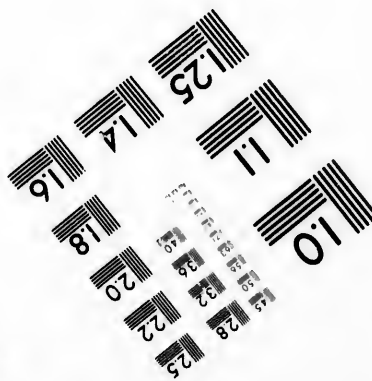
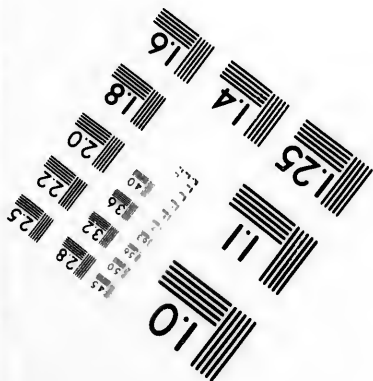
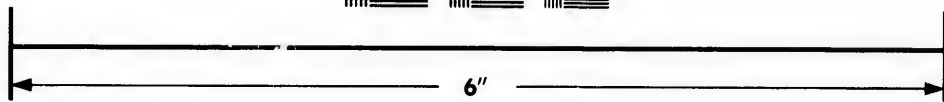
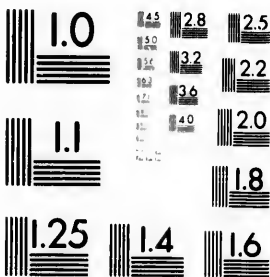


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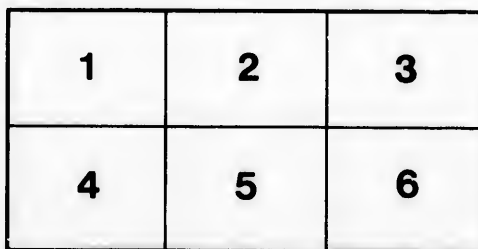
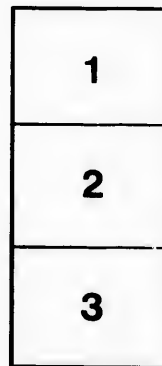
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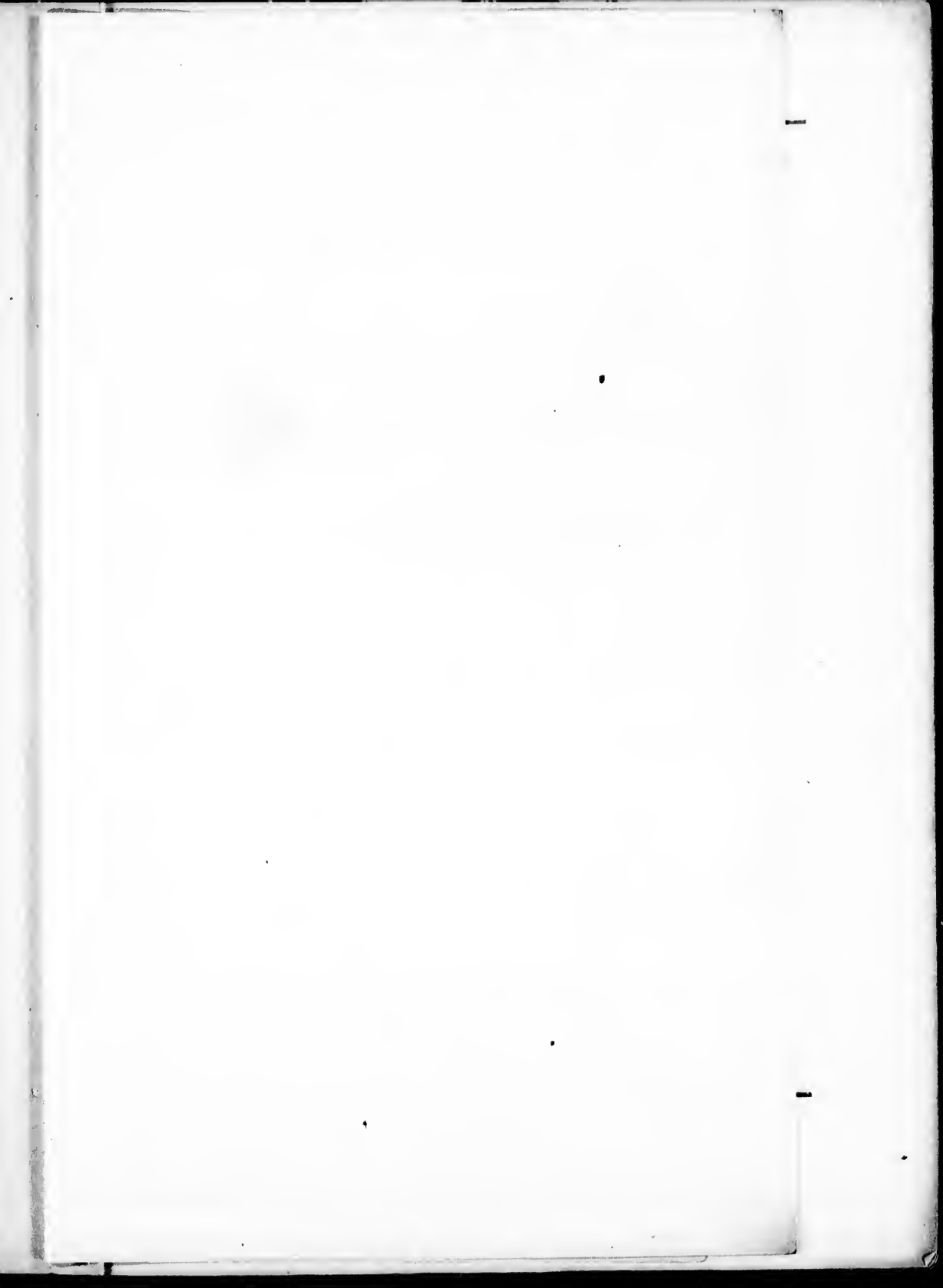
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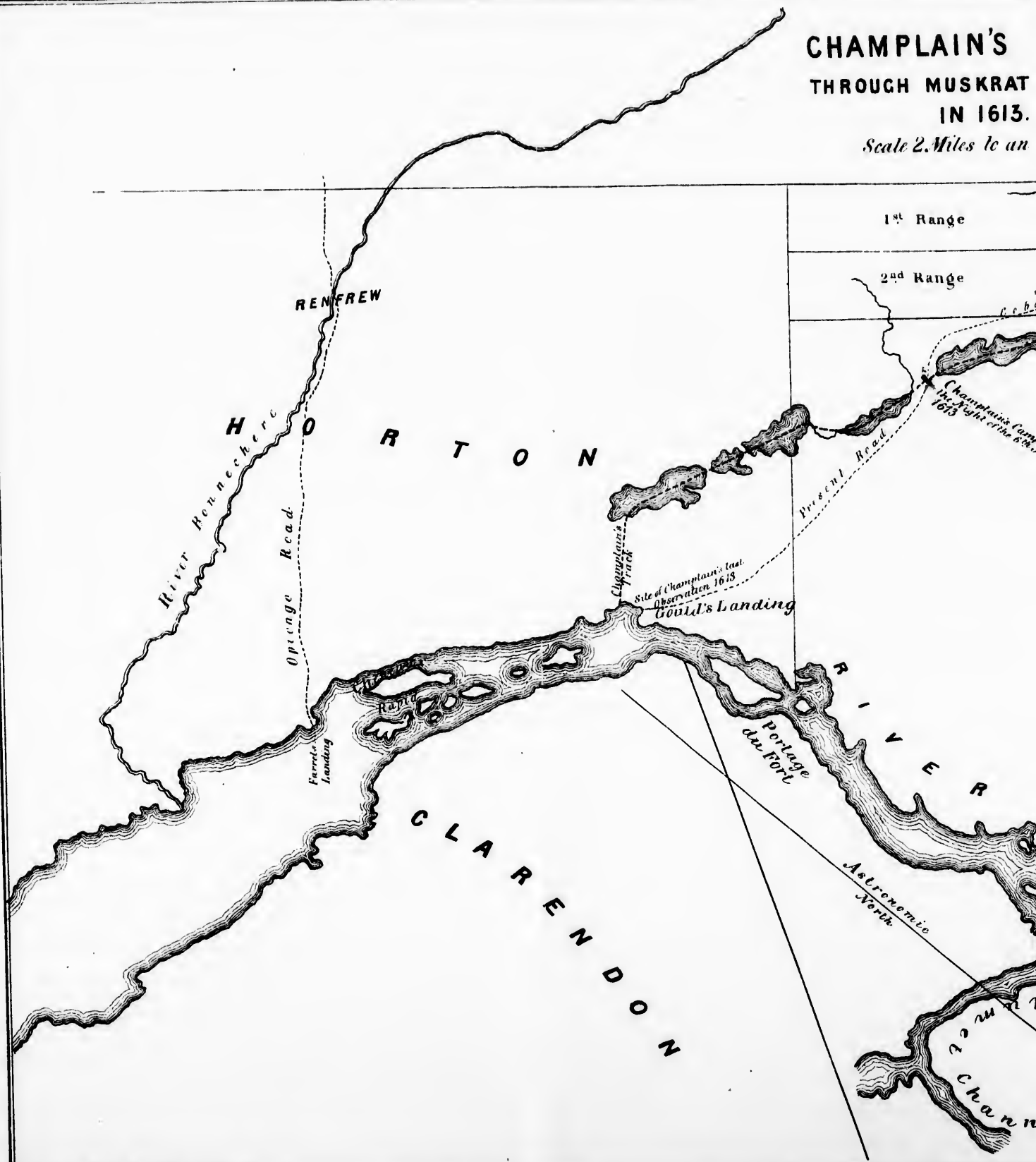


# CHAMPLAIN'S THROUGH MUSKRAT IN 1613.

Scale 2 Miles to an

1<sup>st</sup> Range

2<sup>nd</sup> Range

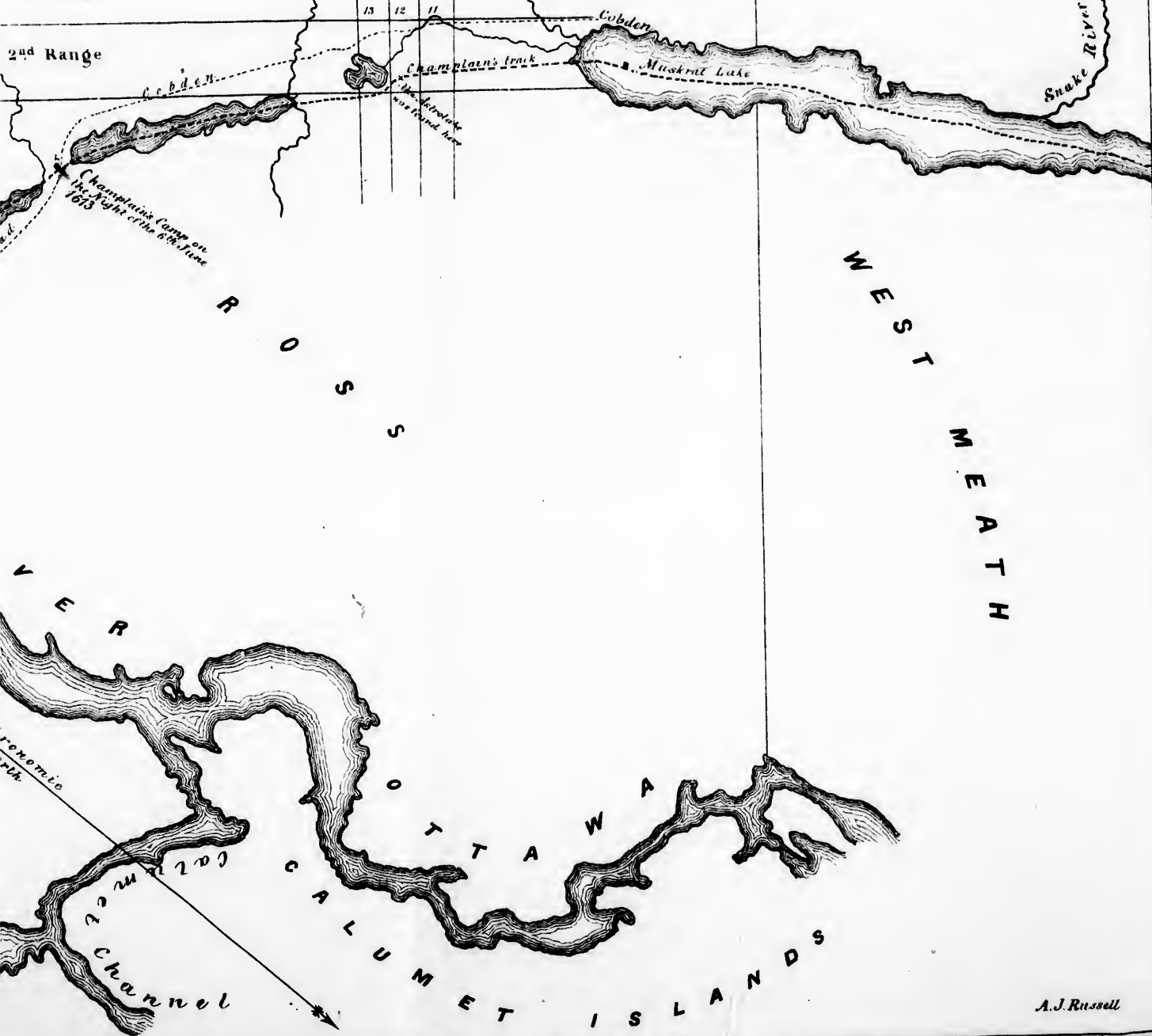


# CHAMPLAIN'S ROUTE THROUGH MUSKRAT PORTAGE IN 1613.

Scale 2 Miles to an Inch.

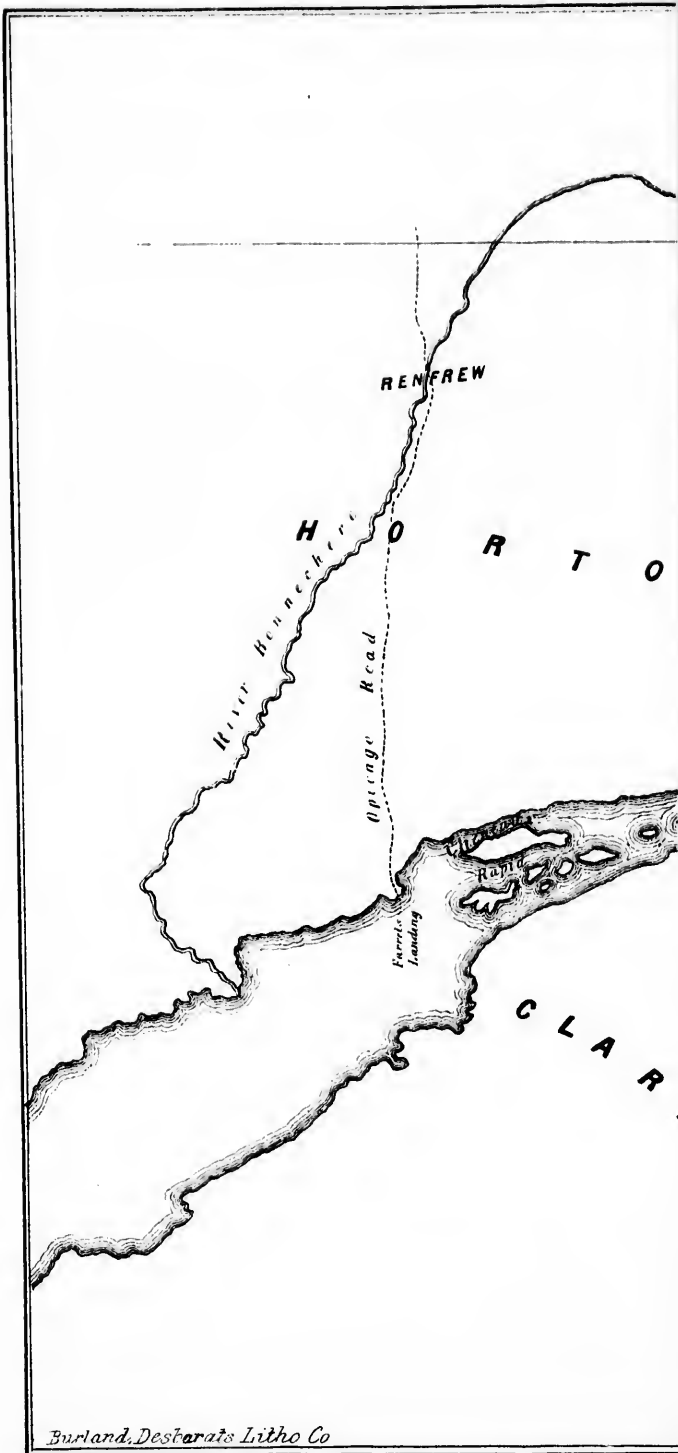
1<sup>st</sup> Range

2<sup>nd</sup> Range



A.J. Russell





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ON  
**CHAMPLAIN'S ASTROLABE,**

LOST ON THE 7TH JUNE, 1613,

AND

FOUND IN AUGUST, 1867,

CONSIDERED IN SOLUTION OF AN OBSCURITY IN HIS JOURNAL OF HIS  
FIRST VOYAGE UP THE OTTAWA; AND THE GREAT ANTIQUITY OF  
ASTROLABES, AND ORIGIN OF THEIR GRADUATION.

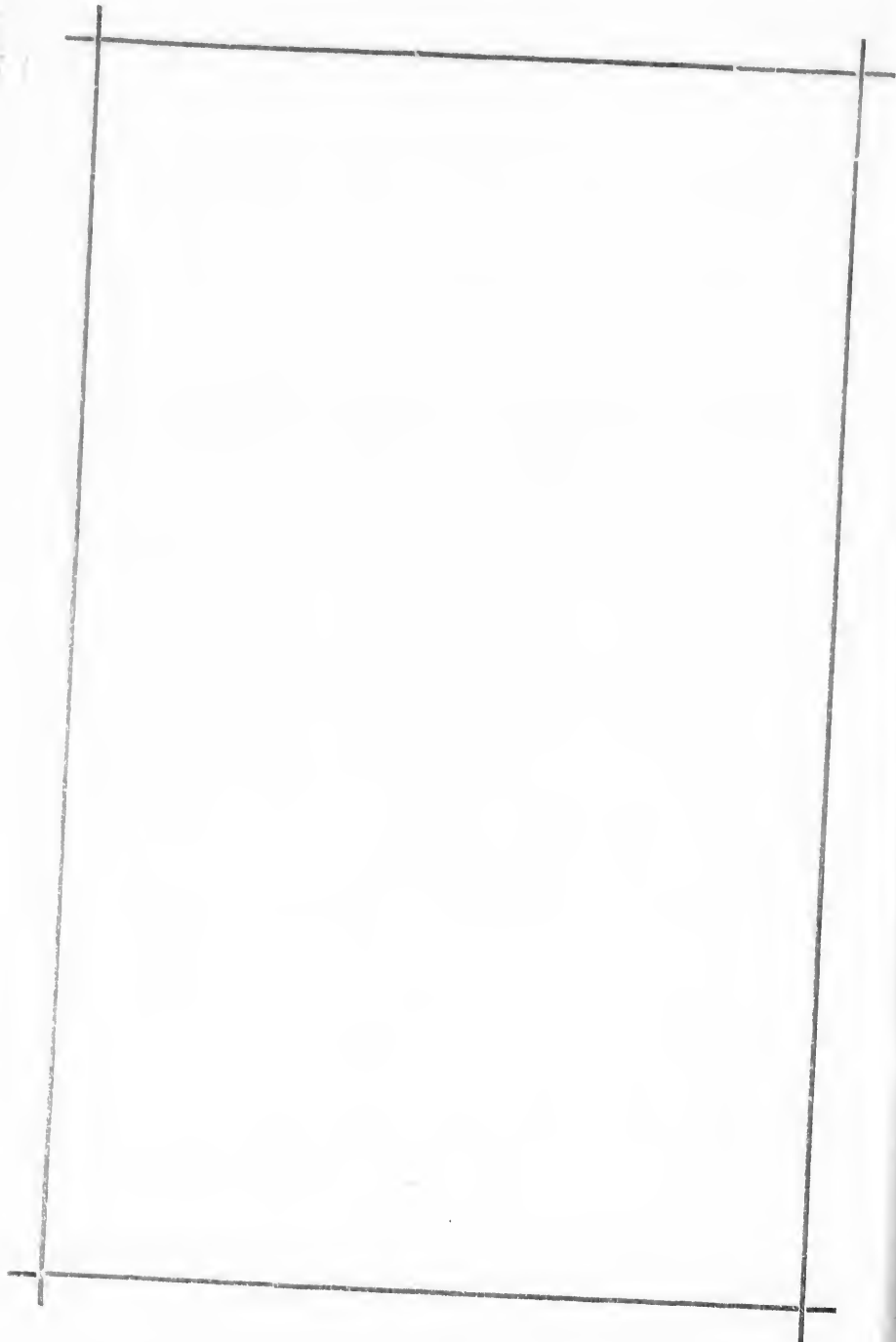
BY

**A. J. RUSSELL.**



MONTREAL:  
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## PREFACE.

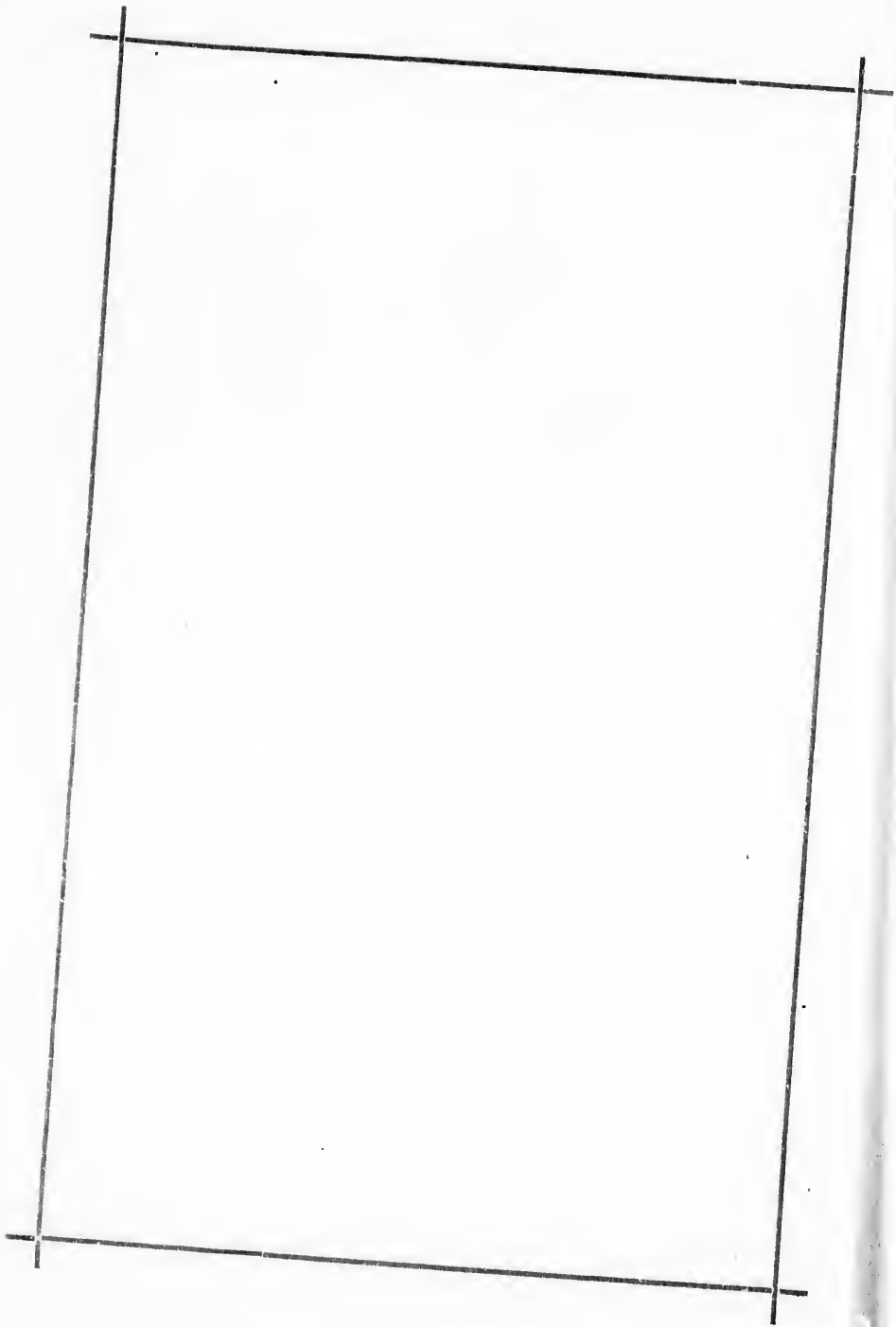
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This brief treatise was not originally written with a view to publication, but, as the subject is connected with the early history of Canada, and throws a little additional light on an obscurity in a part of Champlain's journal of his first voyage up the Ottawa, I have been induced by the flattering recommendation of a few friends to have a very limited edition of it published, trusting it may be in some degree interesting to Canadian readers.

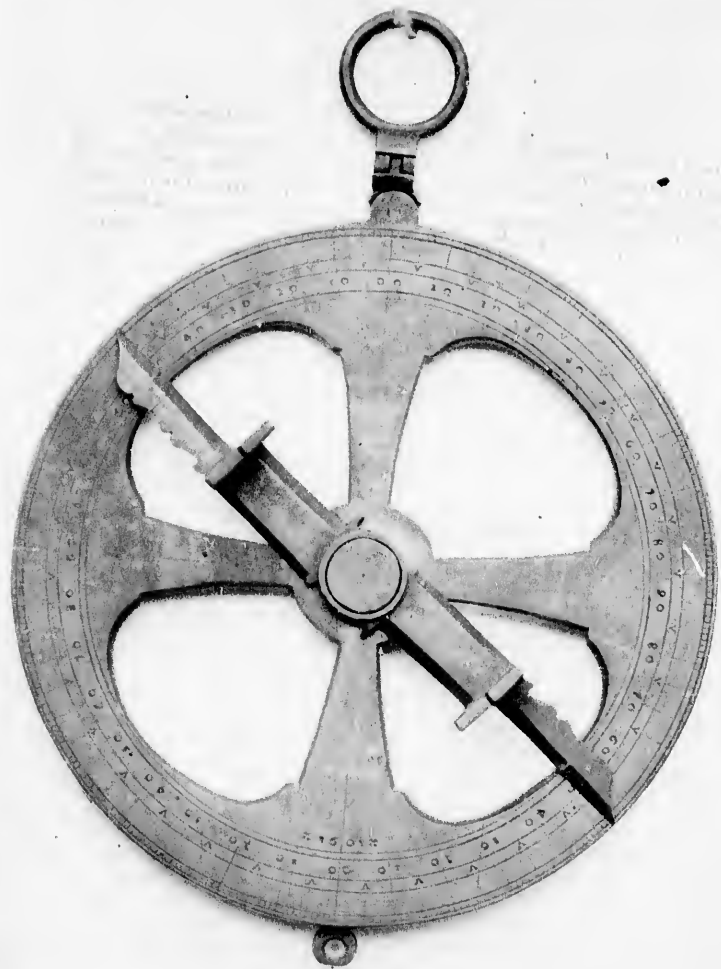
The astrolabe, which is the subject of it, was shewn to me by Capt. Overman, of the Ottawa Forwarding Company. He afterwards gave it to R. W. Cassells, Esq., then President of that Company, now of Toronto, who obliged me with the loan of it. Knowledge of the portage on which it was found led me to believe that it was the one that Champlain's journal contains evidence of his having lost there in 1613.

A. J. RUSSELL.

OTTAWA, 6th January, 1879.







## CHAMPLAIN'S ASTROLABE.

**T**HE Astrolabe, of which a photograph is prefixed, was found, in 1867, on the rear half of lot No. 12, in the 2nd Range of the township of Ross, in the County of North Renfrew, in the Province of Ontario, on the River Ottawa, by Captain Overman's people, in cultivating a piece of ground, at a small lake near the road from the Ottawa to Muskrat Lake, and is believed to have been lost by Champlain in traversing that portage, on his way up the Ottawa, in the year 1613. The following particulars respecting it, and reasons for believing it to be Champlain's, may, perhaps, be found interesting to Canadian readers.

It is about two-thirds larger than the photograph of it, its diameter being five inches and five-eighths. It is of plate brass, very dark with age, an eighth of an inch thick above, increasing to six-sixteenths of an inch below, to give it steadiness when suspended, which apparently was intended to be increased by hanging a weight on the little projecting ring at the bottom of it, in using it on ship-board. Its suspending ring is attached by a double hinge of the nature of a universal joint. Its circle is divided into single degrees, graduated from its perpendicular axis of suspension. The double bladed index, the pivot of which passes through the centre of the astrolabe, has slits and eyelets in the projecting sights that are on it. By turning the index directly



to the sun, at noon, so that the same ray may shine fully through both eyelets while the astrolabe hangs freely, the sun's meridian altitude, and thereby the latitude of the place of observation, can be taken to within about a quarter of a degree, or even less, which is as close as Champlain's latitudes generally were taken. The date of 1603 is engraved on the face of the astrolabe.

Champlain made his first voyage up the Ottawa in 1613, and his journal contains conclusive evidence that he lost *his* astrolabe on the 6th or 7th of June of that year, in passing through the portage on which *this* astrolabe was found.

It is singularly remarkable that this evidence lies chiefly in an error in Champlain's latitude, of what is now the village of Pembroke, which attracted the special attention of our Canadian historian M. Ferland, and is the subject of a copious note on page 307 of the splendid illustrated edition of the Works of Champlain edited with copious and interesting notes by Abbé Laverdière of the Laval University, and published by Mr. Desbarats in 1870; while it is equally worthy of remark that the loss of his astrolabe accounts sufficiently for Champlain's not afterwards detecting and correcting this error of his by subsequent observations; and his having lost it accounts also for his having made no more observations for latitude on that voyage, which he certainly, otherwise, would have done.

It will be seen, on examination, that Champlain's error in observation of latitude took place near Gould's Landing, below Portage du Fort (which seems to have escaped the notice of M. Ferland and others), and that his error, in speaking of the latitude of Pembroke, is simply a continuation of his first error, arising from its being merely an estimation, or rough dead reckoning, of his northing from Gould's

Landing, in consequence of his not having the means of determining it by actual observation, owing to his having lost his astrolabe.

This will be more clearly apparent by following the course of Champlain, and noting what he says about his observations for latitude.

He left the Island of Ste. Helene, where his barque lay at anchor, on the 27th of May, 1613, with a party of four Frenchmen and one Indian. (There was no Montreal in those days.) Being delayed by bad weather, he did not leave Sault St. Louis till the 29th.

On the 30th he took an observation for latitude at Lachine. His words, in the French of his time, are : *Je prins la hauteur de ce lieu, qui est par les 45 degrez 18 minutes de latitude*, which is only about five minutes less than the true latitude of the place, a very insignificant error when it is taken into consideration that the verniers we now have, on all scientific instruments, for reading the subdivisions of degrees, were not then in common use, though invented about that time.

Giving a brief but vivid and highly interesting description of the danger he experienced in towing his own canoe up the Long Sault Rapids—of the fair and spacious tributary rivers, the beautiful islands and magnificent woods, as he passes along; and exchanging one of his Frenchmen for an Indian of a war party that he met at an island near what is now the site of the antique-looking and picturesquely situated manor house of the late Hon. Louis Joseph Papineau, and passing the Rideau Falls, which excite his admiration, he reaches the great "Asticou," as his Indians called it, and which in their language meant Chaudiere, and describes that great waterfall of the Ottawa in all its native grandeur.

which all old Bytonians so well remember, though now impaired and desecrated.

On passing it, on the 4th of June, he took an observation for latitude at what is now the overgrown busy village of Hull.

He says, *Je pris la hauteur du lieu et trouvoy 45 degrez 38 minutes de latitude*, that is only about 12½ minutes in excess of the true latitude, which is 45° 25' 33" N.

Passing the Chandiere Lake and the Eardley Mountains on the 5th and the great Falls of the Chats, where singularly enough they left their provisions and part of their clothing to avoid the fatigue of carrying them, he ascends the Chats Lake and camps on an island at the head of it, where he first meets the Ottawa red pine trees, and admires their beauty. He there erected a cross made of one of them with the arms of France cut upon it.

Leaving it on the 6th, he paddled up the Cheneaux Rapid. The reader who has passed that way will remember the narrow passage between the rocky islands and the lofty precipitous rocks whose shadows darken the swift and surging waters through which the steamer sways and struggles before entering the picturesque reach of smooth water leading to Portage du Fort.

Here Champlain says he crossed to the west side of the river, *where it turns to the north*, and landed for the purpose of taking the route, by the Muskrat Portage and Lake, to Pembroke—by the advice of his Indians—to avoid the many rapids and falls on the main river. The place of his landing is very definitely apparent on the sketch with this, which is copied from the plan of the Ottawa canal survey. And here he says he took an observation of the latitude. *Nous traversames donc à Pouest la riviere qui courait au*

*nord et près la hauteur de ce lieu que estoit par 46 2-3 de latitude.*

It is here that he makes the error of a full degree, in addition to the usual amount of error due to the imperfection of the instrument, for the latitude of his landing place is only about  $45^{\circ} 35'$ ; and this, it is to be observed, is the last observation that he says he took during this voyage.

He then says, "We had much hardship in making our way by this land route, being loaded, for my own part, only with three arquebuses, as many paddles, my 'capot' and some little baguettes. I encouraged my people, who were a little more heavily loaded, and more harrassed by the musquitoes than by their burdens.

"Thus, after having passed four small lakes or ponds (*petits étangs*), we were so fatigued that it was impossible for us to go further, as for nearly twenty-four hours we had eaten nothing but a little roasted fish, without sauce, for, as I have said, we had left our provisions: we rested on the banks of a little lake, which was pleasant enough, and made a fire to drive away the musquitoes.

"The next day, (7th June), we passed this pond (*étang*), which may be a league in length, and then made our way by land for three leagues, through a more difficult country than any we had yet seen, owing to the wind having blown down the pines one over another, which is no small inconvenience, having to pass sometimes over and sometimes under these trees.

"Thus we came to a lake six leagues long," (Muskrat Lake), &c.

The four little lakes that he passed, on the 6th, are shown on the accompanying sketch, and his distance made that day, of two and a half leagues from the Ottawa, is very nearly

correct, so also is the length of the lake he traversed on the morning of the 7th; but the distance from it to Muskrat Lake is estimated by him at nearly double what it really is, but that is exactly what might be expected from any person little accustomed to the woods, in struggling through wind-falls.

The small lake, near which I was informed by Captain Overman that the astrolabe was found, and which is most accessible at that end, would be a most suitable halting place.

He reached Muskrat Lake early enough in the day to be entertained formally with the pipe of peace and friendship, in Indian fashion, followed by a speech and refreshments from Nebachis, the chief of the Indians, who cleared and cultivated land there, and had fields and gardens which they took him to see.

Nebachis had a couple of canoes equipped, and took him down Muskrat Lake, and across the short portage of three miles, by a well-beaten, easy path (now the stage route to Pembroke), to see the chief Tessouat. He arrived there on the 8th of June, so early that after visiting Tessouat, and making some arrangement with that chief, he had time to go over to Allumette Island, the chief abode and stronghold of that branch of the Algonquins called the "Kiehsipirini" (men of the Grand River), characterized in "*Les Relations des Jésuites*" as *extrêmement superbe*. There, examining at leisure their land and burying grounds, he conferred with their chiefs and principal men and invited them to attend the feast, or public dinner, that the "*bon vieux Capitaine Tessouat*" was to give on the 9th, at Pembroke.

On which day, after Tessouat's formal state-dinner had come off, in its various courses, such like as they were, attended by the chiefs and great men, each bringing with

him his own wooden bowl and spoon, and after solemn smoking and speechification, Champlain, to pass the rest of the day, walked about in their gardens.

But neither during this time, nor the day after, nor indeed during the remainder of the voyage, does he speak at all of taking any more observations for latitude. What he says of Pembroke is simply that it is about the 47th degree of latitude,—“*Elle est par les 47 degrés de latitude;*”—that is in speaking of Allumette Island and the foot of Allumette Lake.

In noticing this as an error of fully a degree, in the absence of any other means obvious to him of accounting for it, M. Ferland, in page 164 of his “*Cours d'histoire du Canada,*” says, “*Par cette erreur n'a rien qui doive surprendre dans une expédition où il lui devait être difficile de faire des observations exactes.*”

But we cannot accept of this explanation as adequate to account for the difference between the true latitude of Pembroke, which is about 45° 50' N., and that of 47° given by Champlain; for, in examining his errors in latitude, in the cases quoted, and those made on his voyage to Lake Huron, two years later, after having been again in France (if it be right to designate as errors differences his instruments were not graduated minutely enough to indicate), we find that they are comparatively insignificant, seldom amounting to the third part of a degree, which corresponds closely with the capacity of the astrolabe found. We see therefore that this error of a degree, in the latitude of Pembroke, could not arise from imperfect power of his instrument, as M. Ferland's explanation seems to suggest. In fact, a little further consideration enables us to see that the circumstance of this great error of a degree, having been

originally made below Portage du Fort, demonstrates conclusively that he took no observation at all at Pembroke. For we all know, especially those of us that are accustomed to the use of instruments for the observation of altitudes, or have even the ordinary knowledge of the doctrine of chances, that, as Champlain knew well that he was travelling northward, the certainty is, that if he had made an observation at Pembroke at all, he would have assuredly detected his error made on the 6th; for by it he would be necessarily made to appear to have been going South. We are not at liberty to suppose he would have made the error of a degree a second time, accidentally, for we know that on the common principle of chances, the probability was more than ten thousand to one that he would *not* make the same accidental error twice in succession.

Also, as we see that he was in the habit of taking observations for latitudes of less important points, as he went along, and very formally noticing his observations, we may be very well assured that he would not have failed to determine by actual observation, as usual, the latitude of a position so important as the extreme point that he had reached, if he had had the means of doing so: and no other cause that can be assigned accounts sufficiently for his not having the means of doing so, and for his having taken no observations on this voyage after the 6th June, excepting the loss of his astrolabe on the portage where this one was found.

Taken together, therefore, there is strong circumstantial evidence that this was his astrolabe; and that his loss of it, there and then, was the cause of the extraordinary error in his latitude of Pembroke, which attracted the attention of his commentators.

While we look upon this astrolabe as a relic of the founder of civilized society in Canada, her greatest man and most daring explorer, the founder of her most ancient cities, of her great commercial metropolis: and while we regard it with additional interest as a memento of early adventure on what was even then Canada's great interior highway of commerce, and is, by the same destiny now, the site for her great Pacific Railway, we may also look upon it as a relic of ancient and even pre-historic science and civilization.

The day of astrolabes, like that of the men who used them, has long gone by. This was probably one of the last of them that were used. One of the last works on them is Clavius' "Treatise on Astrolabes," printed at Mayence, in 1611. They were soon after superseded. Vernier, the inventor of the vernier scale, now in use, on the indexes of all scientific instruments for reading subdivisions of degrees, published a tract on "*La Construction, l'Usage et les Propriétés du Quadrant Nouveau de Mathématique,*" at Brussels, in 1631. In it the nature and use of the vernier is explained, and it had indeed been known for a number of years before. It will be readily understood by all acquainted with scientific instruments, that the *Quadrant Nouveau*, with its vernier, would speedily supersede so imperfect an instrument as the astrolabe before us.

The astrolabe was found in general use, among the Southern Arabians, by Vasques di Gama, when he discovered, as it is commonly held, the way round the Cape of Good Hope to India, known in the days of Pharaoh Necho.

The origin of the use of it by them is lost in the remote past. From the days of di Gama back to the earliest



notices of commerce in existence, the commerce of the Arabians and their predecessors, the Cushite Arabians, extended to every coast and almost to every island of the Indian Ocean, "from India to Abyssinia," as Rawlinson says in his work on Herodotus. Our "Alchimy, Arabic figures, Almanac, and Algebra," indicate the channel through which our sciences came.

Notwithstanding the opposition shewn by Chevalier Bunsen, Max Muller and other eminent men, to the idea of an ancient Cushite race of Asiatic Ethiopians having held the valley of the Euphrates, and southern Asia generally, and extended their civilization and commerce over it, that such was the fact seems now to be fully established by the successful reading of the great number of books, written in arrow-headed characters, on tablets of baked clay, found by late excavations in the libraries of the ancient ruined cities of Babylonia and Assyria.

To use the words of an article in the "Edinburgh Review," for January, 1872, on "Tylers' Primitive Culture," in speaking of the Asiatic Ethiopians, it would seem that "it is certain that they represent the earliest progressive civilization of which we have any record, and that the civilization of Babylon, Egypt, and Phenicia, though ascending far beyond the dawn of history, are comparatively modern offshoots of that primitive culture."

From one of these old Babylonian tablet books—a great work on astronomy and astrology, written not later than the 16th century B. C.—it is evident that the Babylonians divided the heavens into twelve parts—the signs of the Zodiac—and used them in speaking of the position of heavenly bodies. One of these divisions was called a "Kaspu," and the day was divided into twelve Kaspus.

It is remarkable that the greatest term, or denomination of lineal measure of the Babylonians, was also a "Kaspu;" and the Kaspu contained, or was divided into 360 "quani"—the quani into 60 cubits, and the cubit into 60 parts. Now it is very remarkable that this system of lineal measure, with its two sexagesimal divisions, is not only in the utmost degree foreign to any mode of measurement and enumeration natural to man, such as the decimal system from the ten fingers, or any simple doubling up or multiplication of simple quantities, such as men in a simple condition of life would, or could naturally use, and would be likely to continue to use long after they became civilized; but it also is precisely our division of the circle into 360 degrees that was in use at the time of Ptolemy, and had existed from time immemorial before.

But what are we to think of a people who evidently had abandoned some simple and natural system of lineal measure, previously long in use, and had adopted a complex and unnatural system which involves the relation of the semi-diameter, or radius of the circle to its circumference? How are we to account for this coincidence between the subdivision of the circle for scientific purposes, and the Cushite-Babylonian system of lineal measure, without assigning the origin of both to the same people? And to whom are we to attribute the astrolabe, or at least its design and system of graduation, excepting to that great mysterious pre-historic race that gave Babylonia and Egypt their science and civilization, and whose colonies and commerce extended, according to our more advanced archaeologists, from the Spice Islands of the Indian Ocean to the British Isles?

The foregoing was written early in the year 1872, and

deposited in the Parliament Library at Ottawa, with the view of bringing the subject under the notice of those who take an interest in the early records of discovery and heroic adventure in Canada. But while the fact of this astrolabe having been Champlain's, and lost by him, on his first voyage up the Ottawa, was admitted as fairly established by the circumstantial evidence adduced, some learned friends objected to the conclusion ventured upon in assigning the origin of the astrolabe to the ancient Chaldeans, and the graduation of the circle into 360 degrees to their denominational divisions of lineal measure, as being visionary and erroneous; maintaining the astrolabe to be of Greco-Egyptian origin and that the graduation of the circle was derived simply from the division of the year, known in early history into twelve months of thirty days each or 360 days.

The publication of the results of the researches of archaeologists of the highest authority, however, has since definitely established the early Chaldean origin of the astrolabe, and of our graduation of the circle into 360 degrees and their sexagesimal subdivision into minutes and seconds.

Two years after the original of this article was written, the late eminent archaeologist, W. Smith, of the British Museum, who had been for some time engaged in Assyrian archaeological exploration, communicated to the public in advance of his great work, published in 1875, the interesting fact that he had discovered in the palace of Sennacharib (excavated at a great depth under a village on the hill of Kouyungie), among other wonderful treasures of antiquity, a part of an astrolabe.

It was seemingly an instrument of superior character to Champlain's. Its circumference was divided into twelve

parts, corresponding with the signs of the Zodiac, the degrees in each marked, with an inner circle naming prominent stars. (There have been different descriptions of astrolabes even in modern times.)

The immense antiquity and consequently profound import of that relic of science, verified by the great depth at which it had lain buried, for more than two thousand years, must have rendered it a more impressive object of contemplation than even the astrolabe of Champlain, the hero of our early Canadian history.

As to the idea that the circle was divided into 360 degrees in correspondence with the number of days in the year, it may be sufficient to say that no people who made and used the astrolabe for astronomical purposes could have held that the year contained only 360 days; especially the ancient Chaldeans and Assyrians who maintained astronomical observatories in their chief cities, and whose copious astronomical tablets are now in the British Museum; for that rating of the year, in eighteen years, would have differed three months from their own systematic observations, and from the actual seasons of the year.

The baked clay tablet books, from the long buried libraries of the ancient Assyrians, including copies and translations of works written a thousand years before the reign of Sennacherib, shew that the civil year of the Assyrians and Chaldeans, like that of the Hebrews, consisted of twelve lunar months, the last, "Adar," our February, being a double one through the intercalated "Ve Adar" (called in the Accad or ancient Chaldean "Dir Se"), added, as explained by MM. Lenormant and Smith to keep the civil year in proper relation with the solar year—shewing, apparently, that neither of the years could give 360 degrees to the circle.

Speaking of the sexagesimal system employed by the Chaldeans and Assyrians in their mathematics, from which the division of the circle into degrees, minutes and seconds, in our mathematical instruments, is evidently derived, M. Lenormant says, "This, it is very evident, was the result of a wise combination, of a very practical character, intended to combine the advantages of the two systems of dividing unity, that have been in dispute at all times and among all nations, the decimal and the duodecimal."

Though it was in the library of an Assyrian king that Smith found the part of an astrolabe mentioned, there is no reason for supposing that it, or the division of the circle into 360 degrees, was of Assyrian origin; for, as he states, the copious and valuable tablet libraries of the ancient Assyrians chiefly consist of copies of very much older Akkad (or Accad) originals; the Assyrians having little original literature of their own. He expresses it to be the opinion of the majority of Assyrian scholars, that the civilization, literature, mythology, and science, of the Babylonians and Assyrians, were not the work of a Semetic race, but of a totally different people, speaking a language totally different from the Semetic tribes; and that the conquering Assyrians, though they imposed their Semetic language on the subjugated elder Akkad, or, as he says, Turanian race (whether Cushite or Turanian, which is disputed, matters little to our subject), adopted its mythology, laws, and literature and almost every art of civilization. Indeed it is evident, from the Assyrian bilingual copies of ancient Akkad Chaldean astronomical and legendary works, that they cherished that ancient Akkad language as European nations have cherished the classical languages of Greece and Rome; and we see that many centuries after the over-

throw of the dominion of the Akkad Chaldeans, the Assyrian king Sardanapalus, in his tablets of historical memoirs, boasts of his erudition in Akkad literature; while the grammars and vocabularies of that ancient tongue, found in his library, with other works on science and general knowledge, evidently designed for educational purposes, and stated by him to be for the use of his people, attest the importance that was attached to the study of Akkad literature and science by the Assyrians, during the thousand years that elapsed from the establishment of their dominion, in Mesopotamia, till the final catastrophe of its extinction, when it had just risen to its greatest grandeur of extent and magnificence.

It is to the science of these Akkad Chaldeans, therefore, or their professional successors, when to be a Chaldean was synonymous with being a professor of astronomical science and astrology, that the origin of the astrolabe is to be attributed, as far as the light of archaeology before the public enables us to see, and with it the necessary prior origin of the division of the circle, for the purposes of science, into 360 degrees, and their sexagesimal subdivision into minutes and seconds, which still is, and probably ever will be, used in mathematics and the graduation of scientific instruments.

And as all myths may be taken as legendary records, however uncouth and distorted, of actual facts and phenomena on which they are based, the tradition given in the fragment of the writings of the Babylonian priest Berosus, quoted by the learned from Alexander Polyhistor, of the great mysterious being, with the body of a fish, but the head, hands, and feet of a man, that ascended the Euphrates from the Erythrean Sea and taught the abori-

gines, "letters and sciences, and arts of every kind" — "to construct cities, to found temples, to frame laws; and explained to them the principles of geometrical knowledge," may be taken as a mythical reference to the advent of Akkad (Cushite or Turanian) colonization and civilization into the lower valley of the Euphrates.

This "cultus," or rather the founder of it, the Oannes of Berosus (and if we are to credit him), the earliest professor of mathematics on record, to whom we owe the original germs of much modern science—we find, by scripture history, deified and worshipped by the men of Gaza and Ashdod [Khamitic in race and Cushite in civilization] as the Fish-god Dagon—a maritime, agricultural and commercial god, appropriate for a maritime people.

Whether we take this "Oe," "Oannes," or "Odakon," to be "Nin," a god of secondary rank, called the "city founder," and also the "Fish-god" and "god of the Sea,"—the two latter attributes being, probably, transferred to him by the conquering Assyrians, who also substituted Assur (the Scripture patriarch Ashur) the founder of their nationality, for the original Supreme God;—or, what seems more probable, that he was identical or confounded with "Hoā," or "Hea," a god of the first triad, called the "god of the Ocean," the "god of the Abyss" (Hades), called also the "Intelligent Fish," the "Teacher of Mankind," "the god of Knowledge and Science," and the "god of Life,"—of which attributes the serpent was the symbol,—we may assume that he continued to be worshipped, and his special attributes acknowledged, under one name or another, by the maritime nations of Cushite or Khamitic origin; worshipped by the Chaldean mariners of the "Ships of Ur" spoken of in Scripture, and of the "Ships of Chittim"—the Chittim

of Josephus, who gave Cyprus its ancient name of Chet-hema,—worshipped, we see, by the Phœnicians who founded Gades and Tarshish, and many other cities and towns in Andalusia, and who traded with the Casiterides and Ierne (Erin); and by the mariners who threw Jonah overboard when he thought to flee from the face of the Lord and hide among the Iberians of the Guadiana and the Guadalquiver. So might it well be, for the temple of Dagon, at Ashdod, was not destroyed till the time of Judas Maccabeus; and till then the "Fish-god" must still have been worshipped. Even in remote Caledonia, he, no doubt, was worshipped, under the symbol of his specific emblem, the serpent, on that great relic of serpent worship, the Saurian mound of Glen Feochan, near Oban, on the coast of Argyleshire—probably by Phœnician trading colonists;—and in many other lands, from Egypt to Ceylon, in ancient times, where the attributes of the deity were transferred to his symbol in the form of the proverbial "wisdom of the serpent," and its being long held as an emblem of life and longevity. It is even possible, also, that the archetypical deity or his attributes may have been worshipped by the Mound Builders of North America—not the neolithic mound builders of the Ohio, but the more northerly paleolithic builders of the more ancient and more inscrutably mysterious mounds in the still distinguishable forms of great serpents and other animals, fit symbols of Hoa (or Hea,) the "god of Life."

The Mexicans worshipped the sun (Baal), offering human sacrifices in his temples; under rare conditions that prevented decay—unconsumed bones of human victims have been found on altars of the Ohio mound builders; in Yucatan, Waldeck, on excavating ruins of ancient temples overgrown with forests, found statues and triune vases and



Egyptian-like frescoes, representing men of seemingly different races (some armed like Phrygians or Phœnicians), which Chateaubriand, when called to report on them, decided to be very remotely, but manifestly connected with Indo-Egyptian art and civilization, which we might suppose to be cotemporary with the Poseidon and Cabiri worship of ante-Sidonian Berytus—the Cabiri, divinities who presided over navigation and mining.

But it may be asked what had the astrolabe to do with these men of ancient times; and what did they know about it? To this we may reply that the probability of some of the eminent navigators of the times referred to being acquainted with the use of the astrolabe, seems rather more real than visionary, when we consider the now acknowledged skill in astronomical science that the builders of the great pyramids possessed; even without admitting it to be so transcendent as claimed by some modern writers of great ability. And coming down to later times, we must admit that Hanno, the Phœnician, who circumnavigated Africa for Pharaoh Necho, was quite as likely to be acquainted with the use of the astrolabe as any of his cotemporaries, who, in their youth, had enjoyed the privilege of frequenting the library of Sardanapalus (where Smith found the part of one), before the ruthless devastation of Nabopolasser and his allies, the Medes, and the self-immolation, if true, of the last of Assyrian monarchs had buried its contents in ruin and ashes, that have preserved them for our instruction, wonderfully intact, through many subsequent dark ages of destructive and bigoted barbarism and intolerant ignorance.

That such was the case as regards that eminent Phœnician navigator seems evident, when we consider that the

Phœnicians, as Humbolt tells us, quoting his authority, made use of Babylonian weights and measures; and the Sidonians are stated, by Strabo, as being "described as "industrious inquirers in astronomy, as well as in the "science of numbers, to which they have been led by their "skill in arithmetical calculation, and in navigating their "vessels by night, both of which are indispensable to commerce and maritime intercourse." Indeed, there is now some reason to believe that the Phœnicians were acquainted with the use alike of the astrolabe and the magnetic needle (which was known to the Chinese, in principle, eleven hundred years before the Christian era), both so necessary to their "night sailing"—and that the manner of using them in navigation was kept rigidly secret, as mysteries of that art, through jealousy of rival nations finding the way to their many colonies, and the remote countries with which they traded.

The Greek and Roman navigators of the Mediterranean, studded with islands, and land-locked on each side by known countries, could never get very far, or hopelessly, astray; but it was otherwise with the Cushite navigators of the Indian Ocean, and with the Phœnicians, who traded far beyond the Pillars of Hercules, down the west coast of Africa, and northward over the Atlantic and the German Oceans, to the then Cimmerian Denmark and to the Baltic. They were occasionally exposed to extreme danger. They were liable, in stormy weather, to be carried far out of sight of land, and from their course on the dark and boundless ocean; where even sun or stars, when they appeared, would afford them no indication whether they were north or south of their destination, or how far either way, or how they should steer for it, unless they had the means of taking

observations of latitude ; and we may well suppose they would be as likely to avail themselves of the Chaldean astrolabe as they had been to adopt the weights and measures of the Chaldeans.

Such is the train of thought into which we are naturally led in considering this last of the astrolabes as a souvenir of the science of remote antiquity ; and, if in tracing the origin of the instrument, and the science that gave it birth back, by the dawning light of archaeological research, to the earliest historical ages and to the cloud-land of mythical tradition, the foregoing pages should seem, in parts, unduly tinged with borrowed pedantry, the writer trusts it may be considered incidental to the nature of the subject.

THE END.

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