

XVI.—REPORT OF OPERATIONS AT BATTERY STATION, HAVRE
DE GRACE, MD., FOR THE YEAR ENDING DECEMBER 31, 1886.

BY W. DE C. RAVENEL.

This year was ushered in at Battery Station by a continuance of work on the breakwater at west end of carp pond. This was interrupted early in January by bad weather and ice, so that but 12 feet were added to the work of December, making 92 feet to the end of January. One hundred and fifty tons of ice were cut and stored in this month; 26 iron cots were finished, which completed the 30 originally intended. The boilers and engines of the launches were thoroughly overhauled, as also the pumps. One of the station carpenters assisted in work on steamer *Haleyon* for fifteen days during January. On the 30th, at 9.30 p. m., 200 feet of the crib at the outer end of the wharf were carried away to low-water mark by ice and overthrown into the carp pond. The damage is estimated at \$1,000. On 31st, the entire force was at work cutting ice to move pile-driver to a place of safety. The presence of ice made it necessary to use sledge-boats in trips to Havre de Grace for mail, provisions, etc.

A very small portion of February was suitable for outdoor operations, it being generally too cold. But very little work was done to the new breakwater; the piles pushed off the main wharf by ice were recovered, and such timbers from the broken wharf as could be got at and wedged apart were saved. The general and routine work was carried on; repairs to launches were made in the way of stanchions, fenders, scraping, and sand-papering. The barge kitchen and mess-room were given two coats of paint inside, and tinware used in hatching operations was painted outside.

Ice covered the head of the bay all the first portion of February. A heavy movement of ice occurred on 13th at 4 p. m., lasting thirty minutes, crushing about 20 feet of the sheet-pile dike erected during the winter. At midnight, same date, a movement lasting ten minutes crushed about 25 feet of the southern end of the same work. The damage by ice this month is about \$180. The ice piled 15 feet above wharves on north side of island.

During the early part of March, work on the machinery, etc., of the launches was pushed to completion, and, as soon as the weather permitted, all of the boats, scows, etc., belonging to the station were over-

hailed, painted, and launched. Six new flat-bottom row-boats were purchased, making the number of this class available 20. Two new round-bottom gilling skiffs, 21 feet long, with masts, oars, and anchors, were also purchased for use in the shad work. Two gilling nets of 100 fathoms each were added to the outfit, and the seine was hung and tarred. The seine haul was well dragged and cleared of snags and stumps, and all necessary work for putting the station in order for the hatching operations was done.

The shad season opened on April 18 and closed June 10, during which time the station collected 60,766,000 shad eggs and 600,000 eggs of the rockfish. A full report of these operations has been submitted by Mr. L. R. Grabill, the superintendent of the station at that time.*

At the conclusion of the shad work the temporary force was discharged, the equipment dismantled and stored, and the seine cut out. A drive-well was started on the island, with the view of obtaining an artesian water supply. The well was carried to a depth of 150 feet by July 1. The Assistant Commissioner obtained authority from the U. S. Geological Survey to have a geologist examine this well, and Mr. W. J. McGee proceeded to Battery Station during the first half of July. His report, however, was adverse, and the well was abandoned.

In the middle of July, Mr. Grabill left the station temporarily to assume charge of some dredging operations to be conducted at Saint Jerome Station. This work occupied him until August 5, when the dredging-machine, which had been borrowed from the Navy Department, was brought to this station in tow of the steamer Fish Hawk. The report of the work accomplished will be embodied in the annual report of Mr. W. de C. Ravenel, superintendent of St. Jerome Station.

In the mean time, the routine work of the station was carried on under the supervision of Mr. William P. Sauerhoff, and the roof of hatching-house was painted and work was done to pumps, etc. The launch Blue Wing arrived at the station on August 10, and was at once dismantled and the machinery removed for overhauling, and the launch towed to Havre de Grace to be hauled out for repairs to hull and condenser. She was returned to Battery Station on August 21 and hauled out.

On Mr. Grabill's return with the dredging-machine, he proceeded to cut a channel from the main channel to pool gates, and completed this between the 9th and 14th of August; the cut was 20 feet wide with a depth of 8½ feet at low water, mean. The remaining work in this line was completed by August 21, and Colonel Abert, deciding to postpone further dredging at Saint Jerome, the proposed return to that point was given up. Mr. Spencer agreeing to make certain concessions as to the use of his railway at Havre de Grace if permitted to do one day's dredging with the mud-machine, the dredge was towed to that point on the 23d, the work he desired performed, and then the machine returned to the station. The well-driving equipment was transferred to the steamer

* See F. C. Bulletin for 1886, p. 361.

Fish Hawk, and on the 21st transported to Saint Jerome Station, to be used there in securing an artesian water supply. On the 24th of August the dredge force was discharged, the machine laid up, and Mr. L. R. Grabill left the service of the Fish Commission to return to the U. S. Engineer service under Col. S. T. Abert. The station was then transferred to the charge of Mr. William P. Sauerhoff.

After Mr. Sauerhoff assumed charge of the station, and up to the latter part of September, the small force under him was engaged in routine work of painting flat-boats and deck of Blue Wing and interior of launches, and in repairs to pile-driver, gill-boat sails, pumping out dredge and pile-driver, work on pile-driver, engines, etc. The well-driving equipment sent to Saint Jerome by the Fish Hawk was returned to this station on September 6. September 22 Maj. N. H. Hutton visited the station to obtain information as to the depth of water around the island, etc. His visit was followed by those of Captain McCullough and Mr. Glenn in reference to the engineer work provided for by act of Congress.

Mr. McGee arrived at station on 21st, and on 22d and 23d used launch in his investigations as to the geology of the surrounding country. Towards the latter part of October the United States engineer force began to arrive at the station and soon had preparations for their work completed. The operations were commenced October 27 and continued until December 23, when work was suspended on account of ice. The work of extending the hatching-house was commenced in the first part of November, and was vigorously pushed during the following weeks. The foundation for the new storehouse was started, and the men from the Fish Hawk, which had arrived on the 4th of November, and from the Halcyon, assisted the station force in these operations. The Assistant Commissioner frequently visited the station to supervise the work.

On November 20, Mr. W. de C. Ravenel, superintendent of Saint Jerome Station, was transferred to the charge of this station and took the work in hand. During the latter part of November and through the month of December the work on the hatching-house was carried forward with all energy. The force was increased by details from the Fish Hawk and Halcyon. In the machinery department, all pumps and machinery were overhauled, as were launches, small boats, etc.

HAVRE DE GRACE, MD., *September 9, 1887.*