

Statement showing the acreage, product, and value, &c.—Continued.

Counties.	Oats.		
	Acres.	Bushels.	Value.
Davis	1,313	59,085	\$9,453 60
Riley	2,267	113,350	20,403 00
Wabaunsee	2,265	92,865	16,715 70
Pottawatomie	7,203	360,150	57,624 00
Shawnee	2,758	110,320	19,857 60
Jefferson	8,617	310,212	49,633 92
Douglas	6,434	257,360	41,177 60
Leavenworth	5,756	212,972	42,594 40
Johnson	12,923	581,535	87,230 25
Wyandotte	1,980	59,400	10,692 00
Total	51,516	2,156,249	355,382 07

Products.	Summary.		
	Acres.	Bushels.	Value.
Wheat	95,542	1,424,146	\$1,383,030 28
Rye	21,853	422,856	145,263 69
Corn	442,137	18,366,981	4,008,938 46
Barley	7,036	161,567	51,515 90
Oats	51,516	2,157,249	355,382 07
Total	618,134	22,532,799	5,944,130 40

The combined product of the five crops above named gives 735,802 tons, or 73,580 car-loads.

The increase in the acreage of wheat alone in 1878 over that of 1877 is 74,092 acres, or 77.55 per cent. Estimating the yield at 20 bushels per acre, we have a product of 3,392,680 bushels, or 101,780 tons, an equivalent to 10,178 car-loads.

Assuming that the other crops named will hold their own, we shall have a grand tonnage of products of the five crops for 1878 of 794,858.

Table showing by counties the total number of acres, number of acres under cultivation, number of acres not under cultivation, and the per cent. of cultivated to whole number of acres, for 1877.

Counties.	Total number of acres.	Acres cultivated.	Not cultivated.	Percentage cultivated to whole number of acres.
Davis	260,480	33,422.25	227,057.75	12.83+
Riley	394,880	62,189.00	332,691.00	15.75-
Wabaunsee	514,560	46,147.25	468,412.75	8.97-
Pottawatomie	542,720	91,272.87	451,447.13	16.82-
Shawnee	357,120	98,420.37	258,699.63	27.56-
Jefferson	425,600	135,581.00	290,019.00	31.86-
Douglas	300,160	136,688.75	163,471.25	45.54-
Leavenworth	291,200	120,397.50	170,802.50	41.35-
Johnson	307,200	160,255.50	146,944.50	52.17-
Wyandotte	97,920	39,755.25	58,164.75	40.60-
Total	3,491,840	924,124.74	2,567,715.26	26.47-

The total acreage of the above ten counties is 10.39 per cent. of the total acreage of the seventy organized counties of the State, and the cultivated acreage of the same counties is 16.52 per cent. of the cultivated acreage of the seventy organized counties.

The population of the ten counties March 1, 1878, was as follows:

Davis, 5,382; Riley, 7,419; Wabaunsee, 5,386; Pottawatomie, 11,196; Shawnee, 19,114; Jefferson, 12,471; Douglas, 18,931; Leavenworth, 28,544; Johnson, 18,139; Wyandotte, 13,161.

The aggregate population is 19.72+ per cent. of that of the whole State.

APPENDIX P.

ANNUAL REPORT OF LIEUTENANT EDWARD MAGUIRE,
CORPS OF ENGINEERS, FOR THE FISCAL YEAR ENDING
JUNE 30, 1879.

UNITED STATES ENGINEER OFFICE,
Saint Paul, Minn., August 12, 1879.

GENERAL: I have the honor to forward herewith my annual reports for the fiscal year ending June 30, 1879, upon the improvement of the Missouri River above the mouth of the Yellowstone, and upon the survey of the Yellowstone River.

Very respectfully, your obedient servant,

EDWD. MAGUIRE,
First Lieutenant, Corps of Engineers.

Brig. Gen. H. G. WRIGHT,
Chief of Engineers, U. S. A.

P I.

IMPROVEMENT OF MISSOURI RIVER ABOVE THE MOUTH OF THE YELLOWSTONE.

My report for the previous year treated in detail of the section of country to be specially benefited by the improvement of navigation on the Missouri, of the nature and value of its productions, and of the importance of the river as a line of communication and transportation.

For that portion of the river below Benton it remains therefore but to give a statement of its commerce for the season of 1878, and to report upon the engineering work accomplished during the same year.

COMMERCE.

The number of steamboat arrivals at Benton was 46, an increase of 21 over 1877. The freight carried up the river amounted to 8,764 tons, of a value of about \$2,631,300, showing an increase over 1877 of 3,091 tons, of an approximate value of \$927,300. Maj. William B. Hughes, Quartermaster U. S. A., under date of October 16, 1878, informed me that he had shipped from Yankton, Dak., for the Missouri River above Buford, 261,131 pounds of government freight. Capt. E. B. Kirk, Assistant Quartermaster U. S. A., informs me that the government freight shipped up the river from Buford amounted to 94,424 pounds.

I have been unable to obtain a full exhibit of the exports, but the amount of wool shipped down the river was 696,000 pounds, an increase over 1877 of 487,541 pounds. For purposes of comparison the value of the wool is assumed as that of 1877 shipments; hence, the money value on the increased shipment amounted to about \$169,639, or the total value of the 1878 wool was \$242,599.

Six of the descending boats were loaded with cattle. It is safe to assume that the amount of other articles of export did not fall below that of 1877. The amount of freight carried up the river will hereafter be greater, on account of the establishment of a large post, Fort Assinaboine, on Milk River, about 40 miles north of the Missouri.

WORK ACCOMPLISHED.

The working force on the river was divided into two parties, one of which, under Mr. H. E. Stevens, assistant engineer, proceeded to Dauphin's Rapids; the other, under Mr. W. H. Wood, assistant engineer, to Cow Island.

At Dauphin's Rapids the 100-foot channel was cleared for a further distance of 1,600 feet, requiring the removal of 675 cubic yards of stone and the use of 226 blasts. The total length of channel attained during the two seasons was 3,400 feet, with a minimum depth in places of 30 inches, the remainder varying in depth from 3 to 5 feet.

The dam to close the right chute was finished. This dam has a length of 530 feet, and contains 791 cubic yards of stone.

At Cow Island the upper dam was extended by the addition of 121 cubic yards of stone; the middle dam contains 637 cubic yards, and the lower one contains 340 cubic yards of stone. The projected work of improvement at this place is now complete, and a navigable channel of over 3 feet secured. This result is due partly to the "raising" effect of the dams and partly to the scouring action of the water on the bottom. It is probable that a further increase of depth may be expected from the latter cause.

The party left Cow Island September 23 for Grand Island, where a survey of the locality having been made the left chute was closed by a fascine dam. This dam contains 887 fascines, or a total of 702 cubic yards of brush, stone, and gravel. The effect of this dam was to increase the depth of water on the upper shoal two-tenths of a foot.

PROJECTED WORK OF 1879.

One party will continue the work at Dauphin's Rapids, and it is expected that in this connection Bird's Rapids will be improved.

The work upon this portion of the river necessarily progresses slowly, but the results attained are sure and permanent.

Another party will complete the improvement of Grand Island, and then proceed to Shonkin Bar to commence the work at that point.

It was the intention to send a third party to Half-breed Island, on the river above Benton. However, it was so late in the season before the appropriation was made available, the distance so great, and the facilities of transportation and purchase of the necessary lumber so uncertain, that I concluded it would be better to put the third party at work on Kipp's Rapids, where improvement is very much needed. In addition, I learned that the proposed boat to be placed on the upper river has not been built, and there was an uncertainty as to when the project would be carried out. When I pass through Helena this summer I will investigate the subject thoroughly, and will submit a special report upon the river above Benton. I have at present only Mr. Roberts's report to depend upon, and should prefer to have more data at my command than are now in my possession before making any further recommendations.

The authorized survey of the river from Benton to Carroll cannot be made this year owing to the lateness of the season and to the fact that

the whole attention of the assistant engineers must be turned to the work of improvement.

It is impossible to submit at present any project for the continuance of the work next year, as such a project must be governed very much by the results to be attained this season.

As stated in my last report, there are some very extensive rapids above Dauphin's, which render navigation both difficult and dangerous, and should receive early attention.

A tracing of the map of Grand Island and vicinity is respectfully forwarded herewith.

Money statement.

July 1, 1878, amount available.....	\$33,597 63	
Amount appropriated by act approved March 3, 1879	45,000 00	\$78,597 63
July 1, 1879, amount expended during fiscal year.....	25,786 67	
July 1, 1879, outstanding liabilities	531 34	26,318 01
July 1, 1879, amount available.....		52,279 62
Amount that can be profitably expended in fiscal year ending June 30, 1881.		50,000 00

P 2.

SURVEY OF THE YELLOWSTONE RIVER.

UNITED STATES ENGINEER OFFICE,
Saint Paul, Minn., July 1, 1879.

GENERAL: I have the honor to submit the following report on the survey of the Yellowstone River for the fiscal year ending June 30, 1879.

THE YELLOWSTONE RIVER.

Aside from the picturesque and historic interest attached to the Yellowstone, it possesses an interest as a navigable stream of no mean order. Constituting as it does one of the main arteries of Montana, it will increase in importance as a line of transportation for the productions of what will ultimately, and at no late date, become one of the most important States of the Union.

The river has its source in a large lake in approximately 110° 30' west longitude and 44° 30' north latitude. Running through impassable gorges nearly due north until it unites its waters with those of Shields River, it then changes its course to the eastward, taking a general direction a little north of east until it receives the Powder, when its course changes to almost due northeast, and it finally empties into the Missouri about 3 miles above Fort Buford. Its drainage area is approximately 78,750 square miles. It receives numerous tributaries, none of which, however, as streams, are important save as feeders.

In their report on the Mississippi River, Humphreys and Abbot refer to the Yellowstone in effect as follows:

In this distance (Snow Mountains to Clark's Fork) it is characterized by many islands and by bold sweeping curves frequently impinging upon the hills. Between Clark's Fork and the mouth of the Big Horn the river is unobstructed by rapids and flows with a swift current of some 3 or 4 miles per hour.

Below the Big Horn to Powder River, the width increases and the river becomes turbid, resembling the Missouri.

From Powder River to the Missouri, the river assumes much of the characteristic appearance of the Missouri, containing numerous sand bars, densely timbered islands, &c. There are also some rapids and shoals.

The floods are neither sudden nor excessive, and the river is well adapted to navigation by steamboats drawing 30 inches to 3 feet of water from about the middle of May to the middle of August.

This information was of course drawn from Reynolds's report upon the exploration of the Yellowstone.

Interesting reports upon this river and its valley have been made by Colonel Stanley, Twenty-second Infantry, and Col. J. W. Forsyth, military secretary to General Sheridan.

Colonel Forsyth ascended the Yellowstone in the summer of 1875. He reached a point which he estimated to be 250 miles above the mouth of Powder River, and then turned back for the reason that "any further progress made up the stream could only be accomplished by sparring and warping, and without any adequate reward for the labor expended."

He further says:

The mouth of the Big Horn may be regarded as the head of navigation on the Yellowstone River, and for three months of the year this river presents less obstacles to its navigation than the Upper Missouri, and indeed many other rivers in this and other countries. The channel is unchanging, for it passes over a gravel bed from its head to its mouth, and there are no snags.

While both Reynolds and Forsyth are generally correct, their reports in certain particulars are erroneous. The mouth of the Big Horn is not the head of navigation on the Yellowstone, since boats have ascended to Coulson City, situated a few miles above Baker's battle-ground, and found but little trouble in so doing. I have been informed by persons who have descended the river in mackinacs from Benson's Landing that the river above Coulson is as good as below. Upon this statement I do not place much reliance, and only a survey can demonstrate its truth or falsity.

My personal knowledge of the river is confined to the portions extending from the mouth of the Big Horn to the Missouri. For this length it may be said that with the exception of the 5 miles at the lower end, where the valleys of the Yellowstone and Missouri appear to blend into one, the river has no shifting bars, is of a fixed regimen, and that the work necessary for the improvement of its navigation will be simple in its character and permanent in its effects. This work will consist of the removal of rocks from the rapids and the building of dams to close lateral chutes and confine the volume of water to the main channel.

It is not considered advisable to submit any detailed project of improvement until the completion of the survey commenced last year. It is sufficient to state that the most important obstruction in the river, Buffalo Rapids, should receive immediate attention. A steamboat was wrecked on these rapids in June and was a total loss.

The sum of \$25,000 was appropriated for this work by the act of Congress approved March 3, 1879.

THE YELLOWSTONE AS A LINE OF COMMUNICATION AND TRANSPORTATION.

The section of country to be specially benefited by the improvement of the Yellowstone is of course the Territory of Montana. Reference will

be made to the productions of the Territory in general, but more particularly to the region adjacent to the river in question.

The valley of the Yellowstone is not inferior to other sections of Montana. The soil is as good, the grasses as fine, and the region south of the river in the neighborhood of Clark's Fork and its tributaries is rich in valuable ores. The Commissioner of Mining Statistics, in his report for the year ending December 31, 1874, says:

From Mr. John Barnett, an old prospector in this region, Mr. Wheeler procured some fine specimens of ore, containing from 70 to 80 per cent. of lead, which he had found at the headwaters of Soda Butte Creek, a tributary of Clark's Fork of the Yellowstone near the east boundary of the National Park.

Blackmore and New World mining districts have been located here, taking in 12 miles from east to west, and 6 from north to south. They contain a large number of well-defined leads. The mountains, as Mr. Barnett describes them, are covered with wash-boulders of galena, and the veins, so far as tested, are from 6 to 25 feet wide.

A tunnel across the Mammoth vein in the New World district shows 25 feet of solid ore, and the width of the vein is not known.

The New Caladonia shows a well-defined 6-foot vein. The Great Republic, Gurley, Iron Clad, Houston, Woody, Silver Zone, Silver Gift, Blackfoot, Shoo-Fly, Alta California, Alta Montana, and a large number of other veins, have been located but not developed. There is an abundance of wood and water for all purposes. A few miles of road-building would make the mines accessible for wagons. The ores could then be hauled in vast quantities to or near the Crow Agency, on the Yellowstone.

From crude assays these ores will yield from 50 to 200 ounces of silver per ton, and from 70 to 80 per cent. of lead. The mines are about 110 miles southeast of Bozeman.

In his report of April 11, 1876, the Commissioner says:

The Clark's Fork mines show on the surface large quantities of galena and silver ore, very rich in galena—60 to 80 per cent.—and in silver bearing from \$40 to \$600 per ton, according to the tests that have been made. * * * A company has been found to begin their development. But it will take both time and money to make them profitable. *The improvement of navigation on the Yellowstone would bring steamboats within 100 miles of them.*

He says further, that quartz-mining is on the increase all over the Territory, while the yield of placer mines is slowly diminishing year by year.

More retort gold from arrastras and small stamp-mills has been sold in 1875 than ever before, and less dust from placer mines.

The number of tons of silver ore worked and shipped in 1875 is very nearly double the quantity worked and shipped in 1874.

The copper interest is growing.

Mr. Wheeler estimates the yield of gold, silver, and copper, during the year 1875, as worth \$3,596,100. This was the amount actually realized, "but at the close of the year there were more tons of silver and copper ores at the mouths of the mines prepared ready for shipment, of equal average value per ton, than were shipped during the year; and 100,000 tons of ores, running from \$40 to \$150 per ton, that will not bear shipment, are piled by the dumps for future working or awaiting cheaper transportation."

Want of transportation is the continual cry in Montana, and, in a great measure, limits the yield of the mines.

A remedy is hoped for in railroads or the improvement of the navigation of the Missouri and Yellowstone Rivers, by help of Congress, for which the legislature has forwarded a memorial.

Mr. William F. Wheeler, formerly United States marshal, informs me that the mineral yield for the year 1877 was \$4,151,000 in value.

But the mineral wealth of Montana is of secondary importance compared to her value as a stock-raising and wool-growing section, being unsurpassed in the trans-Missouri country. The number of beef cattle driven and shipped from the Territory in 1877 amounted to 12,500 head,

of an approximate value of \$250,000. The total wool shipment was 310,000 pounds, of an approximate value of \$108,500.

The improvement of the navigation of the Yellowstone will certainly give rise to an increase of population, and hence an increase of productions and shipments.

As stated above, the Yellowstone Valley is not inferior to other sections of the Territory, and is rapidly being settled. In a report forwarded to the Chief of Engineers March, 1877, I expressed the opinion that, agriculturally considered, the valley of the Yellowstone could be classed as "fair." It was only on an overland trip last fall from Fort Keogh to Fort Buford that I was enabled to fully appreciate its value. As late as 1876 almost every foot of this valley was in the undisputed possession of the Indians. Now there are settlements of white men, the river bank is lined with wood-yards where the laboring-steamboats may purchase fresh supplies of fuel; the traveler encounters every few miles ranches with claims under cultivation producing great varieties of vegetables and cereals besides the luxury of melons, while the fertile bottom lands and gentle slopes are dotted with stock grazing upon the bunch and buffalo grasses with which the land is thickly carpeted. Irrigation is a problem of easy solution, demanding an expenditure of but little labor and money, and such cheap and successful irrigation fulfills the only condition requisite in this region for the profitable growth of all kinds of grain. There is plenty of timber, and the valley is intersected by numerous streams of clear, sweet, running water.

The principal town of this section is Miles City, the seat of Custer County. It is beautifully situated on the east bank of Tongue River in sight of the Yellowstone, and at present has a population of about 1,000 souls. It is a prosperous and thriving town, apparently free from much of the disorder and lawlessness so characteristic of frontier settlements.

Coulson City, about 6 miles above Baker's battle ground, is the highest point ever reached by a steamboat. I have never seen this town, and have been unable to obtain any definite information concerning it. It would appear that it owes its origin to the fact that as far as known its site is the head of navigation on the Yellowstone, and that it was expected that it would be the transfer depot of supplies for the lower portion of Montana.

I was unable to obtain any reliable information from the citizens along the river of the amount and value of the freight carried up the Yellowstone last year. Capt. E. B. Kirk, assistant quartermaster, U. S. A., estimates the amount of private freight last year as 1,000 tons of an approximate value of \$300,000. Large amounts of freight were later in the season carried overland by wagons. The total amount of government freight was about 5,088 tons.

The river is at present the main line of transportation connecting the two large posts, Forts Keogh and Custer, with the East. The Northern Pacific Railroad is in progress of construction to the Yellowstone, and it is the intention to carry it up the valley of that stream. This road will of course detract somewhat from the value of the river, but a healthy competition will arise and result in a benefit to the people of Montana. The river will always receive its share of the freight, especially of the bulky class, and of such articles as do not demand an immediate market, since it is better adapted to their carriage, at rates to which the railroads cannot safely descend. It will also by its competition keep at reasonable figures the rates on those articles which will, other things being equal, seek the railroad for rapid transit.

The Northern Pacific probably will not for years have any local business on the long stretch of over 200 miles from Bismarek to the point where it will strike the Yellowstone, and naturally freight rates to and from Montana will be high, unless kept down by competition. It will be only for the western portion of the Territory that the Union and Northern Pacific Railroads will compete, and consequently the Yellowstone will be the only line of transportation for the southeastern section to rival the latter railroad.

HISTORY OF THE SURVEY.

By a letter dated July 8, 1878, from the office of the Chief of Engineers, I was directed to submit a project for a survey of the Yellowstone. The project having been approved, the sum of \$15,000 of the amount appropriated for examinations, surveys, and contingencies of rivers and harbors, by the act of Congress approved June 18, 1878, was made available for the purpose. Accordingly two parties were organized in this city, and with them I departed for the scene of operations.

Tents were furnished by the Quartermaster's Department and authority was obtained for the purchase of rations from the commissary department at Forts Buford and Keogh. I was fortunate enough to be able to charter a steamboat at Fort Buford, and thus much delay and inconvenience was avoided in placing the parties in the field.

As it was so late in the season before the work could be started, the original intention of commencing the survey at Benson's Landing, near Bozeman, was abandoned and Fort Keogh was selected as the point of beginning. Consequently, on the trip up the river one party was landed near the mouth of Powder River and the other taken to Fort Keogh.

The lumber for the boats was purchased at Miles City, near the mouth of Tongue River, and the boats for the lower party, when finished, were sent down the river with the men brought up for the purpose.

Each party consisted of two transit-men, one leveler, one recorder, and 14 men.

Of the 52 days in the field, September 6 to October 27, inclusive, 11 were consumed in building boats, and of the remaining 41 there were 33 working days.

The work accomplished in that time was as follows:

Miles of river surveyed (per channel).....	145½
Miles of developed shore-line.....	527
Number of soundings taken.....	59,731
Number of sounding lines.....	3,056
Number of stations for azimuth observations.....	24

The river was also gauged at three different points, with the following results:

- 1st. Discharge at Fort Keogh, for a stage 1.87 foot above low-water, 14,462 cubic feet per second.
- 2d. Discharge at Wolf Rapids, for a stage 1.22 foot above low-water, 11,235 cubic feet per second.
- 3d. Discharge at Diamond Island, for a stage 0.42 foot above low-water, 8,155 cubic feet per second.

The following table gives the distances, fall, and rate of fall per mile, of the Yellowstone:

Stretch of river.	Distance in miles.	Total fall in feet.	Fall per mile in feet.
Ferry at Keogh to head Buffalo Rapids.....	12.38	48.937	3.95
Head Buffalo Rapids to foot Buffalo Rapids.....	.7803	7.699	9.87
Foot Buffalo Rapids to head Baker's Rapids.....	18.0602	69.262	3.83
Head Baker's Rapids to foot Baker's Rapids.....	.712	5.162	7.25
Foot Baker's Rapids to head Wolf Rapids.....	6.767	21.526	3.18
Head Wolf Rapids to foot Wolf Rapids.....	.42	4.226	10.06
Foot Wolf Rapids to head McEwen's Rapids.....	3.9	13.873	3.55
Head McEwen's Rapids to foot McEwen's Rapids.....	.25	2.262	9.048
Foot McEwen's Rapids to 300 feet below head White Sand Rapids.....	9.227	20.674	2.24
300 feet below head White Sand Rapids to foot White Sand Rapids.....	.1534	1.519	9.928
Foot White Sand Rapids to head De Russey's Rapids.....	10.0303	24.596	2.452
Head De Russey's Rapids to foot De Russey's Rapids.....	.5985	2.288	3.83
Foot De Russey's Rapids to 930 feet below head Walker's Island Shoal.....	4.1316	7.467	1.807
930 feet below head Walker's Island Shoal to foot Walker's Island Shoal.....	.57	2.85	4.965
Foot Walker's Island Shoal to head Monroe Rapids.....	7.4917	23.301	3.11
Head Monroe Rapids to foot Monroe Rapids.....	.309	1.248	4.04
Foot Monroe Rapids to head Reno's Bend.....	38.7708	104.397	2.69
Head Reno's Bend to foot Reno's Bend.....	.8958	5.174	5.77
Foot Reno's Bend to head Beef Slough.....	12.522	34.852	3.29
Head Beef Slough to foot Beef Slough.....	1.15	5.316	4.622
Foot Beef Slough to foot Diamond Island.....	16.137	31.881	1.976
Total.....	145.2566	438.49
River, excluding rapids.....	139.4176	400.766	2.875
Rapids.....	5.839	37.724	6.461
Total as above.....	145.2566	438.49

In accordance with my instructions to them, the parties ceased work October 28, and arrived in Saint Paul November 4.

On November 5 all of the men, with the exception of assistant engineers Towar, Lightner, and Spalding, were paid off and discharged. These 3 assistants were retained on the work until the close of the fiscal year, when, the appropriation having been exhausted, they were discharged.

The office work during the year consisted of the necessary computations and plotting. A map of the river in 42 sheets, on a scale of $\frac{1}{8600}$, with an index sheet, is forwarded herewith. A map in 16 sheets, on a scale of $1=4800$, with an index sheet, was made for use in this office.

My thanks are due to the assistant engineers engaged upon the survey, for the efficient manner in which they performed their work.

I would respectfully recommend a continuance of the survey, not only on account of the general value of the information to be obtained, but because such a survey is necessary in order to supply the data required for an estimate of the cost and nature of the improvement of navigation.

For the completion of the work the sum of \$10,000 will be required.

As I have stated before, the scene of operations is so distant from depots of supplies that the items of transportation and subsistence alone are great, and, consequently, the cost per mile of the survey is largely in excess of that for a river east of the Mississippi. Men and material both must be sent from this city.

Very respectfully, your obedient servant,

EDWARD MAGUIRE,

First Lieutenant, Corps of Engineers.

The CHIEF OF ENGINEERS, U. S. A.

APPENDIX Q.

ANNUAL REPORT OF MAJOR F. U. FARQUHAR, CORPS OF ENGINEERS, FOR THE FISCAL YEAR ENDING JUNE 30, 1879.

WASHINGTON, D. C., July 21, 1879.

GENERAL: I have the honor to transmit herewith the annual reports of operations under my charge during the fiscal year ending June 30, 1879.

The statistics of the commerce of the Upper Mississippi River are appended to the report on improvement of Upper Mississippi River.

To the following gentlemen I am much indebted for the intelligence and energy they have displayed in carrying on the works assigned to their local charge:

Capt. B. D. Greene, Corps of Engineers, in local charge from foot of Rock Island Rapids to mouth of Illinois River.

Mr. M. Meigs, United States civil engineer, in local charge from 5 miles above Fountain City, Wis., to head of Rock Island Rapids and Galena River.

Maj. E. F. Hoffman, assistant engineer, in local charge of Rock Island Rapids.

Mr. J. L. Gillespie, assistant engineer, in local charge from Saint Paul to Alma, Wis.

I am also under obligations to the Ordnance Department, United States Army, which, through the commanding officer, Rock Island Arsenal, Maj. D. W. Flagler, much facilitated the works under my charge, by doing work in the arsenal shops of great excellence and dispatch, and at much less rates than elsewhere.

Hoping this may meet with your approval,

I am, very respectfully, your obedient servant,

F. U. FARQUHAR,
Major of Engineers.

The CHIEF OF ENGINEERS, U. S. A.

Q 1.

OPERATIONS OF SNAGBOAT IN IMPROVEMENT OF UPPER MISSISSIPPI RIVER.

The old snag-boat *Montana* worked as usual during the season of 1878. The stage of water was very low and lasted for almost the entire season. The deep draught of the *Montana* rendered her useless for scraping the bars, and so the principal work was snag pulling. The rottenness of her hull prevented any great strain being brought upon it, and some very large snags were not pulled in consequence.

A new steamer, the General Barnard, was built by contract by David S. Barmore, Jeffersonville, Ind., during the past winter. The dimen-