A Sailor's Lament *(Date Unknown)*

We are not built for work like this
we're sailors through and through -
and digging holes on scruffy isles
we are not meant to do!

But dig we must, the Captain says
our mission here is plain -
So we'll keep digging tunnels here
through ice and wind and rain.

But it would sure be nice to know
just what we labor for -
full 20 fathoms deep we've dug
our arms and backs are sore.

What could be so precious that
it must be hid so well?
The pits we dig must be nigh on
the blackened gates of Hell!

Once, while we were crossing
I even made so bold -
to sneak below decks, take a peek
at what was in the hold.

Alas, the prize was well-hid
in the darkness down below -
but did I just imagine there
an other-worldly glow?

No matter: Ours is not to quest
we do as we are bid -
but is it just a rumor
that our Captain's name is Kidd?

And Jedediah overheard
while standing near the rail -
the Captain and a Templar Knight
converse about some grail.

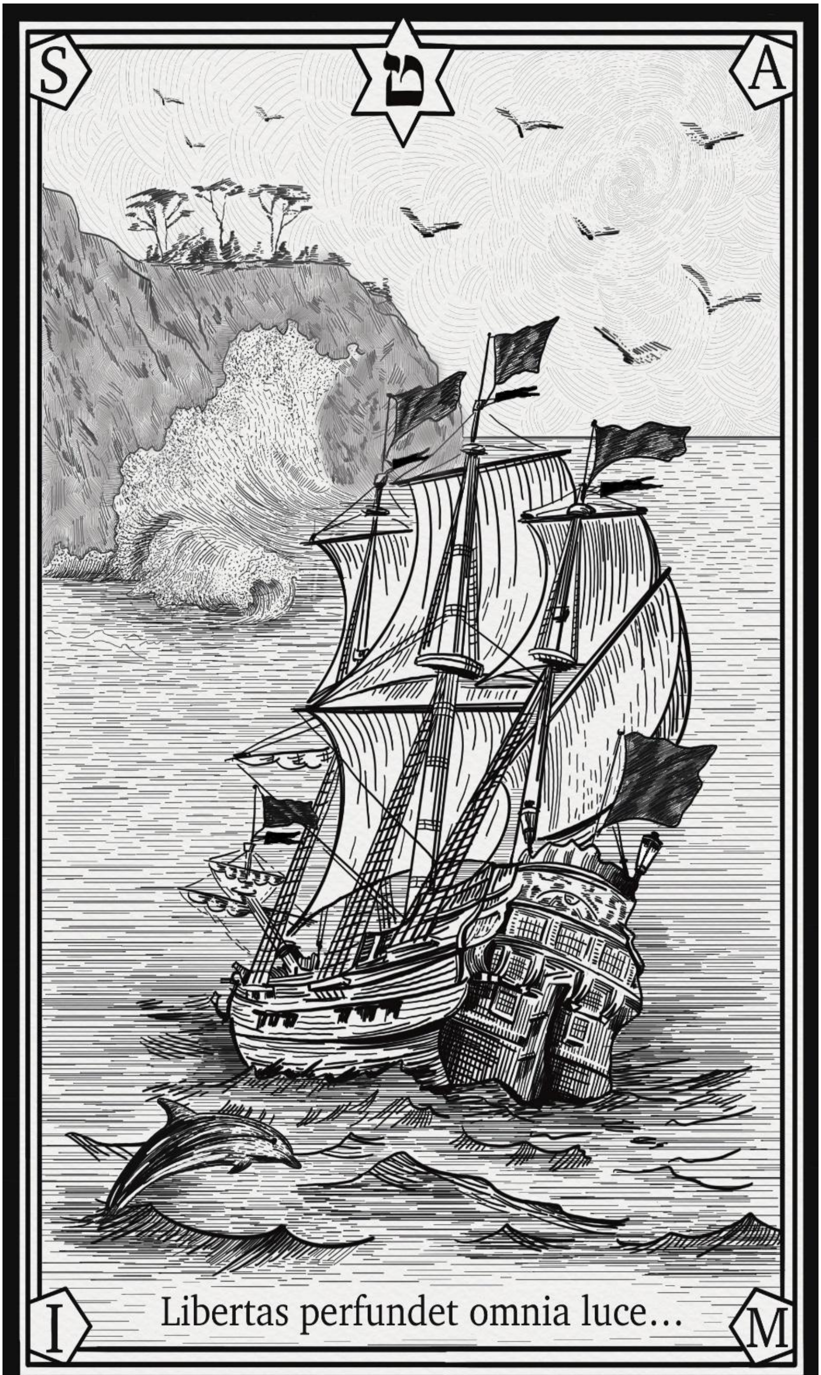
And old Ben Moses thought he heard,
near mess hall in the dark -
some mealtime conversation
about some sort of ark.

And should we credit gospel to
the tale of Tinker Joe -
who swears he heard some talk
about - a Shakespeare folio?

I think the treasure's something
I was not meant to know -
I just wish we would bury it,
and board the ship and go.

For I am just a sailing man
my ship: Lagina Mag -
Let's leave this digging and set sail
beneath our Templar flag!

Joe Urbanski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Libertas perfundet omnia luce…
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Chapter Nine

I'LL TAKE 2,000 BAHARS TO GO, PLEASE

Not until Alfonso de Albuquerque, appointed as the second Governor and Viceroy of all Portuguese possessions in the east, did a European acquire retted coconut coir fiber, from the husk of seeds of the *Cocos nucifera*. Albuquerque arrived in Cochin, India circa 1509, to assume his duties.[1] The Viceroy would be a busy man as he attempted to firmly affix Portugal's control over the whole Indian Ocean spice trade. His ambitious plan was to establish *factorias* (entrepots) throughout the Indian Ocean and all the way to China, accessing spices and other goods from their source locations. While at the same time, the Portuguese King was pushing the Viceroy to capture and control the trading ports in the Persian Gulf, Red Sea, and coastal Africa. In the lead up to launching these endeavors, Albuquerque constructed fortified naval facilities along the Goa River for servicing ships of the Portuguese Armadas stationed in Goa, India, circa 1510.[2]

Albuquerque's secretary and scribe Gaspar Correa, authored an important chronicle of the early history of Portugal's exploration in the east and is titled *"Lendas de India."*[3] It is in the following passage from that tome where we learn of coir fiber and a *'bahar.'* The bahar will help quantify the amount of coir found on Oak Island and from historical understanding we will forensically construct the purpose of the coir fiber brought there. This in turn will show how it becomes relevant to the Oak Island Treasure story.

> *"1510 – The Governor (Alboquerque) devoted much care to the preparation of cables and rigging for the whole fleet, for what they had was all rotten from the rains in Goa River; ordering that all should be made of* ***coir*** *(cairo), of which there was great abundance in Cananor; because a Moor called Mamalle, a chief trader there, held the whole trade of the Maldive islands by a contract with the kings of the isles … so that this Moor came to be called the 'Lord of the Maldives,' and that all the* ***coir*** *that was used throughout India had to be bought from the hands of this Moor…. The Governor,*

> *learning this, sent for the said Moor, and ordered him to abandon this island trade and to recall his factors.... The Moor, not to lose such a profitable business, ... finally arranged with the Governor that the Isles should not be taken from him, and that he in return would furnish for the king [Portugal] 1000 bahars (barés) of coarse* ***coir,*** *and 1000 more of fine* ***coir,*** *each bahar weighing 4½ quintals; and this every year, and laid down at his own charges in Cananor and Cochyn, gratis and free of all charge to the King (not being able to endure that the Portuguese should frequent the Isles at their pleasure)."—Correa, ii. 129–30.*

Albuquerque had quickly learned why the locals had rigged and sewn their vessels with coir cordage, as it seemed impervious to the saline humidity whipped up by the ever-present rains. His armadas rigging was dissolving in its anchorage and would soon be useless to project the power Portugal had sent him to deploy.

This chapter discusses the volume of palm fiber (both date and coconut) found on Oak Island and addresses if the quantity of fiber can reveal answers to the *who*, *what*, *where*, *why* and *how* of this conundrum.

At this historical reference point (Goa, India), the word "Bahar," pronounced like *Joy Behar* – means 'load' (no joke). A weight used in large trading transactions; it varied much in different localities; and though the name is of Indian origin it was naturalized by the Arabs, who carried its use to the far East. The bahar was being used as far away as the Moluccas when the Portuguese arrived.[4] Though a bahar is often in the form of a large sack it can also be in the form of a basket, bundle, bale, or other container of a predetermined weight for the specific commodity involved in the transaction.

A **BAHAR**, "Arabic: *bahār*. Malayālam: *bhāram*. Sanskrit: *bhāra*. Malacca: *bahar, bagar.* Goa: *bahars, bahares, bares.* Indian islands (**Lakshadweep**) [Laccadive, Chagos, Maldives, Minicoy, and Amindivi island chains],[5] the *bahār* is equal to 3 *peculs* (q.v.), or 400 *avoirdupois*. But there was a different *bahār* in use for different articles of merchandise; or, rather, each article had a special surplus allowance in weighing, which practically made a different *bahār* everywhere (see PICOTA)."[6]

PICOTA, s. [think of a forced Tip] "An additional allowance or percentage, added as a handicap to the weight of goods, which varied with every description, and which the editor of the *Subsidios* supposes to have caused to the varieties of bahar (q.v.). Thus at Ormuz the bahar was of 20 *farazolas*, to which was added, as picota, for cloves and mace 3 *maunds*, or about 1⁄72 additional; for cinnamon 1⁄20 additional; for benzoin 1⁄5 additional, &c. See the Pesos, &c. of A. Nunes (1554) passim. We have not been able to trace the origin of this term [**Picota**], nor any modern use (Hobson-Jobson)."[7]

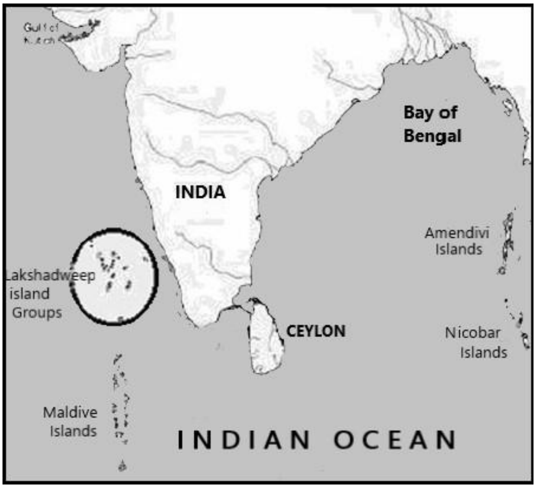


Fig. #1. Indian Ocean[8]

To add yet another layer of complexity to know what a bahar really is, King Manuel I of Portugal strove to establish a list of standards for weights and measurements for all territories. The universal policy for implementing these laws and standards were referred to as the Manueline standards.[9] The first in a long string of royal dictates to implement this policy, was "*Regimento dos Oficiais, fl. 80-80v,* distributed in 1502."[10] How and when it was implemented by governors of Portuguese India is as dubious to define as we see chronicled next in the confusing application of what a bahar is and what is its volume for coir fiber. The purpose of understanding the weights and measures of the past will actually help to apply the oak island volume of palm fiber to the weights and measures of today; thus representing an eventual commodity used by those *ancient voyagers* on the island. On the following page are historical footnotes listed under the definition and application of **bahar** in *Hobson-Jobson.*[11]

A Bevy of Bahar Bounty

1498.—"... *and begged him to send to the King his Lord a* ***bagar*** *of cinnamon, and another of clove ... for sample*" (*a mostra*).—Roteiro de V. da Gama, p. 78.

1510.—"*If the merchandise about which they treat be spices, they deal by the* ***bahar****, which* ***bahar*** *weighs three of our* ***cantari.***"—Varthema, p. 170.

1516.—"*It (Malacca) has got such a quantity of gold, that the great merchants do not estimate their property, nor reckon otherwise than by* ***bahars*** *of gold, which are 4* ***quintals*** *to each* ***bahar.***"— Barbosa, p.193.

1552.—*"300* ***bahares*** *of pepper."*— Castanheda, ii. p. 301. Correa writes **bares,** as does Couto.

1554.—*"The* ***baar*** *of nuts (noz) contains 20* ***faraçolas****, and 5* ***maunds*** *more of* ***picota****; thus the* ***baar****, with its* ***picota****, contains 20½* ***faraçolas****....*"— A. Nunes, p.6.

c. 1569.—*"After this I saw one that would have given a* ***barre*** *of Pepper, which is two* ***Quintals*** *and a half, for a little Measure of water, and he could not have it*."— C. Fredericke, in Hak. Soc. ii. p. 358.

1598.—"*Each* ***Bhar*** *of Sunda weigheth 330* ***catten*** *of China*."—Linschoten, 34: Hak. Soc. i. p. 113.

1606.—*"...Their came in his company a Portugal Soldier, which brought a Warrant from the Captain to the Governor of Manila, to trade with us, and likewise to give John Rogers, for his pains a* ***Bahar*** *of Cloves*."— Middleton's Voyage, D. 2. b.

1612.—"*The* ***bahar*** *is 360* ***rottolas*** *of Moha.*"— *Danvers, Letters*, i. p. 193.

1673.—"...*Weights in Goa: 1* ***Bahar*** *= 3½* ***Kintal****. 1 Kintal = 4* ***Arobel*** *or* ***Rovel****. I Arobel = 32* ***Rotolas****. 1 Rotola = 16* ***Ounces*** *or 1/. Averd*."—Fryer, p. 207.

1802.—*"That at the proper season for gathering the pepper and for a* ***Pallam*** *weighing 13 rupees and 1½ Viessam 120 of which are equal to a* ***Tulam*** *or* ***Maund****-weighing 1,732* ***rupees****, calculating, at which standard for one* ***barom*** *or* ***Candy*** *the Sircar's price is Rs. 120*."— Proclamation. at Malabar, in Logan, iii. p. 348.
Note: This makes the **barom** equal to 650 **lbs.**

Trying to understand all this gibberish is the science of Metrology. It was once said, "*measurement is at the root of all civilizations and at the root of metrology is pure number*."[12] John Neal, having written "*The Science of Metrology*," further notes "*It has become customary for us to label certain metrological values with a cultural appellation, such as Sumerian, Egyptian, Greek, Roman, etc*." Another noted scholar (De Sanctis) remarked that "*Ancient metrology is not a science, it is a nightmare*."[13]

So with all this chaos swirling around, we have found what had been the measurements and weights used by Afonso Albuquerque while negotiating with Mamalle the Moor, on the tribute to be paid by him so he could keep his monopoly over the Maldives. Below is the conversion table, found in the journal of Jorge & Pero de Sousa Pereira, circa 1560.[14]

NOTE: We have expressed the figures in exact measurements.

1 Arratel	=	16 oz. (457.8 grams)
128 Arratels	=	1.0 Portuguese Quintal
1 Quintal	=	58,598.4 grams
4.5 Quintals	=	263,692.80 grams
1 Bahar	=	4.5 Quintals
1 Bahar	=	263,692.80 grams
100 Bahar	=	4500.0 Quintals
100 Bahars	=	26,369,280.0 grams
1000 Bahars	=	263,692,800.0 grams
4.5 Quintals	=	9,301.48979355 ounces
	or	581.3431 Pounds
1,000 Bahars	=	263.6928 Metric Tons
2,000 Bahars	=	527.3856 Metric Tons

Records show Mamalle promised to pay the Viceroy a tribute of 527.4 metric tons of coconut coir fiber each year. That is a lot of coconuts and represents, based on our next formula - *bundles of soodies*.

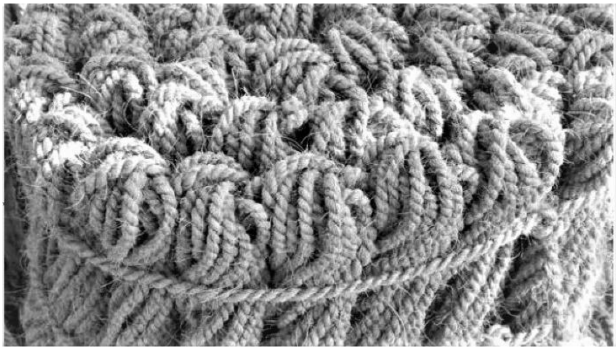
First Fiber Formula

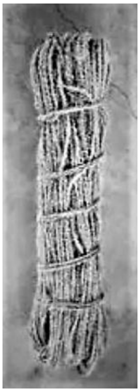
To further untangle this mathematical measurement, we turn to the pages of the *Journal of the Bombay Natural History Society*, circa 1841, to convert raw coir fiber into lengths of coir yarn (twine) and then into coir rope. Here is the formula used in 1841…

[Note: Twine is a thicker/braided lamp wick material, discussed later]

> *"The yield of fibre is estimated by Robinson at one pound of coir from each 10 nuts, giving 35 fathoms of yarn. He adds that "2 lbs. of such yarn, measuring from 70 to 75 fathoms, are made up into 'soodies,' of which there are fourteen to a bundle, averaging about a maund of 28 lbs. A Mangalore candy of 560 lbs. will, therefore, be the produce of 5,600 nuts and should contain about 20,000 fathoms of yarn." In contrast with this yield, Robinson mentions that it takes only three of the large coarse coast nuts to yield a pound of coir, but that this coir will only produce 22 fathoms. A ton of Laccadive coir will thus produce 80,000 fathoms of yarn against 50,000 yielded by a ton of Malabar coir."*[15]

Figure #2 & #3. **Image of a bundle of soodies today & Image of a single soodie. Courtesy, CoirBoard.**[16]





As noted earlier, the term bahar was Indian, but naturalized when Muslim traders settled into the Malabar area, believed to be as early as the 10th century.[17]

Oak Island was determined to have had 1.54 metric tons of coconut coir fiber dispersed in the Money Pit and in the filtration system found in Smith's Cove. You can review this formulation in Volume One, Chapter Ten, "*Cracking the Nut*." This weight was equivalent to 3,391.66 lbs. If it takes ten nuts to produce 1 lbs. of coir fiber, then 3,391.66 lbs. of coir fiber took 33,916.60 coconut husks to make the fiber found on Oak Island, based on Robinsons' formula above. Following his calculations, the volume of fiber found on Oak Island would produce **118,708** *fathoms* of coir yarn. Our calculations, based on current production figures, required only 18,000 coconuts to produce the Oak Island fiber. This difference is based on current nut production criteria.

What then does a fathom tell us? First, during the Byzantine period of our *ancient voyagers*, a fathom was known by the ancient Greek word "*orguia*." To further complicate this story, there was the '*simple*' orguia which was six byzantine ft (1.88m) in length, or the '*imperial*' orguia. The imperial orguia comes in at six byzantine feet and a span - *width of the palms of both hands, or* (2.10m) in length.[18] Perhaps this is more *picota* corruption during that day and age.

Yet the historical measurement definition used here is not when those *ancient voyagers* set sail on the ocean, but how Mr. Robinson made his determinations. This will be the official standard used to verify the total length of rope, cables and rigging on a ship, for these calculations. To keep things free of *picota* percentages we will be applying the definition of a *fathom* recognized officially by the British Admiralty at the time, which says a fathom is 6.05 ft. (1.85m).[19]

The process of making ropes and cables is described in written form on the following pages. Also linked for the reader, is the official YouTube instructional channel by the Indian CoirBoard; an agency which promotes mercantilism of coconut products. The link is very informative and watching an episode called "*Lesson for Coir Rope Making, Lesson 20*" will show how simple it is creating ropes from CCF. The episode is less than ten minutes and can be watched at this site:

https://duckduckgo.com/?q=how+to+make+coir+rope+for+boats&iax=videos&iai=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DTUOGkcyYciU&ia=videos

"A rope is a material of cordage construction with a circumference of 1 inch or more. It is made up of 3 or more strands of coir. The strands themselves being as an assemblage of coir yarns [twine] twisted together. By varying the number of coir yarn strands, creates rope circumference and strength. The twist pattern of both individual strands and the strands twisted together is intrinsic to the strength of the rope. Coir rope is made into three categories for maritime purposes." They are:

1) '***Hawserlaid Rope***," which is made from 3 strands up to 1 inch in circumference.

2) "***Shroudlaid Rope***," which is made from 4 strands or more, and is 1 inch or more in circumference.

3) "***Cablelaid Rope***," which uses 3 or more strands that are 1½ inches thick each, twisted around a center strand, with a total circumference of 5½ inches and larger.[20]

Using the conservative measurement of 118,708 fathoms of coir yarn made from the 1.54 metric tons of fiber found in Oak Island, multiplied by the length of a British Admiralty fathom length of 6.05 ft, equals a total of 718,183.40 linear ft of yarn.

With an assumption the majority of the ropes, rigging, cables, and cordage used on our *ancient voyagers* vessel would use no larger than the 'Shroudlaid rope' shown earlier. As it is made of 4 strands of yarn [twine] twisted together, we will divide this total length of yarn into four (allowing the twisting of four strands to produce the heavier cables as a conservative estimate). So the 718,183.40 linear feet of yarn, divided into four equal lengths, leaves us with 179,545.85 linear ft of Shroudlaid rope, being more than 1 inch thick.

A) It is determined the volume of CCF from Oak Island was sufficient to twist almost 180,000 linear ft of moderately strong, **Shroudlaid coir rope** for maritime use.

To produce these equations, measurement for containers of coir from the early 1500s were used, and now used is the measurement for coir yarn production from the mid-1800s. We can apply these protocols to the time period of when those *ancient voyagers* set sail, because nothing in the packaging of - or production of coconut coir fiber into yarn, had changed over those hundreds of years. The subgroup-type of coconut palm remained consistent. The retting process was still used then and had not changed. In addition, the packaging and marketing of CCF as a commodity was also consistent throughout this period of Arab mercantilism in India, up to today. Only the nut size had changed or was known to be of differing sizes, based on the location of where they originally grew. Yet even this is vacuous as harvested CCF was collected from Laccadive and Maldive islands and sent to Malabar (Kerala India). There, the fibers were separated based on length, and not location. The key determinatives had not changed prior to the British building factories and commercializing CCF processing into twine, mats, rugs, brushes, etc. The first such factory was constructed in Alleppey, India, by the Darragh - Smail & Co. established in 1859.[21]

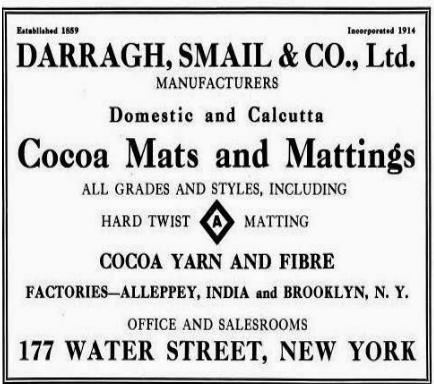


Figure #4. **Darragh – Smail & Co. Ad** [22]

With these factors now identified, a determination of how much CCF it would take to replace the cordage, rope, rigging and caulking needed for the presumptive sailing vessels used by our *ancient voyagers*, can be determined.

Caulking To and Fro

How much the volume of Oak Island mystery fiber could be manufactured into CCF marine cables and ropes should the need arise during any extreme journey is now known. But what about caulking? CCF was also used for caulking. Caulking is the process of maintaining the watertight integrity of the hull.

Historically, building vessels was more of an art than a science and the crew did not want to find out your carpentry skills were deficient once they left the shoreline. So, like any prepared sailor, on-hand methods of emergency and preventative measures and materials were brought along for the continual effort to minimize leaks. Most caulking was performed before the vessel was launched. Caulk was used in all types of hull construction up until steel vessel manufacturing. Sealing the hull, its' seams, planks and joints, would be essential to stay supernatant. While floating, many unforeseen mishaps can cause a loss of hull integrity. Unlike a cannon ball crashing through your bow, most leaks start out small and innocent. To determine if the ship has a leak or many leaks, the crew will obediently monitor onboard water levels for sign of losing buoyancy. For wooden ships to stay afloat, it was vital to reduce water intake as much as possible and caulking was critical.

Think of caulking like chinking a log home, where material (also referred to as caulk) is stuffed between the logs (or ship planks) to keep out the cold and make the home airtight, and a vessel watertight. Unlike cold drafts which can be miserable in a log home, a leaking ship will assign you to Davy's Jones's Locker.

CCF was a useful product in the Indian Ocean and surrounding seas to caulk those cracks, seal those seems and tighten up a treenail should the need be noticed. In our equation, a percentage of loose or bulk CCF would be set aside to assist in caulking, either during the voyage or if the vessel needed to be careened for hull repair.

Figure #5. Courtesy: **Nic Butler Ph.D**[23]

When sailing the sea or rafting a river, the mode of transporting atop water does tend to sharpen ones interest in doing it successfully. People can all float – or at least one time in the past, but floating is risky business and requires attention to the understanding of buoyancy. Being buoyant basically implies you keep the water below you as you navigate a waterway. Up until the introduction of complete metal hull ships, this task of caulking was very important and required experienced craftsman. In Chapter Six, *"Why, Oh Why… Oh Why,"* offers a detailed discussion on how caulk is made and applied. Though the techniques were similar in application, the materials use in caulking and to caulk - in effort to maintain buoyancy, varied by regions of the world. Archaeobotany can establish historical norms and insights of mariners and their materials by studying shipwrecks and maritime history.

We know by the archaeobotanical record, few vessels used CCF for either caulking, sewing, lugging, or rigging outside the Indian Ocean in general, and related far-east adjacent seas in particular. Furthermore, the absence of any CCF rigging, rope or twine found on the island to date, indicates fiber wasn't even partially preassembled (into twine or yarn) so as to provide rope for their mining operation; or as preparation for making additional maritime cables, should that need become necessary. It is much easier for a sailor to use existing rope for caulking then to weave twine and then rope into cables while at sea. Perhaps most odd, is they left the bulk fiber in the island constructs and, if departing by vessel, did not take usable fiber for making any needed maritime rigging, cordage, nets, caulking, etc.. The mystery fiber seems to have been abandoned in places where the fiber has no known or workable function. Yet it was placed there with intent.

With this factored into the understanding where such volumes of CCF could be acquired and that Alfonso Albuquerque was the first European to acquire coconut fiber, it becomes highly problematic CCF was bought by the bahars by those *ancient voyagers* traveling to Oak Island. Lest we recall Occam's Razor yet again.

Occam's razor indicates that the simplest explanation — that is, the solution that requires the fewest assumptions — is preferable.

"When you hear hoofbeats think horses, not zebras"

Second Fiber Formula

As shown, It has been determined the volume of mystery fiber from Oak Island was sufficient to twist almost 180,000 linear ft of **Shroudlaid coir rope** for maritime use. Further…

> B) It is determined, If DPF, the volume from Oak Island was sufficient to produce 718,183.40 linear ft of **lamp wick** (twine).

As for DPF production into lamp wicks, the process to harvest, ret and produce twine cordage from mesh/sheath trunk date palm fiber, has not changed in any manner since it began seven millennia ago. With similar physiochemical and mechanical properties as CCF, DPF yarn is nearly identical, as shown in Chapter One. Few exceptions apply to the twine profile, yet CCF remains more stretchable, buoyant, and can spontaneously combust as it has coconut oil within its fiber. Since DPF twine was used in a different setting than CCF, its application is measured using a different commodity standard, as earlier described. The length of CCF twine from the Oak Island mystery fiber would produce similar lengths of DPF twine for those *ancient voyagers*.

Since the making of wick entails only the basic process steps of twisting an initial weave of twine/yarn, we can state the length of "wick" also equates to 718,183.40 linear ft in length. If the purpose of the fiber included making fuses for explosives used in mining,[24] then the twine would be rubbed or soaked with a locally available flammable material, such as resin, sap, etc.. Perhaps even gun powder! This would not diminish the volume of twine created from either CCF nor DPF.

The contention within the *Thesis* is, the DPF was brought to Oak Island for two purposes; 1) to use as a symbolic marker of the three entrances accessing the underground constructs, and 2) to be crafted into wick for use on the Menorah and any other lampstands taken to the *New World* to herald a *New Jerusalem*. Of these two functions, both would require quick retting (48 hours) and would appear as cleansed bulk fiber. The second purpose requires the additional step of weaving the bulk fiber into twine, and thus create that 718,183 ft of twine. When needed, a length of twine could be cut to form a wick. The length required for use as a wick in oil lamps is discussed ahead. This initial weave could have easily been performed on the island, and as needed. The remaining question to be answered here is - ***what was the length of those wicks, and thus, how many days of lamp functioning wick were available?***

Figure #6. **Maimonides Menorah**[25]

As discussed in Corjan Mol & Christopher Morford's book *"The Jerusalem Files: The Secret Journey of the Menorah to Oak Island,"* the original style and form of the seven straight-branched Menorah was given to Moses on the mountaintop and took on the iconography of a sacred tree of light.

Further mentioned in their account is the goddess ***Asherah***, "Queen of the Heaven."[26] "***Asherah's*** name translates as 'a tree or sacred grove' and her cultic object was the *Asherah Pole*, most commonly depicted as a date palm tree.[26, 27, 28, 29] The Assyrian Sacred Tree was also a date palm deity of "sacred plantation trees," identical to Asherah later in the Bible.[30] This stylized tree would be found at her places of worship, in the high places around Jerusalem, and in Solomon's Temple."[31]

"In ancient Ugarit, the wife of god ***El*** is ***Aserah***. She is identified with the palm tree and as the one who brings to it the water of life. ***Aserah*** occurs in the Bible. During the period of king Solomon the worship of ***Asherah*** started to develop. As a result, gradually Asherah stands both in the Temple of Jerusalem and at the shrine of Baal. There were '***asheroth***' or ***asherot***/***asherim***, small wooden representations of the goddess, which seem to be the developing ideas of the sacred tree."[32]

Asherah, as we read in Chapter Seven is a goddess or cult figure known as ***Anath***, **Aserah**, ***Ashera***, ***Asherah***, ***Ashteroth Aššur***, ***Astarte, Ashtoret/Astarte,*** and ***Astratum*** are all similar or identical goddesses in Assyrian, Babylonian, Canaanite, and Judaic religions.

"Their identities began to merge during the 1st millennium BC. '***Ashteroth*** or ***Ashterot***' were variations of ***Asherah*** as seen in the Tanakh in Judges 3.7, 2nd Chronicles 19.3 and 3.3. ***Ashera***, ***Anath*** and ***Ashtoret***/***Astarte*** are all similar goddesses in Canaanite religion. Already difficult to distinguish between them, their identities began to share characteristics and were remolded or eliminated. The goddess ***Asherah***, one of the ***Great Mother Goddesses of the Mediterranean***, was worshipped for close to 2,000 years. She is first mentioned in texts of the first dynasty of Babylon (1830-1531 BC), here she is called ***Asratum***. There was a temple dedicated to ***Asherah*** in Babylon and her name spread westwards through Canaan in 2nd millennium BC. She is portrayed on plaques and in figurines dating from 2000-1700 BC and found through Canaan, Egypt, Phoenicia, Ugarit, Spain, Arabia, Carthage, Rome, and Syria-Palestine in various forms."[33]

In 1993, author Tykva Frymer-Kensky's book, "*In the Wake of the Goddess: Women, Culture and the Biblical Transformation of Pagan Myth*" (p.44), she helped to untangle the issue, determining: "

> *<u>DATE PALM</u> ~ Female palm with dates is the tree most closely associated with **Asherah/Tannit** in Syria Palestine. Phoenician **Asherah** plaques, which show only face, breast and pubic triangles, frequently have a date palm tree of palm branch engraved above the pubic region. In one seal/amulet, the branch sprouts out from her genitals. She is also depicted as a tree flanked by ibexes on a 10th century BC cult stand from Ta'anach. <u>TREE POLE</u> ~ The biblical texts always bring **Ashera** into close association with trees. It therefore seems reasonable that her symbol, the **asherah** - commonly thought to be a "cult pole" - was some sort of stylized tree in her image."*[34]

"It is well-known that the origin of the iconography of the menorah is to be traced to Near Eastern representations of the sacred tree.

Recent archaeological discoveries may suggest that the menorah was designed with the usual form of an ***Asherah*** – the cultic symbol of the goddess ***Asherah*** – firmly in mind. […] show that the asherah was an extensively pruned living tree, very similar in form to the stylized tree of the menorah."[35]

The debate rages in some circles as to what species of tree was Asherah, or more correctly, 'an' asherah. Different texts interpreted by various experts have argued that Asherah was a cultic deity or a species of tree, or more likely, a tree used by pagan worshippers to connect with certain deities, idols, gods, and goddesses. Asherah was most likely the evolutionary deity central to date palm worshipping. Appendix B, "*Date Palm Deity*," fully traces the evolution of date palm worshipping from its pagan roots in predynastic Egypt, to Sumer, Assyria and Babylon, through Canaanite and Hebrew writings, and its spread in Phoenician, Greek and Roman periods and into Judaism, Christianity, Islam and Hinduism.

Fig. #7. **Detail from Sumerian stone bowl, Susa, Elam, circa 2300 BC.**
Courtesy: **L. Yarden.**[36]

For now, this chapter will concentrate on calculating wick usage of the original Menorah believed to have occupied Solomon's Tabernacle and Temple, at one time.

Menorah Measurement

The menorah was designed to represent in stylized form a particular tree, some argue the date palm, the acacia tree, the fig tree or the almond tree. Interpretation of texts and commentary written over hundreds of years has led to many species under consideration. The making of the menorah in a specified form was, according to Exodus, commanded by God and instructed to Moses at Sinai:

> *"And you shall make a lampstand of pure gold. The base and shaft of the lampstand shall be made of hammered work; its cups, its capitals, and its flowers shall be of one piece with it; and there shall be six branches going out of its sides, three branches of the lampstand out of one side of it and three branches out of the other side of it; three cups made like almonds, each with capital and flower, on one branch, and three cups made like almonds, each with capital and flower, on the other branch-so for the six branches going out of the lampstand; and on the lampstand itself four cups made like almonds, with their capitals and flowers, and a capital of one piece with it under each pair of the six branches going out from the lampstand. Their capitals and their branches shall be of one piece with it, the whole of it one piece of hammered work or pure gold. And you shall make the seven lamps for it; and the lamps shall be set up so as to give light upon the space in front of it. Its snuffers and their trays shall be of pure gold. Of a talent of pure gold shall it be made, with all these utensils. And see that you make them after the pattern for them, which is being shown you on the mountain."*
>
> (RSV Exod. 25.31-40; cf. 31.17-24)

Ironically, this detailed description of how the Menorah should be formed does not at all mention the lampstand's dimensions, proportions, style, function or operation. This is all derived from later sources.

The following dimensions and descriptions helped to determine proper wick length and usage for the Holy Menorah, as provided by L. Yarden's "*The Tree of Light, A study of the Menorah – the Seven-branched Lampstand*."[37] Here they will be called *clues*.

1. "The lampstand measured 18 handbreadths or 3 cubits (4.5 ft) in height and that the spread of the outer branches was 2 cubits (3 ft)."

2. "It is stated in the rabbinic literature that the distance between each branch corresponded to its own thickness."

3. "The Menorah was not a candelabrum, as it held seven gold cups that would be filled with oil and lit by means of a wick."[38]

4. "Talmud says each lamp held a half-log (vol. equal 3 eggs) per lamp."

5. "The 6 side lamps were able to be turned towards the central lamp, which alone faced the space in front of the lampstand."

6. "Atop each lamp a thin golden plate, which the priest pressed 'down towards the mouth' when ejecting the wick with burnt-out substance, and 'towards the back' when putting in fresh oil."

7. "Internal evidence suggests the lampstand was kept alight only at night: lamps were 'dressed' (cleaned and filled) in the morning, being 'set up' or lit first at nightfall."

8. "That the lampstand at Jerusalem had a lamp 'which is never extinguished by night or day and referred to as the Western Lamp."

9. "Lamps were cleaned and filled every day before morning service, with the exception of 3 lamps were always alight."

10. "The last few lamps were left burning until after morning service and attend to then."

11. "The 'Western lamp' alight all day, as not trimmed until the evening, after which its flame was used for lighting the other lamps."

12. "Care of the lampstand(s) in the Tabernacle was a privilege of Aaron; in the Temple, it was that of the officiating priests."

13. "Accessories to operate the lamps included; tongs, snuff dishes, trimmers, pipes, trays, etc."

From this selection of elements describing the original Menorah one can calculate the size and function of the six separate lamps sitting atop the six elliptical branches of the Menorah. ***Reading clues #1 + #2:***

> **1.** "The lampstand had a spread from each of the outer branches was 2 cubits (3 ft), or 36 inches."
>
> **2.** "In the rabbinic literature the distance between each branch corresponded to its own thickness."

Within this 36 inch spread from left to right, there are seven branches of the same width, and six equidistant spaces of the same space between those branches: [totaling 7 branches and 6 spaces = 13 equal width dimensions, divided by the 36 inch span (36 ÷ 13 = 2.77 inches or 7.03 cm]. This translates to each branch being no thicker in width than 2.77 inches, and the space between the seven branches, no wider than 2.77 inches. This is also equivalent to the width of a man's wrist.

The shape of the seven detachable lamps themselves are critical to determining oil volume and wick size and usage. ***Reading clues #3 + #4:***

> **3.** "The Menorah was not a candelabrum, as it held seven gold cups that would be filled with oil and lit by means of a wick."
>
> **4.** "Talmud says each lamp held a half-log (vol. equal 3 eggs) per lamp."

These two clues provide concrete descriptions critical to making the determination of wick formulas for the mystery fiber found on Oak Island. As a lampstand, the original Menorah held at the end (top) of each branch (or attached), individual lamps made of gold. They were capable of holding a volume equal to three eggs (normal size?). A normal egg has a volume of 48 grams or 3 Tablespoons, or 1.75 ounces in a normal-sized egg. Therefore, these golden lamps had a reservoir within them which held approximately 144 grams or 9 Tablespoons, or 5.25 fluid ounces. When a wick is inserted into the reservoir of an oil-based lamp, it too adds to the volume within its lamp reservoir, through displacement. This should be a consideration based on the shape of the lamp. ***Reading clues #5 + #6:***

5. "The 6 side lamps were able to be turned towards the central lamp, which alone faced the space in front of the lampstand."

6. "Atop each lamp a thin golden plate, which the priest pressed 'down towards the mouth' when ejecting the wick with burnt-out substance, and 'towards the back' when putting in fresh oil."

For ritual purposes discussed in L. Yarden's book, the six oil lamps, three on each side of the seventh 'stem' oil lamp, were capable of being turned, atop their individual branch, so to rotate and face the center branch. This moves the lamps flame end facing or closer to the center stem, yet the center stem lamp always continues to face the front. The illustration of Aaron lighting one of the lamps shown to the right, demonstrates this alignment of lamps with the three on the left and the three on the right, turned and facing the center stem.

Figure #8. **Aaron Lighting Menorah.**[39]

The six branch ends of the Menorah holding individual oil lamps were 2.77 inches or 7.03 cm wide. For a lamp to fit securely balanced to the branch end, the oil lamp could not be made much wider at its base than the 2.77 in/7.03 cm upon which it sat. The lamp would have to be made taller and more elongated to hold a reservoir capable of containing 5.25 ounces of fluid (⅔ cup), without risking toppling. There is only an additional 2.77 in/7.03 cm space to the side a lamp would turn, when facing the seventh 'stem' branch lamp. Considering this cramped space, the oil lamp has a maximum space of the 2.77 in/7.03 cm width of the branch on which it sits, and no more than a second 2.77 in/7.03 cm space before it encounters and crowds into the adjacent lamp. The maximum space available upon the Menorah branch would have been double 2.77 in/7.03 cm or 5.54 inches/14.06 cm. This represents the maximum theoretical space available for a lamp. To keep flames from one lamp - now at the rear of an adjacent lamp, from heating and igniting that adjacent lamp, the appropriate elongation of each lamp should not exceed 4.5 in/11.5 cm in length, providing less than an inch of clearance to the next lamp.

Most likely these oil lamps were made short but taller, giving room for easy access for maintenance of the Menorah and its safe operation. If any handle was affixed to the lamp, the length of the lamps may be further reduced to fit in this limited space. With less than 5.54 inches of space, when turned to face toward the center stem (seventh lamp), it is inconceivable the lamps, made of gold, would not be elongated more than 4.5 inches at the maximum.

This equation deduces the length of date palm fiber twine wick, which when inserted into the reservoir and protruded from the nozzle not more than one half inch, could be approximately as short as 5 inches in length. Today oil lamps often coil additional wick within the lamp reservoir to allow wick to fully absorb the viscous olive oil; as it is held a distance above the reservoir. In antiquity, the goal was to place the burning wick as close to the reservoir as possible, without it falling or sliding back into the reservoir. Due to the limited reservoir of the lamp (5.25 oz), coiling was a poor option and attendees simply replaced wick as needed.

Fig. #9. **Bronze oil lamp** [40]

Clues further describe a cover over the reservoir, protecting oil from wick sparks and spillage. It also operated in such a way as to clamp down on or pinch the wick while aflame. Frequent oil lamps of antiquity dealt with wicks sliding back and sinking into the reservoir causing heavy smoke or fire. Often a float was attached to the wick to prevent this. In ancient Greece, the plant fiber most commonly used for wicks was Greek Horehound "*ballota acetabulosa*," and the floats were cork.

This oil burning clay lamp with its original DPF wick sticking from the flame end (nozzle), is twice the size (H: 4.3 cm, L: 10 cm) to the lamp depicted atop the seven-branched Menorah. Found 1997 at Khirbet Qumran, Israel, with the Dead Sea Sect and its scrolls.

Fig. #10. **1st cent. BC to 1st cent. AD. Oil Lamp with original Wick** [41]

Photo (C) Israel Museum, Jerusalem, by Avraham Hay

The following set of clues deal with the frequency of lighting certain menorah oil lamps, and the length of time they are left aflame. ***Reading clues #7, #8, #9, #10 + #11***:

> **7.** "Internal evidence suggests the lampstand was kept alight only at night: lamps were 'dressed' (cleaned and filled) in the morning, being 'set up' or lit first at nightfall."
>
> **8.** "That the lampstand at Jerusalem had a lamp 'which is never extinguished by night or day and referred to as the Western Lamp."
>
> **9.** "Lamps were cleaned and filled every day before morning service, with the exception of 3 lamps were always alight."
>
> **10.** "The last few lamps were left burning until after morning service and attend to then."
>
> **11.** "The 'Western lamp' alight all day, as not trimmed until evening, after which its flame was used for lighting the other lamps."

Somewhat conflicting, but it is apparent the 'Western Lamp' stayed aflame perpetually with only trimming of wick and oil refilling. This may indeed be a separate lampstand altogether. The clues state all but three lamps are snuffed out, cleaned, filled, and relit in the morning – before mornings services. After morning services, those three lamps which had not been attended, were snuffed out, cleaned, filled and relit after morning services. This schedule for servicing the Holy Menorah affirms all seven lamps burn 24 hours a day except during daily maintenance which is split up before and after morning services. ***Reading clues #12 + #13***:

> **12**. "Care of the lampstand(s) in the Tabernacle was a privilege of Aaron; in the Temple, it was that of the officiating priests."
>
> **13**. "Accessories to operate the lamps included; tongs, snuff dishes, trimmers, pipes, trays, etc."

These last two clues seem of little interest, but they confirm evidence which has been presented in this Second Fiber Formula. The care of the Menorah, exclusive to Aaron and his specific staff, indicates the amount of work it took to maintain just seven lamps and an incense burner, housed in the Tabernacle. There may have been additional lamp stands or other candelabrum in the Tabernacle, but without knowing for sure, this formula will be based only on the original Menorah. As for the accouterments identified for the implementation of operating and maintaining the Menorah, a variety of accessories were provided. The golden tongs would have been used to 'fish out' either short remaining pieces of unburnt wick floating in the reservoir, stuck in the nozzle, or to remove remaining burnt wick when it was time to extend fresh wick and refill the lamp reservoirs for relighting. The snuffers would extinguish the wick prior to rotating the lamp on its branch, maintenance, refilling the reservoir or when adding new wick. Trimmers would cut off the now extinguished burnt wick end as well as cut new lengths of wick from a spool or coil of date palm fiber twine. It is doubtful Aaron and his priests would pre-cut lengths of a quantity of wicks, which this calculation assesses to optimally be **5 inches in length**. The concern, however, is the twine. At such short lengths, twine could have a tendency to unravel at the ends and create additional problems when inserting new wick into the lamp nozzle and reservoir.

Oily Operations

During this historic period, olive oil, especially for ritual purposes, was preferred over other flammable liquids for lamps. Olive oil burns the cleanest and provides a bright lamp light. The oil is more viscous than other liquids and it takes longer for wicks to absorb it. Yet, a wick which is wider, thicker and preferably braided (woven) improves the capillary action of bringing oil to the flame. As seen in Fig. #9, date palm fiber woven into twine, provide the thickness, width and absorption of the oil to maintain a brilliant flame. Date palm fiber is superior to most plant fibers found within the Fertile Crescent for water absorption (see endnotes).[42] This indicates, given the time to soak oil in the reservoir, the DPF wick will absorb more oil and therefore provide a brighter and longer lasting flame. Experts argue how much wick should be exposed; ⅛, ¼, ⅜, or ½ an inch of wick protruding above the oil. However, it is universally accepted that no more than ½ inch of wick should be lit, or the lamp will smoke and consume too much wick too quickly. Our calculation incorporates a ½ inch wick protrusion when initiating an unlit oil lamp for the Menorah. From the gathered evidence, the thicker the wick, the brighter the light. However, burning olive oil does emit a gas which taints the wick and unless trimmed, could render it unclean and give off an inefficient or flickering flame. Any smoke from an oil lamp is directly related to the wick needing to be trimmed or the wick has water or other debris within the material of the wick. This indicates noncombustible material has been introduced to the flame. A flickering lamp flame can throw off sparks or embers which can be problematic.

Ironically, it is best to immerse the wick into the oil reservoir so the wick becomes saturated with the oil, prior to lighting the lamp. Many experts even claim the wick should be coiled up within the lamp so there are fewer interruptions of the burn which uses less wick and less oil over time. Yet, as discussed, these lamp reservoirs held "3 eggs worth" of purified olive oil (5.25 ounces = ⅔ cup), and the dimensions of the Menorah do not allow for a larger lamp with a larger reservoir to hold more wick within - and be mounted on the Menorah safely. The lamp vessel itself is less than 4.5 inches from nozzle to the handle or back of the lamp, drastically limiting the amount of space available for lengthy wicks within the lamps reservoir. Stuffing the reservoir with wick, even soaked in olive oil, presents another problem. Capillary action is attributable to very specific conditions which allow the oil to move by itself up through the woven texture of the wick to reach the flame. The flame is living on the flammable liquid brought to it by the wick acting like a conveyor belt. Yet the wick does not burn at the same rate as of the flammable liquid. Think of a torch. Therefore, Should too much wick be stuffed into the reservoir, it could interrupt this dynamic flow and create a condition for frequent flameout. The wick would need to be eased out of the nozzle, from being balled up within the reservoir. Yes, this is why trimmers and tongs were part of the assemblage. Another approach to wick length can be determined from another parameter – *the oil.*

In general, oil lamps are said to burn ½ ounce of olive oil per hour when appropriately adjusted. Since the reservoir only holds 5.25 ounces, one deduces the lamp reservoir could keep the flame lit for 10.5 hours. Others claim a burn rate of one half tablespoon of olive oil will take one hour to completely burn away. With 9 tablespoons of olive oil making up the 5.25 ounces, this has olive oil lasting 18 hours to consume the oil. The difference here is based solely on the size or diameter of the wick. The more wick the more substantial the capillary action bringing more oil to the flame but burns slower.. Lamp expert claim ½ inch diameter of woven wick burns one half inch of length, in one hour. Therefore, a woven wick, like that made of date palm fiber twine, if 5 inches long, will burn for 10 hours.

Calculation Conclusion

Below is the expressed formula for conversion of Oak Island mystery fiber determined to be date palm fiber, into twine and then into wicks to burn olive oil in the seven lamps upon the Menorah lampstand. This calculation is based on the evidence discussed.

- ❋ Oak Island Mystery fiber is sufficient to produce 718,183 linear ft of date palm twine. **718,183 linear ft of twine**, cut into 5 inch wicks, would produce **143,636 wicks**.

- ❋ There are seven olive oil lamps on the original Menorah, each burning 24 hours a day except during daily maintenance. Each lamp would, from the number of wicks created, receive an inventory stock of **20,519 wicks**.

- ❋ Each of the seven lamps, actually burning a flame for 23 of 24 hours a day, would **consume 2.3 wicks daily**, when each wick is capable of lasting 10 hours with a full reservoir of olive oil.

- ❋ With a stock of 20,519 wicks, and consuming 2.3 wicks a day, all the lamps on the one Menorah would have **1,274 days-worth of wicks** for operation. With the full complement of 10 more menorahs and two candlesticks, the fiber wicks would last +2 years.

Weird Wicks of Fancy Fibers

During research, evidence included conflicting opinions, historical statements and biblical laws governing wick and oil use in antiquity, and in Solomon's Temple and Tabernacle specifically; or so later writings say. It appears the future commentary on these issues of the past, may have been lessons learned at Solomons Temple, or to uncomplicate the status of what was considered pure and what was impure.

As you will read in Appendix A, *"Rabbi's Write Which Wick is Right,"* is an example where the level of micromanagement in a macroenvironment can manifest into a burning issue; built on a false premise or protocol which did not exist back in time. Yet, to apply standards built around other potentially fluid narratives frequently leads leaders to install evermore complications. Appendix C provides insights into thinking centuries after the fact, which highlights when history is written by analysts, it all becomes fuzzy.

We could invoke Occam's razor to help untangle this fibrosity, but availing yourself to this unique historic commentary is perhaps a better tonic to reason why our assessment of the logistical and pragmatic use of date palm fiber, up to and prior to Solomon's Temple, answers why the Knights Templar felt obligated to bring it to Oak Island. Unfortunately, this is why a *Thesis* is tendered here at the end of the forensic evidence.

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> "The Hebrew means "happy" or "upright" [like the cultivated date palm] and some suggest "(sacred) place." Sometimes she is known as "Lady Asherah of the Sea" but could be taken as "She who walks on the sea." As **Athirat**, a cognate name for **Asherah**, she is mother of 70 children (this relates to the Jewish idea of the 70 guardian angels of the nations). Arguments have been made that **Asherah** is a figure in Egyptian, Hittite, Philistine and Arabic texts. Egyptian representations of "**Qudshu**" [or **Qedeshet**] (potentially the Egyptian name for **Asherah**) show her naked with snakes and flowers, sometimes standing on a lion. Whether this should be interpreted as **Asherah** is contested and thus should be viewed with caution. Another suggestion is **Asherah** is also the Hittite goddess **Asertu**, who is married to **Elkunirsa**, the storm god (she is often viewed in connection with the regional storm god). As **Athirat** in Arabian inscriptions there is a possibility that she is seen as a sun goddess (this is perhaps a connection in Ugaritic literature as well). In Phoenician, she is the mother goddess, which is different from **Astarte**, the fertility goddess; there is some debate regarding a confusion of the two relating to 1 Kings 18:19. In Akkadian, she might be **Asratum**, the consort of **Amurru** (chief deity of early Babylon). The connection is made because the Akkadian kingship (early 14th century B.C.E.) takes the title "servant of **Asherah**."

*Her relationship with **Baal** is complicated, and it is suggested that **Baal** has killed large numbers of her children. In these texts, she intercedes with **El** to get **Baal** a palace, after **Anat's** (his "sister" and her "daughter") request is refused. She supplies a son to reign after **Baal** descends into the netherworld. The relationship is further complicated by debates as to whether she is the mother of **Baal** or his consort or both. The idea of her being a consort comes from later Phoenician sources, where scholars have associated **Asherah** with **Tinnit**."*

[**NOTE:** Baal was originally the god of unirrigated land as contrasted with **Ishtar** (**Astarte**), who was the goddess of irrigated soil and fertility. **Baal** is an old Semitic word which, even today in Arabic, means an unirrigated palm; and its metamorphosis into the execrated divinity of the idolaters is traced fascinatingly by Dr. George A. Barton.28 This clearly shows **Baal** as the typical feral or wild date palm which as pointed out in Chapter One, is the opposite of the cultivated and irrigated female date palm tree – who, was thought knew where water was to be found. **Astarte** and **Asherah** in various cognate names, were the same, or evolved from one to the other. This further associates the date palm tree with **Asherah** the goddess and relationship to the motif of the menorah.]

***28**. "The Date Palm in Antiquity."* By Paul Popenoe, Sep. 1924. Published in *Scientific Monthly*, Vol. 19, No. 3 (Sep. 12924, pp 313-325). Publisher, American Association for the Advancement of Science. See Pg. 320. https://www.jstor.org/stable/7328

29. "*The Assyrian Stylized Tree: A Date Palm Plantation and Aššurnaṣirpal II's Stemma*." By Norma Franklin*, University of Haifa. Published in Ash-sharq, Volume 5, 2021: Pg. 77
"The Assyrian stylized (palm) tree is actually the stylized image of a date palm plantation that appears more than 190 times in the Northwest Palace

30. ""*The Assyrian Tree of Life: Tracing the Origins of Jewish Monotheism and Greek Philosophy*." By Simo Parpolo. University of Helsinki. Published in Journal of Near Eastern Studies, 1993. University of Chicago.

***31. "The Jerusalem Files: The Secret Journey of the Menorah to Oak Island*." By Corjan Mol and Christopher Morford. 2024. Watkins Media Limited. See Pgs. 20-21

32. "*The Assyrian Tree of Life and the Jewish Menorah: The idea of the Tree of Life in the Ancient Near East and Greece*." By Christos G. Karagiannis. Published in *Tradition and Innovation in the Ancient Near East*, proceedings of the 57th Rencontre Assyriologique Internationale at Rome, July 4-8, 2011. See Pg. 461

33. "אֲשֵׁרָה *Ashera: The Goddess in Our Midst*." By Ariel Root Wolpe.
https://www.sefaria.org/sheets/410089?lang=bi

34. "*In the Wake of the Goddesses: women, culture, and the biblical transformation of pagan myth*." By Tykva Frymer-Kensky, 1993. Fawcett Columbine Publishers. NY. Pgs. 42 - 45

35. "The Asherah, The Menorah and the Sacred Tree." By Joan E. Taylor, 1995. Department of Religious Studies, University of Waikato, New Zealand. Downloaded from jot.sagepub.com at Kings College London. See Pg. 29

36. Figure #7. "Detail from Stone Bowl, Susa, Elam, circa 2300 BC." Louve, Paris *(Ch. Zervos, L`Art de la Mésopotamie*, Paris, 1935, P. 226). Provided by L Yarden's *The Tree of Light – A Study of the Menorah*," 1971. Cornell University Press, Ithaca, NY. Illus. #6

37. "The Tree of Light: A Study of the Menorah – the Seven-branched Lampstand." By L. Yarden, 1971. Cornell University Press, Ithaca, New York. See Pgs. 8 - 14

38. **"**The Jerusalem Files: The Secret Journey of the Menorah to Oak Island." By Corjan Mol and Christopher Morford. 2024. Watkins Media Limited. See Pg. 15

39. Figure #8. **"**Aaron Lighting Menorah**."** Published in *The Tree of Light: A Study of the Menorah – the Seven-branched Lampstand*," by L. Yarden, 1971. Cornell University Press, Ithaca, New York. See Pg. 19, Illustration #29

"Aaron pouring oil into menorah lamps, illuminated Bible from Northern France, circa AD 1277-8. British Museum, MS. Add. 11639, Fol. 522 b (Jewish Art, fig. 193)."

40. Figure #9. "Egyptian or Syrian bronze oil lamp with menorah covering." Published in *The Tree of Light: A Study of the Menorah – the Seven-branched Lampstand*," by L. Yarden, 1971. Cornell University Press, Ithaca, New York. See Pg. 19, Illustration #173

"Bronze oil lamp from Egypt or Syria. M. Shaar Schloessinger Collection, on loan at Israel Museum ((Photo I.M., no. 29192)."

41. Figure #10. "1st cent. BC to 1st cent. AD. Oil Lamp with Original Wick." Provided by Israel Museum, Roitman, A. (ed.), *A Day at Qumran, The Dead Sea Sect and its Scrolls, Shrine of the Book*, Jerusalem, 1997.

"Accession number: 97.74 (147). H: 4.3; L: 10 cm. Oil lamp with original date palm fiber wick."

42. "Processing and Properties of Date Palm Fibers and its Composites." By Faris M. AL-Oqla, Othman Y. Alothman, M. Jawaid, S.M. Sapuan, and M.H. Es-Saheb. Published in *Biomass and Bioenergy*, August 2014. DOI: 10.1007/978-3-319-07641-6_1 https://www.researchgate.net/publication/265085416_Processing_and_Properties_of_Date_Palm_Fibers_and_Its_Composites (accessed Jun 24, 2024).

[Author's note: In a comparison study of plant fibers such as: wood, cotton, bagasse, rice straw, rice husk, wheat straw, flax, hemp, pineapple leaf, coir, oil palm, date palm, doum fruit, ramie, curaua, jowar, kenaf, bamboo, and rapseed for use in composites, date palm was superior for water absorption over all but hemp, sisal and jute (Jawaid and Abdul Khalil 2011; Majeed et al. 2013)]

"It can be seen from the comparison that the date palm fiber has an added value over both hemp and sisal, because it has less cellulose content than they do which reduces the ability of the date palm fiber to absorb water comparing with hemp and sisal (Al-Oqla and Sapuan 2014)."