One Man's Trash (or, Crackpot Theory #51)

A strange race of aliens frantically raced -
Across all the trackless and cold void of space
From hundreds of light-years and farther away -
In saucer-shaped vessels they landed one day

On the Oak Island farm of one Samuel Ball -
To barter for things that they craved most of all
For Ball's farm had plenty of riches untold -
To an alien, something more precious than gold

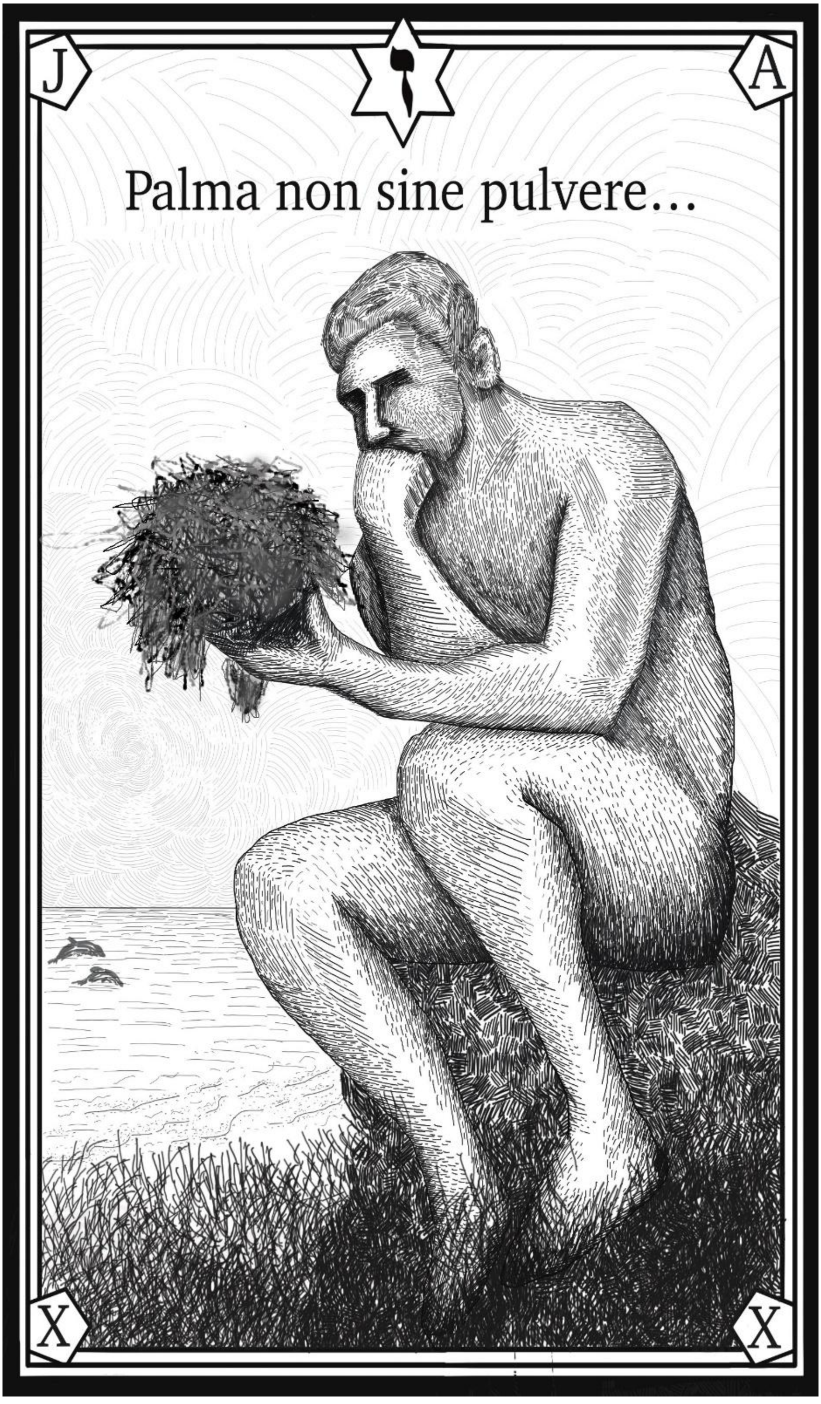
Now Samuel Ball hadn't yet struck it rich -
He lived in a cabin of oak logs and pitch
He did make some cash growing cabbage and such -
But in truth cabbage farms never paid very much

So when aliens laid out the terms of a trade -
He could hardly believe it, the deal he had made
He gave what they wanted, they left for the stars -
In payment they left him three tons of gold bars

They'd come all that way, not for cabbage or rocks -
The things that they valued were shoes from an ox
And spikes bent and rusted from seagoing boats -
And buttons and buckles from officers' coats

The lesson is hereby laid out for our pleasure:
One man's pile of crap may be aliens' treasure

Joe Urbanski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Chapter Six

WHY, OH WHY… OH WHY!

Arguing a reason why anyone would want to schlep more than two tons of coconut coir fiber (CCF), over a minimum of 16,883 miles[1] to this one of 365 islands, in a bay along Nova Scotia's Atlantic coast, is a mystery all by itself. What were they thinking? What were they doing? Is there a reason *Why* coconut fiber? Or is it date palm fiber?

In 1996, after spending two months examining Oak Island, Woods Hole Oceanographic Institute (WHOI) issued a 151-page Draft Report.[2] As previously mentioned, one of their involvements was to radiocarbon date the fiber they procured from under the shoreline at Smith's Cove. Their findings on two specimens tested came to AD 855 and AD 1185.[3] This dovetails with other tested specimens from Oak Island.[4] To explain this very strange substance, their researchers could only identify four 'pathways' to explain its presence *in* Oak Island. Their report postulates the fiber could only have…

> "**i**) Been surreptitiously planted by a searcher,
> **ii**) Floated up Gulf Stream from the Tropics,
> **iii**) Discharged as dunnage from a passing ship, or
> **iv**) Brought and used by **ancient voyagers** for flood tunnel purposes."

They further stated, "*Finally, we cannot discount the final pathway: use by ancient voyagers. Perhaps the only way to determine whether this was an appropriate pathway or not is to discount the other three pathways*."[5] Our first two Volumes, "*Oak Island Mystery Trees and other Forensic Answers*" and "*Oak Island Mystery Trees and other Forensic Answers – Compendium*," go to great lengths to do just that – *disprove the first three pathways*.

Yet in this chapter we will concentrate on the why? Were WHOI analysts correct that fibers were used for "flood tunnel purposes," and what were those purposes specifically? *Why* coconut fiber?

WHOI's position on the coconut fiber is very interesting as they never, in their report, agreed there were man-made flood tunnels in Oak Island. They preferred to determine it as "*natural subterranean flow through the island based and attributed to hydrographic communication with the surrounding bay*." If no flood tunnel(s) were created by man… why bring the coconut fiber for the remaining pathway – "*brought for flood tunnel purposes?*" Maybe this is one reason why a Final Report was never issued.

This research has covered much ground regarding exactly what the palm fiber is, where it could be obtained, its niche growing environment around the world, and its migratory history with man. Both previous volumes have fully briefed the reader on all things related to the species of palm tree specifically known as *Cocos nucifera*.

Now it is time to explain *why* it is part of the Oak Island Treasure Story, and how it makes this 229-year tale a true conundrum. We start out by refreshing you of some knowledge on very specific characteristics of the coconut husk fiber itself. To know *why* it was used, we first needed to look at its properties and how it has been used in the distant past.

The fiber obtained from the husk (pod) of a coconut, a drupe, are unique and versatile and once processed, is called "coir."[6] Coconut Coir Fiber (CCF) is the only natural fiber resistant to saltwater and is highly resistant to abrasion.[7] The retting process treats, cleans, and enhances the fiber structure - making those fibers stronger, more elastic, more absorbent, buoyant, anti-microbial, heat resistant, and nearly non-biodegradable.[8, 9] This includes being static-free, rot resistant, anti-fungal, anti-bacterial, moth resistant and highly durable.[10, 11, 12] The retting is a unique natural chemical enhancement to the fiber itself.[13] Untreated fibers from the husk or the husk itself, are absent these characteristics and will rot away like any vegetable, fruit rind or peel. Coir is the hardest, most durable and resilient, and one of the strongest of natural fibers.[14] Furthermore, coir made possible a successful maritime history for those who lived throughout the Indian Ocean and adjoining seas.[15]

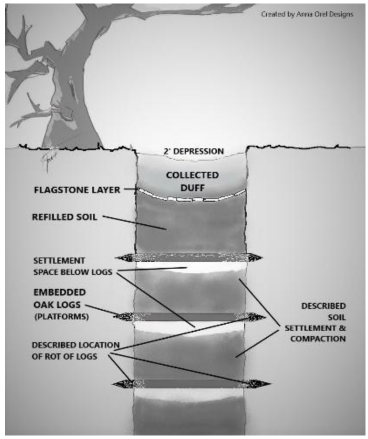
Filtration System at Smith's Cove

Let us hypothesize that WHOI researchers were indeed correct in their determination CCF was used for "flood tunnel purposes." This also validates the identity and presence of the manmade filtration system, found in 1850 by the Truro Group.[16] At this juncture we will quickly review the Filtration System found at Smith's Cove to try and understand how those "pieces" of the system functioned. Here is the description of the Filtration System found in Smith's Cove, written in the Oak Island Treasure Company's Public Share Offering of 1893.[17]

> "*Smith's Cove, on the extreme eastern end of the island and about 30 rods from the "money pit" was first examined by reason of its many natural advantages as a starting point for work of this kind, and from the fact that at about the centre of this cove it had always been noticed that at low tide, water was running out of the sand. Investigations were begun at this point and the result of a 'few minutes' shoveling proved beyond a doubt that they had struck the place they were looking for. After removing the sand and gravel covering the beach, they came to a covering or bed of a brown, fibrous plant, the fibre very much resembling the husk of a cocoanut, and when compared with the plant that was bored out of the "money pit" already mentioned, no difference in the two could be detected. However it was subsequently proved to be a tropical plant, in former times used as "dunnage" in stowing ship's cargo. The surface covered by this plant extended 145 feet along the shore line, and from a little above low to high water mark, and about two inches in thickness. Underlying this and to the same extent was about four or so inches of decayed eel grass, and under this was a compact mass of beach rocks free from sand or gravel. It was found impracticable to remove these rocks and make further investigation unless the tide was kept back. Accordingly a cofferdam was built around this part of the cove, including the boundaries just described. After removing the rocks nearest the low water, it was found that the clay (which with the sand and gravel originally formed the beach) had been dug out and removed and replaced by beach rocks. Resting on the bottom of this excavation were five* well-*constructed drains (as shown on the plan) formed by laying parallel lines of rocks*

about 8 in apart and covering the same with flat stones. These drains at the starting point were a considerable distance apart but converged towards a common centre at the back of the excavation. With the exception of these drains the other rocks had evidently been thrown in promiscuously. Work went on until half of the rocks had been removed where the clay banks at the extreme sides showed a depth of 5 ft, at which depth a partially burned piece of oak wood was found."

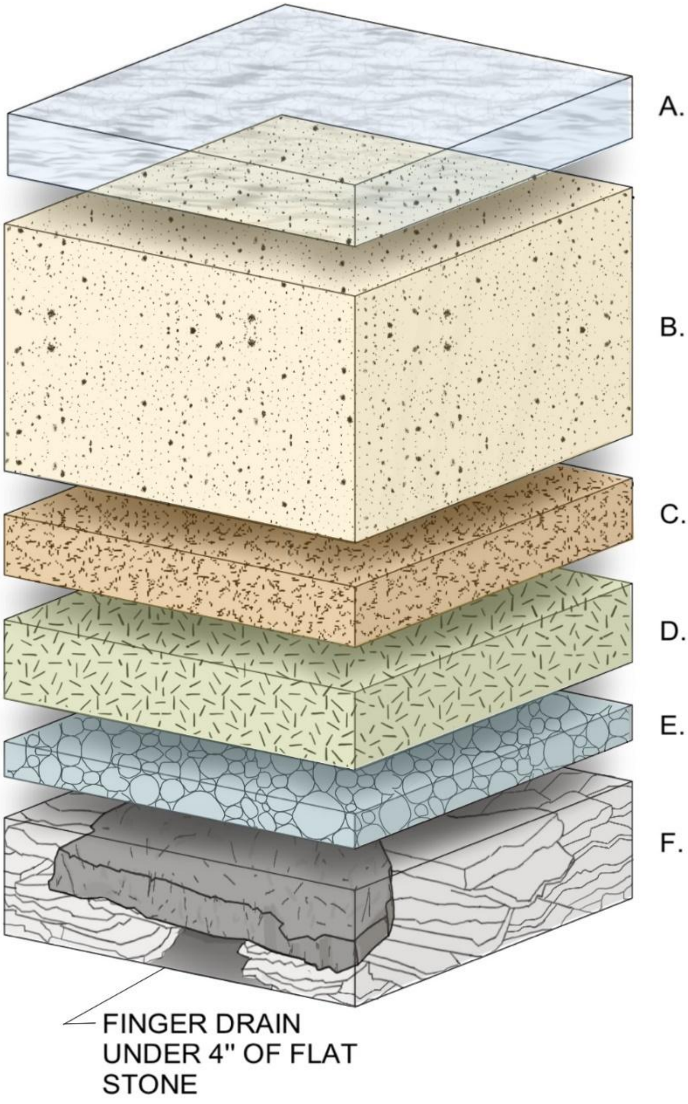
NOTE: None of the theoretical possible functions or uses of CCF reviewed in this chapter address its placement on the sixth oak log platform within the Money Pit. Our explanation for both coconut coir fiber and date palm fiber use in Oak Island, is fully explained based on the forensic research and examination conducted herein.



The layout of the Filtration System Makeup (Figure #1) on the following page is of our interpretation from the above description, as well as from reviewing other authors graphic designs. And, one cannot have a flood tunnel system, without a Flood Tunnel. Therefore, the utilization of CCF in the elaborate and sophisticated Filtration System as a filter medium, along with the finger drains found converging into the island, does indeed verify a tunnel or tunnels were built to flood the Money Pit. See Figure #2.

It is recommended you review the Flood Tunnel design and Filtration System makeup illustrated on page 50 & 51 of Graham Harris & Les MacPhie's "*Oak Island and its Lost Treasure*." The illustration of the Filtration System provided with the 1893 Share Offering, which can be found in Volume One, "*Oak Island Mystery Trees and other Forensic Answers*," is helpful to understand the systems complexity, but does not properly illustrate the size and structure of the Smith's Cove construct; which is critical in understanding its function and true purpose.

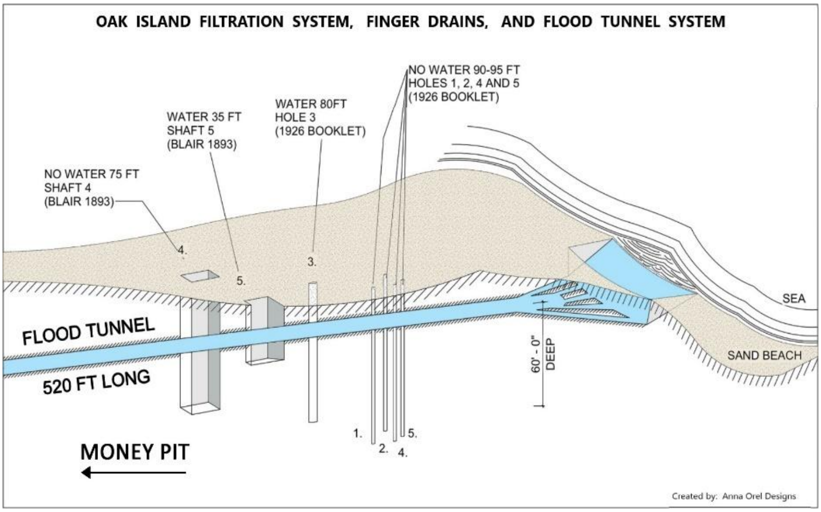
Figure #1. **Filtration System Makeup.**[18]



A. - SEA; B. - 3 FEET OF BEACH SAND; C. - 2 - 4 INCH OF FIBER; D. - 5 - 8 INCH OF EELGRASS; E. - 2 INCH OF SMALL SMOOTH BEACH STONES; F. - 18 INCH OF ROCK.

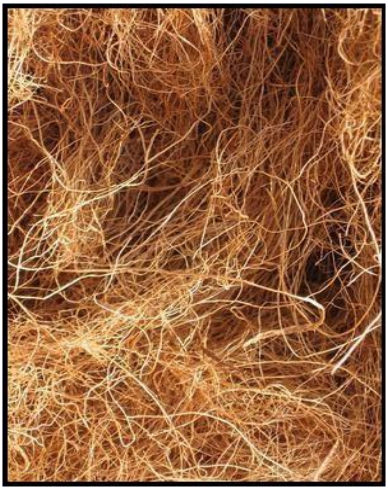
Created by: Anna Orel Designs

Figure #2. **Flood Tunnel Design** [19]



The formula in determining the amount and volume of CCF can be found in Volume One, Chapter 10, "*Cracking the Nut*," page 304.[20] It only factors in the fiber found on the sixth oak log platform in the Money Pit and the Filtration System uncovered in Smith's Cove. It does not account for the rumored placement of CCF within a "third" entrance to the Oak Island underground construct. Placement within these constructs makes no forensic or functional sense.

Figure #3. **Extracted CCF**.[21]



Common sense logic seems to escape many who have heard the Oak Island story. Those like WHOI authors, tended to gravitate to answers like *natural subterranean hydrographic communications* as the most reasonable cause of constant Money Pit flooding. However, our conversation is not to arbitrate that geologic issue here but determine *Why* CCF was selected as a material medium.

There are numerous theories and possible explanations why a filtration system on Oak Island exists. We will review the popular theories and conclude with what the research deduces is the actual reason *Why* CCF was brought to Oak Island and why it ended up where it did. At the end of this chapter, the research extends explanation for date palm fiber, as well.

Salt Extraction Function Theory

Some believe the reason coconut coir fiber was found on Oak Island has nothing to do with fables of flood tunnels, and more to do with the process of fisheries back in those early explorer days.

Long before Nova Scotia was named, fisherman from a variety of countries and cultures came to catch a cornucopia of cod. The shores, river estuaries, and coves along the Atlantic coast of Nova Scotia, Newfoundland, and America, were legend for the bountiful selection and unending quantity of marine animals of all kind. Medieval Basque and Breton fisherman[22] frequently fished these waters since AD 1000.[23] The Basque had cheap supplies of salt for preserving their catch and became the top cod traders.[24] By 1550, 60% of all the fish eaten in Europe were cod.[25] The Vikings had developed a method of drying cod by hanging it out in the cold costal air until 4/5 of the fish had dried.[26] They could be hung, laid out on platforms or on the rocky coasts. As a dried product cod could last for more than five years.[27]

Figure #4. **Drying cod in early Atlantic Provinces.**[28]

For more temperate climate clients, salted cod was preferred. Not all countries had the salt resources of the Basque and Portuguese, so oftentimes, the hunt for salt got spicy and - *caused war*.[29, 30]

In the 5th century, Japan and other regions where salt was not as plentiful as desired, techniques to "make" salt were designed, most of which dealt with concentrating salt from saltwater and saltwater plants. Using small ceramic pots to boil the seawater or sea wrack or using the "*agehama*" method of seawater drawn and spread on banked sand terraces to evaporate, the Japanese would then collect the brine and boil it down in a specially constructed kiln or wide pan.[31] Using the sun to heat up and dry salty items was also a common chore if the weather worked in your favor.[32]

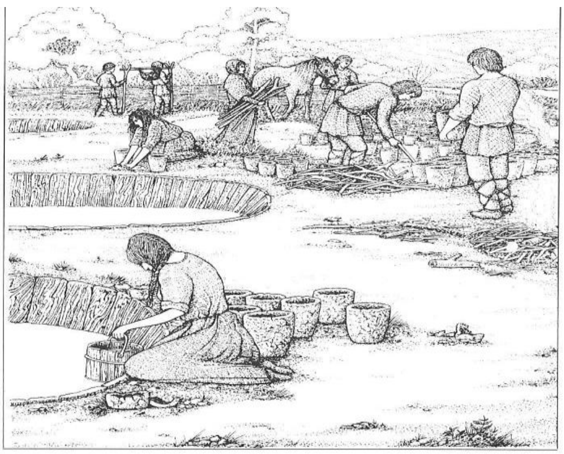


Figure #5.
Japanese Style Salt Extraction.[33]

Figure #6.
18th Century Scottish Salt Mills.[34]

In our Oak Island salt extraction theory, the coconut coir fiber could be a *filtering medium* and/or, a *collecting medium* to trap the salt.

As a filtering medium, the saltwater would be cleaned or filtered of sand, shells, and other seaborne detritus by the coir fiber, and the eelgrass below would collect the salts from the water. Therefore, the 5-8 inch layer of eelgrass found in the filtration system would be the medium holding the concentrated salt brine, now ready for removal. A modification of this theory is for the CCF itself, being porous, becomes the collection medium of salts from the water. Once saturated with salt, the coconut coir fiber could be taken and boiled in a pot where the water would evaporate and leave the salt brine. Similarly, salt production from seaweed or eelgrass as the collection medium, can be boiled, as the Vikings did. Millennium-old Viking tradition involved evaporating seawater over a juniper, cherry, elm, beach and oak-wood fire, infusing the salt with smoky bonfire notes. More isolated members of the Nordic community were even more salt-deprived than those on the European continent. Icelanders used black salt, created by boiling down huge quantities of seaweed, until the 15th century when white salt was first imported to Iceland. In two copies of the *Book of Settlements*, one dated to early 1300s, mentions a salt works in Svefneyjar, an island in west Iceland.[35]

On Oak Island, both scenarios have the saltwater, after shedding some of its salt, would supposedly filter down into the stone and rock containment basin below those fibers and be discharged into a hole or absorbed by the surrounding sandbank.

The problem with this salt collection function centers on *practicality*. Since the filtration system was found under 3 ft of beach sand, are we to assume when in use, the sand would not be there, but placed off to the side while the system was functioning? So, seawater poured onto the coconut coir fiber or naturally flowing atop the fiber from the coves' tide, would filter through the fibers and start the process?

Or, was all that beach sand atop the construct and the fiber and eelgrass below it, part of the phases of the filtration and collection process? This is a problematic process for sure.

In any case, the coconut fiber or the eelgrass must be collected separately, for the process of gleaning the salt brine from the filter medium or the collection medium, whichever they may be, to be successful. Like a coffee filter keeping grinds out of your cup, the filter or collective medium is removed and a new or "cleaned" medium must be replaced. Extraction of salts from the collective medium would be processed by "rinsing" the salts from the medium and then using evaporation of the concentrate from the water. In colder climates, this is most commonly done by simmering or boiling the filter medium or the collection medium in a pot of saltwater. With the water evaporated away, salt brine residue would be concentrated within the pot. The collection medium, if hardy enough, could be returned to the filtration containment apparatus in the beach, for reuse.

Yet realistically, with the filtration and collection system covering almost 1100 sqft,[36] digging up and reburying the fibers, or simply leaving the pit open and scooping up the saltwater-saturated fibers or eelgrass, is ridiculous. Would it not make more sense to simply boil or burn a bushel full of seaweed or eelgrass as was done in that time period? The eelgrass may be too fragile for boiling but burning it for salt production was a very old technique in use during the time of the ancient voyagers.

Archeological evidence shows salt-making using eelgrass (*Zostera marina)* began in medieval times. Along the lowland estuaries from Flanders (Zeeland) to Denmark (Jutland),[37] depleted peat marshes were replenished with eelgrass. 'Zostera-salt' was used for the preservation of fish, meat, bacon and butter from medieval times up through the 19th century.[38] Salt from this plant also played a role in the production of glass, alum, and soap (Houytuyn, 1783).[39]

Oak Island in Mahone Bay is open to the Atlantic Ocean. It was literally surrounded by seaweed and eelgrass. So was such a large operation to acquire salt really necessary and is that what this was?

Figure #7.
Eelgrass harvesting in Nova Scotia.[40]

But all in all, if we are trying to collect something abundant and concentrate it for extraction, I seriously doubt a 145 ft by 7.5 ft by 5 ft deep, containment area, would be worth the effort?

Finally, coconut coir fiber is microscopically porous and can retain 78% of its weight in water.[41] The fiber is not very heavy, so consider what 78% water weight really means. How much salt it can absorb is a completely different equation. Any container or absorbing medium has a saturation point where it ceases to function as desired.[42] A two inch thick coir fiber layer would be oversaturated relatively quickly. If buried on purpose with no plan to remove the beach sand on a recurring basis, the coir fiber would become useless as a collection medium. The CCF may still filter out the larger clogging particles and therefore function as a filter medium. Yet the fibers functioning ability as a collection medium is unknown and has no historic precedence until recently. [See Reference #62 on patent]

Furthermore, why… if CCF was a filter medium or a collection medium, was it placed on the 6th oak log platform, at 60 ft within the Money Pit? Was it also supposed to concentrate salt? Or, was it there for a different purpose entirely?

Salt extraction function theory is so flawed in its fiber function, it cannot be considered a serious contender to what the Smith's Cove construct was for, or *why* the coir fiber was used as either a filtration medium or a collection medium.

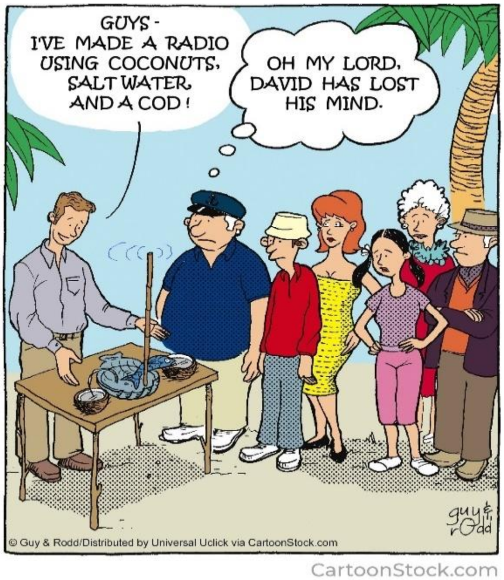


Figure #8.
Salty AM/FM Cod. [43]

Desalinization Function Theory

If it's not enough salt, then perhaps it's too much salt!

Desalination is the removal of salt and contaminants from water. It involves a broad range of technologies that yield access to marginal sources of water such as seawater, brackish ground - and surface water, and wastewater.[44]

An early and illustrative reference appears in the Bible (Exodus 15:22–26) and is widely considered to be about desalination.

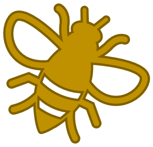
> *"When they came to Marah, they could not drink the water of Marah because it was bitter; therefore it was named Marah. And the people grumbled against Moses, saying, "What shall we drink?" And he cried to the LORD, and the LORD showed him a log, and he threw it into the water, and the water became sweet."*

In the year 350 BC, Aristotle compiled his works on separating salt and water, in *Meteorologica*. He stated, "*Salt water when it turns into vapor becomes sweet and the vapor does not form salt water again when it condenses*," (Forbes 1948, p. 383).[45]

His comment continues to ring true, as the most common distillation-based method is for a thermal application.[46]

Yet we don't have to stray far from the foremost Oak Island treasure theory which swirls around **Sir Francis Bacon**. He was born January 11, 1561 in France[47] (it is said) and secretly whispered to be the child of Francois II, King of France, and Mary, Queen of Scots. His Baptism Record calls him Mr. Franciscus Bacon[48] and his death has been listed as April 9, 1626.[49] Officially, his parents were said to be Lord Keeper, Sir Nicholas Bacon (Lord Chancellor) and his second wife, Lady Anne Bacon.[50] As the head Lady-in-Waiting to Queen Elizabeth, she was the foster mother and keeper of the Queen's secret regarding Francis.[51] Both were court consorts to Queen Elizabeth I.[52]

Trust me, the story is as secretive, entangled, and obfuscated and with as much intrigue as the island itself.



Much can be said about the relationship between the island and the mystery man, but this chapter will highlight how Francis Bacon himself, tried to create a method for desalinization on the sandy beach shores of an island.[53] This fact is much less known than the Shakespearean Folios theory[54] or his inquiry in the use of quicksilver to preserve documents and maybe, even bodies![55]

Officially, Lord Francis Bacon died of pneumonia at the Arundel mansion at Highgate outside of London, in the spring of 1626.[56] Rumors and evidence of Bacon faking his own death have elevated his status as cultlike and is being pursued by researchers today. Again, the record reflects his chaplain, Dr. Rawley, collected Bacon's writings, notes and poems and published them in 1627, titled, "*Sylva Sylvarum or, A Natural History in Ten Centuries*."[57]

Bacon's related scientific examinations regarding desalinization from this compilation, are listed next. However, the full text of his findings were expressed in Chapter Four, "*Serving up Some Bacon*."

Century I

1-8. *Experiments in consort, touching the straining and passing of bodies one through another; which they call Percolation.*

25. *Experiment artificial touching the making of artificial springs.*

Century IV

391-**397**. *Experiments in consort touching the goodness and choice of water*.

Century VIII

768. *Experiment solitary touching clarification.*

Century IX

881. *Experiment solitary touching the dulcoration of salt water.*

882. *Experiment solitary touching the return of saltness in pits upon the seashore*.

883. *Experiment solitary touching attraction by similitude of substance.*

884. *Experiment solitary touching attraction.*

Yes, the experiment titles above seem to have nothing to do with desalinization. But as you read the related sections, you will see Bacon was very much into the scientific exploration and pondered theorem and evidentiary facts regarding the various ways to cleanse water.

Each of those previous passages provide another approach or scientific experiment in creating potable water. This passage is the most related and shown as an example.

> ***882. Experiment solitary touching the dulcoration of salt water:*** *"It hath been set down before, that pits upon the seashore turn into fresh water, by percolation of the salt through the sand: but it is further noted, by some of the ancients, that in some places of Africa, after a time, the water in such pits will become brackish again. The cause is, for that after a time, the very sands through which the salt water passeth, become salt, and so the strainer itself is tinctured with salt. The remedy therefore is, to dig still new pits, when the old was brackish, as if you would change your strainer."*[58]

So, one may ponder if the filtration system in Smith's Cove may have been an attempt to construct a more advanced desalinization apparatus with filter mediums deployed. This theory does 'hold more water' – *pun intended*, but still does not pass the *practicality test*.

Assuming the filter mediums of the CCF and eelgrass do provide some sense of desalinization, are we to assume the cleansed water now trickles down into the flood tunnel? And if that be the case as there seemed to be no other access to the clean water, how is one to retrieve the sweet subterranean secretions? The practicality of this function also seems to be – *all wet.*

The evidence proves Smith's Cove filtration system is neither to extract salt from fluids using fibers, or a fibrous filtering of saltwater for potable purity. Searchers on Oak Island Have found at least two ancient shallow water wells functioning in the vicinity. Both have radiocarbon dates of operation, earlier than radiocarbon dates of the coconut fiber,[59] and evidently capable of providing insipid water. There would be no need to rely on such a concocted construct to effort the same outcome provided by either well.

Freshwater / Wastewater Function Theory

Ancient Sanskrit and Egyptian writings document practices that were followed to keep water pure for drinking and elimination of wastewater. The "*Sushruta Samhita"* (3rd or 4th century) specified various methods, including: boiling and heating under the sun.[60] The text also recommends filtering water through sand and coarse gravel. Images in Egyptian tombs, dating from the 15th to 13th century BC, depict the use of various water treatment devices.[61]

Oak Island is considered by most geologists and paleogeologists to have once been attached to the mainland, or more clearly, a land peninsula or cape.[62] A map at the end of this chapter reflects Oak Island as part of the mainland in AD 1384.[63] This would have been a period when sea levels were considerably lower than they are today. If the radiocarbon date of the coconut coir fiber is indicative of when the filtration system was installed, then Oak Island shoreline would have been almost half way further out to Frog Island, and saltwater would most likely not have been the source of the water for this systems use. However, the creation of a wastewater processing location, or – *outhouse*, could 'flush-out' the realistic reason why coconut coir fiber was employed here within.

Before you *poopoo* this concept, consider that in 2004 an International Application for a World Intellectual Property Patent was filed for "*a system and method for treating wastewater using coir fiber*."[64] The application cites…

> *"Within the container for treatment of wastewater effluent, is a fibrous filter composed of a mesh material that mechanically filters out large particles and simultaneously provides a substrate with high surface area for the colonization of beneficial aerobic microorganisms. A preferred composition for the fibrous material is coconut coir. It provides a natural substrate* [medium] *with a large surface area that is highly resistant to degradation in an aquatic environment. It is also a source of organic carbon, which aids in the de-nitrification of the wastewater."*

Furthermore, the 50-page patent describes various add-on processes which may be incorporated with this apparatus for enhanced ecologically-conscious effluent removal. The application claims the performance of coir fiber this way…

> *"one exemplary embodiment, one cubic foot of coconut coir material may be used for a flow rate of wastewater of about 10 gallons per day. However, larger volumes of coir material may be used with larger flow rates at appropriate proportions*."[65]

Perhaps the Oak Island filtration system was at one time a 145 ft long latrine, constructed atop coir fiber and eelgrass filtration medium below. Upon the final flush on using this communal commode, the sand could have been refilled atop the septic tank-like apparatus. There would be no need for flushing out the flood tunnel - unless the curse was ignored, and then searchers were in for a crap of a time! Yet alas, was a toilet constructed on the 6th platform within the Money Pit too?

Flood Tunnel Function Theory

So perhaps those WHOI researchers were correct when identifying the coconut coir fibers were used for 'flood tunnel purposes.' Flood tunnels require water to flood and the Smith's Cove filtration system was duly noted as attached to the flooding tunnel(s). The construct appears to be well engineered to inconspicuously attain and absorb saltwater on a long-term basis; feeding filtered and cleansed water into a flood tunnel or tunnel system for that very purpose. The filtration function was designed to minimize collecting any clogging detritus within the flood tunnel(s) using both the fiber and the eelgrass mediums to that end.

And yet in my research, I've discovered a much more practical reason for including CCF into this filtration containment facility. The product I am referring to has been on the open market for approximately ten years now, so it was not available to our *ancient voyagers*; yet the functioning concept is the same. Described below, It can be found online under several names, such as '*Coir Blanket*,' '*Coco Erosion Blanket*,' or '*Eco Erosion Control Rolls*,' and all operate by the same principal and function.

Erosion Control Function Theory

A coir blanket is a matting or screen-type blanket or covering made of woven coconut coir fiber.[66] Though the thickness can vary, the task is the same. Primarily it is used on slopes or other terrain areas prone to erosion or sloughing.[67] As previously described, coconut coir fiber has all the aspects and characteristics which allow air and water to penetrate and percolate through the protective blanket into the substrate below.[68] Yet the blanket maintains soil cohesion with its tactile strength[69] and lateral distributions of water and air. This prevents the inundation of the soils below, thus reducing or eliminating those erosive environmental effects.[70]

The *Journal of Natural Fibers,* researched this type of functionality and its findings are published in "*Coir Fiber – Process and Opportunities*;" saying…

> *"Coir netting with its tensile strength and the friction between coir and soil is appropriate to justify its application for use in slope stability. This would act as reinforcement for the earth fill and will not allow any surface shear to develop during failure. Coir geotextiles can be effectively used as reinforcement materials in soft soil stabilization."*[71]

Furthermore, products such as "Coir Draining Blankets" are now used to consolidate clayey soils in a variety of sites worldwide. Coir non-woven geotextile is one of the materials, used as a horizontal blanket over vertical drains, roadways, and embankments in the application of soil consolidation and geotextile applications.

> *"The use of coir geotextiles for construction of subbase layer* [beach sand] *over soft subgrades* [eelgrass] *is studied in this paper. Various engineering properties of coir geotextiles have been reported, also in this paper. These properties are comparable to those of intermediate to high density other engineered-material geotextiles. The tests have clearly indicated the capability of coir geotextiles in improving the stiffness and load bearing, as well as erosion and stability control. The physical and hydraulic properties of these coir geotextiles are quite comparable to those of non-woven geotextiles."*[72]

So when you consider the bevy of natural threats to your filtration system apparatus for your flood tunnel functionality, such as natural recurring forces like strong tidal action, ocean surge, rain-driven wind, and other weather impacts, you would want to eliminate or minimize the movement of the protective top substrate [sand] with some sort of screen or protective mesh. And coconut coir fiber has been proven to do just that. Otherwise, such forces would obliterate your more fragile filter medium within [eelgrass] as the covering beach sand is washed away. In other words, beach sand on its own is not a solid mass, and that wind, surf, storms and other impacts, can easily displace it, erode it, or pile it in unintended places. Such a catastrophe would eventually clog up the flood tunnel apparatus with the filter medium washed away.

Since it is believed the filtration/flood tunnel construct has worked perfectly well for the past 229 years, the CCF has been a very well-suited substrate and filter medium during this same period, providing this mesh erosion blanket effect as well. Hence, the reason for interest in much of today's industry in CCF use and application are similar to those described here in this chapter. Yet again, was erosion a problem on the sixth platform down in the Money Pit?

Figure #9. **Coir Blanket Similarities with Fiber at Smiths Cove.** [73]

Courtesy: https://www.grainger.com/product/Erosion-Control-Blanket-8-34FY06

In the above image you can distinguish how the exposed center section of this hillside has already experienced erosion, whereas both opposite sides, with the blankets applied on the surface, have not. The bottom of the hill is located at the top of the image, where you can see soils which have sloughed off and piled at the bottom.

Are we simply overthinking this described contraption and its purposes? What, long ago, would man need on the shores of an island to have dug a 145 ft long pit or trench, which was to envelope the beach from the low tide mark, to the high tide mark? As we *flounder* around looking for a reason, could the construct be something simple?

Fish Weir - Haafing Function Theory

Forget about picking up a top-of-the-line telescopic fishing rod made of graphite and fiberglass and *Shimano Stradic Ci4+ 3000 FB Spinning Reel with Front Drag*. Or getting fitted for some *Simms Breathable Tributary Stockingfoot Waders* and matching boots with your *Patagonia Mesh Master II Vest* to hold your Eco-friendly *Day-Glo Lures*. You can put down the floatable *Orvis Nomad Net* and rewrap the Buff *Coolnet UV Plus Insect Shield Multifunctional Headwear* under your

Oakley Split *Shot Polarized Sunglasses*… attached to your sunburn-sensing *Day-Glo Croakies.*[74] Instead, you can become the "subsistence fisherman" your ancestors were, on most coastal shores of the planet. Be like the Vikings and bring home some fantastic flatfish with nothing more than a shovel and a fishing priest – *just as early fisherman did*.

As opined in the *Vinland Sagas* chronicling Greenlanders and Eirik the Red's perilous Icelandic exploration by the Norse of North America, one can read of just what may be the answer to our dilemma. This may be a description of what the filtration system actually was… a type of '*fishing trap*'!

> *"Karlsefnie and his company sailed into the lagoon and called the land Hop (Tidal pool). . . . [E]very stream was teaming with fish. They dug trenches along the high-water mark and when the tide ebbed there were flounder in them."*[75]

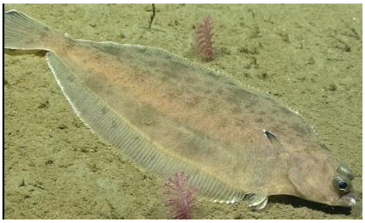
The physical description of the Oak Island filtration system containment apparatus found in 1850 by the Truro Company; was also similarly described that once the sand and gravel of the beach was removed it extended 145 ft along the shore line and from a little above low to high water mark. And once rocks were removed it was 5 ft at its deepest point. An impressive trench for a fishing trap indeed!

The earliest known fish traps to date are from Mesolithic sites in marine and freshwater locations in the Netherlands and Denmark, dated to between 8000-7000 years ago. In 2012, scholars reported new date ages on the *Zamostje 2* weirs near Moscow, Russia, of more than 7500 years ago. Neolithic and Bronze Age wooden structures are known at *Wooton-Quarr* on the *Isle of Wight* and along the shores of the Severn estuary in Wales. The *Band e-Dukhtar* irrigation works of the Achaemenid dynasty of the Persian Empire, which includes a stone and trench weir, dates between 500–330 BC. *Muldoon's Trap Complex*, a stone-walled fish trap at Lake Condah in western Victoria, Australia, was constructed 6600 calendar years ago cal YBP by [trenching] basalt bedrock to create a bifurcated channel. Excavated by Monash University and the local Gundijmara Aboriginal community, Muldoon's is an eel-trapping [containment], one of many located near Lake Condah. It has a complex of at least 350 meters of constructed channels running alongside an ancient lava flow corridor. It was used as recently as the 19th century to trap fish and eels, but excavations reported in 2012 included AMS radiocarbon dates of 6570-6620 cal [YBP].[76]

On Oak Island, this would have been more of a tidal-fishing methodology; where the rise of the inflowing tide fills the dug trench near a shore or even in an estuary. The fish arrive with the high tide to eat what shrimp, small crustaceans, worms and such have floated in and sunk within the trench. The slightly darker, cooler and deeper waters within the trench are preferred by fish, both those hiding and hunting. As the tide recedes, the sea life gathered within, become trapped. This concept is similar to the natural rock pools found amongst coastal shores.

Manmade fish traps come in many styles and arrangements, have been used throughout human existence and are known by different names: *fish impoundment, tidal weir, fish-trap, weir, yair, coret, gorad, kiddle, visuywer, fyshe herdes*, and *passive trapping*.[77] Some add rocks or stones to enhance the trap, set up wattles and fencing to direct the fish, or add baskets to create deadly safe hiding spots for those who become entrapped. Variations of trench fish trapping have V-shaped corrals made of temporary stone dams set up within running water, which then direct fish in a trench excavated site. Once the trench fishing is complete, the stone dam is dismantled and the trench runs dry, stranding the fish and are gathered by hand (Best 1977).[78] This technique is also known as 'stranding,' or in Africa, 'digging out.'[79]

In the *Vinland Sagas* we read they caught flounder, which is most likely the type of fish one would catch in the containment dug out at Smith's Cove of Oak Island, off the Atlantic coast.



Flounder is identified as a *flatfish*. This is the common name for an order of fish with over 800 species worldwide. In Canadian waters there are approximately 39 species and familiar flatfishes include *halibut, plaice, flounder* and *turbot*. Distinguishing features of the flatfish… is they are flat! *Almost missed it did ya?* Other traits are they have eyes on one side of their body, and each can watch different attractions as they blend in with the debris on the bottom of the hole. As adults they become benthic and stay on the bottom. They are carnivorous, are ambush predators, and many can camouflage themselves as they have chromatophore cells in their scales - *allowing them to change color and patterns*.[80]

> *"Flatfish like to hide and hunt in and around underwater structures, rocks, depressions, eelgrass and ocean vegetation. They're not the most hardworking fish, you see. If you're fishing from a beach, search around holes in shallow water, sandbars, oyster bars, slews, and drop-offs." Wherever there's some "hideable" structure on the bottom and a lot of bait fish around, there's Flounder to be had."*[81]

So what are flatfish not to like about the 145' long trench filled with beach stones, eelgrass and exotic CCF fiber? If the crustaceans, baitfish, and other marine edibles like its perceived safety, then your effort to simply dig the hole or trench with a shovel at low tide – only needing to return at the next low tide with your fishing priest in hand - is all it would take. This would create for that subsistence fisherman a constant food source for you and the other *ancient voyagers*. Sounds like a perfect purpose for the Oak Island construct at Smith's Cove, right?

Well, that is unless you also placed five radiating finger drains within the trench allowing water to drain down into the attached flood tunnel. This would definitely defeat the purpose of a fishing trench on Oak Island. If that was the purpose, than I too would cover it up with 3' ft of beach sand and hope nobody found it.

If you think such a technique has no downfall, think again. Last spring Russian troops were tired of their rations and ventured into a forested area and dug trenches near a waterway. They were attempting to trap catfish. Perhaps not knowing where their invasion mission had sent them, they fell ill with radiation sickness. Hunting local game, digging foxholes and trapping catfish and eel, the troops bivouac was located near Chernobyl's Reactor No. 4. Doctors believe the trenching down into the deeper more radiated soil was most problematic. Troops left five weeks later as Ukrainian troops launched counterattacks elsewhere. Many died of the radiation poisoning.[82]

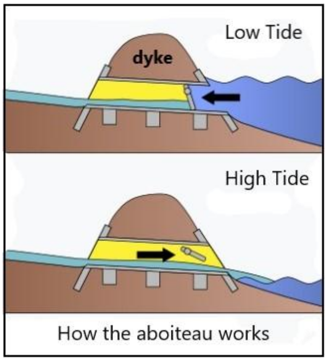
Even if you were '*haafing'* it in Mahone Bay like the Vikings did along the Irish Sea, employing a soccer goal-like net structure for trapping salmon or trout in trenches;[83] you effectively were dragging the shallows and directing fish into your treacherous trench for the next buffet. But was fetching the fibers from faraway India really necessary to fish for flounder? How is it flatfish are found without the husk fibers from a coconut; yet there are those who believe this was the purpose – *a flounder fish fry?*

Again, practicality and pragmatic realism proves this was not the intended purpose of the so-called filtration system in the beach of Smith's Cove.

Ancient Aboiteau Function Theory

When one wonders what possibly the coconut fiber could have been used for on Oak Island, many assume an ancient aboiteau was at hand. Also spelled *aboiteaux*, this theory attempts to account for Acadian settlers arriving in Nova Scotia post AD 1600, and has little to offer in way of form, function or fiber. To simplify for the reader, an aboiteau is a type of earthen dam which allows drainage.

This apparatus provides a mechanism to drain water from lowlands at low tide and protect this exposed land for agricultural use, at high tide. Yet to actuate an aboiteau, the builder relies on halophile plants to firm up the dam from erosion due to tidal movement. These kind of plants live in salt marshes and have a deep tangle of roots or shoots where they grow and thrive. Such a living root structure provides living plant material to then anchor and protect the dike structure.



Courtesy: Kirill Borisenko, 2012

Those who find this theory valid miss several key components of how the construct works and the value of the halophile plant life. Eager to plant any fiber within their theory, they believe changing out a halophile plant with CCF will do just fine. And, as we just discussed the benefits of CCF in erosion control, there is a misunderstanding of what the fibers can and cannot do. In the case of the Acadian use of aboiteau for land reacquisition, live salt marsh plants provide a variety of functions that CCF is incapable of doing, including hydraulic flow, saltwater filtration, and self-maintenance. What made Acadian aboiteau so functional to this day, is the living plant matrix used.

> *"Thus, the Acadians had but two species with which to build dykes. Without those grasses, would they have had the motivation to build dykes by hauling rocks, driving pilings, or adding board facing to piles of mud? Would they have opted for clearing forests from upland rocks? Or would they have sensibly gone back to Europe in disgust? Although Salt Meadow Hay and Black Grass belong to different plant families, structurally their root systems are similar, consisting of many small diameter roots and innumerable fine rootlets. […] The larger roots serve as little reinforcement rods, keeping everything to shape, and their interstices are in-filled with clay, water, and even finer woolly-like rootlets."*[84]

The point to understand is, no matter how much coconut coir fiber you apply as an erosion control mechanism, it cannot and will not replace live plants which grow root systems firmly grasping the clayey soils, retain water, and replenish themselves.

Not to belabor the point, the catchment construct found under the beach sands of Smith's Cove do not at all function as an aboiteau. Nor does the 6th oak log platform CCF within the Money Pit parallel such a theory. In summary, dead CCF cannot do what Cord Grass, Black Grass and Salt Meadow Grass – which was locally available, could do to preserve a dike or help function an aboiteau.

Caulking, Careening & Cables Function Theory

For some reason, there are those who think Oak Island was a repair station for ships sailing from the Caribbean back to European ports. It is well known that later in time, places in Mahone Bay, Halifax, Liverpool, Lunenburg and elsewhere in Nova Scotia were extensively involved in shipbuilding and repair for all cycles of a vessel's life. However, Oak Island was not such a facility. In examining why coconut coir fiber may have been brought to Oak Island, most people consider it was used in the making of ships cables and rigging and careening and caulking the hulls of vessels. This is simply a romantic myth – *at best!*

Regardless of the species of the palm fiber found on Oak Island, it is clear by the bathymetric studies, especially for the period of the radiocarbon dating of that unique fiber (AD 1185-1330), careening was not possible except for small skin-covered boats. Later, coastal utility vessels like cots, currachs and skiffs (clinker built) could be careened and caulked on almost any Mahone Bay island with a shallow beach. In later maritime history, gunning skiffs and some ketches and barks may have been seen being repaired or recalked, but this is hundreds of years after the fibers dating and therefore not applicable.

The next myth in this theory is the suggestion that coconut husks were brought to the island where they could be "retted" and/or "softened" so the fibers could be used for caulking.

This demonstrates the lack of understanding of both the retting process necessary for coconut husks as well as what "caulking" is.

Image: Half of a coconut husk with seed removed

To briefly explain how coconut husks are retted, it is important to note the process is a chemical fermentation and dissolvement of plant binders which glue fibers into a protective pod. This pod (husk) is a thick, tough cover (exocarp) of the seed, or nut. The process of retting can take from 6-12 months for the husk to soak and baste in warm, saltwater-filled pools, ponds or lagoons which are affected by tidal action. The swamp on Oak Island contains both insipid and seawater which is much too cold to support the enzymatic fermentation necessary to dissolve binding agents of coconut husks. Nor is the climate conducive to this lengthy retting. Soaking in heated seawater has shown not to promote the retting process at all. For a full description of the retting scenario for coconut husks, please see the **Glossary** definition for "retting."

> **Caulk** (calk) is a transitive verb: to stop up and make tight against leakage (something, such as a boat or its seams, the cracks in a window frame, or the joints of a pipe); caulked; caulking; caulks. Caulk is also a noun: **material used to caulk**. Also Caulking.

When one *caulks* a ship using *caulking*, one is applying a compound to a location (usually the hull) to fill in gaps, cracks, splits or other areas which could leak or need to remain "water-tight." This compound consists of a **filler** (e.g., *jute, hemp, esparto, flax, wool, cotton, lime bast, sisal, coir, animal hair*, etc.); and a **binding agent** (e.g., *linseed oil, resin, sap, pine tar, pitch, fish oil, animal or plant glues*, etc.). Sometimes the binding agent is applied after the caulk has been wedged in, hammered in, or laid upon the surface to be filled in.

In the latter case, a patch is applied as both an adhesive for the filler to the site and as a coating to waterproof (e.g., tin, lead, copper, wood, cloth, or coating of tar or bitumen). This can be appliable to either side of the hull on ships. The Vikings Long Boat used wool as the filler and tar as the binding agent and kept both affixed with clinker nails.[85] It is not possible to use coconut fiber as a binding agent, only as a filler.

Furthermore, maritime application of various caulking compounds is often determined by regionally available materials, cultural shipbuilding techniques, and the fibers found already aboard a sailing ship. ***Oakum*** is not a caulk per se, but a formulaic compound most common in shipping during the *Age of Sail*. Oakum was a compound composed of picking apart old marine ropes that were no longer useful on ships. These ropes were mostly made of hemp, jute, cotton or flax in the European and Colonial Atlantic. These fillers were then loosely twisted into cords and used as a crack or crevice filler with the binding agent and sealant material of Linseed oil and/or hot Pine Tar.[86] Seagoing trade in medieval Europe, especially the Hanseatic League, and particularly in the Baltic Sea region used moss and tar for caulking (see: Luting) their new creation – *the Cog*.[87]

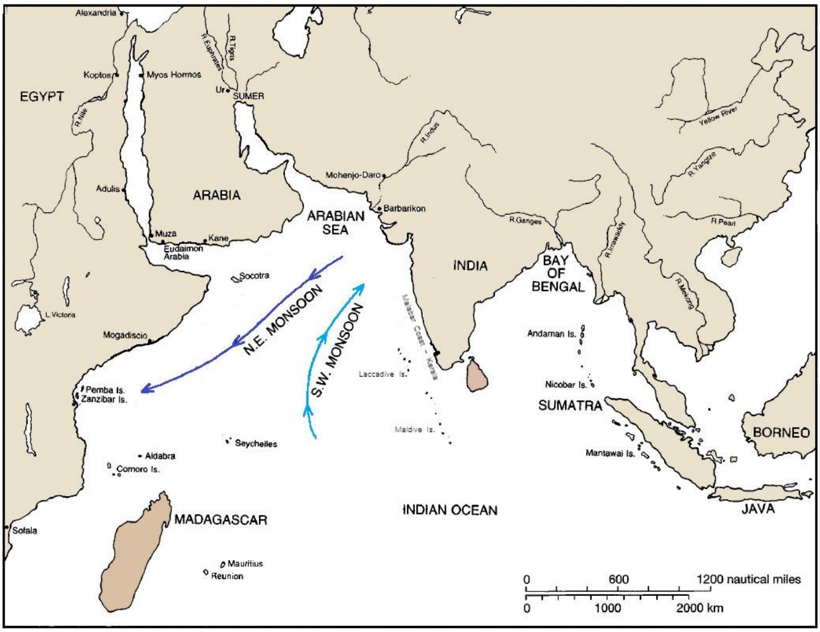
Finally, the forensic research shows CCF used as a caulking filler was limited to parts of the Indian Ocean and was not introduced into the Atlantic or most of the Pacific Ocean Basin. This is for four reasons:

1) Retting of coconut husks was a rarely known process
2) Other caulking fillers were better or easier to obtain
3) No coconut palm trees were available to get nut husks
4) No similar atmospheric conditions as in the Indian Ocean

As The third largest ocean on the planet,[88] the Indian Ocean is also unique in regards to the salinity of its water and within its atmosphere. The Indian Ocean is a salt-saturated evaporative basin (Wijffels et al., 1992) constantly stirred by the winds of monsoons.[89] This unique condition made salt-resistant plant fiber like CCF invaluable. This is not the case in other oceans. See Figure #10.

As we report in Chapter 9, *"I'll Take 2000 Bahars to Go, Please*," Europeans were unaccustomed to these salt-encrusting climate conditions and its effects on their sailing ships when they sailed into the Indian Ocean. Thus, In 1510, Afonso de Albuquerque, as the second governor and viceroy of all Portuguese possessions in India and the east, became the first European to replace his fleets riggings and caulking with coir fiber – *256 tons worth of the fiber!*[90]

Figure #10. **Indian Ocean Basin Monsoonal Wind Paterns.**[91]



As discussed in Chapter 2, under the Section *"The Purposeful Use of Coir Fiber*, the forensic examination discusses the unique environmental atmosphere which makes the use of CCF so impactful. This is not the case but in just for a few locations in the world - *not Oak Island.*

> *"On the whole, the Indian Ocean is considered an evaporative basin as it loses about 1.392 × 104 km3/yr of freshwater in net evaporation to the atmosphere* [Wijffels et al., 1992]. *The variation in the flux parameters therefore can set up seasonal differences in the initiation, sustenance, and variability of salinity transport in the Indian Ocean and its atmosphere especially given the dynamics of processes associated with the monsoons."*[92]

Which Palm Fiber On Oak Island

Coconut Palm Fiber

If you think any of the reasons just explained were functions *why* coconut coir fiber was selected to perform on Oak Island, the answer is ***no***. No, coconut coir fiber was not brought to Oak Island for any of those purposes, in my humble and well-researched answer. As disappointed as I became while searching for the 'Holy Grail' of answers to *why*, I realized I had already answered the question. This was somewhat satisfying, if not worthy of historical note or appearance on History Channel's, "*Curse of Oak Island*" cable show. I admit I am chagrined.

In Volume One, Chapter 9, "*Foreign Fibers Found*," we discussed the principle of parsimony as espoused by William of Occam, in Surrey, England. Ironically, he lived from AD 1285-1347, and was a man of our unique timeline. Occam's Razor is very much applicable to this topic.

We have researched the coconut's characteristics, historical uses, and potential application of their fiber in the investigation in identifying *why* it was applied within the manmade constructs found inside Oak Island. Some are plausible. Some are more arcane. Yet one is quite sophisticated that science is just now implementing it in today's world. But we have looked too far into the *what if*, of CCF's *impressiveness,* that this anomaly has tricked us into accepting what it is not.

Figure #11. **William of Occam**[93]

Instead of 'shaving off' unlikely or complicated answers to this conundrum, we have delved into more esoteric answers launching us on professorial pilgrimages searching for truths to fit our fibers.

Well it was fun and exciting while it lasted. But alas, we find ourselves trimmed by the razor of logic, practicality, and functional purpose as to *why* CCF may have been found in Oak Island.

You have already read in this Volume some reasons *why* CCF would have been found in Oak Island. As previously discussed, we know coir fiber is the only natural fiber resistant to saltwater and is highly resistant to abrasion.[94] We are aware of the multiple maritime functions and uses of coir,[95] primarily within the ocean tropics. And we know the Indian Ocean is a salt-saturated evaporative basin (Wijffels et al., 1992) constantly stirred by the winds of monsoons.[96] So, would it not be logical, practical, and functional, for those *ancient voyagers* to have acquired coir fiber for that same reason people of the Indian Ocean Basin and adjacent seas, had relied upon it? Those *ancient voyagers* may have known or surmised CCF was necessary for their future caulking, cordage, rigging, rope, nets and other maritime needs. It would be an obvious need if they were planning for a long voyage across vast oceans. So in anticipation of a long and dangerous expedition, they stocked up on coconut coir accordingly.

Finding so much bulk coir fiber in Oak Island informs us the fiber was an intentional acquisition. And those *ancient voyagers* made considerable effort to obtain it. To acquire it they had to go to, ***or*** were already in, the faraway Indian Ocean or connecting seas. With the influence of marine life in the Indian Ocean, it only made sense to have included coir fiber for their future plans; which is obviously hypothesized as travel to Oak Island, Nova Scotia!

This was a monumental voyage of some 16,883 nautical miles, as explained in Chapter Nine, "*I'll Take 2000 Bahars to Go, Please!*"[97]

To clearly state: Coconut coir fiber was brought along for the purposes of maintaining the ship(s) ropes, rigging and caulking so desperately a part of maritime action within the Indian Ocean Basin. These *ancient voyagers* may have assumed such an oceanic environment would likewise be found in the southern Atlantic tropics and they wanted to be prepared. How it was applied on Oak Island, was simply happenstance.

Further evidence of the practical reason *why* coconut fiber was brought along can be seen in the amount of fiber found on the island. In Chapter Nine, we determined how much coir fiber would be needed to repair and replace the cordage, rigging, ropes and caulking of the vessels sailing Indian Ocean waters. This led us to determine the type and number of ships in their flotilla which could need repair or replacement supplies of the fiber.

Forensically, had the functional task of CCF been just to 'filter,' then additional locally available eelgrass could have been added to bulk up the filter medium of the filtration system in Smith's Cove. Other commonly used filtration media of that time such as: peat, straw, grass, sponges, hay, moss, alum, wool, and cotton were available all around those *ancient voyagers* when they arrived on Oak Island.

Was the coir fiber a packing material? One would assume the packing material would stay with whatever was packed, even if stowed away deep inside an island repository. Why use a packing material found to be spontaneously combustible, staining, and odiferous? Even its water absorption abilities would mean it retains the moisture, not eliminate it. And in so doing, CCF would have kept your valuables wet. Like being packed in a wet diaper, cargo would have remained exposed to the moisture and whatever damage it could do to the packed items. This is the same reason why coconut coir fiber was never used as dunnage on any mythical sailing ship.

Finally, one needs to factor in finding the source of the fiber so far away in India. Not in Egypt, or Constantinople, nor Italy or on the Iberian Peninsula, CCF would only be acquired on the southwestern tip of the exotic country of India; on the far end of the Indian Ocean. Were our *ancient voyagers* so invested in having coconut coir fiber for their mission, they needed to launch their expedition from so far away? Or go so far away to obtain it?

I think it prudent to let our 'barber,' William of Occam, use the razor of logic, practicality, and functional purpose to free us from being entangled in finding the fibers function.

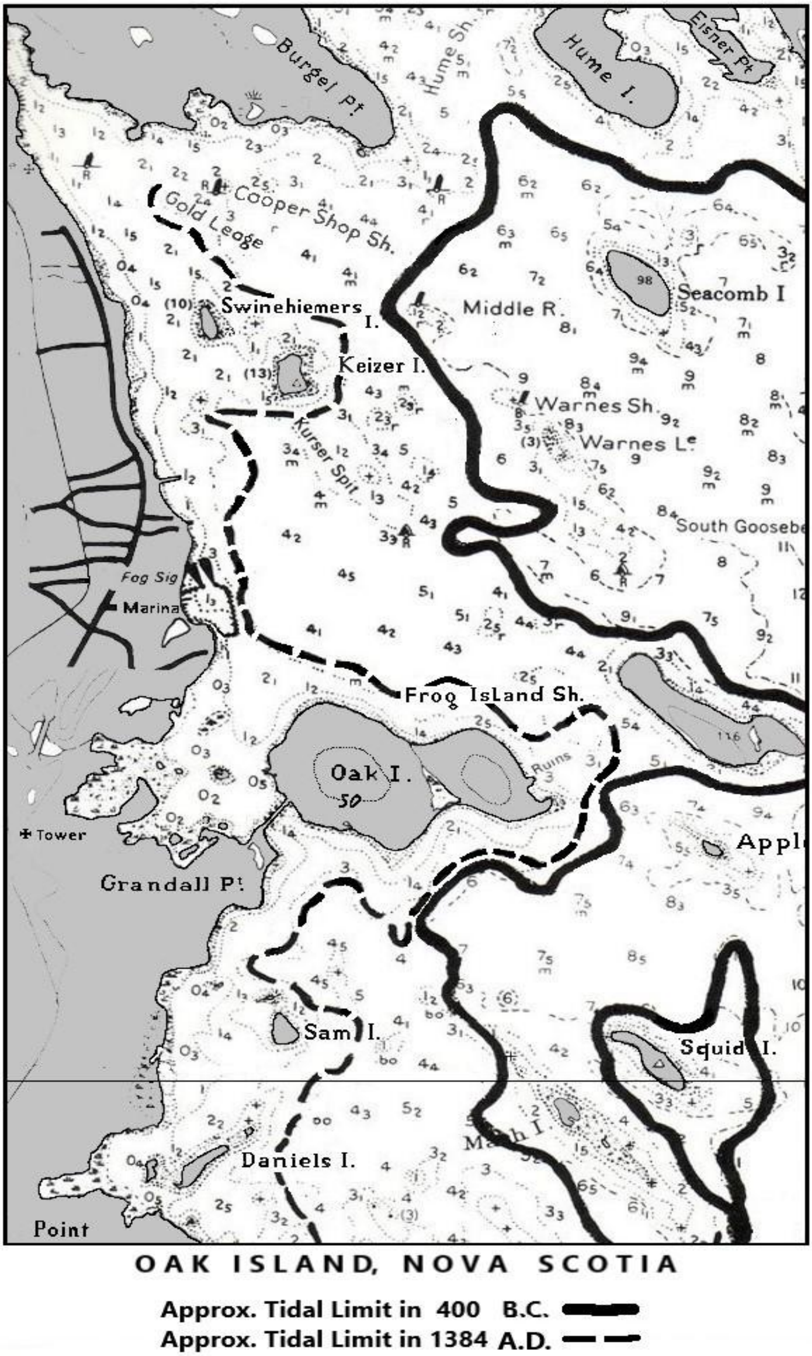
Date Palm Fiber

The forensic analysis for *why* leaf/sheath or mesh/sheath fiber from the trunk of the date palm *(Phoenix dactylifera*) was found on Oak Island, is both simple and perplexing. As you've read, both fibers are physiochemically and microstructurally similar and both have been used throughout history for identical purposes. Yet neither fiber can tell us why they were functionally applied to the two underground constructs on the island. Neither underground construct is even fully understood as to their purpose, and the application of either fiber is confounding.

Is this where the *forensic scientific method* ends and conjecture begins? No, it is what brought us the answer, and that answer has received Friar Occam's tacit approval. Though this researcher would have preferred finding a "receipt" for tons of palm fiber, or perhaps, a ship's cargo manifest, the conclusion is - *conclusive*.

The mystery fiber, which was brought to Oak Island by *ancient voyagers*, was applied to the entrance(s) to underground workings, as a symbolic sign of *protection*. Like when Jews marked the doorposts of their homes with lambs blood to protect them from the Angel of Death befalling Egypt, the date palm fiber symbolically and metaphysically protected the valuable sacred knowledge, sacred numbers and sacred relics – intricate aspects of the *Tree of Life*, from destruction. The full details and description of this conclusion have been partly covered in Chapter Four, "*Serving up Some Bacon*," charted in Appendix A, "*Forensic Scientific Method*," and detailed in Appendix B, "*Date Palm Deity*." A summary is offered in Chapter Ten, "*Fibers for the Final Time*."

Figure #12. **Mahone Bay Sea Level Around Oak Island circa *AD 1384*.**[62]



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http://alldistancebetween.com/in/distance-between/cape-of-good-hope-india-6646282e8ea42d6418ab33e4ab6553d5/. And…
https://www.travelmath.com/distance/from/Halifax,+Canada/to/Cape+Town,+South+Africa

> *"9,427.1 nautical miles from Kerala, India to Cape of Good Hope, South Africa. Plus 7,456 nautical miles from Cape of Good Hope, South Africa, to Halifax, Nova Scotia, Canada. Total travel distance is 16,883.1 nautical miles."*

2. "*Oak Island Hydrogeology, Hydrography and Nearshore Morphology, July – August 1995, Field Observations*." By David G. Aubrey, Wayne Spencer, Ben Guiterez, William Robertson, and David Gallo. Unpublished Draft Report. Woods Hole Oceanographic Institution, Woods Hole, Maine. Apr. 8, 1996. 151 pages.
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3. "*Chapter 10, Cracking the Nut - Formula*." By David Neisen, Chris Boze, and Robert Cook. Volume 1 – *Oak Island Mystery Trees and other Forensic Answers*, 08-28-2022. See, Page 59. "Draft Report" by Woods Hole Oceanographic Institute (WHOI), 4-8-1996.

> *"Tested using Acceleration Mass Spectrometry. Pages 13-17."*

4. "*Les MacPhie Complete Archives from Documents A00 to C10*." Created and Archived By Les MacPhie. Located at www.oakislandcompendium.ca See below.

Summary of Documents and Results for Carbon Dating at Oak Island
Compiled by Les MacPhie July 2006 (Page 2 of 2)

Documents		Carbon Dating (See Note)			
Description	Page	Sample Description	Age Yrs	Error ±Yrs	Year and Range
Letter from Dick Nieman to Beta Sept 12, 1990	33	Coconut fibre recovered by Dan Henskee Summer 1990	770	60	1180 1120-1240
Report by Beta Analytic, Miami, Florida Oct 4, 1990	34-37				
Letter by Dick Nieman Oct 7, 1990	38				
Report by Beta Analytic, Miami Sept 22, 1993	39-42	Wood sample from new shaft found by F Nolan	150	50	1900 1850-1950
Letter by Dick Nieman Sept 27, 1993	43				
Letter from Dick Nieman to Beta Sept 12, 1993	44	Coconut fibre sample 20 years old from museum	820	70	1130 1060-1200
Report by Beta Analytic, Miami Sept 30, 1993	45-47				
Letter by Dick Nieman Oct 6, 1993	48				
Draft Report by Woods Hole Oceanographic Institute (WHOI) Apr 8, 1996 Carbon dating done by the National Ocean Sciences AMS Facility of WHOI (AMS = Acceleration Mass Spectrometry, a test method that requires only small samples)	49-56	Coconut fibre provided by Dan B, no information on recovery	765	35	1185 1150-1220
		Coconut fibre from Smith's Cove recovered by Dan Henskee in the presence of WHOI 1995	1140	30	810 780-840
		Wood from 165 feet in 10X provided by Dan B, probably from 1971	120	35	1830 1795-1865
		Wood (from 10X?) provided by Dan B, probably from 1971	75	30	1875 1845-1905
		Peat from 8 feet below MSL in Beach Pit 2 by WHOI in 1995, pit is opposite swamp	1940	40	10 30 BC-50
		Peat from 10 feet below MSL in Beach Pit 8 by WHOI in 1995, pit is opposite swamp	2340	35	390 BC 425-355 BC
		Seaweed at Smith's Cove in 1995			Modern

Note: The age is with reference to 1950. The year is determined by subtracting the age from 1950.

5. "*Oak Island Hydrogeology, Hydrography and Nearshore Morphology, July – August 1995, Field Observations*." by David G. Aubrey, Wayne Spencer, Ben Guiterez, William Robertson, and David Gallo. Unpublished Draft Report. Woods Hole Oceanographic Institution, Woods Hole, Maine. Apr. 8, 1996.

"See Section Coconut fiber, Page 39, para. 12 on Page 42."

6. "*Cocos nucifera L.*." By M. Doring, 2022. Published in English Wikipedia – Species Pages. Wikimedia Foundation. Checklist dataset. https://doi.org/10.15468/c3kkgh accessed via GBIF.org on 2022-06-27

7. "*Coir Fiber – Process and Opportunities: Part 1)*." By Akhila Rajan and T. Emilia Abraham. Published in *Journal of Natural Fibers*, Page 31. September 25, 2008. http://dx.doi.org/10.1300/J395v03n04_03

8. *"Coir Fiber – Process and Opportunities-Part 2."* By Akhila Rajan and T. Emilia Abraham. Published in *Journal of Natural Fibers*. January 2008. https://doi.org/10.1300/J395v03n04_03

9. "*Natural & Synthetic Fiber Rope*." By Captain Joseph Murphy, 2008-2015. Marlinspike Seamanship. Lapwire. http://www.lapware.org/files/pdf/rope-1.pdf.

"Coir rope is made from coconut husk fiber and is a buoyant rope that does not become waterlog and does not decay in saltwater."

10. "*What is Coir? What is it, Uses and Advantages*." Online article @ Treasurie. https://blog.treasurie.com/what-is-coir/

11. "*Coir Fiber – Process and Opportunities: Part 1)*." By Akhila Rajan and T. Emilia Abraham. Published in *Journal of Natural Fibers*, Pages 33-35. September 25, 2008. http://dx.doi.org/10.1300/J395v03n04_03

12. "*Development of a Coir Fibre Extracting Machine*." By Temidayo Emmanuel Omoniyi and Emmanuel Bayo Ayodele. Published in International Research Journal of Engineering and Technology (IRJET). E-ISSN: 2395-0056. Volume: 07, Issue: 07, July 2020. www.irjet.net

13. "*Development of a Coir Fibre Extracting Machine*." By Temidayo Emmanuel Omoniyi and Emmanuel Bayo Ayodele. Published in International Research Journal of Engineering and Technology (IRJET). E-ISSN: 2395-0056. Volume: 07, Issue: 07, July 2020. www.irjet.net

"The traditional production of fibres from the husks as [ ] is a laborious and time-consuming process which highly pollutes water surfaces as observed by and results in the accumulation of large dumps of pith. After manually separating the nut from the husk, the husks are processed by various retting techniques, and generally in ponds of brackish waters (for about 3 – 6 months) or in salt backwaters or lagoons. This requires 10 to 12 months of anaerobic (bacterial) fermentation. By retting, the fibres are softened and can be decorticated and extracted by beating, usually by hand. After hackling, washing and drying (in the shade) the fibres are loosened manually and cleaned. […] The stronger fibres are washed, cleaned dried, hackled, and combed. The quality of the fibre is greatly affected by these procedures."

14. "*Coir: One of the Strongest Natural Fibers*." Published Online by Coir.com. https://coir.com/utility/coir-one-of-the-strongest-natural-fibers/

15. "*What is Coir? What is it, Uses and Advantages*." Online article @ Treasurie. https://blog.treasurie.com/what-is-coir/

"In fact, it's known as the oldest type of fabric that has been used worldwide throughout history. From Greek sailors to Polynesian navigators, coir has kept both boats and fishermen alive for centuries. Coir made possible a successful maritime history by those who lived throughout the Indian Ocean and adjoining seas."

16. "*The Secret Treasure of Oak Island, The Amazing True Story of a Centuries-old Treasure Hunt*." By D`Arcy O`Connor. 2018. Updated Version. Published By Rowman & Littlefield Publishing Group.

"See pages 22 & 23 for the description of the flood tunnel found by the Truro Group in 1850."

17. "*The Story of Oak Island – 1895*," By Frederick L. Blair. Included in *Buried Treasure*, part of Oak Island Treasure Company's Public Share Offering.

"See: Additional Information Included."

18. Figure #1. "*Filtration System Makeup*." Created by David H. Neisen

19. Figure #2. "*Flood Tunnel Design.*" Created by David H. Neisen

20. "*Oak Island Mystery Trees and other Forensic Answers*." By David H. Neisen, Robert C. Cook, and Christopher L. Boze, August, 2022. Hammerson Peters Publishing. Chapter 10, Cracking the Nut, page 304.

21. Figure #3. "*Extracted CCF*." Courtesy of iStock image

22. "*Bretons and Britons: Exploring Prehistoric Britain's French Connection*." By Barry Cunliffe, 2021. Summary published in *Current Archaeology*, 03-02-22, "Bretons and Britons: The fights for identify." Oxford University Press, £25, ISBN 978-0198851622 https://the-past.com/feature/bretons-and-britons-exploring-prehistoric-britains-french-connection/

23. "*Review of 'Cod: A Biography of the Fish That Changed the World*." By Richard Wolkomir, May 1998. Published in *Smithsonian Magazine*. Book titled *Cod: A Biography of the Fish That Changed the World*. By Mark Kurlansky, Jul. 1, 1998. Published by Penguin Books. https://www.smithsonianmag.com/arts-culture/review-of-cod-a-biography-of-the-fish-that-changed-the-world-152948483/

24. "*Review of 'Cod: A Biography of the Fish That Changed the World*." By Richard Wolkomir, May 1998. Published in *Smithsonian Magazine*. Book titled *Cod: A Biography of the Fish That Changed the World*. By Mark Kurlansky, Jul. 1, 1998. Published by Penguin Books. https://www.smithsonianmag.com/arts-culture/review-of-cod-a-biography-of-the-fish-that-changed-the-world-152948483/

25. "*Review of 'Cod: A Biography of the Fish That Changed the World*." By Richard Wolkomir, May 1998. Published in *Smithsonian Magazine*. Book titled *Cod: A Biography of the Fish That Changed the World*. By Mark Kurlansky, Jul. 1, 1998. Published by Penguin Books. https://www.smithsonianmag.com/arts-culture/review-of-cod-a-biography-of-the-fish-that-changed-the-world-152948483/

26. "*Review of 'Cod: A Biography of the Fish That Changed the World*." By Richard Wolkomir, May 1998. Published in *Smithsonian Magazine*. Book titled *Cod: A Biography of the Fish That Changed the World*. By Mark Kurlansky, Jul. 1, 1998. Published by Penguin Books. https://www.smithsonianmag.com/arts-culture/review-of-cod-a-biography-of-the-fish-that-changed-the-world-152948483/

27. "*Viking Hordes Dined on Frozen Norwegian Cod shipped to Germany*." By Andy Coghlan, Aug. 7, 2017. Published in *The New Scientist*. https://www.newscientist.com/article/2143059-viking-hordes-dined-on-frozen-norwegian-cod-shipped-to-germany/

> *"The dry-air freezing of Cod, allowed Vikings to travel as much as 2,000 kilometers and over a months' worth of sailing to bring their catch to hungry customers, even in Germany, The dried cod, properly treated, can last for more than five years."*

28. Figure #4. "*Drying cod in early Atlantic Provinces*." Published in *Eyewitness Accounts of Early Outport Life,* by Jenny Higgins. 2015, Newfoundland and Labrador Heritage Web Site. Illustration by Percival Skelton. From Joseph Hatton and MI. Harvey's, *Newfoundland, the Oldest British Colony* (London: Chapman and Hall, 1883) https://www.heritage.nf.ca/articles/exploration/eyewitness-accounts.php

29. "*List of Conflicts in Europe*." Published in Wikipedia Online. See https://en.wikipedia.org/wiki/List_of_conflicts_in_Europe

> "Revolt of Ghent (1449–1453)
> *During his visit to Ghent in January 1447, Philip decreed a semi-permanent tax on salt, after the French example of the gabelle. The gabelle was a very unpopular tax on salt in France, established during the mid-14th century and lasted, with brief lapses and revisions, until 1946. Repealed in 1790 by the National Assembly in the midst of the French Revolution, the gabelle was reinstated by Napoleon Bonaparte in 1806. It was briefly terminated and reinstated again during the French Second Republic and ultimately abolished in 1945 following France's liberation from Nazi Germany."*

30. "*List of Conflicts in Europe*." Published in Wikipedia Online. See https://en.wikipedia.org/wiki/List_of_conflicts_in_Europe

> "The Salt War (1540)
> *The war was a result of an insurrection by the city of Perugia against the Papal States during the pontificate of Pope Paul III. The principal result was the city of Perugia's definitive subordination to papal control."*

31. "*Preserving Japan's Sea Salt Making Tradition*." By Laura Cocora and Kaori Brand. Published in *Development & Society: Food, Security, Agriculture, Traditional Knowledge, Asia, Oceans*, Jun, 6, 2010. United Nations University. https://ourworld.unu.edu/en/preserving-japans-sea-salt-making-tradition

32. "*On the History of Salt Extraction*." Published online by *European Route of Industrial Heritage*. https://www.erih.net/how-it-started/history-of-industries/salt/

33. Figure #5. "*Japanese Style salt Extraction*." Courtesy Quora.com.

34. Figure #6. "*18th Century Scottish Salt Mills.*" Published in *Salt Harvesting: Turning Sea Water into 'White Gold' in a Fife Village*, By Angie Brown, BBC Scotland News. Jan. 9, 2021. Illustration by William Brownrigg. https://forums.canadiancontent.net/threads/salt-harvesting-turning-sea-water-into-white-gold-in-a-fife-village.169207/

35. "*Vikings: The Salty Dogs of the Northern Seas?*" By Beth Rogers. Article posted on Medievalist.net. Twitter @BLRFoodHistory. https://www.medievalists.net/2018/11/vikings-the-salty-dogs-of-the-northern-seas/

36. "*Chapter 10, Cracking the Nut - Formula*." By David Neisen, Chris Boze, and Robert Cook. Volume 1 – *Oak Island Mystery Trees and other Forensic Answers*, 08-28-2022.

> *"See page 306 (G): Again, 3 vertical ft of wet sand weighs approx. 390 Lbs. ft^3.[8] This would be sufficient pressure to compress +4 inches of volume of coconut fiber, over time, into 2 or 3 inch-thick horizon reported by searchers."*

37. "*Evidence for Medieval Salt-Making by Burning Eelgrass (Zostera marina) in the Netherlands*." By B. van Geel and G.J. Borger. Published in *Netherlands Journal of Geosciences-Geologie en Mijnbouw*, Vol. 84-1, 2005. Page 4, *Salt-making Based by Burning Peat*. https://www.cambridge.org/core/services/aop-cambridge-core/content/view/71677023A581BAE626B3B9829E45AB5E/S0016774600022897a.pdf/evidence-for-medieval-salt-making-by-burning-eel-grass-zostera-marina-l-in-the-netherlands.pdf

38. "*Evidence for Medieval Salt-Making by Burning Eelgrass (Zostera marina) in the Netherlands*." By B. van Geel and G.J. Borger. Published in *Netherlands Journal of Geosciences-Geologie en Mijnbouw*, Vol. 84-1, 2005. Page 4.

> *"See: Historical Evidence Concerning the Burning of Zostera for Salt-Making."*

https://www.cambridge.org/core/services/aop-cambridge-core/content/view/71677023A581BAE626B3B9829E45AB5E/S0016774600022897a.pdf/evidence-for-medieval-salt-making-by-burning-eel-grass-zostera-marina-l-in-the-netherlands.pdf

39. "*Evidence for Medieval Salt-Making by Burning Eelgrass (Zostera marina) in the Netherlands*." By B. van Geel and G.J. Borger. Published in *Netherlands Journal of Geosciences-Geologie en Mijnbouw*, Vol. 84-1, 2005. Page 4.

"See: Historical Evidence Concerning the Burning of Zostera for Salt-Making."
https://www.cambridge.org/core/services/aop-cambridge-core/content/view/71677023A581BAE626B3B9829E45AB5E/S0016774600022897a.pdf/evidence-for-medieval-salt-making-by-burning-eel-grass-zostera-marina-l-in-the-netherlands.pdf

40. Figure #7. "*Eelgrass harvesting in Nova Scotia*." Postcard owned by David H. Neisen.

41. "*Peat Moss vs. Coco Coir: What's the Difference Between These Go-To Gardening Supplies*?" By Audrey Stallsmith. Published Apr 20, 2022 @ Bob Vila Online. https://www.bobvila.com/articles/peat-moss-vs-coco-coir/

"University of Arkansas says both media retain water well, with peat moss "holding 60 to 68 percent of its volume in water" and coconut coir retaining 73 percent to 80 percent, "which is slightly higher than a typical sphagnum peat." Coco coir is "sweetest," with a pH between 5.8 and 6.9, Coir takes longer to decompose than peat and can even be reconditioned and reused. Coconut coir fiber is microscopically porous and can retain 78% of its weight in water."

42. "*Solubility Limit and Saturation*." Last updated Jul 20, 2016. Libre Texts. Chemistry online. https://chem.libretexts.org/Courses/Heartland_Community_College/HCC%3A_Chem_161/12%3A_Solutions/12.3%3A_Solubility_Limit_and_Saturation

"Dissolution and Precipitation. (a) When a solid is added to a solvent in which it is soluble, solute particles leave the surface of the solid and become solvated by the solvent, initially forming an unsaturated solution. (b) When the maximum possible amount of solute has dissolved, the solution becomes saturated. If excess solute is present, the rate at which solute particles leave the surface of the solid equals the rate at which they return to the surface of the solid. (c) A supersaturated solution can usually be formed from a saturated solution by filtering off the excess solute and lowering the temperature. (d) When a seed crystal of the solute is added to a supersaturated solution or oversaturated, solute particles leave the solution and form a crystalline precipitate."

43. Figure #8. "*Salty AM/FM Cod*." Image by CartoonStock.com. Modified by D.H. Neisen.

44. "*Desalination, also called Desalting, Removal of Dissolved Salts*." By Melissa Petruzzello, Feb. 24, 2023. Encyclopedia Britannica Online.
https://www.britannica.com/technology/desalination

"Desalinization from seawater and in some cases from the brackish (slightly salty) waters of inland seas, highly mineralized groundwaters (e.g., geothermal brines), and municipal wastewaters. This process renders such otherwise unusable waters fit for human consumption, irrigation, industrial applications, and various other purposes. Existing desalination technology requires a substantial amount of thermal energy, usually in the form of fossil fuels, and so the process is expensive. It is used only where sources of fresh water are not economically available. The desalting of seawater is an ancient notion."

45. "*Meteorologica, Vol. 1-5*." By Aristotle, 350 B.C.E. Translated by Erwin Wentworth Webster, 1923. Internet Archives Online. (Forbes 1948, Page 383)
https://archive.org/details/meteorologica00aris

46. *"Desalination, also called Desalting, Removal of Dissolved Salts*." By Melissa Petruzzello, Feb. 24, 2023. Encyclopedia Britannica Online.
https://www.britannica.com/technology/desalination

47. **"***The Sublime Prince of the Royal Secret from The Marriage of Elizabeth Tudor."* By Alfred Dodd. https://sirbacon.org/links/anne_&_sir_nicholas_bacon.htm

48. **"***Francis Bacon's Personal Life Story, Chapter VI: The Laying of Great Bases for Eternity (1579-1587)*." By Alfred Dodd.
https://sirbacon.org/links/anne_&_sir_nicholas_bacon.htm

49. **"***Did Francis Bacon Die in 1626? Or, Did he Feign His Death with the help of his Rosicrucian-Freemasonry Brotherhood?"* By A. Phoenix August 2021.

50. **"***The Marriage of Elizabeth Tudor 1940*." By Alfred Dodd. Section, Francis Bacon's Foster Parents. https://sirbacon.org/links/anne_&_sir_nicholas_bacon.htm

51. "*The Marriage of Elizabeth Tudor 1940*." By Alfred Dodd. Section - Francis Bacon's Foster Parents. https://sirbacon.org/links/anne_&_sir_nicholas_bacon.htm

52. "*The Marriage of Elizabeth Tudor 1940*." By Alfred Dodd. Section - Francis Bacon's Foster Parents. https://sirbacon.org/links/anne_&_sir_nicholas_bacon.htm

53. "*Sylva Sylvarum or, A Natural History in Ten Centuries*." By Francis Bacon, Compiled by Dr. Rawley, 1627. Kessinger Publishing, Rare Reprints.

> "See #**1-8**. *Experiments in consort, touching the straining and passing of bodies one through another; which they call Percolation.* #**881**. *Experiment solitary touching the dulcoration of salt water.* #**882**. *Experiment solitary touching the return of saltness in pits upon the seashore*."

54. "*The Shakespear Authorship Question, Who Wrote Shakespear?*" By Peter Dawkins, Dec. 2017. Published in *The Francis Bacon Research Trust*, Newsletter No. 80. www.fbrt.org.uk

> *"Very recently the solid wall of dogma concerning the Shakespeare authorship, in which even to ask the question was to be sentenced to eternal damnation in the eyes of orthodoxy, has begun to crumble. The first real evidence of this was the publication last year of the new edition of "The New Oxford Shakespeare: The Complete Works," by the Oxford University Press. In this orthodoxy of all orthodox publications the contents page list not just Shakespeare as involved in the writing of the works but also include Marlowe, Peele, Nashe, Barnfield, Griffin, Deloney, Raleigh, Jonson, Williams, and "Anonymous* [Bacon]*." – Peter Dawkins*

55. "*Bacon's Apples: A Case Study in Baconian Experimentation*." By Dana Jalobeanu. Institute in Research in the Humanities, University of Bucharest. Chapter 4, Francis Bacon on Motion and Power. International Archives of the History of Ideas. https:doi: 10.1007/978-3-319-27641-0_4

56. "*Sylva Sylvarum or, A Natural History in Ten Centuries*." By Francis Bacon, Compiled by Dr. Rawley, 1627. Kessinger Publishing, Rare Reprints.
"See Editor's Preface. http://www.kessinger.net ."

57. "*Sylva Sylvarum or, A Natural History in Ten Centuries*." By Francis Bacon, Compiled by Dr. Rawley, 1627. Kessinger Publishing, Rare Reprints.
"See Pgs 7, 8, 10, 58, 59, 103, 121. http://www.kessinger.net ."

58. *"Sylva Sylvarum or, A Natural History in Ten Centuries."* By Francis Bacon, Compiled by Dr. Rawley, 1627. Kessinger Publishing, Rare Reprints.
*"See Page 121. See **#882**. Experiment solitary touching the dulcoration of salt water:"*

59. **"*Two Ancient Functioning Shallow Water Wells on the island in Vicinity*."** COOI Episode SE06/EP20,"*Short Days and Tall Knights*" well discovered on Lot 16. Aired 04-09-19. And COOI Episode SE10/EP13, "*All's Well.*"
"Well discovered on Lot 26, twig in well dated to = 1100 AD, *(1028-1172). Aired 02-20-23."*

60. **"***The Past, Present, and Future of Water Filtration Technology*." Online @ HistoryofWaterFilters.com. http://historyofwaterfilters.com/early-water-treatment.html *and,* https://en.wikipedia.org/wiki/History_of_water_filters

61. "*Water Desalination History, Advances, and Challenges*." By Manish Kumar, Tyler Culp, and Yuexiao Shen. Dec. 19, 2016. Published in *Winter Bridge on Frontiers of Engineering,* Volume 4, Issue 46. National Academy of Engineering https://www.nae.edu/19579/19582/21020/164237/164313/Water-Desalination-History-Advances-and-Challenges

62. *"Cape Land Forms – Definition, Formation, and Examples."* https://study.com/academy/lesson/cape-in-geography-definition-examples.html
"A cape refers to a landform that juts or extends into a body of water, such as an ocean, river, bay or lake, creating a clear change in the shape or composition of the coastline. A large cape is called a peninsula. There are five types of capes, each characterized." See last page map, Figure #12.

63. "*Ancient Peoples and Modern Ghosts*." By G. Young,1980. Canada.
"Coastline map reflect Oak Island as part of the mainland in 1382 AD.**"**

64. "*A System and Method for Treating Wastewater Using Coir Filter."* International Patent Publication No.# WO-2004/098083-A3. Canadian Intellectual Property Office. Posted Nov. 18, 2004. Page 12.

65. "*A System and Method for Treating Wastewater Using Coir Filter."* International Patent Publication No.# WO-2004/098083-A3. Canadian Intellectual Property Office. Posted Nov. 18, 2004. Page 11.

66. "*Coir Draining Blanket for Consolidation*." By M. Sudhakaran Pillai. Published at *International Seminar on Technical Textiles*, Mumbai, India, Jun. 2-3, 2001. Central Institute of Coir Technology, India Coir Board, Bangalore, India.

> *"Coir Blanket is a matting, screen-type blanket or covering made of woven or non-woven coconut coir fiber. While performing as a separator, the coir blanket acts as a filter allowing water to pass through or into the plane. It tends to confine the supporting aggregate beneath the pressure aggregates, and able to retain reinforcement within itself. The installed coir blanket permits water entering to be transmitted laterally, away from the areas of loading. As a barrier, the blanket prevents the inter mixing of materials from either side."*

67. **"***Soil Sloughing*." https://en.wikipedia.org/wiki/Soil_sloughing

> *"Sloughing is when soil is falling off banks and slopes due to a loss in cohesion. Soil sloughs off for the same reasons as landslides in general, with very wet soil being among the leading factors. Sloughing is a relatively shallow phenomenon involving the uppermost layers of the soil."*

68. "*A System and Method for Treating Wastewater Using Coir Filter."* International Patent Publication No.# WO-2004/098083-A3. Canadian Intellectual Property Office. Posted Nov. 18, 2004. Pgs 22-24.

69. "*Coir Geotextiles as Separation and Filtration Layer for Low Intensity Road Bases*." By K. Rajagopal, S. Ramakrishna **IGC 2009**, Guntur, INDIA. 76 pages.

70. "*Coir Geotextiles as Separation and Filtration Layer for Low Intensity Road Bases*." By K. Rajagopal, S. Ramakrishna **IGC 2009**, Guntur, INDIA.

> *"With its tactile strength bond with the coir geotextile for the load transfer to take place a layer of coir geotextile, the reinforcement layer at the mid-depth of gravel prevents its lateral spread and hence higher loads are mobilized in coir reinforcement which contributes to the increase in ultimate pressures. This can also be explained by the good bond between the coir and the gravel as shown from the interface shear strength properties (section 2.3)."*

71. "*The Journal of Natural Fibers,"* Researched this type of functionality and its findings are published in "*Coir Fiber – Process and Opportunities*.

72. "*Coir Geotextiles as Separation and Filtration Layer for Low Intensity Road Bases*." By K. Rajagopal, S. Ramakrishna **IGC 2009**, Guntur, INDIA.

> *"See Conclusion,* Page 946*. "The physical and hydraulic properties of these coir woven geotextiles are quite comparable to those of non-woven geotextiles."*

73. Figure #9. "*Coir Blanket Similarities with Fiber at Smith's Cove.*" Courtesy, Grainger Co. https://www.grainger.com/product/Erosion-Control-Blanket-8-34FY06

74. "*The Essential Fishing Gear Checklist for Outdoorsmen*." By Chris Wright. Published in *Men's Health Online*. Jun. 1, 2020. https://www.menshealth.com/technology-gear/g32731941/essential-fishing-gear/

75. "*The Vinland Sagas: The Icelandic Sagas about the first Documented Voyages across the north Atlantic: The Saga of the Greenlanders and Eirik the Red's Saga*." Translated by Keneva Kunz. Published 2008, Penguin Publishing. New York. https://archive.org/details/vinlandsagasicel0000unse/page/44/mode/2up

76. "*All About the Fish Weir: A Tool of Subsistence Farmers for 8,000 Years or More*." By Prof. K. Kris Hirst. Published online at *Thoughtco*. Updated 01-26-2018. https://www.thoughtco.com/fish-weir-ancient-fishing-tool-170925

77. *"Fish Catching Methods of the World*." By A. Brandt. 3rd. Edition. Published in Fishing News Book, 1984. Farmingham, UK.

78. "*Fishing Gear types: Barriers, Fences, Weirs, etc..*" FAO 2023. Technology Fact Sheets. Fisheries and Aquaculture Division, Online. Rome. Accessed Jul. 20, 2023. https://www.fao.org/fishery/en/geartype/228/en

79. "*Traditional Fishing in Africa*." Posted online. https://www.reelcoquinafishing.com/blogs/florida-fishing-blog/traditional-fishing-techniques-around-the-world

> *"Fishermen use a "digging-out" technique to catch catfish. This involves digging a hole in the riverbank. When the tide goes out, the catfish are stranded in the hole. The fisherman then simply scoops them out with his hands."*

80. "*Flatfish*." https://www.thecanadianencyclopedia.ca/en/article/flatfish

81. "*How to Fish for Flounder: The Complete Guide*." By Andriana. Published in Fishing Booker Blog, May 3, 2023. https://fishingbooker.com/blog/flounder-fishing-beginner-guide/

82. "*Thick-skinned Russian soldiers down with Radiation Sickness after Fishing, Digging Trenches in Chernobyl*." By Abhishek Awasthi. Published online in *World News*. Last updated Apr. 30, 2023.

83. *"How Did Vikings Fish?*" By the authors of Give Me History, Online. Updated Feb. 7, 2023. https://www.givemehistory.com/how-did-vikings-fish and… https://www.givemehistory.com/author/editorial-staff

84. *"Sods, Soil, and Spades: The Acadians at Grand Pre and their Dykeland Legacy."* By Bleakney J. Sherman, 2004. Montreal. McGill-Queens University Press.

85. *"The Trailblazing Technology of Viking Ships*." Written by Stephanie Nikolopoulos, November 14, 2023. Published Online at Thomas, Industry Insights – Engineering & Design. https://www.thomasnet.com/.../the-trailblazing.../

"The Viking longships could withstand the choppy waters of the ocean because, although they were strong, they were engineered to maintain a certain suppleness that allowed them to absorb shock. To accomplish this, the Viking shipbuilders did not nail the wooden boards tightly together. Rather, they were constructed of overlapping planks that were caulked with wool and tar and affixed with iron clinker nails. This allowed them to bend instead of break. The American Society of Mechanical Engineers (ASME) notes that the Vikings understood how important flexibility was to the structural integrity of their ships far before most other shipbuilders did."

86. "*Illustrated Glossary of Ship and Boat Terms*." By J. Richard Steffy. Edited by Ben Ford, Donny L. Hamilton, and Alexis Catsambis. The Oxford Handbook of Maritime Archaeology. https://DOI: 10.1093/oxfordhb/9780199336005.013.0048

"Oakum *[Oakham]. Caulking material made from rope junk, old rope, and rope scraps; it was unwound, picked apart, and the fibers were rolled and soaked in pitch before being driven into planking seams."*

87. "*War at Sea in the Middle Ages and the Renaissance*." By Timothy Runyan, 2003. Warfare in History, Vol. 14. Editors John B. Hattendorf and Richard W. Unger. Woodbridge, Suffolk: Rochester, New York. Boydell Press. Pgs 53-68. *ISBN 978-0851159034.*

"Caulking was generally tarred moss that was inserted into curved grooves, covered with wooden laths, and secured by metal staples called sintels."

88. "*The Indian Ocean*." World Factbook. Published Online at *Go to CIA.org*. https://www.cia.gov/the-world-factbook/oceans/indian-ocean/

89. "*Seasonal variability of salt transport during the Indian Ocean monsoons*." By Ebenezer S. Nyadjro, Bulusu Subrahmanyam, and Jay F. Shriver. First published Aug. 27, 2011. https://doi.org/10.1029/2011JC006993 or, See...

"*Transport of Freshwater by the Oceans*." By S.E. Wijffels, R.W. Schmitt, H.L. Bryden, and A. Stigebrandt, 1992. Published in *Journal of Physical Oceanography*, 22, pgs.155–162. https://DOI:10.1175/1520-0485(1992)022<0155:TOFBTO>2.0.CO;2 . https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2011JC006993

"The magnitudes of E, P and R define the surface freshwater flux of a region and they show significant variability in the Indian Ocean. This is as a result of the seasonal reversal of winds, which causes monsoon cycles to vary greatly thereby affecting the distribution and variability of sea surface salinity (SSS) [Levitus, 1988; Nyadjro et al., 2010]. Surface salinity is higher in the northwestern end as a result of E exceeding P in the Arabian Sea (AS) and lower in the northeastern end due to higher precipitation in that region, river runoff into the Bay of Bengal (BoB) and low-salinity water from the Indonesian Throughflow (ITF) [Piola and Gordon, 1984; Donguy and Meyers, 1996; Joseph and Freeland, 2005]."

90. "*Chapter 9, I'll Take 2000 Bahars to Go, Please*." By David H. Neisen, Christopher L. Boze, Brent Sallans, 2004. Published in *Oak Island Mystery Trees and other Forensic Answers- Fibrosity*.

91. Figure #10. "*Indian Ocean Basin Monsoonal Wind Patterns*." Interregional Trade during the Postclassical Era. Published on *Slide to Doc.com*. https://slidetodoc.com/interregional-trade-during-the-postclassical-era-eq-how/

92. "*Seasonal variability of salt transport during the Indian Ocean monsoons*." By Ebenezer S. Nyadjro, Bulusu Subrahmanyam, and Jay F. Shriver. First published Aug. 27, 2011. https://doi.org/10.1029/2011JC006993

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> *"The wide array of uses of coconut coir byproducts such; as nets, cordage, rope, standing rigging, running rigging, fenders, hammocks, mats, hawsers, laid rope, mooring line are well documented, and uniquely applied to early maritime history of the Indian Ocean."*

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> *"9,427.1 nautical miles from Kerala, India to Cape of Good Hope, South Africa. Plus 7,456 nautical miles from Cape of Good Hope, South Africa, to Halifax, Nova Scotia, Canada. Total travel distance is 16,883.1 nautical miles. This includes stops and known ports along the route."*