

## THE VICTORIA REGIA.

The two engravings given herewith represent the grandest of all water lilies, the immense Victoria Regia. In cultivation the plant is an annual, with a fleshy root stock, from which are produced leaves from six to twelve feet in diameter. These are fixed to the petiole by the center, and have a margin turned up as a border, as shown in Fig. 1, from two to three inches high, giving the leaf the appearance of a huge tray. Their upper surface is of a rich green color and studded with small prominences. The lower surface, purple or violet, is traversed by ridge-like veins, which divide the whole into compartments, while both veins and stalks are covered with spines or prickles. These enormous leaves are capable of sustaining a large water fowl, and by placing a board upon them to distribute the weight they will hold up a child of ten years of age. The flower is of two days' duration, and is exceedingly fragrant. It is cup-shaped, and measures from twelve to sixteen inches across. In cultivation the plant requires a tank 20 or 30 feet across and from 3 to 4 feet deep, with special arrangements for heating the water to 80° or 85°. It is indigenous to the river Amazon and tributaries.

## Telephone Notes.

It is now well known that if the wire of a telephone be extended parallel to telegraph wires, and supported on the same posts, the clicking of the telegraph instruments will be distinctly heard in the telephone, so that messages passing can be read. This opens a new war utilization of the telephone, as it will be necessary simply to carry its wire near an enemy's telegraph line to read his dispatches, without tapping his wires.

Another new use of the telephone is in the Norwegian herring fisheries. The fishing season takes place when the herrings come into the shoals to deposit their eggs; but it often happens that the fish accomplish their purpose and go back into deep water before all the fishermen can be warned. Some 120 miles of submarine cable have been laid and telephones connected with it, so that all the fishermen on the coast can be immediately notified.

The telephone is a very simple contrivance, and it would seem that nothing could be more direct than the transmission of the voice to the ear of a listener; yet no less than eight transformations take place. The muscular effort of the speaker is transformed (1) into air vibrations; (2) into metallic vibrations; (3) into magnetic waves; (4) into electric induction; (5) into magnetic induction; (6) into metallic vibrations; (7) into air vibrations; (8) into vibrations of the auditory apparatus of the hearer.

## The Improvement of Southern and Western Rivers.

The Annual Report of Capt. W. R. King, U.S. Engineers, for the year 1877, as an appendix to the Report of the Chief of Engineers, has just reached us. The report embraces the details of work on the following rivers:

1. The Tennessee above Chattanooga.—The object of improving this part of the river is to secure a low-water channel of sufficient depth for steamboats and other crafts across the numerous bars and shoals between Chattanooga and Knoxville, by the excavation of rock and gravel, and by building rock dams to contract the width and thus increase the depth of the water way. The work of the year was directed to the removal of sixteen obstructions. There were also about 105 cubic yards of gravel excavated, and many snags and overhanging trees removed. Below Chattanooga the obstructions consist of shoals; on the Elk river shoals no work has been done; on the Big Muscle shoals the work of enlarging and rebuilding the old canal around the shoals has been carried on under six contracts, all but one of which have been closed and completed during the year; on the Colbert shoals, which form the most serious obstruction to navigation on the Tennessee below the Muscle Shoals, considerable work has been done, and the improvement would have been completed had it not been for unusually high water.

2. The Cumberland River.—Below and above Nashville to the Kentucky line, a large quantity of stone has been excavated from the channel and quarried for dams, and a large number of snags, loose rocks, and overhanging trees removed at various points. The most formidable obstruction between the mouth of the Cumberland river and the Great Falls is known as Smith's Shoals. It consists of a succession of bad shoals over 8 miles long, and with a fall of 55 feet. The improvement of these shoals is very much needed to enable ves-

sels to reach the coal fields in the vicinity of Rock Castle river, as well as to furnish an outlet for the agricultural products of the country. The work on this section has consisted in the excavation of 6,120 cubic yards of rock, one half of which has been put into dams. From Smith's Shoals to the Falls of the Cumberland, nothing was done.

3. Coosa River, Georgia and Alabama.—The obstructions in this river consist of shoals, some of them of formidable character and costly to remove. Work has been commenced on 13 shoals, upon which there was less than 2½ feet of water at low tide. The object to be gained in the improvement of

there is no demand whatever for navigation from one point to another along the course of the stream itself, and, as far as he could discover, no demand for the improvement of Etowah at all, except a contingent one.

## Trial Trip of a New Twin Steamer.

The trial trip of the new twin steamer Express, which has been built by Messrs. A. Leslie & Company, shipbuilders, Hebburn-on-Tyne, for the Channel Passage Company, for service between Dover and Calais, took place lately. The passage between Dover and Calais is a very turbulent, and therefore an uncomfortable one for passengers; and the question how to make the voyage lighter and steadier, so as to remove as far as possible the discomfort attending it, has often presented itself to nautical minds. Some few years ago Capt. Dicey, the originator of the Channel Company, designed the Castalia for this object, and, so far as equability and comfort were concerned, she thoroughly answered her purpose; but her speed was far below that of ordinary steamers, and therefore, although many preferred the more pleasant passage, and chose to take the slower vessel, the majority elected rather to face the storm and have the advantages of the swifter mode of transit. Mr. Leslie, however, undertook to produce a vessel having the qualities required, and the result has been the Express. The Express was guaranteed to have a draught of not more than seven feet, and to be capable of working at a minimum speed of fourteen knots—the difficulty of this being to get sufficient power into her without immersing her too much in the water, and this Mr. Leslie has accomplished. The draught of the Express is about one foot less than the Castalia, her length ten feet greater, and she is one foot broader. The two

hulls are each about one foot wider, and the channel between the two ships is slightly narrower in the Express than in the Castalia; the great difference in construction between the two vessels, so far as the hulls are concerned, however, is, that whereas the Castalia is, as it were, two half ships placed a certain distance apart, forming between them a channel, the sides of which are parallel, the Express is two complete symmetrical ships, thus making the channel wider towards the ends of the vessel, and narrower towards the paddle wheels. This has the result of giving a more plentiful supply of water to the wheels, and enables them to utilize a much greater proportion of power than with the parallel channel. In the Express the two hulls are very rigidly united together by four transverse iron girder bulkheads spanning across the channel. The rudders, of which there are four, one at each end of each ship, act also as bows without any resistance. The vessel is steered by steam, the steering gear being supplied by Messrs. Brotherhood & Hardingham, London. The whole of the passenger accommodation is provided on the superstructure. The saloons are all approached by circular staircases from the upper decks; a large general saloon and a ladies' saloon are forward, and the refreshment saloon and range of state rooms for private families aft. The furnishing is all of the highest order. The vessel accommodates one thousand passengers. The engines, which have been supplied by Messrs. Black, Hawshore & Company, Gateshead, are four thousand indicated horse power. They are diagonal inclined engines, having two cylinders in each ship working on one crank pin. The cylinders are 63 inches in diameter, with six feet stroke and 40 revolutions per minute. There are two patent paddle wheels working independently of each other. The trial trip on Saturday extended along the coast to Coquet Island, a distance from the Tyne of 22½ miles. Amongst the company on board were Mr. Leslie, Captain Dicey, and several engineers and surveyors of the Board of Trade and Lloyd's. The vessel sailed remarkably steadily, and a very pleasant day was spent by the company on board. The runs from Coquet Island back to the Tyne were made a test, and the distance was done in one

hour and twenty-two minutes, an average of 14.48 knots per hour. The distance from the Tyne to Coquet is one mile and a half longer than from Dover to Calais. The trial was considered highly satisfactory. The Express is expected to commence service soon, and at all events will start in time for the Paris Exhibition.—*London Daily News.*

An anonymous friend of humanity offers a prize of 6,000 francs, to be awarded in 1880, for the most useful application to the healing art of M. Pasteur's discoveries.

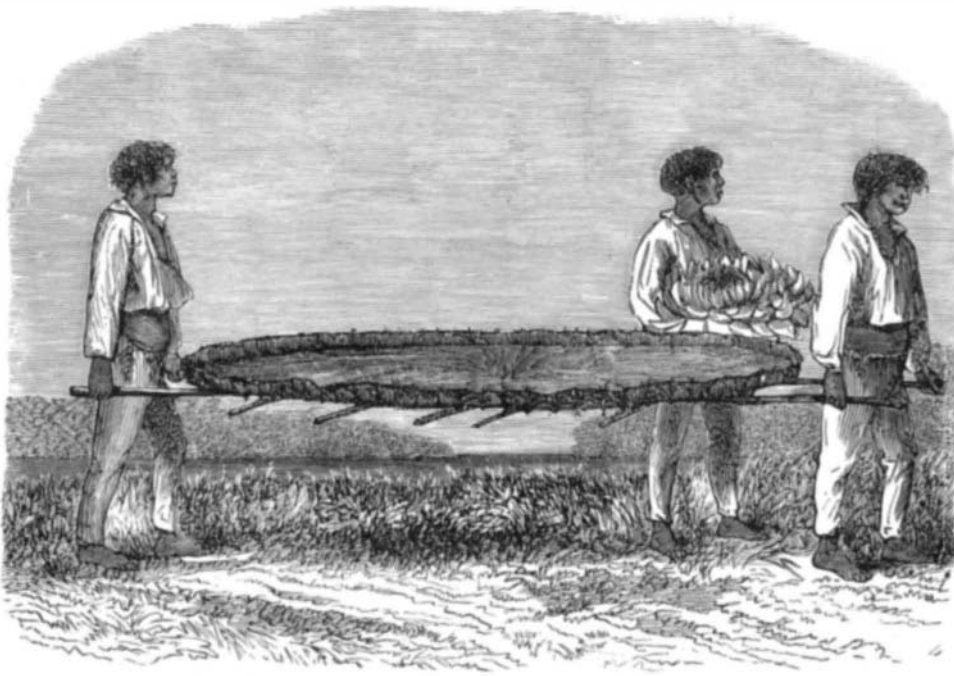


Fig. 1.—LEAF OF THE VICTORIA REGIA.

this river is the opening of the coal fields of St. Clair county, Alabama, to the people of Rome and the owners of various iron works along the Coosa, which are languishing for want of cheap coal, and also to furnish an outlet for the agricultural products of Northeastern Alabama and Northwestern Georgia; and it will supply an important link in a chain of waters of over 800 miles in length.

4. Hiwassee River, Tennessee.—The obstructions in this river consist of shoals. Matthew's Shoals and Magil's Island Shoals were selected as the first to be improved. Work was commenced on them and making good progress at the end of the year.

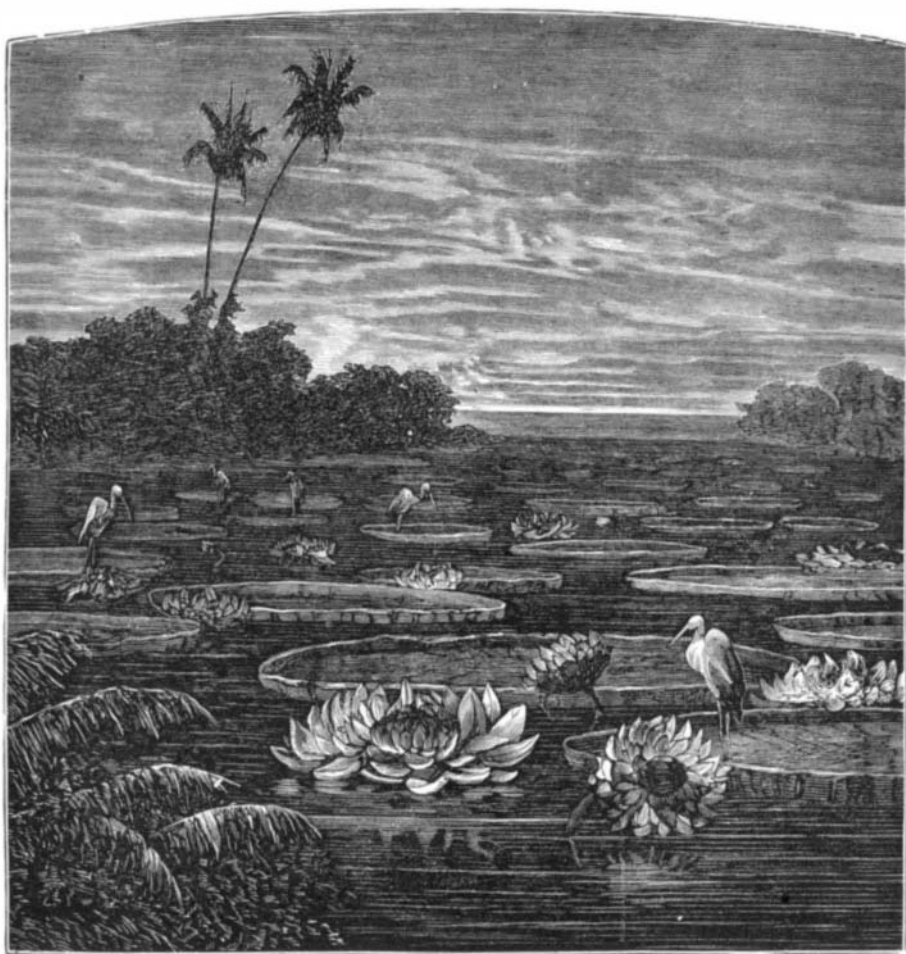


Fig. 2.—THE VICTORIA REGIA.

5. Ocmulgee, Oostenaula, and Coosawattee Rivers, Georgia.—No work has been done on these rivers.

6. Etowah River, Georgia.—The improvement of this river, if undertaken, will be very costly and difficult. Owing to the great number of shoals and rapids, the improvement would necessitate a series of locks and dams, some ten in number. Although Congress appropriated \$10,000 for the work, the engineer in charge learned from conversation with people living on its banks that there is no local interest which can be benefited by local improvements, and that