidence existed of a considerable supply, especially after a storm. Boulders containing copper also are frequently met with. Some distance in the woods we fell in with a stake on which was marked "Jefferson Avenue." We were extremely tickled by this little incident, as it so thoroughly exemplified the state of these incipient cities.

Forty miles coasting brought us to the snug little harbour of Hiawatha, the original spot from whence the legend of the celebrated chief of that name is taken. The harbour is the best on the North coast of this lake that we have seen. It is of curious formation,—a semicircle, which would be quite open to the S.W. were it not for two natural piers of trap rock that jut out from either end of the bay—thus forming an excellent little dock on each side.

As this harbour is decidedly the best for a considerable distance of

coast on each side, it may be predicted that a settlement will soon be made here. The Government think it a good point for a lighthouse, and the site was decided on and fixed during our stay, on the eastern end of a natural pier. It is asserted that there is a good farming country in the rear, and a chain of small lakes and portages which can easily be connected with this harbour. As it is probable that the Canadian Government will ere long build a railroad through that territory, it must infallibly pass in the rear of Hiawatha. It is fair to infer, therefore, that this place has a better chance of success than most of the projected towns on the North coast.

The parties to whom this place belongs it appears are not actuated by the fever of speculation so common on this lake. They intend to introduce an agricultural population as a foundation on which to erect their city. Their town plot does not exceed 320 acres. This is a fine timber country, backed by a plentiful water-power. Large quantities of white-fish, fiskowit, and trout are taken. There are evident indications of mineral wealth. Altogether it is refreshing for once to see a projected city that has some chance of success!

After carefully pointing out the position of Hiawatha lighthouse we proceeded towards Isle Royale. As we ran along the coast we perceived by the never failing indication of deserted clearings and dilapidated houses, the site of abandoned mines.

At 10h. a.m. on the 19th we entered Rock Harbour, a natural inlet of great capacity, and forming an extensive and landlocked harbour. Finding the water too deep to anchor without inconvenience, we hauled alongside the rocky margin. The clearness of the water on this (the North) side of Lake Superior is beyond belief. At ten fathoms (sixty feet) the anchor and chain were distinctly seen from the deck.

The lighthouse-keeper was a blunt specimen of a Britisher from Preston, in Lancashire. He had an exceedingly intelligent half-breed wife, with four of the most beautiful children ever seen. He told us that his family were the sole residents of Isle Royale since the mine "bust up." "I guess," he exclaimed to the inspector, Captain Scott, "Uncle Sam does not treat me well. I am obliged to steal my wood. There is none on the island." This created some merriment, and he was asked if he ever went to the North shore—the mainland. "Sometimes," he replied, "but yon is hard work on the ice,—it is fifty miles. I guess, Captain, I shan't stop here. I want to get to a more civilized place." Altogether he was a curious specimen of a Lancashire and Yankee cross, streaked with lighthouse misanthropy!

The buoyancy of the water of Lake Superior is no less remarkable than its clearness. We were in the habit of jumping overboard every morning for a swim. The first time we indulged in this "very cold" bath we were astonished at the apparent buoyancy of the water floating us higher above the surface than in the sea, and infinitely higher than the river Thames. We were informed by one of the veteran voyagers of the Hudson Bay Company that this buoyancy of Lake Superior water has long been noticed. So much so, that canoes can

carry a heavier cargo after passing a certain point in the Sault St. Marie River. In other words, a canoe draws less water as she ascends the river.

As regards the clearness of the water, it is difficult to describe it. Leaning over the bows of the *Michigan*, as she was running towards the end of Lake Superior, into the Sault River, we were watching the bottom, which, outside the ripple made by the bows, was as clear as glass. How is it possible in words to express the wondrous purity and clearness of this almost liquid glass that we were in? Every pebble was distinct! Steadily onward went the sharp stem, cleaving the transparent medium, whilst we were lost in admiration of it, when suddenly a strange object was presented to our bewildered gaze and broke the spell of enchantment which had so long fixed our astonishment.—We were gliding over the bows of a sunken steamer! She seemed to pass swiftly but distinctly beneath us, and vanished under our feet. "Is this a dream?" we exclaimed, rubbing our dazzled eyes, and distrusting our senses. We were speedily recalled to reality by the harsh voice of Captain Reed, in the wheel-house over our heads, hastily calling out "I guess that's the wreck of the *Independence*, blown up and sunk in 1854!" And so it was!

Half an hour after this little incident we were again in the canal, and, speedily passing through the locks, bade adieu to magnificent Superior for ever!

Scarcely was the *Michigan* moored to her wharf when the alarm was given that the canal banks were giving way. Hastening along the banks to examine the damage, we soon discovered a hole two feet in diameter, one-third of which was below the water line. On peering into this we perceived a deep hollow, into which the water poured with violence. On the river side of the bank a dismal, muddy stream issued, bearing the contents of the embankment. On the surface of it were large cracks, momentarily widening. Suddenly, however, the shrill whistle of the *Michigan's* steam-pipe called us away, and a few moments more we were moving rapidly down the river, and soon the beautiful rapids of the Sault St. Marie vanished from our lingering gaze.

As we are now about to finish our cruize, having inspected all the harbours and lighthouses on the American coast of Lake Superior, let us take a glance at the coast belonging to Canada.

It is believed that this coast abounds in all the treasures—animal, mineral, and piscatory—of the American coast; and that there are more natural harbours, and more facilities for progress and commerce there than on the American coast. If this be so, and we fully believe it, what is the reason that there is not a single lighthouse on the British side? Why should the provincial trade be indebted to Uncle Sam for lighting Lake Superior? A patriotic Britisher wishes to see this amended, and we respectfully call the attention of the authorities to this national disgrace. To bring the case clearly before their minds we subjoin a list of the Lake Superior lighthouses kept up by the American Government.

Lighthouses Visited and Inspected by Captain Scott, U.S.N., and Captain Smith, Topographical Engineers, accompanied with lampists, artificers, and attendants.

No.	Name.	Position.
496.	Round Island	Near entrance to River St. Marie.
497.	Point Iroquois . . .	On South shore of Lake Superior.
498.	White Fish Point .	On White Fish Point, Michigan.
499.	Grand Island	North point of Grand Island.
500.	Marquette	On North point of Marquette Harbour.
501.	Portage River	Near mouth of Portage River, southern shore of Kernenau Bay.
502.	Manitou	On Manitou Island.
503.	Copper Harbour . . .	On Copper Harbour, Michigan.
504.	Rock Harbour	N.E. end of Isle Royal.
505.	Eagle Harbour	At Eagle Harbour, Michigan.
506.	Eagle River	South shore of Lake Superior.
507.	Ontonogan	At mouth of Ontonogan River, Michigan.
508.	La Pointe	On the island near La Pointe.
509.	Minnesota Point . .	At the head of Lake Superior; mouth of the St. Lewis River.
	Beaver Harbour . . .	Selected site for.
	Hiawatha Harbour .	Ditto.

In conclusion we beg to state that all we have said about the copper mines and speculative cities is done so conscientiously; and although we may create a very bitter and hostile spirit in numerous speculating circles, whose plans are here analysed, yet we feel sure that these remarks will meet the approbation of the great majority of the public, both in England and the United States.

SUGGESTIONS FOR AVOIDING COLLISIONS AT SEA,—By S. M. Saxby.

In all things connected with shipping, and especially with their evolutions, simplicity is highly desirable.

Collision at sea is generally the result of a sudden act on the part of a master, or pilot, or commanding-officer of the deck. Such hasty decision often proceeds directly from a mere glance at the relative positions of the approaching ships; consequently, the remedy seems to lie in the enabling of commanders and others to gather from such "glance" *absolutely correct* notions for their guidance at the moment.

Experience convinces that no positive "rule of the road" can properly be laid down for the avoidance of collisions; a certain discretionary power in each commander seems to be necessary for the guidance of each vessel;—"positive rules" for the management of the helm may even be dangerous.

Collisions are not confined to the hours of darkness, since they