

REPORT

UPON THE

COLORADO RIVER OF THE WEST,

EXPLORED IN 1857 AND 1858 BY
LIEUTENANT JOSEPH C. IVES,
CORPS OF TOPOGRAPHICAL ENGINEERS,

UNDER THE DIRECTION OF THE OFFICE OF EXPLORATIONS AND SURVEYS,

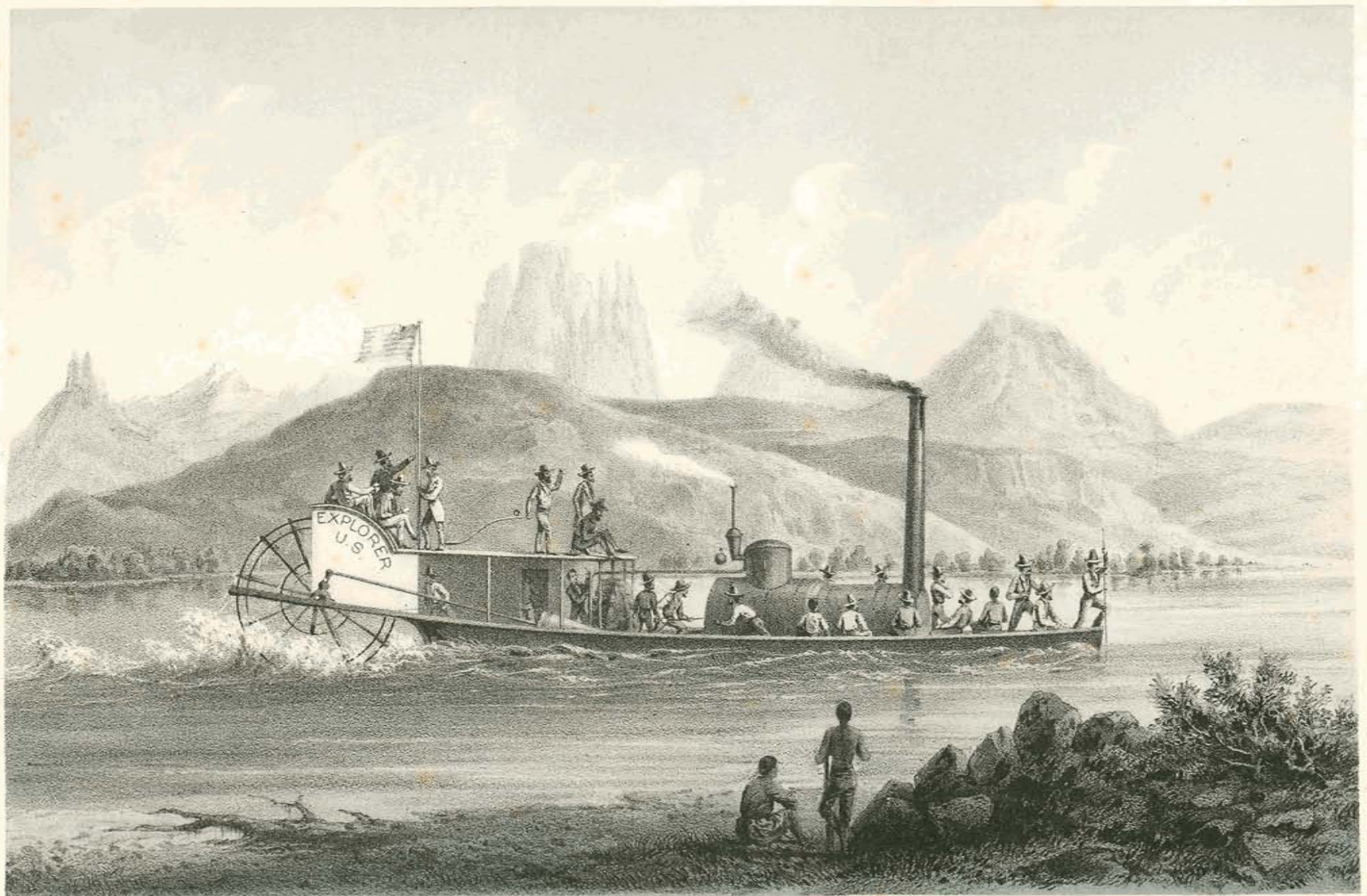
A. A. HUMPHREYS, CAPTAIN TOPOGRAPHICAL ENGINEERS, IN CHARGE.

BY ORDER OF THE
SECRETARY OF WAR.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1861.

Long
1058

46094



J. YOUNG, from a sketch by H. B. MOLLHAUSEN.

Lith. of Sarony, Major & Knapp, 449 Broadway, N.Y.

CHIMNEY PEAK.

be ascended in boats.

DESCRIPTION OF BOAT TO BE USED UPON THE COLORADO.

With a boat of proper construction the Colorado can be navigated without trouble, at all seasons of the year, between the head of the Gulf of California, and the mouth of the Black cañon. The most essential conditions in regard to the boat are as follows:

- 1st. That she should not draw more than twelve inches when light.
- 2d. That the boiler should be of large capacity and the engines of great power.
- 3d. That she should have a large stern-wheel.
- 4th. That the bottom should be perfectly flat and smooth.
- 5th. That the hull should be divided by water-tight bulkheads.

For service upon the river I would recommend iron boats in preference to wooden ones. In the hot climate of New Mexico the former would be more durable; they can be built of lighter draught for the same capacity; are cheaper, and more easily and rapidly put together. A good description of boat would be an iron stern-wheel steamer, with the hull one hundred feet long, and the greatest breadth of beam twenty-two feet; built sufficiently full to insure a draught, when light, not exceeding twelve inches; if in sections, the flanges, where the sections meet, to be turned inwards, in order that the bottom may be perfectly smooth and flat; to have a large boiler and a powerful high-pressure engine, with two fourteen-inch cylinders of five

feet stroke; a stern-wheel eighteen feet in diameter; the hull to be separated into four water-tight compartments, one at the bow, one enclosing the boiler, a third behind the space set apart for stowing the cargo, and the fourth near the stern; to be steered by three wooden rudders; the bottom to have such a sheer aft that the lower edge of the transom may be, when the boat is loaded, about two inches above the surface of the water, so that the pilot can see by looking over the rail if any of the rudders are bent or foul; to be provided with a capstan; with two anchors of one hundred and twenty-five pounds weight, and a small kedge anchor; with plenty of extra rudders, wheel buckets, and stout lines.

The water of the Colorado holds in suspension a large amount of fine silicious sand, sharp as emery, that cuts away the valves almost as rapidly as it could be done with a file. Unless the boiler is made large it would require but a week's service to disable the engine so as to render it impossible to run the boat.

A steamboat, built as above described, and run by an experienced pilot, would occupy, in making a round trip from the mouth of the river to the head of navigation, from twelve days to five weeks; depending upon the season of the year and the stage of the water.

FUEL.

Wood of excellent quality for the purpose of fuel can be obtained in abundance, alongside of the bank, at short intervals, between the mouth of the river and the Painted cañon. It is principally mesquite, willow, and cottonwood. There are large groves of sun-dried trees, ready for instant use. The mezquite wood makes the hottest fire, but, if much used, injures the boiler. Between the Painted and Black cañons, wood is less frequently met with, and were this part of the river to be constantly navigated, it would be necessary to establish depots, which would derive their supply from below.

ESTIMATE OF COST OF TRANSPORTATION.

A suitable boat, capable of carrying sixty tons, should be able to make fifty trips between tide water and the head of navigation before becoming unserviceable. Such a number ought certainly to be accomplished within six years, which would enable 3,000 tons of freight to be carried to the highest navigable point during that period. A boat of the character described could be built and put together at the mouth of the river for \$20,000 00

The annual expenses of running her would be—

For pay of captain	\$2,000 00	
For pay of pilot	2,000 00	
pay of two engineers, at \$1,500 each	3,000 00	
For pay of eight hands, at \$450 each	3,600 00	
For rations of twelve men, at 30 cents per day, about	1,300 00	
For repairs	1,100 00	
		13,000 00
Annual expenses		13,000 00
Expenses for six years		78,000 00
Total expense of transportation of 3,000 tons of freight		98,000 00
Or about \$30 per ton.		

No estimate is made for expense of fuel. The boats are unable to run at night. As has been stated, there is abundance of wood along the banks, and eight men, while at camp, would be able to lay in a sufficient amount for a day's consumption.

It is believed that the above estimate is a liberal one, and rather exceeds than falls below the expenditure that would be actually involved were a sufficient amount of transportation business done upon the river to keep the boats in service constantly employed.