

ISSUED EVERY MORNING, (Monday Excepted).

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THE CITY.

The Daily Astorian will be sent by mail to any address, free of postage. Readers who contemplate absence from the city can have the Astorian follow them. DAILY or WEEKLY editions to any post-office without additional expense. Addresses may be changed as often as desired. Leave orders at the counting room.

Fresh California butter just received and for sale by J. Strauss.

Mr. E. C. Holden auctioneer advertises his regular sale at 2 p. m. today.

Best Salem flour is sold in this city at \$5.50 per barrel by Warren & McGuire.

The Prince Amadeo has completed her cargo of wheat, she has on board 88,429 bushels, valued at \$35,500.

Warren & McGuire have the early rose potatoes for seed. Farmers, please remember this.

The wind in Astoria on Thursday morning was but a quiet zephyr when compared with it up the Columbia and Willamette rivers.

Onion sets, sugar corn and garden seeds, at J. W. Gearharts. Also, best Salem flour sold at \$5.50 per barrel.

We understand that Mrs. Eliza Kinney of Salem, will soon build on the lot in Union house block, which she has lately bought of Mr. Job Ross.

Services at Presbyterian hall, Sabbath morning and evening, will be conducted by the pastor Rev. E. N. Condit. A cordial invitation extended to all. Sabbath school at 12 o'clock.

We learn from the Oregon Daily Statesman that Mr. G. W. Gray has been elected mayor of Salem by the common council to fill vacancy occasioned by the resignation of Professor Thea. Gatch.

The British ship Centennial came down from Portland yesterday in tow of the Ordway, Reed pilot, and is now laying at the Oregon Steam Navigation company's upper dock, receiving balance of cargo from barge alongside.

Hill's theater has been enlarged and refitted, and the new private boxes will be opened to-night for the first time. The new drop curtain and scenery executed by Mr. W. West is an artistic piece of workmanship.

Rev. J. T. Wolfe will discourse in the Congregational church tomorrow morning on "Man's life a Plan of God," and in the evening on "Christian Faith." Sabbath school, Judge Bowley superintendent, will assemble immediately after the morning sermon.

In consequence of the fact that Mr. Carl Adler must go below, in about fifteen days, and must have money, he has marked his goods down and is selling at reduced rates to make room for new goods. Persons in want of Blank Books, Stationery, Brackets, frames, toys, baby-carriages, or anything in his line, are invited to call around.

The attention of our readers is directed to the advertisement of E. C. Holden in another column, announcing a special sale of valuable furniture "for account of whom it may concern," on Tuesday next 11th, inst., at half past ten a. m. Parties furnishing private residences or boarding houses preparatory to the opening of the fishing season will do well to avail themselves of this opportunity of buying good furniture at auction prices.

Real Estate Sale.

Mr. E. C. Holden, real estate agent, yesterday effected the sale of a valuable lot, belonging to Job Ross, esq., situated in the heart of the city.

The Columbia River Bar.

Its History During the Present Century.

Report of Major Gillespie.

UNITED STATES ENGINEER OFFICE, 1 Portland, Oreg., December 18, 1878.

GENERAL: I have the honor to forward herewith my report on the survey of the bar at the mouth of the Columbia river, Oregon, made in compliance with the requirements of the river and harbor act approved June 18, 1878.

This survey was intrusted to the charge of my predecessors, Maj. J. M. Wilson, corps of engineers, and was conducted in person by Lieut. A. H. Payson, corps of engineers, who was by a telegraphic order from the chief of engineers, dated August 15, 1878, temporarily detached from the orders of Lieut. Col. C. S. Stewart, corps of engineers, at San Francisco, and assigned to this district for that purpose.

On relieving Major Wilson, in compliance with special orders No. 193, paragraph 3 current series, headquarters of the army, adjutant-general's office, the duty of submitting plans and estimates for the permanent improvement of the bar developed upon me. The able and comprehensive report of Lieutenant Payson for the survey of the mouth and bar of the Columbia river, to which is appended a supplementary report on the current observations, taken in both north and south channels and inside of the river's mouth, gives a summary of the changes which have occurred since the survey of 1869 by the United States coast survey, and enables one to form a very clear conception of the condition of the river's mouth and bar at the present time, and to judge approximately of the forces at work there tending to disturb the relations between the two channels through the outer bar, to modify their depths and directions, and to distort the form and positions of the inner-lying shoals.

The entrance to the river's mouth from the sea is virtually 6 miles wide, extending from Cape Hancock, or Disappointment, on the north shore to Point Adams on the south. The whole area comprised between these points, however, is not available for navigation; from the former, a shoal makes out to the southwest, forming what is called the north breakers, or Peacock spit; and from the latter, a shoal toward the northwest, forming Clatsop spit; between these two shoals, and lying somewhat inside of them is a consistently-shifting Sand island, which is at the present time nearly 1 1/2 miles in length by 1,000 to 1,200 feet in width. From the western end of this island the submerged bank known as the middle sands extends within the 3-foot curve in a direction a little south or west for nearly four miles, and thence runs south for an equal distance parallel to and overlapping Clatsop spit. The griddle or submerged sands in front of the river's mouth is crossed by two channels leading into the river; one passing north of the middle sands, and called the north channel; and the other passing south of the middle sands, and called the south channel.

These channels unite east of the eastern end of Sand island. The north channel is wide, deep and straight in its outer part, and has 23 feet at low water on the bar, but on the inside, near its union with the south channel, there is a bad shoal about half a mile wide, with only 15 to 17 feet of water upon it. The south channel, though shoaler and more tortuous than the former in its outer reach, is yet the one principally used by shipping at the present time. This preference is due in part to the protection and cover given to its entrance by the middle sands, and to its being the more direct and convenient route for vessels making the harbor from the south. It has at mean low water a depth of 20 feet on the bar, though the tides sometimes reduce this depth by 1 or 2 feet, and a minimum width between the 18-foot curves of about three-fourths of a nautical mile. During ordinary weather, then, the bar can be conveniently crossed at mean low water by vessels drawing not to exceed 20 feet, a depth which is rarely exceeded by the shipping of the port.

The outer harbor, however, is particularly sensitive to high winds and their consequent seas, and there are times when sailing vessels are detained in port or at sea for several weeks waiting for the sea to grow sufficiently calm on the bar to enable them to cross. Steam-vessels are not so much embarrassed by this state of affairs, and their detention is seldom protracted beyond one or two days. From early autumn to spring, shipping has its most trying experiences in entering or leaving the harbor. During this period strong southerly winds prevail all the time, and the waves break heavily upon the coast, almost normal to the line connecting Cape Hancock with Point Adams.

In connection with the survey, I have had prepared and submit with this report an outline tracing of the harbor, showing in differently colored lines the shore-lines of the capes and of the mid channel shoals, so as to present at a glance the changes which have occurred since the survey of 1869

by the United States survey. These changes, which are noted in detail in the report of Lieutenant Payson, are brought out clearly on an examination of the tracing, and one cannot fail to be impressed with the conviction that a new channel is preparing to be opened across the Middle Sands a short distance west of the western extremity of Sand island. The depression in the sands, which indicates the direction of the prospective new channel, has already been used for some time by vessels during favorable winds and tides, both for entering and for passing from the north channel into the south channel, and the precipitous slope on the seaward side and the very diminished distance across the sands between the 18-foot curves are strong indications of an early decline of the old channels and the inauguration of a new, deep, and direct channel midway between them.

The bad shoal at the inner end of the north channel almost completely closes that channel for deep-draught vessels, except under the most favorable conditions of wind and tide. The shoaling of the south channel and contractions of its outer part by the southward extension and eastward advance of the middle sands, while not materially interfering with its present efficiency, still draws our attention to the accumulating strength of the sand griddle at this point, and invites us to look elsewhere for a point of weakness already developed or developing under the demands of the river for an outlet for its own water, supplemented by the action of the waves and tides of the sea. Even if this new channel is opened the benefits accruing therefrom will, it is thought, remain unimpaired only for a short period of time, for the bar is of pure sand which continually shifts under prevailing winds and seas, advancing in one direction, throwing wavelets of sand into the open channels, reducing their depth, at the same time receding and diminishing in depth in another direction.

Such is the condition of the harbor at the present time, and if we review its history from the beginning of the century, when the first examination was made, we shall find the same forces at work, operating in the same way and repeating the same cyclical changes. Here I desire to express my acknowledgments to Prof. George Davidson of the United States coast survey, for valuable information he has gathered on this subject.

The earliest reliable survey of the entrance to the river was made in 1790 under the orders of Admiral Vancouver of the English navy. At that time but one channel existed; it was six miles long from the outer 5-fathom curve to a long line joining Point Adams and the cape; was located on the north side of the entrance, 1 1/2 miles south of Cape Disappointment; was 1 1/2 miles wide, and had not less than 4 fathoms of water. Chinook Spit stretched nearly straight for about a mile east of the cape of Chinook point. In the space enclosed by the three lines joining Cape Disappointment, Point Adams, and Chinook Point, 5 fathoms was the least found, and the deepest water after crossing the bar was under the north shore eastward of Chinook Point.

BRITISH ADMIRALTY SURVEY IN 1839.

The next examination was made by Sir Edward Belcher in 1839. The Sand Island of to-day, and its companion, the middle sands, bare at low water, with its covering of snags and trees, is mentioned for the first time. It was 1 1/2 miles long, covering about 4 square miles, and lay within the area said to have given 5 fathoms water in 1792. Deep water was found at its eastern end. Two channels were formed by the waters of the river passing on either side of the obstructions, the north channel affording the best water. This latter channel was separated from Baker's Bay by a middle ground. Chinook spit, as connected with Chinook Point, did not exist. The western part of Clatsop spit had been cut away to a distance of 3 miles, and a channel opened along Clatsop beach and South shore, and the north breakers had advanced 1 1/2 miles to the southward nearly across the channel of 1792.

At the time of the survey of the United States exploring expedition of 1841 but one channel across the bar existed. The accretions to Clatsop spit on the west side had practically closed the south channel of 1839. The north channel had changed but little, had 6 feet more water than the south channel, and retained within the cape its former shape and direction. The shape and position of the middle sands were nearly the same, but the east end had been moved nearly half a mile to the northwest, while the west end remained unchanged.

The United States Coast survey made its first examination in 1850. Again there were two channels. Clatsop spit, which in 1841 stretched the 6 miles westward of Point Adams, had been cut through midway between the point and its western extremity by a wide channel with 17 to 18 feet of water running south by west from Sand Island, or at right angles with the corresponding channel of 1841. The north channel had changed but little, and had still over a fathom more water than the south channel.

It had moved to the southward, its southern part cutting away over a mile of the west end of South sands of 1841. Inside the cape it had retained its direction of 1841, but had contracted somewhat. The middle sands had very much changed, but the northern part was similar to that of previous surveys. The eastern part had moved north-north west three-quarters of a mile since 1841. Sand Island had much increased in size, and had apparently moved with it. The western end of the great middle shoal eastward of Point Adams had been cut away three-quarters of a mile, and Clatsop spit had made from Point Adams in north-westerly direction for over a mile.

The second examination by the coast survey was made in 1852. The following changes since 1850 were noticed: The new south channel had been fully cut out and the bar had moved three-quarters of a mile eastward, with a wider entrance and three feet more water. The North channel was contracted to half its width at the bar with its northern line in the line of 1850. The depth was reduced, but there was still over one fathom more water than on the south bar. The channel was not so straight as in 1850; and a south channel had formed southward of the cape across the north breakers. Chinook spit had commenced to re-form. The middle sands had increased in size, and Sand Island had moved to the west-northwest over a quarter of a mile, giving 8 fathoms of water where the beacon of 1850 stood.

Compared with the surveys of 1839 and 1841, we find that one part of Sand Island retained the same position, but that position, one mile in extent, stretching east by south half south had been completely cut away and was crossed by the south channel. Clatsop spit had changed its shape and extended westward. The western end of middle shoal east of Point Adams had not changed. The course in over the bar, through the south channel, was straight for over 6 miles, until abreast of Point Adams, and then followed that of 1839. No re-survey was made until 1868, but it is known that early in 1857 the west end of the middle sands had swung around to the southward so as to throw the south channel within less than a mile of the beach south of Point Adams, and in October of that year that the south channel had completely closed, while the north channel had remained wide and straight.

The third examination by the coast survey was made in 1868, and extended from the 15-fathom curve outside the bar the "Three Trees" point, off Woody Island, in the Columbia river, a distance of about 23 miles.

The following changes were developed: The south channel had reopened with a fathom more water than in the north channel; the new channel was over 2 miles between the south point of the middle sands and the southwest side of Clatsop spit, and had over 4 fathoms in it. The north channel was narrower, but held pretty much the same position as in 1857, and had 3 1/2 fathoms of water. The north breakers extended 2 1/2 miles south-west from Cape Disappointment; 1 1/2 miles of this distance had less than 22 feet of water, and for five-eighths of a mile they were dry at low water. Sand island was found to have separated into two parts, each three-fourths of a mile in length; the eastern-most part lying east-northeast and west-southwest, and the western-most part north-northeast and south-southwest. At low water both parts were joined, and the whole formed a bare spit 2 miles long. From the west end of this sand spit the great middle sands extended first southwest 2 miles, with an average width of five-eighths of a mile, and then south-southeast 2 1/2 miles, the south point bearing south by east nearly 5 miles from Cape Disappointment, and southwest by west 4 1/2 miles from northern extremity of Point Adams. Clatsop spit extended west one-fourth north from Point Adams to a distance of 2 1/2 miles, and was composed of several spits bare at low water; the spit was 2 1/2 miles wide in a northeast and southwest direction at a distance of 1 1/4 miles from Point Adams; from its northwest point to the east end of the middle sands is exactly one mile between the 3-fathom curves; this is the narrowest part of the south channel.

Chinook spit ran 5 1/2 miles west half north from Chinook point; the extreme end of the shoal was about half a mile east three-fourths south from Cape Disappointment; at this point the north channel was barely 400 yards wide between 3-fathom curves. Midway between Chinook point and Cape Disappointment; the shoal was bare for 1 1/2 miles at low water, forming an island lying in very much the same position as Sand island. Three distinct channels were noticed after passing Sand island, all of which unite at Tongue point only to break again with divergent branches in crossing the shoal areas immediately at the entrance to the river; the north channel hugs the north shore closely for about 7 miles, and then breaks across the great middle bank direct to Tongue point; the south channel skirts the south shore for a distance of 7 miles to Tanzy point, thence across the mouth of Young's bay, close to Smith's point, and after passing Astoria turns

northeast to Tongue point; the middle channel occupies a line midway between the two former channels, and runs with slight curvature straight to Tongue point.

During all these changes, exhibited by the several surveys since 1792 it will be observed that the north channel has maintained itself better than the south channel (the latter being closed in 1792, from 1841 to 1850, and from 1857 to 1868), and is less subject to change either in depth or direction, owing to the firm and enduring character of the north shore-line. The outer harbor to-day is very much in the same condition it was in the early part of 1857, just before the south channel was closed by the union of the westward and southward extensions of the middle sands with the beach southwest of Point Adams, with this difference, that the spine of the middle sands, midway between their western extremity and Sand Island, has been much reduced in height, leading us to anticipate that the waters of the river will again cut through these shoals, as was done in 1850, though in a more northerly direction, or more in the direct extension of the inner reach of the south channel, and closely approximating to the direction assumed by the single entrance noticed in 1841.

With these facts before me, I am of the opinion at the present time that any improvement designed to be of a permanent nature should be applied in the north channel. In the event that the new channel across the middle sands is, contrary to my expectations, not opened at an early day, it is believed that the proper improvements for the north channel, in connection with an easy and navigable channel to be subsequently made through the interior grand middle banks to the "Three Trees" point, will consist of a training-wall rising only a few feet above low water, starting at the outer end of Point Adams, and running north by west (skirting the east side of Clatsop spit at the inner end), so as to direct the ebb toward the north channel at the point where the shoal now exists east of Sand island. This wall may extend 1 1/2 miles to hard bottom at the 4-fathom curve; but its dimensions, exact direction, and cost, even if such an improvement should be adjudged proper and advisable, I cannot now give by reason of the limited time I have had for studying the question.

The artificial means necessary and fitting to be constructed to maintain a permanent channel across the bar can only be determined upon a prolonged and careful study of the conditions which affect the character of the harbor. A hasty decision on imperfect data is liable to do more harm than good, and an injury once done require in its correction a greater outlay of money than is obtainable, not to speak of the embarrassments which commerce might have to suffer in the meanwhile, and which cannot be estimated in dollars and cents. The reason causes me, then, to ask permission to defer any recommendations looking to a permanent improvement (accompanied by plans and estimates) until such time as I shall have been enabled to study the problem more carefully and become more familiar with the wants of the commerce which seeks this port. I would recommend, however, an appropriation of \$5,000 to provide for a limited survey and a continuous observation of the currents.

It is not believed that dredging on the bar will be of any value. The season of severe storms covers a period of six months, and the material of the bar is so light and shifting that we may anticipate that a channel dredged during a short period of calm would be filled up during the first succeeding storm. The place is so exposed, too, that the times at which a dredge could work would be rare and of very limited extent, and any dredging so done would not increase the confidence of the pilots. The only remedial measure, it seems to me, is to ascertain the best means of securing the full effect of the ebb through some elected channel, and then let nature undisturbedly work out its own course.

Lieutenant Payson deserves great credit for the energy and judgment displayed in the discharge of the work assigned to him, and for the zeal and devotion with which he labored against the difficulties constantly attending him in the prosecution of the survey.

I am, general, very respectfully, your obedient servant,

G. L. GILLESPIE, Major of Engineers, Brevet Lieutenant Colonel, U. S. A. THE CHIEF OF ENGINEERS U. S. A.

NOTICE.

The closing out sale of Ladies Underwear and Embroidery, on Chenamus street, next to Dement's drug store, will only be open until Tuesday, the 11th inst. New goods opened for this week which will be sold at low prices. Respectfully, MAURICE H. BLACK.

Important to the Ladies of Astoria.

Mrs. A. Glider, in David Ingalls building, corner of Cass and Jefferson streets, takes pleasure in informing the ladies of Astoria and vicinity that she has just opened a well selected stock of Ladies' underwear, and Children's and Infants' goods, to which she invites the attention of purchasers.

LODGING HOUSE—Persons requiring furnished or unfurnished rooms can be accommodated at reasonable rates at Mrs. Munson's Chenamus st., Astoria.