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THE SPANISH IN NOVA SCOTIA IN THE XVI CENTURY—
A HINT IN THE OAK ISLAND TREASURE MYSTERY

by

Ross Wilhelm
Associate Professor of Business Economics
University of Michigan

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BACKGROUND OF THIS PAPER

The attached article has been accepted for publication by the Dalhousie Review at Dalhousie University, Halifax Nova Scotia.

Comments on the article or related matters are invited. The article should be of interest to those concerned with the economic history of the XVI Century--the period when the world's money supply was expanding by the output of New World gold and silver. Others who might be interested are those concerned with Canadian history and the history of cryptology.

THE SPANISH IN NOVA SCOTIA IN THE XVI CENTURY
A HINT IN THE OAK ISLAND TREASURE MYSTERY

Ross Wilhelm

Introduction

Over the past one hundred years one of the standard pirate and treasure seeking stories has been the "Oak Island Mystery." Oak Island is in Mahone Bay, Lunenburg County, Nova Scotia, and is about forty-five miles from Halifax, on the Atlantic Coast. For the past 175 years various groups have been digging on the island for what is believed to be a huge buried pirate or Inca treasure. All efforts to date have been frustrated by the intrusion of unlimited amounts of sea water into the diggings. The sea water enters the "treasure" area through an elaborate system of man-made drains or tunnels, one of which is hundreds of feet long and built similar to a stone sewer tunnel. While the findings of the treasure hunters indicate the probable existence of some type of treasure vault on the island, the main purpose of this paper is not to further document the efforts of the treasure hunters beyond what has been set forth in DesBrisay's History of the County of Lunenburg Nova Scotia (1), or in Harris' book The Oak Island Mystery (2), or in the numerous

accounts of the efforts in the mass media (3). The purpose of this paper is to show that there is evidence that seems to indicate that an agent of Philip II of Spain, or one of the other kings of Spain in the XVI Century, built the Oak Island installation. The purpose of this paper is to set forth the reasoning and evidence which leads to this hypothesis and to indicate other possible ways in which additional evidence could be secured to verify or deny the hypothesis.

While the history of Nova Scotia and Canada does include recognition that the area was frequented in the XVI Century by Spanish fishing fleets (4), there is no indication in the standard works that the rulers of Spain or the private enterprisers of the era had sufficient interest in the area to establish a colony or permanent installation. It is believed on the basis of the evidence set forth below that the Spanish crown had greater interest in Nova Scotia than has been assumed to date.

The Oak Island Mystery

Oak Island, heavily wooded, about three-quarters of a mile long and half a mile wide, is located at the rear of Mahone Bay which contains over 300 other islands. Oak Island is about 300 yards from the western shore. In 1965 a causeway was built connecting it with the mainland. Treasure hunting efforts have concentrated at the eastern end of the island on a spit of land which stands between two coves. The island is uninhabited now except for a tar-papered shack in which a watchman sleeps, but at various times throughout its history families have lived on the island.

The Oak Island mystery began in 1795, according to DesBrisay, when Daniel McInnis (or McGinnis), one of the first settlers on the Island, discovered a spot which "gave unmistakable proof of having been visited by someone a good many years earlier." DesBrisay continued,

"There had been cuttings away of the forest and oak stumps were visible. One of the original oaks was standing, with a large forked branch extending over the old clearing. To the forked part of this branch, by means of a treenail connecting the fork in a small triangle, was attached a block and tackle. McInnis made known his finding to his neighbors. Next day the three visited the place, and on taking the block from the tree it fell to the ground and went to pieces...The ground over which the block had been had settled and formed a hollow. They cleared away the young trees and removed the surface soil for about two feet, when they struck a tier of flagstones, which they found differed from the island stones and concluded they had been brought from the vicinity of Gold River. On removing these they saw they were entering an old pit that had been filled up. The mouth was seven feet in diameter, and the sides were of tough, hard clay; but the earth which had been used in filling was loose, and easy to be removed. Ten feet lower was a tier of oak logs tightly attached to the sides, and the earth below them had settled nearly two feet. The logs were very much decayed on the outside. Removing these they went fifteen feet farther down. To get below this they required help, but none seemed willing to assist." (5)

Between seven and fifteen years later work was resumed by Simeon Lynds, some friends, and the original three diggers. They restored the original pit, continued to dig downward, and reached a second tier of oak logs like the first. Ten feet lower they came to charcoal. Ten feet below this putty clay. At a point between 68 feet and eighty feet down they found "a flagstone about two feet long and one foot wide, with rudely cut letters and figures which they could not decipher. The engraved side was downwards." (6)

The engraved stone was not known to have been copied or rubbed and has since been "lost." The only record of the stone's cryptic symbols which defied the ability of treasure hunters to decipher, is based upon memory. The remembered message was: (7)

▽ ∙ ∇ △ ∇ ∇ :: △ T : □ ∙ □ △ □ ∙ ✕ :: □ □
∴ ∙ ✕ ⊖ ∙ + ✕ II ⊙ ∙ ∅ : + + ∅ ∴ ∴ II

Since the engraved stone's message is deciphered below and that decipherment is the basis of this paper's Spanish hypothesis, the stone and the controversy which has surrounded it will be discussed in greater detail later in this paper.

At ninety feet water began to show in the pit and at ninety-three feet it increased. At that time the party stopped digging for the day and before leaving the pit they probed the bottom with a crowbar. At ninety-eight feet the crowbar met with a hard impenetrable substance bounded by the sides of the pit. Whether the substance was a wooden chest or simply wood supports was undecided. When the party returned to the digging the next day, the pit contained sixty feet of water. All subsequent treasure seeking efforts at Oak Island have been frustrated by sea water (8). A schematic drawing summarizing the findings of the first two digs is shown in Illustration 1.

Subsequent Efforts

A detailed history of the subsequent efforts at Oak Island is beyond the scope of this paper, however some description is necessary for understanding.

Treasure hunting efforts on the island have centered upon the construction of new shafts around the original pit, undermining the bottom of the original shaft and drilling in the area for exploratory purposes. Dye tests have traced the source of the water inflow to Mahone Bay. Dynamite and coffer dams were used in attempts to stop the flow of water. The history and the findings of the subsequent efforts to find the treasure have been clouded by the secretiveness of men convinced they are on the verge of finding a huge treasure and by exaggerations and perhaps lies which have been made in attempts to raise funds to continue the efforts. It is little wonder that there are many persons today, as well as in the past, who have believed that the Oak Island mystery is little more than a hoax or a confidence game (9).

From an archeological viewpoint the Oak Island digging area is so chopped up it probably can never be reconstructed. Past treasure seekers used dynamite and steam shovels to accomplish their ends rather than trowels and careful investigation. The workings have been confused to the point where no one today is absolutely certain where the first treasure hunters pit dug in 1795 is located! (10)

The Findings

Despite the difficulty of accurate reconstruction of the events and their sequence at Oak Island, the following findings of treasure hunters after the Lynd party's efforts appear to be well substantiated (11).

1. The original pit was connected to the waters of Mahone Bay by at least one man-made tunnel which led from a system of boxdrains in a nearby cove. The main water tunnel was two and one-half feet wide, four feet high, and sloped downward from the bay for a distance of approximately five hundred and twenty feet. The stone box drains were the only means whereby water could enter the water tunnel to the original pit. The box drains were built of flat rocks set about eight inches apart and covered with flat stones. The drains reached down the beach to the sea like the fingers of a hand. Above the beach they converge to a single point, a downward drain that fed the underground tunnel. The drains extended from the low water to the high water mark. Like the tunnel, the drains are filled with large and small stones.

The drains were sealed ingeniously so that water could only enter the ends of the five drains reaching toward the low water mark by layers of beach rocks, eel grass, and coconut fiber which extended for one hundred and forty five feet along the beach from the low to high water marks. The layers of grass and fiber also probably served as a filter system to prevent the drains from filling with sand.

2. There are other means whereby sea water from the bay enters the digging area. It is not clear, however, from the published accounts whether these other sources of water are man-built tunnels or they are a consequence of natural tunnels created by the erosion of the underlying ground and rock of the island or are due to the extensive use of

explosives in past digging efforts or the digging efforts themselves (12).

Recent drilling operations, which are discussed below, seem to indicate the presence of a large oak lined cavern in bedrock below the area of the original digging. Mr. Arthur O'Shea, a professional news reporter and long-time student of the Oak Island mystery, has determined, using standard engineering formulas and various reasonable hypotheses as to how the original work might have been done, that the construction of the main shaft, a cavern in the bedrock at the indicated depth as well as two water tunnels and drain systems as described above, could have been built by a relatively small group of workers in one normal season when the ground at Oak Island is free of frost. Mr. O'Shea has verified his findings with professional engineers. His analysis raises doubts about the oft-made claims that construction of the Oak Island system would have required the efforts of several hundred men for several years (13).

3. Drilling and probing in the area of the original shaft indicates it extended downward to bedrock. Indications of additional wooden oak or spruce platforms, at various depths, have been found as well as recurrances of the presence of coconut fiber and charcoal. There also have been indications of the presence of quantities of "loose metal", soft stone or cement, as well as iron sheets. There

also have been reports of the discovery of links of a gold chain, copper wire, and a small piece of parchment with lettering on it, far below the surface.

4. In the period since the publication of the Harris book, a new treasure seeking group, Triton Alliance Ltd., has been formed (14). The Triton group has sought to sell the publication and television right to describe their efforts at Oak Island and their findings. Triton press releases state they have conducted an extensive drilling program on the island in the area of the former diggings. The group claims to have discovered a large cavern thirty to forty feet below bedrock in the area of the original shaft. They state that the cavern is lined with oak which has been carbon dated to 1580 plus or minus eighty-five years and that the lining includes a thin layer of hard clay. The Triton group also states it has found a large man-made heart-shaped stone in the area of the boxdrains. It also claims to have discovered that in the surface of the bedrock below the original workings there is a depression fifty feet by thirty feet which is filled with what appears to have been clay which was poured, as a sealant from the surface. A piece of brass is alleged to have been recovered from this clay which Triton says laboratory tests establish that the brass was manufactured prior to 1850. They also claim to have found a pair of iron scissors in the area which were of Spanish-American manufacture prior to 1850.

Lastly, the Triton group claims to have talked to a "Haitian engineer" named Albert Lochard who alleges he discovered a structure in Haiti in 1947 which was built in bedrock and protected by water tunnels. Mr. Lochard also is reported to have found a heart-shaped stone, similar to the Triton group's stone, in a tunnel leading from the underground cavern. Thus far this author has found no published reports of such a find in Haiti, nor have the findings of the Triton group been independently verified (15).

Is It a Hoax?

While it is not possible to fully verify or deny all of the findings over the years concerning the Oak Island structure, credible evidence does support the conclusion that there is some type of installation on the island which required considerable effort and knowledge to construct and which was built prior to 1795. Further, the nature of the structure points strongly toward it having been some type of treasure vault.

It does not follow, however, that even though there is a treasure vault on the island, that the vault now contains treasure. The principal argument put forth by those who support the existence of a treasure is that if it had been removed prior to 1795 the owners would not have replaced the wooden platforms, the carved stone, the sealing clay and other elements, and refilled the shaft (16). However, there is at least one use for such a shaft which would not preclude its being refilled when empty. If someone in the dim past had wished to conceal

a treasure for later removal without the thought of reusing the vault, the obvious way to do it would have been to simply dig a hole, bury the treasure, and to keep the location of the hole a secret. However if it were desired to have a vault which might be used many times for temporary storage, as is a bank vault, the security of the treasure could not depend on secrecy of location. Rather, the security would depend, as it does today in commercial banks, upon the presence of guards and knowledge as to how to open the vault.

It is clear from the account of the first discovery of the Oak Island pit, that little attempt was made prior to 1795 to keep the location of the pit a secret. The DeBrisay account, as indicated above, clearly states the presence of signs that showed something was there. The absence of secrecy of the location and the absence of guards at the site for a long period prior to 1795 seems to support the beliefs that (a) the Oak Island treasure vault was designed for use on a continuing basis rather than for one time temporary storage, (b) that the last time treasure was taken from the vault, the "combination" to the vault was reset in anticipation of possible further use in the future, and (c) that the vault was finally abandoned when it was no longer needed.

If the above beliefs are substantially correct, then the question which becomes paramount is "who had a need for such a structure and particularly a structure of such a size?". Further, if the Oak Island structure were designed for use over time by different persons, then it seems possible, if not

probable, that the message on the carved stone found by the Lynds party was some type of enciphered operating instruction as to how to reach the vault without flooding.

It was the above conclusions which led to the analysis and evidence cited below.

The Carved Stone

As has been indicated above, the present whereabouts of the carved stone is not known today. All reports are that the stone has been "lost". It seems very doubtful that such a possible key to the mystery could be lost or carelessly treated, since there is the tenacious belief that the Oak Island structure contains an enormous treasure. It seems much more likely that the stone was hidden away by one of the treasure seekers. Since the persons who have been associated with the Oak Island effort have been in many cases second and third generation relatives of earlier seekers, it is more probable that the carved stone still exists.

The depth at which the carved stone was found as well as its dimensions and appearance also are a matter of controversy. From the deciphered message set forth below it seems likely that the stone was found at eighty feet or less as is indicated in the DeBrisay account (17).

The message carved on the stone also is in doubt. However as will be shown below, the message, as remembered, appears to be substantially correct. Faulty memory, erosion of some of the carving, and XVI Century cryptological practices could explain the few "errors".

The Decipherment

When the author first examined the message on the carved stone, he was struck by the resemblance between the symbols and those used on Cipher Disks which were first described in Porta's book De Furtivis Literarum Notis, published in 1563 (18). See Illustration 2.

Giovanni Battista Porta's book, long a classic work in cryptology and cryptoanalysis (19), is illustrated with several cipher disks which he developed. A cipher disk is a mechanical means of enciphering and deciphering messages. Through the use of a cipher disk a given cipher symbol may represent many different plaintext letters in the message. A cipher disk consists of an outer ring of metal which has been divided into spaces and inscribed in each space is a different letter of the alphabet. Porta's cipher disks arranged the letters of the alphabet clockwise in their normal sequence moving from A through Z. Porta suggested that when the plaintext messages are in languages such as Italian or Spanish where the language includes unusual letters such as the double l (ll) that such letters be omitted from the alphabet even if it resulted in the misspelling of certain words (20). The outer metal ring of the cipher disk containing the letters of the alphabet was fixed to a backing and was immobile. Inside the outer metal ring was a movable circular piece of metal in the shape of a coin. The coin shaped inner piece of metal also was attached to the backing, but it could be moved either clockwise or counter-clockwise. The inner piece of metal was divided into the same number of

spaces as the outer disc and in each space was a cipher symbol. The cipher symbols shown in Porta's illustration were similar to some of those shown in the carved stone cipher, especially the triangle Δ or ∇ , the cross \dagger , the Roman numeral II, and the square \square . Also contained in the inner coin shaped metal piece was an index marker which was used for the first setting of the cipher disk when enciphering or deciphering a message.

The cipher disk was used by setting the index marker at a prearranged position in relation to a space on the outer ring. The first letter in the plaintext message was enciphered by recording for it the cipher symbol on the inner metal disk which coincided with the respective letter engraved on the outer metal ring. After enciphering each letter, the inner coin shaped metal piece was moved one space on the outer ring to the right. It also was possible in using a cipher disk to include in the message symbols known to the sender and receiver of the message and which served as operating instructions for using the disk but which were not included on the cipher disk and did not represent letters in the plaintext message. In the XVI Century also, it was still a common cryptological practice to separate the words in the message (21). The practice of dividing an enciphered message into the words in the plaintext message was abandoned shortly after the XVI Century because it greatly weakened the security of the enciphered message.

Porta also recommended that where a language has many words which end in a limited number of letters the common recurring letters be dropped from the enciphered message to increase security. Porta also recommended that words be deliberately misspelled to make cryptoanalysis more difficult. (22)

In analyzing the Oak Island message it was concluded that the symbol \div is the same symbol which is used in arithmetic for division and that this symbol probably was used to divide the words in the message. If this assumption is correct, it probably dates the message as having been enciphered in the period of the XVI Century. If the \div symbol divides words, then it follows from the Oak Island message set forth above that the first word in the message consists of one letter and is represented by the ∇ or Δ symbol. It also was concluded that the ∇ and the Δ symbol were the same and that the inversion was used to increase the security of the message.

Subsequent analysis and testing indicate also that the Oak Island message includes operating symbols which did not represent letters of the alphabet. The operating symbols and instructions for using the cipher disk employed in enciphering the Oak Island message are:

(1) If no operating symbol is shown, automatically turn the inner coin shaped metal one space. Omit this turn if operating symbol is shown.

(2) If one dot \cdot is shown, turn inner disk one turn. (This symbol is needed for use with other operating symbols to be able to give instructions for any number of space shifts on the inner coin shaped metal piece.)

(3) If three dots are shown $\cdot\cdot\cdot$, move the inner disk three spaces.

(4) If two dots over each other are shown $\ddot{\cdot}$, move the inner disk four spaces.

(5) If four dots (two sets of two dots) are shown $\ddot{\cdot}\ddot{\cdot}$, move the inner disk eight spaces.

(6) If an operating symbol or an alphabetical symbol is enclosed in a circle, as a dot in a circle \odot , this is a null symbol introduced for confusion and acts as if the symbol were not present. It is obvious, of course, that a circle is a zero in mathematics and is not a very secure means for indicating a null.

(7) If the last letter in a word is omitted (as is the case in three of the words in the Oak Island message), turn the inner disk an extra space to indicate the omission. If a letter is omitted from within a word, act as if the letter were not present. One letter is omitted from within a word in the Oak Island message.

Analysis also indicates that the remembered version of the carved stone's message is incorrect in two minor details.

It is believed that the correct version of the carved stone's message is as follows:

$\nabla \cdot \phi \triangle \downarrow \nabla :: \triangle T : \square \cdot \square \triangle \square \cdot \times :: \square \square$
 $:: \cdot \times \ominus \cdot + \times \text{II} \odot \phi \cdot : ++ \phi :: : \text{II}$

The corrected version of the carved stone's message differs from the remembered version in the following ways:

1. The second set of three dots in the fourth word should be four dots : : .
2. The single dot in the sixth word which follows the null symbol and precedes the Ø symbol should follow the Ø symbol rather than precede it.

It is reasonable to assume that such differences between the remembered version of the carved stone's message and the corrected version can be explained by either (a) erosion of the symbols on the stone, or (b) failures of memory.

Prior Decipherment

Harris (23) indicates that a treasure seeking group formed in 1866 had stated in its efforts to raise funds, that James Liechti, Professor of Languages at Dalhousie College, Halifax, N.S., had expressed the belief that the inscription on the stone could be deciphered to the following plaintext message:

"Ten feet below two million pounds lie buried."

Harris also reports widespread skepticism concerning this decipherment because the group was seeking to sell stock. Skepticism also seems warranted because of the improbably content of the message.

Early in the effort by this author to decipher the carved stone found on Oak Island, attempts were made to decipher the message to verify the above plaintext. Efforts were made using a variety of methods, including the use of Porta type cipher disks, using English, French and Spanish as the plaintext

languages. In addition, a variety of possible alphabets and alphabetical arrangements in each language were tested. None of these efforts were successful.

From this exercise, however, it was surmised that the plaintext language was probably Spanish and further that a simplified alphabet was probably used and the alphabet probably was ordered in conventional sequence.

The initial setting, as well as the alphabet and cipher symbols used to encipher the Oak Island message, according to the above instructions, are shown in Illustration 3.

Decipherment of the Message

Fairly quickly after it was assumed that the language was Spanish and a probable simplified alphabet was used in conjunction with a Porta Cipher Disk, the first two words of the plaintext message were deduced to read: "At eighty ...". The significance of the word eighty was obvious since the carved stone had been reported to have been found by DeBrisay and others at eighty feet or less in the money pit.

The process of deciphering the carved stone moved rapidly after the initial breakthrough. It was finally concluded that the plaintext message of the carved stone probably read:

"A ochenta gui(a) mij(o) r(i)a sumideq(o). F."

The letters enclosed in the brackets in the above decipherment are letters which it is assumed were omitted for security purposes since "a" and "o" occur frequently as the endings of

Spanish words. The last word has been misspelled and the proper spelling would be sumidero, which means drain or sewer tunnel. It is assumed the last letter in the message is a signature - F for Filipe or Philip. It also is of interest to note that the cipher symbol which represents the signature letter is the Roman numeral II which could also have been intended to have a plaintext meaning thus the signature would be, if this is correct, F II. This could be a pun for Philip II!

The English translation of the above plaintext message is: (words in parenthesis are inserted by author)

"At eighty (you) guide, maize or millet (into the) estuary or firth drain F."

The plaintext message is striking for it does indicate a means never before suggested, which seems likely to stop the flow of water into the shaft on the island. As has been indicated above, the water tunnel and the box drains in Mahone Bay were filled with stones. If maize or millet were poured into such drains at low tide, when the tide turned the grain would be carried into the box drains. Grain such as maize or millet swells after soaking in water. If a substantial quantity of such swollen grain were in the drains, it seems likely it would fill the interstices between the stones and stop the inflow of water. If the drains were so plugged, water remaining in the water tunnel could have been easily bailed or pumped out of the shaft on the island. An indispensable advantage of such a plug in the input drains would be automatic unplugging in a

short period as the grain rotted, was eaten by small sea animals, and was worked loose by tidal action. Thus over time the water would again be admitted to guard the treasure vault.

It should be noted that in the enciphered message the cipher symbol T appears in the second word. According to the list of cipher symbols shown in Illustration 3 the letter T does not appear and the proper symbol which should appear instead of the T is a second **□**. It is believed that the second **□** was not used as might be required by the list of cipher symbols because Porta in his book notes that under certain conditions where multiple repetitions of the same symbol appear in a message this can be used as a basis for breaching the security of the message (24). If the individual who enciphered the Oak Island message was guided by Porta's work and instructions, as has been assumed, then the message would have had a **□□** in the second and fourth words. To avoid the repetitions of the same symbol in successive order, it seems likely that the second **□** in the second word was changed to the proper plaintext letter T to improve security.

The Evidence

The reasons why it is believed that the above decipherment of the Oak Island message is correct are:

1. The plaintext message provides a fully feasible set of instructions as to how the treasure vault could be opened, and used on a continuing basis, and an influx of water into the vault be prevented.

2. The message seems to have been enciphered according to the instructions for using a Porta Cipher Disk. The Porta book was published in 1563, seven years after Philip II became king in Spain. Further, Philip II was deeply concerned with all of the details of the administration of his government and especially interested in the codes and ciphers used by his agents. In addition, in 1556 Philip ordered a change in all of the codes and ciphers used by the Spanish government and its agents (25). In view of the King's interest in cryptology it is most probable that he would have been aware of the Porta work since this was one of the best works written on cryptology up to that time. The double meaning of the last cipher symbol in the Oak Island message also would be consistent with a type of "cute" deceptiveness that might have been employed during this period. (26)
3. It seems doubtful if any group or nation in the period prior to 1795 would have had a need, or possible need, for a treasure vault which could be used on a continuing basis in Nova Scotia except the Spanish in the XVI and XVII centuries. The possible reasons why the Spanish built the structure are discussed below. It does seem most doubtful if pirates or the French, or English governments would have either had a need for such an installation or if they would have located it

at such a place. From the viewpoint of pirates it seems to be a most unlikely location because of the large numbers of fishing vessels that frequented the area during periods of fair weather and the dangers of navigation in the area during the winter periods. There was no great outpouring of precious metals or gems from North America that would have justified such a structure at that point for either the English, or French governments or North American settlers. The major advantage in locating a continual use treasure vault in the Nova Scotia area is that this is the last possible stop on the mainland of North America before crossing the Atlantic on the Gulf Stream and the prevailing westerly winds.

Why the Spanish?

There are two possible hypotheses as to why the Spanish in the XVI Century might have needed a treasure vault on Oak Island. First, and most likely, is the hypothesis that an Oak Island vault was needed to provide temporary security for cargoes of ships in the silver fleets which were damaged in the North Atlantic after the turn eastward and prior to reaching the area of the Azores. The second hypothesis is that in trading with the natives in the Nova Scotia area Spanish fishermen learned of the presence of gold in the area and the Crown built the installation in the expectation of the recovery of large quantities of the metal.

After 1526 the bulk of the gold and silver shipped by the Spanish to Europe from the New World was moved in guarded convoys of fleets of vessels (27) from Mexico, Panama and Columbia, assembled at Havana, and then proceeded to Europe in the spring and summer (28). The normal course taken during the warm months was to sail to about 38^o latitude north of Bermuda and roughly off the area of Maryland and Delaware and then to turn eastward to the Azores (29). Assuming the fleets sailed an approximate great circle course when moving eastward, there will be a fairly long segment of the course when if the vessels were struck by a storm from the south they would be driven north toward the coast of Nova Scotia and Newfoundland. The prevailing direction of hurricanes in this area of the ocean is from south to north. It is not unlikely that if extensive repairs were required for such vessels that they would stay in the Nova Scotia area over the winter or for an extended period. Vessels at this time were prohibited from sailing from the New World to Europe alone and they probably would have to await escort vessels from the Azores or to rejoin a later fleet if an extensive stay were required (30). Under such conditions it is possible that the Spanish crown would have built a treasure vault in the Nova Scotia area of sufficient size to accomodate the valuable portions of the cargoes of one or more damaged vessels. It is known that the Spanish colony in Florida during this period was maintained because of the need to provide a haven for

shipwrecked sailors (31). It is not unreasonable that an installation was constructed on Oak Island to meet a similar set of needs.

A second less plausible, but possible, hypothesis is that the Spanish learned of the presence of gold in Nova Scotia before gold was officially discovered in the 1860's. The Spanish fishing fleets visited the Grand Banks area annually during the XVI Century. Further, some fishermen stayed in the area year-round and traded with the natives. In the 1860's gold was discovered at Lunenburg, Nova Scotia which is about nine miles from Oak Island. The affinity of the Spanish crown for land areas with gold deposits is well established, and it is possible that the Oak Island installation was constructed because of the presence of gold. The gold hypothesis does not seem as reasonable as the fleet repair hypothesis, however, since it requires that the Spanish knew of the presence of gold long before it was generally known and that they were able to keep their mining efforts and knowledge sufficiently secret so that subsequent settlers did not realize the existence of gold until several hundred years later. Further, the gold hypothesis necessitates assuming the Spanish would have abandoned their workings before the deposits were exhausted.

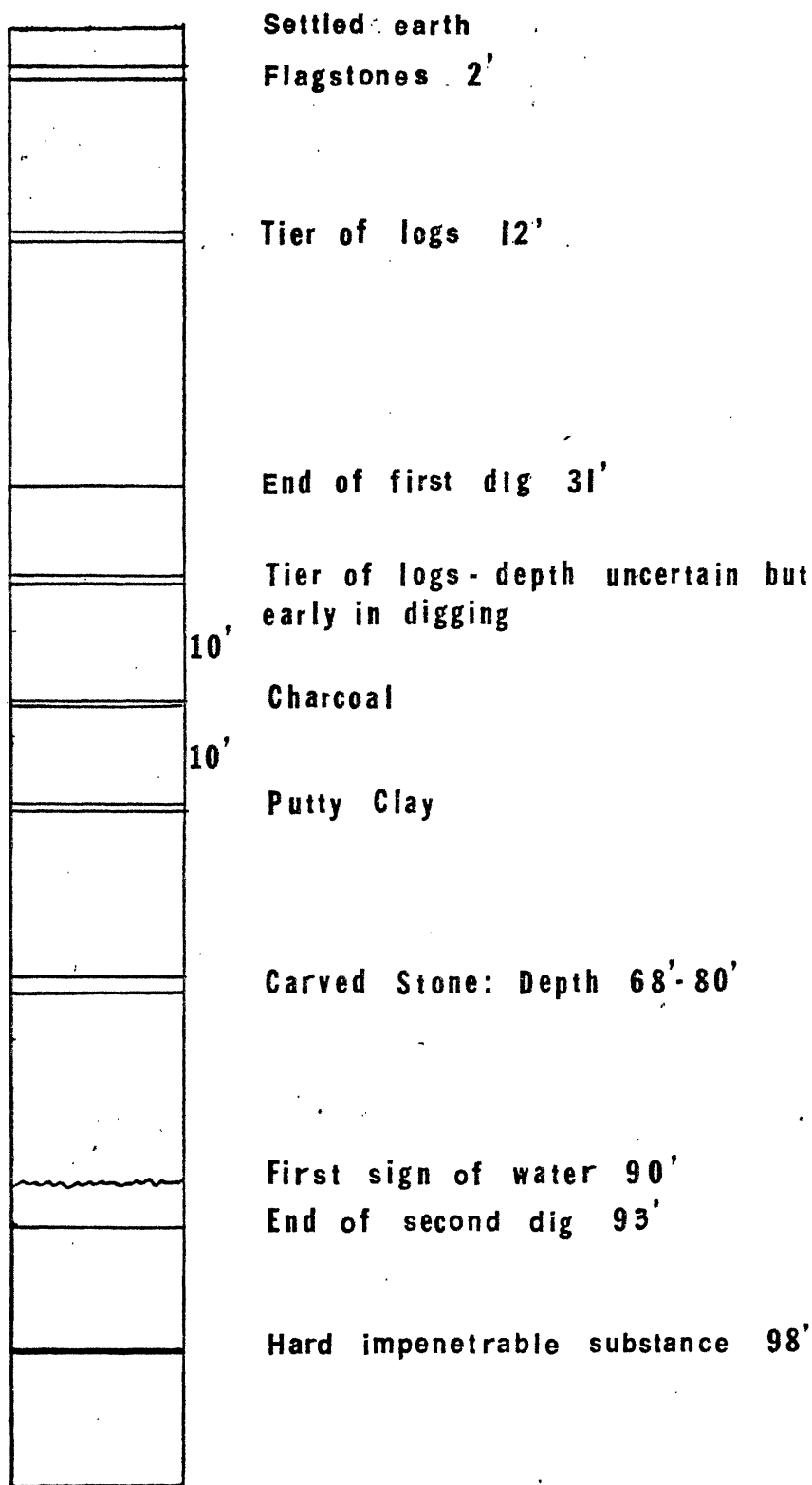
Conclusions

The above analysis offers support for the hypothesis that the Spanish crown built a continuous use treasure vault on Oak Island in the XVI Century. The analysis is based upon long chains of reasoning and conjecture. It is believed, however, that the evidence is sufficiently strong to warrant further

research in Spanish records of the XVI Century.

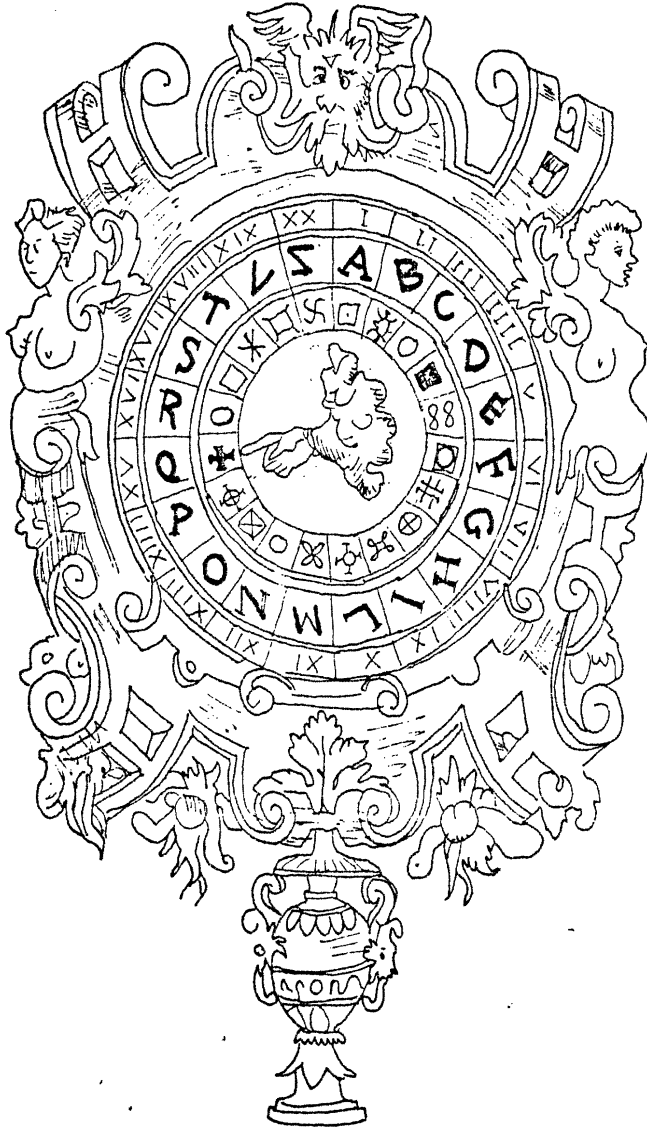
It also should be noted that the author does not believe the vault contains any treasure. No indications of the presence of a treasure have been uncovered to date. Further, during Philip II's reign the Spanish crown was near bankruptcy and desperate for funds. It seems most unlikely that if a treasure were in the vault it would have been forgotten.

Illustration 1



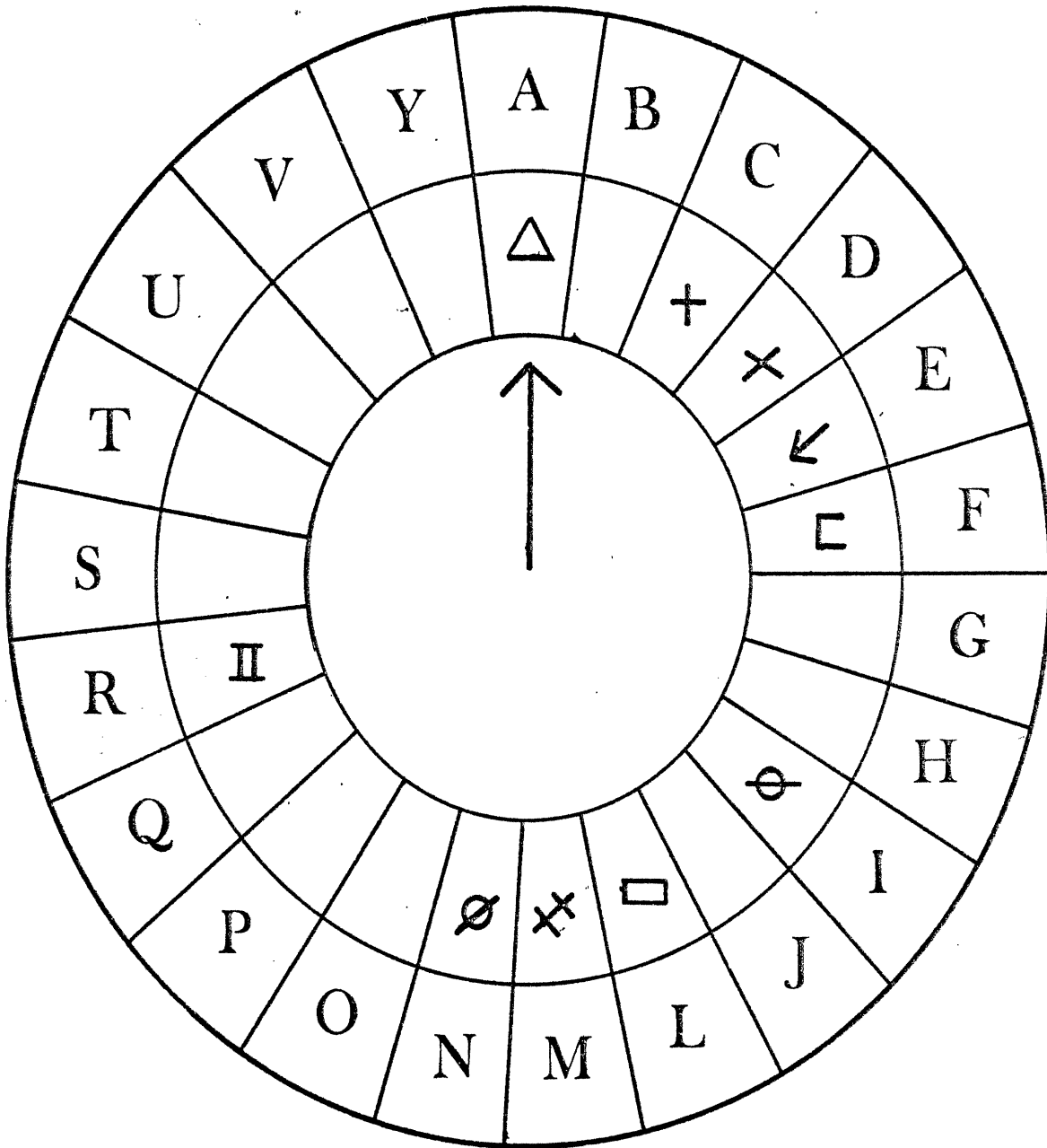
Schematic Drawing of Findings of First Two Digs
at Oak Island According to DesBrisay Account

Illustration 2



One of Giovanni Battista Porta's Cipher Disks

Illustration 3



Reconstructed Oak Island Cipher Disk
Initial Setting
(Only Symbols Used In Message Are Shown)

NOTES ON DECIPHERING THE OAK ISLAND MESSAGE

Shown on the attached two sheets are the steps required to decipher the Oak Island message starting with the initial setting of the Oak Island Cipher Disk and turning it one turn after each symbol is deciphered unless operating instructions are shown. As will be seen, running across the top of each page are the number of turns of the cipher disk. Running across the bottom is the corrected version of the Oak Island message. Running down the left side is the alphabet and in each cell is the appropriate cipher symbol in the position it would have for the particular turn of the cipher disk. This solution is fully consistent with the discussion in the basic paper.

To break the Oak Island message the first step was recognition of the type of device used to encipher the message (a Porta cipher disk type). The second step was recognition of the word divider $\backslash \cdot$. After this it was experimentation on the first two words to learn how the alphabet was ordered (conventional) and to discover the language. The key symbol was the Δ which appears in the first three words. If the first word is a one-letter word represented by Δ then there are only a limited number of such words in either English, French, or Spanish. Further, if the Δ stands for a particular letter in the

first word and if a conventional alphabetical arrangement were used, then it follows that the Δ must stand for particular other letters in the second and third words as the cipher disk is turned according to the instructions.

For example, if the Oak Island message were in English and if the Δ in the first word stood for the personal pronoun I, then in the second word this would mean that the first Δ would stand for K and the second Δ in the second word would stand for M. There is no such second word which even remotely fits.

On a similar process it is possible to eliminate French. In Spanish, however, if Δ stands for A in the first word which means "at" or "by" then the second Δ is a C (in the second word) and the third Δ is E; and further, if $::$ stands for an 8-turn operating instruction, then the fourth Δ represents N. This pattern of letters clearly fits the Spanish word "OCHENTA" which means "eighty." Thus, on these assumptions the first two words are "At eighty...", which is significant in view of the depth at which the stone was found.

Beginning with these assumptions then this clearly gives the meanings of the other symbols used in the first two words. It further indicates that the Δ in the third word stands for U.

From this point I turned to the sixth word where there also is great redundancy in the symbols, especially the $+$, ϕ , and II. Again the process was one of trial and error. If the first $+$ stood for a particular letter then this determines that the second and third

† 's in this word must stand for other letters, and, indeed, two letters which follow each other as D is followed by E or S follows R. Thus by making an initial assumption as to the meaning of the first † and by assigning various meanings as to the operating symbols it becomes possible to obtain clues as to the spelling of the sixth word. Then the process switches to searching various Spanish dictionaries (I used four) to try to find words which might have these spellings. From this process various possible words were found. The most likely, in view of the context, seemed to be "sumidero."

The two halves of the message had to be bridged yet and the middle words were yet to be solved. In addition there is one symbol, \emptyset , which carries over from the second word to the sixth. This meant that if, in the second word, \emptyset stood for O then by the sixth word--if the sixth word was "sumidero"--the \emptyset had to stand for i and r.

Further types of trial and error led to the solution set forth in the paper.

References

- (1) DesBrisay, M.B., History of the County of Lunenburg (Nova Scotia), (William Briggs, Toronto, 1895)
- (2) Harris, Reginald, V., The Oak Island Mystery (The Ryerson Press, Toronto, 2nd Edition, 1967)
- (3) Ibid, pp. 201-205.
- (4) Biggar, H.P., The Precursors of Jacques Cartier, 1497-1534: A Collection of Documents Relating to the Early History of the Dominion of Canada (Public Archives of Canada, Publication No. 5, Ottawa, 1911). It is noted that Spanish and Basque fishermen made annual visits to the cod fishing banks of Newfoundland and Nova Scotia throughout the XVI Century and prior to the landing of Cabot. There also is evidence that many stayed year-round and traded with the natives. Also see, Innis, H.A., The Cod Fisheries, The History of International Economy (Toronto, Rev. Ed., 1954) Chs. 2 and 3. Lescarbot also described a meeting in 1607 with a French fisherman who was on his 42nd annual voyage to the banks. See: Lescarbot, M., The History of New France, Paris 1609. (Translated and edited by Grant, W.L., Champlain Society Publications 1, 7, 9, Toronto, 1907-1914). Haliburton cites Hackluyte, Vol. 3, p. 132 as stating that as early as 1578, "There are about 100 sail of Spaniards who come to take cod, who make it all wet, and dry it when they come home beside 20 or 30 more who come from Biscay to kill whales for train. These are better appointed for shipping and furniture of munition, than any other nation save the English..." See: Haliburton, T.C., An Historical and Statistical Account of Nova Scotia, (Joseph Howe, Halifax, Vol. 1, 1829, page 5 footnote).
- (5) DesBrisay, M.B., History of the County of Lunenburg (Nova Scotia), (William Briggs, Toronto, 1895) p. 302.
- (6) Ibid, p. 303.
- (7) Snow, Edward Rowe, True Tales of Buried Treasure (Dodd-Mead, 1960), p. 25.
- (8) Harris, Reginald V., The Oak Island Mystery (The Ryerson Press, Toronto, 2nd Edition, 1967) p. 15 ff.
- (9) O'Shea, Arthur W. "Treasure Island" (The Detroit News, Detroit, Michigan, Sept. 20, 21, 22, 1970, three articles). See: Sept. 21, 1970. Also Harris, Reginald, V., The Oak Island Mystery (The Ryerson Press, Toronto, 2nd Edition, 1967) p. 186.
- (10) Harris, Reginald V., The Oak Island Mystery (The Ryerson Press, Toronto, 2nd Edition, 1967) p. 171 and p. 197.
- (11) Ibid.
- (12) Ibid, p. 187.

- (13) O'Shea, Arthur, W. "Treasure Island" (The Detroit News, Detroit, Michigan, Sept. 20, 21, 22, 1970, three articles) See: Sept. 21, 1970. Also personal interview.
- (14) Ibid, Sept. 22, 1970. Also news releases, photographs, and other data provided by Triton Alliance Ltd. to the author in August, 1970.
- (15) Ibid. It is of secondary interest to note that the Spanish word for scissors is tijera which also means "drainage tunnel".
- (16) Harris, Reginald, V., The Oak Island Mystery (The Ryerson Press, Toronto, 2nd Edition, 1967) p. 191.
- (17) Ibid, pp. 18-20. Also see: DesBrisay, M.C., History of the County of Lunenburg (Nova Scotia), (William Briggs, Toronto, 1895) pp. 302-303.
- (18) See: Kahn, David, The Codebreakers (Weidenfeld and Nicolson, London, 1967) pp. 141-142.
- (19) Ibid, p. 138.
- (20) Ibid, pp. 138-139.
- (21) Ibid, p. 113.
- (22) Ibid, p. 139.
- (23) Harris, Reginald, V., The Oak Island Mystery (The Ryerson Press, Toronto, 2nd Edition, 1967) p. 19.
- (24) Kahn, David, The Codebreakers (Weidenfeld and Nicolson, London, 1967), p. 142.
- (25) Ibid, pp. 114-114.
- (26) On the other side it should be recognized that any decipherment of a message, without the original key is at best a probability statement. As with all cryptological efforts the decipherment of the Oak Island message is based on trials and errors, hunches and guesses. The credibility of the decipherment must rest upon (a) the internal consistency of the solution, (b) the plausibility of assumptions made in the analysis, and (c) the consistency of the content of the plaintext message appears.
It should be noted that while it appears the carved stone was prepared during the reign of Philip II, it does not follow that the Oak Island installation was built at the same time. The carved stone could have been changed during Philip's reign even though the structure was built prior to his reign.
- (27) Haring, C.H., The Spanish Empire in America (Harcourt, Brace & World, Inc., New York, 1947) p. 304.
- (28) Haring, C.H., The Buccaneers in the West Indies in the XVII Century (Methuen & Co. Ltd, 1910) ch. 1. Also: Haring, C.H., Trade and Navigation Between Spain and the Indies in the Time of the Hapsburgs (Harvard University Press, Cambridge, 1918)

- (29) Ibid. Also see: Hamilton, Earl J., American Treasure and the Price Revolution in Spain, 1501-1650 (Harvard University Press, Cambridge, 1934) p. 19. It is not possible to determine the exact course followed since navigational methods during this period were limited primarily to the determination of latitude. A practical method for precisely determining longitude was not devised until about 1735, with the invention of the chronometer. See: "Navigation", Encyclopedia Britannica (Encyclopedia Britannica Inc., Chicago, Vol. 16, 1956) p. 173.
- (30) Hamilton, Earl J., American Treasure and the Price Revolution in Spain, 1501-1650 (Harvard University Press, Cambridge, 1934) ch. II.
- (31) Ibid, p. 25.
- (32) Davies has noted that throughout the reign of Philip II the Royal Council, in considering the problem of securing the safety of Spain from the Morisco population, frequently discussed the possibility of deportation to Newfoundland among other measures. It does not seem likely that a regime would consider deporting disaffected persons to an area supplying the regime with treasure. Davies, R. Trevor, The Golden Century of Spain, 1501-1621 (Macmillan & Co., Ltd., New York, 1954) p. 249.

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