

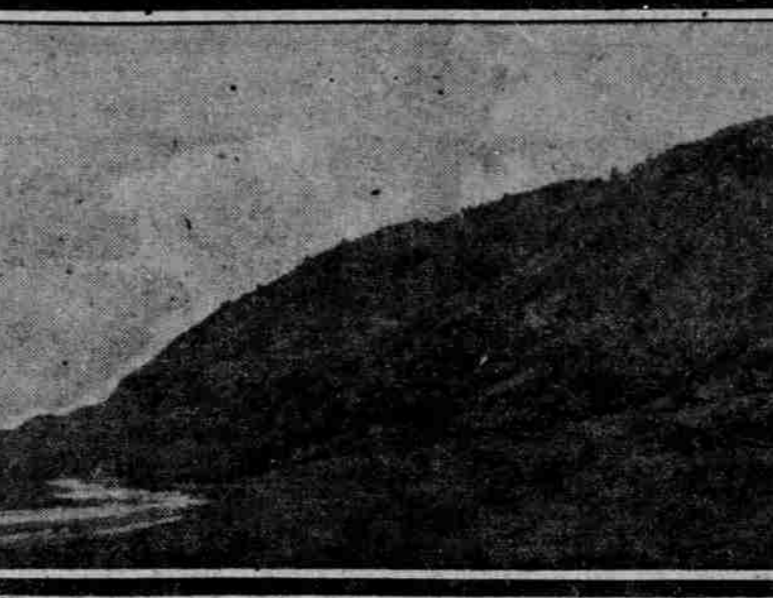
ALL ABOUT THE BEESWAX OF NEHALEM BEACH

No Doubt It Is Part of the Wreck of a Spanish Vessel, Probably En Route to Mexico

O. F. Stafford, Professor of Chemistry, University of Oregon, Gives the Facts and Opinions



MASS OF WAX SHOWING OUT-LINES OF SMALL CAKES AND A LARGE CANDLE PORTLAND CITY MUSEUM



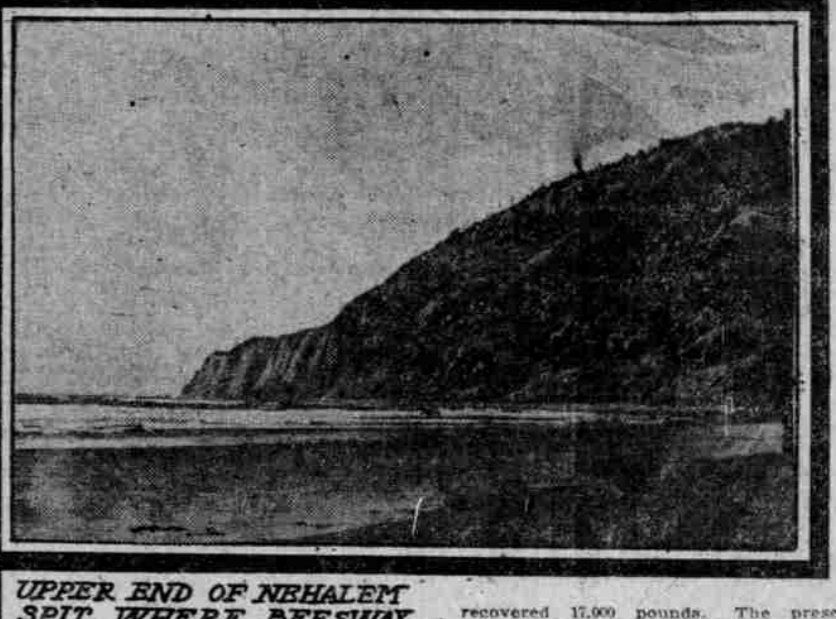
NEKANIE MOUNTAIN



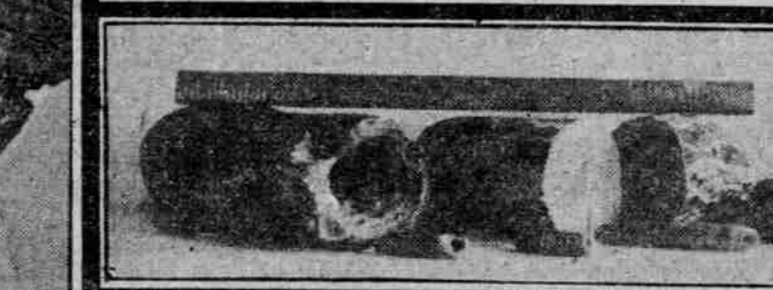
LARGE CAKE OF NEHELEM WAX, SHOWING ENGRAVED CHARACTER THIS CAKE WHEN WHOLE, MEASURED ABOUT 20x6x16 INCHES. PORTLAND CITY MUSEUM



UPPER END OF NEHELEM SPIT, WHERE BEESWAX WAS FOUND.



LARGE MASS OF NEHELEM WAX PORTLAND CITY MUSEUM



PIECES OF CANDLES IN POSSESSION OF AUTHOR THE FRAGMENT AT THE LEFT OF THE PICTURE, HAS A CONICAL HOLE IN THE BASE, FOR THE RECEPTION OF A PEG OR CANDLE-STICK TO SUPPORT IT WHILE IN USE



FRAGMENTS OF CANDLE PORTLAND CITY MUSEUM



FRAGMENTS OF CANDLE PORTLAND CITY MUSEUM

THIRTY miles south of the mouth of the Columbia the Oregon coast line, which for a greater part of the distance has been composed of picturesque rugged headlands and most charming stretches of ocean beach, swings around the sacred mountain Nekanie, of the Indians, and spreads out within a distance of two or three miles into a flat, sandy spit which serves to separate Nehelem Bay from the Pacific. Here is a spot not only beautiful in its surroundings, but rich in mysterious legends of shipwreck and buried treasure, as well as vague traditions regarding the first-comings of white men to the great Northwest. There are now, to be sure, no certain relics of the shipwrecks, and about all that remains to recall the traditions are occasional pieces of wax rescued from the sands of the spit, perchance, by a passer-by. It is of this wax particularly that the present article will deal, for it has long been a subject of interest, speculation, and even of warm controversy. In this substance many have tried to fathom an ancient mystery of the sea; others have hoped to find it a guiding index to a vault in Nature's treasure-house. It has been at once an enigma to the theorizing antiquarian, the despair of the sordid prospector, and the solace of the newspaper space-writer. Yet when all of the evidence bearing upon the matter is summarized the enigmatical aspects of the question are seen to disappear almost completely.

First Historical Mention.

For our first historical mention of this wax deposit we are indebted to that admirable representative of the Northwest Company, Alexander Henry, who in company with David Thompson, official geographer of the same company, made an expedition down the Columbia to the present site of Astoria in the winter of 1811-1812. Henry's journal reproduced and annotated in Cline's "New Light on the History of the Greater Northwest" (Vol. III contains, under the date of December 8, 1811, at which time Henry was at Astoria, the following notation:

The old Clatsop chief arrived with some excellent salmon and the most of a large "hoop" (deer). There came with him a man about 20 years of age, who has extraordinarily dark red hair, and is the supposed offspring of a ship that was wrecked within a few miles of the entrance of this river many years ago. Great quantities of beeswax continue to be dug out of the sand near this spot, and the Indians bring it to trade with us.

Personal Corroboration.

Honore S. Leman, in his "History of Oregon," gives an interesting discussion of the first appearance of white men upon the Oregon coast as preserved in Indian traditions. His main authority is Silas B. Smith, an intelligent half-breed, whose mother was a daughter of the Clatsop chief Kolanaway. Mr. Smith made a special study of the traditions of his mother's people, as a result of which he assigns the earliest comings of white men to three separate occasions, the sec-

ond of which was the wrecking of a vessel near Nehelem. To quote from Lyman: "The Indians state that the ship of the white men was driven ashore here, and wrecked. The crew, however, survived, and reaching land lived for some time with the natives. A large part of the vessel's cargo was beeswax. But in the course of several months the white men became uncontentious to the Indians because of violating their marital relations. The whites were consequently killed, but fought in defense themselves with slingshots, as Mr. Smith notes, this would indicate that they had lost their arms and ammunition.

This account, it is to be observed, agrees essentially with the details given by Henry. References to the wax other than those just given are rather infrequent until recent times. Belcher, an early navigator, obtained some specimens in 1837. It is said that six tons of wax from the mouth of the Columbia were received at a Hawaiian port about 1847. Professor George Davidson, of the United States Coast and Geodetic Survey, while at Cape Disappointment in 1861 obtained a specimen which had been picked up on Clatsop beach. Later, in the Coast Pilot for California, Oregon and Washington Territory, 1869, Professor Davidson describes the wax deposit and evidences of the wreck from which it supposedly came. Others to refer to the subject are C. W. Brooks, in a paper before the California Academy of Science, 1875, and H. M. Davis in a communication to the American Antiquarian Society, April, 1882.

When Scientists Tried to Unset Facts

During this whole period of 80 years, extending from 1812 to 1892, no one seems to have questioned that the deposit of wax was due to any other cause than the thing traditionally accepted as its origin—a wrecked vessel. The only difference of opinion apparent in the matter was regarding the nationality of the vessel, some investigators having it of Spanish ownership, others of Chinese or Japanese. In 1893, however, a new aspect was introduced by two circumstances. The first was an opinion rendered regarding the nature of the wax by the commissioner in charge of the Austrian exhibit at the Columbian Exposition. A part of this exhibit consisted of ozokerite, a wax of mineral origin which is of considerable economic importance, and the commissioner in charge did not hesitate to pose

as an expert authority in judging substances of this kind. A sample of Nehelem wax was submitted to this official by Colonel A. W. Miller, of Portland, with the result that it was pronounced ozokerite. It should be noted, however, that a chemist in the employ of the expedition to whom the same sample was submitted insisted that it was beeswax, pure and simple.

The second circumstance tending to raise the question as to whether the substance might be beeswax or ozokerite was the publication of a series of three articles in Science (New York) during the Summer of 1892. The first of these, appearing in the issue of June 16, was by George P. Merrill, head curator in the department of geology, United States National Museum, Washington, and was descriptive of samples of Nehelem wax received from a correspondent at Portland, Or. Quoting from this article:

The samples are of a material closely resembling, if not identical with, beeswax. Such it would unhesitatingly have been pronounced but for certain stated conditions relating to its occurrence. The material is a grayish color on the outer surface, indicating oxidation, but internally it has all the characteristic of genuine beeswax, as regards physical conditions, color, smell, melting point and conduct toward chemical reagents. It is said to be found in masses of all sizes up to 250 pounds weight; that it occurs in the sand, being found while digging clams at low tide and at a depth of 20 feet below the surface when digging wells. The material has been traced for a distance of 20 miles up the river. Tradition has it that many hundred years ago a foreign vessel laden with wax was wrecked on this coast. This, at first thought, seems plausible, but aside from the difficulty in accounting for the presence in these watery sands at that date of a vessel loaded with wax, it seems scarcely credible that the material could be brought in a single cargo in such quantities nor buried over so large an area.

My correspondent states that the material has been mined by the whites for over 20 years, but not to any great extent excepting the last eight or ten years, during which time many hundred tons have been shipped to San Francisco and Portland. Concerning the accuracy of the above account the present writer knows nothing. It is here given in the hope of gaining more information on the subject.

The above communication is obviously an admission of complete mystification upon the part of its writer. He has little doubt about the substance being beeswax; in fact, in a later note to the

present writer he says he had no doubt about it. Yet the facts regarding the way the wax is found, as reported to him, are absolutely incompatible with any credible occurrence of beeswax. It was simply a matter of requiring more information, and the article is virtually an appeal for such.

Insufficient Proof.

Two articles were almost immediately published in Science in response to this appeal. The first was from Judge J. Wickersham, of Tacoma, Wash., who shows by reference to the writings of Brooks, Davidson and Davis that many shipwrecks of Oriental vessels actually have occurred upon American shores, and that therefore a wreck as the source of the wax was at any rate within the limits of possibility. He also calls attention to an error made in the information to Mr. Merrill regarding the amount of wax that had been recovered—no such quantities as those mentioned were ever found.

The second article was from the pen of C. D. Hiccox, of New York. It is a little peculiar in that it leaves the reader with a strong doubt about its writer ever having even seen a sample of Nehelem wax. There is given a description, to be sure, which would apply equally well to true beeswax, Nehelem wax, or ozokerite, but from the language of the article it is impossible to say which was meant. For the rest the author evidently simply consulted a dictionary and reproduced a lot of statistics for ozokerite. Although this article is often cited as an authority in discussions of Nehelem wax, such citation is not justified for the reason that there is not to be found in it a single significant statement for which there is any proof.

The situation, after these developments of 1893, was not altogether clear to the average citizen without scientific training who might be interested in unusual natural products of his country. The old belief that Nehelem wax was beeswax, while not entirely discredited, was at any rate suddenly in the doubtful list. The doctors were unable to agree, apparently, which was further proof that there were at least two sides to the question. And if this were so, why not the possibility of great ledges of this material—at 15 cents per pound? Or, better yet, widespread strata of oil-bearing sands

down deep below, which should supply this Northwestern country with easily needed heat units? It is not difficult to arouse public interest—sometimes. The interest created in this instance had at least one good result, in that it brought about an examination of the Nehelem field by a competent geologist.

Dr. Diller's Investigation.

Among other duties assigned during the Summer of 1896 to Dr. J. S. Diller, one of the ablest field geologists of the United States Geological Survey, was an investigation of this problem. Dr. Diller made his findings public through a letter to The Morning Oregonian of March 27, 1896. This letter is not only the most authoritative discussion ever published upon the subject of Nehelem wax, particularly as regards its geological aspects, but also deals so briefly with a number of other points at issue that several paragraphs are bodily reproduced here. Dr. Diller says:

During a trip from Astoria southward along the coast the only place where we found fragments of the wax was near the mouth of the Nehelem. At this point it occurs buried in the deep sand just above the present high-tide limit. From the accumulated sediments of the river the beach is gradually growing seaward, and not many generations ago the sea reached the place now occupied by the wax. Mr. Edwards, who was my guide at the place, showed me the stakes marking the areas already dug over by himself in obtaining the deep sand within ten feet of the surface. He expected to continue from here later in the summer, but regarded the locality as almost "mined out." We picked up several small fragments coated with sand, and he showed me others previously collected. Among the latter were several short, cylindrical, hollow pieces, the candles, from which the wax had disappeared. A few larger pieces, weighing from 30 to 75 pounds, were found some years ago by Mr. Edwards, and also by Mr. Colwell. They bear marks apparently of trade, and it is not unlikely that they were once used as far as I could learn, close to the high-tide limit. From the Nehelem beach it has been spread along the coast southward by the strong seabreezes of Summer and northward by the storms of Winter.

There are two coal fields on the Nehelem, one in Columbia County, and the other in Clatsop near the mouth of the Nehelem, but nothing whatever occurs in either field which resembles the wax, and it is evident that it was not derived from the adjacent land, but was transported in a body by the sea and dumped out far from its present position. Its mode of occurrence and the marks upon it clearly indicate that the material is not a natural product of Oregon, but they do not prove that it is wax and not ozokerite brought from elsewhere. The two substances, although very similar in their general composition, are readily distinguishable by chemical tests. H. N. Stokes, one of the chemists of the Geological Survey to whom it was referred for examination, says: "The substance in question is characterized by its easy decomposition by warm, strong, sulphuric acid, and by being gelled by boiling with alcoholic potassium soap which dissolves in hot water, and from which acid is thrown down insoluble fatty acids. In view of this behavior the material is evidently wax and not ozokerite."

The Ozokerite Hypothesis.

It is difficult to understand how anyone could deliberately summon the temerity requisite for calling into question the points established so thoroughly by Dr. Diller, and indeed, it must have been because of an entire ignorance of his work that the subject was opened up again in 1903 by adherents of the ozokerite hypothesis. An analysis of the arguments presented by these people at this time show that they are founded upon two main assertions, viz., that the amount of wax taken out and sold is far greater than could have been carried by a ship of a hundred or two hundred years ago, and that the substance actually proves to be ozokerite by analysis. Now the first of these assertions is unestablished by any proof whatsoever, while the second is fully met by the evidence of Merrill and Stokes. Yet it is interesting to follow out the proofs offered, as they were advanced honestly with the full belief that they established their case. Naturally, it is impossible to arrive at any very accurate estimate upon the total amount of wax contained in the Nehelem deposit, or obtained from it. The believers in the ozokerite idea make estimates running as high as hundreds of tons, it being asserted that one man

recovered 17,000 pounds. The present writer, however, after due investigation, is unable to account for so much. It is hardly probable that the early Indian traffic, such as Henry mentions, could have been very extensive. The Indians themselves, it is likely, had but little use for the wax, and there is no known record of any considerable trade in this substance by the early whites. The first hint of any extensive traffic is contained in the unauthenticated report referred to above that six tons were shipped to Hawaii about 1847. From this time until about the 80s, the only record concerning the recovery of wax is a notation by J. J. Gilbert, of the United States coast and geodetic survey, who made the survey of this part of the coast. He learned that early settlers had plowed the site of the old wreck and obtained 42 pounds of the wax which was sold as beeswax. Dr. Diller's guide and informant, Mr. Edwards, is said to be no longer living, so that further testimony from him is not available. He is accredited, however, by all old residents of the Nehelem country, from whom it has been possible to get the contents of a liberal estimate put by a greater amount of wax than any other person. Mr. Edwards' own estimate of the amount of wax obtained by him, as he gave it to the United States coast and geodetic survey, was almost three tons." Mr. D. S. Boyakin, at present and for many years past a resident of Nehelem, and who, as a merchant, has kept a record of the traffic affairs of all sorts in that locality, estimates that Edwards and other active wax gatherers known to him have secured in all not much over four tons. This, added to the six tons that may have been shipped to Hawaii in 1847, gives ten tons. Another ton or two for Indian traffic, etc., probably places a liberal estimate upon the whole amount recovered. It is almost impossible to find a piece of the wax upon the beach at the present time, and the consensus of opinion among the most expert in the field is that the deposit is practically exhausted. The available facts, then, are not incompatible with the wreck hypothesis, far as the amount of wax to be considered is concerned.

What Analyses Show.

Now as to the analyses reported to prove the substance ozokerite. A preliminary word of explanation should be given here, perhaps, in order that there may be in the minds of everyone a clear idea of the difficulties to be met in considering questions of this kind. Nature has curiously made a great many things in such a way that whereas they are fundamentally entirely different, they may possess certain resemblances which are calculated to deceive even experienced observers unless they exercise great caution. Rock crystal and diamond, for example, may resemble each other so as to make it difficult for even an expert to tell which is from a visual or tactile examination. Chemical analyses or more exact physical examinations, however, at once reveal the difference. In the present case it is a matter of distinguishing between the well-known substance, beeswax and ozokerite, the latter, in its natural state being wax material varying in color from creamy white through many shades of yellow, brown, green-brown, to black. The external resemblance between the two substances may be very close although the chemical characteristics are distinctly different, as are also those physical distinctions which can be numerically gauged, such, for example, as the temperature of melting. This matter is well illustrated in the table given below showing such characteristics for a number of different waxes. From this it may be readily understood, it is hoped, how one who might depend upon mere external appearances to decide this matter might be mistaken. It is a case where the chemical properties of the substance must be depended upon, the determination of which can be made only with expensive appliances and with a considerable expenditure of time. A hasty examination not accompanied by chemical tests is certain to be unreliable, and the reports of analyses offered in support of the ozokerite idea have every appearance of being that very sort. It will take but a moment to pass a review in order that they may be fairly compared with the painstaking work of the Government scientists already given, and with the results of some other work done right here in Oregon which will follow immediately.

Facts Discussed.

A review of the statements of authority under consideration should begin with mention of the opinion rendered by the Austrian commissioner at Chicago and the paper by Hiccox, both of which have been discussed above. The Dearborn Drug & Chemical Company, of Chicago, made a report to Dr. August C. Kinney, of Astoria, indicating that the