

A Sewer on Piles.

Owing to the soft mud great difficulty was found in building the new sewer which is to occupy the Aramingo Canal from the river to Huntingdon Street, Philadelphia. After considering other devices, says *Architecture and Building*, the plan was hit upon of using an extensive system of piling.

Great yellow pine timbers, 12 inches square, are to be driven to solid bottom, 3 feet apart. Transversely in these will rest yellow pine planks, 8 by 8 inches. Broken stone will be filled in two feet deep around the heads of the piles to brace them. On the transverse timbers is a plank flooring, 6 inches thick, and above this the sewer is built, secured at the bottom by a bed of heavy stones laid in concrete. The main sewer will be 9 feet 6 inches in diameter. Below York Street there will be twin sewers, each 8 feet in diameter.

The construction of the canal sewer necessitates the entire reconstruction of the 10 foot sewer on Huntingdon Street as far westward as Sepviva Street, in order to secure the proper slope for drainage. The work will cost nearly \$1,500,000, and will be completed under favorable conditions in about a year.

BICYCLE BOAT.

Small pleasure boats propelled by a screw actuated by pedals have been observed since last summer upon one of the lakes of the Bois de Boulogne. Their mechanism is ingenious. The idea of substituting a screw actuated by pedals for oars or paddle wheels is not new, but this is the first time that we have seen it realized in a sufficiently practical manner to assume the proportions of a genuine enterprise. The motive system of this new boat, devised by Mr. Vallet, has much analogy with that of bicycles, and it is for this reason that it has been called a bicycle boat. One of the models especially (the one represented at the bottom of the engraving and figured 2), which is designed for one person, recalls the bicycle. In another model, designed for several persons, the saddle is replaced by an arm chair, as shown in the general view at the top of the engraving. In both systems, the motor is the same. It consists of a horizontal shaft that passes through the stern of the boat and carries the screw. To this shaft are keyed two bevel wheels, A and B, either of which may be thrown into gear at will with a third mounted upon a vertical axis. This latter receives motion from the pedals through the intermedium of an endless chain running over a sprocket wheel. A hand wheel keyed to the top of this axis keeps up the motion and renders it regular.

The shaft of the screw is movable in the direction of the length of the boat, and this, through a system of levers, D C, that the pilot has within reach, permits of throwing either the pinon, A or B, into gear at will. There is thus obtained, without any necessity of modifying the motion of the pedals, a backward or forward movement or even a complete stoppage, if the shaft be given an intermediate position. As for the steering, that is effected through a bar, analogous to that of bicycles, which controls the rudder.

The ratio of the gearings is so calculated as to obtain a multiplication of five, and the pitch of the screw is 58 centimeters. Each revolution of the pedal therefore causes the boat to move forward 2.9 meters. Supposing that one stroke of the pedal be given per second, an advance of 174 meters will be made per minute or 10.5 kilometers per hour. But practically it would be impossible to keep up one stroke of the pedal per second very long, and it is necessary, too, to take into account the resistance of the water, which increases very rapidly with the speed of the boat. From our own experiments, we believe that it is possible to attain a speed of about eight kilometers per hour in calm water and without wind.

This question of speed, however, is of no great importance, for we have a pleasure boat rather than one for racing, and the speed is of slight consequence, provided that it be adequate. We have been surprised at the easy motion of the pedals and at the facility with which the maneuvering is done without fatigue. It is a very agreeable mode of locomotion, that we find more convenient and more within reach of every one than that effected by the oar or paddle. — *La Nature*.

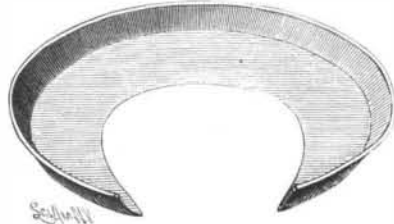
TRICK PHOTOGRAPHY.

In the *SCIENTIFIC AMERICAN* of March 3 we described how, by a simple attachment to an ordinary kodak, one could easily take pictures of the same per-

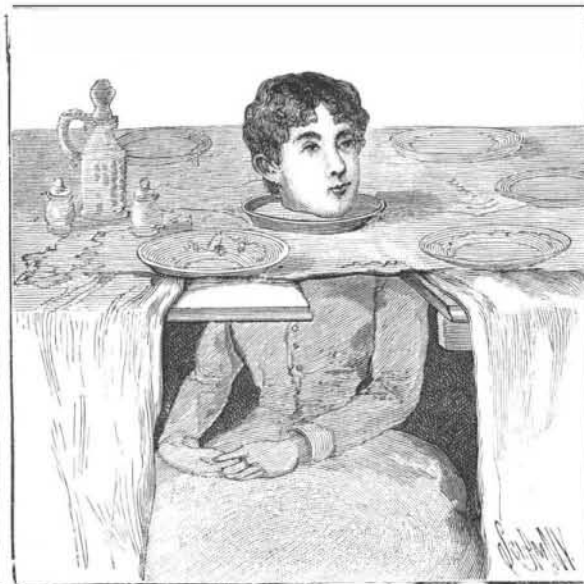


HEAD OF LADY PHOTOGRAPHED ON A PLATTER.

son in different attitudes on one plate. The illustrations given were the work of Mr. Frank A. Gilmore, of Auburn, R. I., who has also sent us the photograph from which is made the accompanying representation



PAN CUT AWAY TO REPRESENT PLATTER.



HOW THE PHOTOGRAPH IS MADE.

of what appears to be the head of a living person on a platter, forming part of the furnishing of a dining room table. Although the way in which the work is done is very simple, pictures made in this manner have been extremely puzzling, and are of especial interest to amateur photographers, as they suggest other methods of producing novel effects. In this case a center leaf was removed from an ordinary extension

table, the lady to be photographed then being seated so that her head appeared just above the table top, on which the cloth and other articles were arranged as nearly as possible in the usual way, as shown in one of the views, the table being built up in place of the removed leaf sufficiently to support the cloth and other articles. To make the illusion complete, a pan, cut away so that it may be conveniently placed around the neck, as shown in the small picture, has the appearance in the photograph of being an ordinary platter, bearing the head of a living person.

Influence of Horticulture on the Manners and Customs of the People.

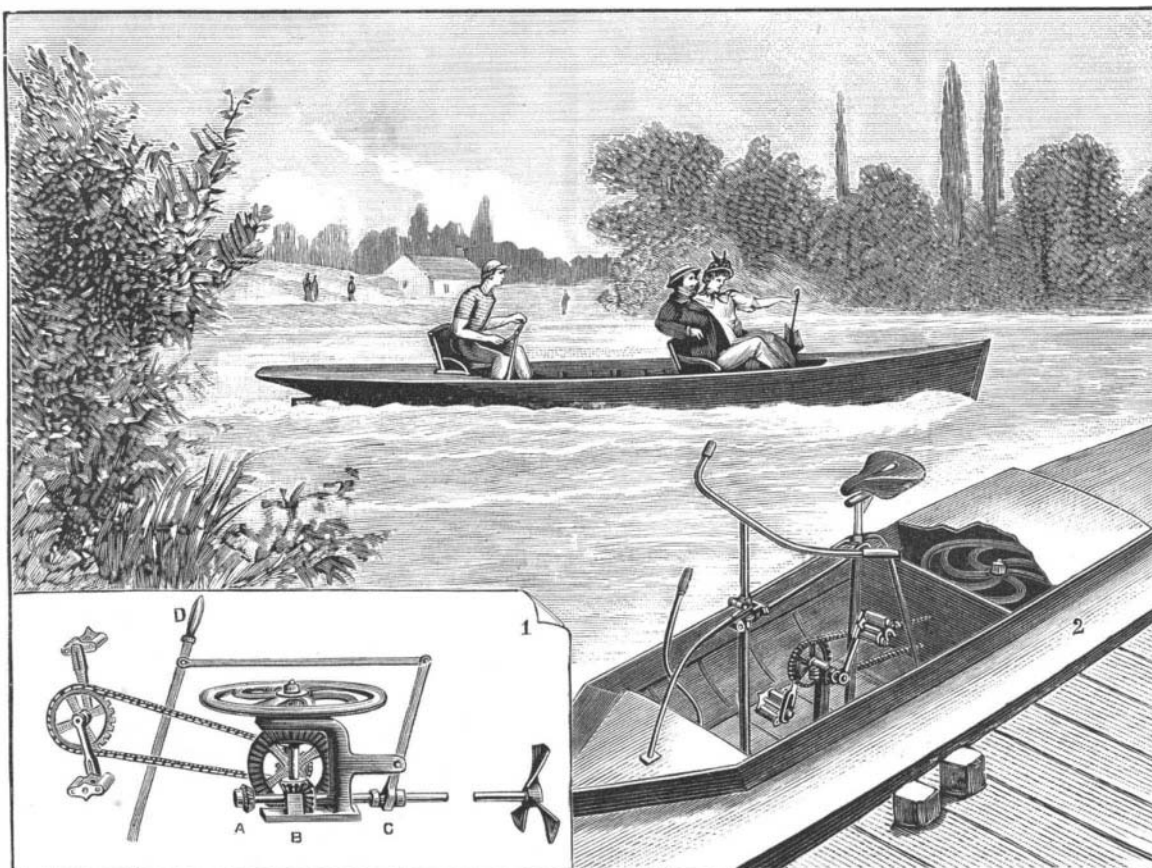
This was the subject of a most interesting and instructive paper lately read by Mr. Harper, custodian of the Aberdeen Duthie Park, to the members of a working men's guild in Aberdeen. After a historical introduction, in which he referred to the Garden of Eden, Mr. Harper said the floralia of the ancients survive to-day in the "battle of flowers" to be seen in Algeria and Italy. Cleopatra paid £200 for the roses employed at one banquet. The first school of gardening was the Jardin des Plantes at Paris, yet the science of horticulture was less generally known in France than in this country. Modern British gardening received its first stimulus in the reign of Henry VIII. It changed under Charles II., again under George II., and in the reign of George III. was profoundly affected by the introduction of flowering plants from North America. The establishment, in 1824, of the experimental gardens at Inverleith Row, Edinburgh, did a great deal for gardening in Scotland. In our own time horticulture is slowly but surely influencing our people to a more correct taste and appreciation of beauty. The parks are being more appreciated every year; a neat flower bed commands the attention and respect even of the vulgar. Horticultural exhibitions are of the greatest use to those engaged in horticulture. Mr. Harper spoke strongly of the work of the guild in the culture of plants in houses. In the child's love of flowers we have the voice of nature; it falls into decay as vice and selfishness harden the tender heart. Speaking of open spaces in the heart of the city, Mr. Harper said they could not fail, if well kept, to be a great benefit to the whole community. A modern feature is the tasteful arrangement of autumn foliage, a form of decoration at once effective and inexpensive.

Aluminum Yachts.

Two examples of aluminum built yachts are at present to be seen in French waters. One is the ten ton yacht *Vendenessa*, launched recently from the stocks of the *Societe de Chantiers de la Loire*. The other is a 33 foot sailing boat. The former craft has been built for the well known French yachtsman, Comte de Chabannes, La Palice, from the designs of M. V. Greiloux. It is computed that if this vessel had been constructed of steel frame and wood planking, like other boats of her class, her hull would have weighed some 4 tons 5 cwt., but in aluminum the weight is only some 2 tons 6 cwt. The other craft referred to is named the *Jules Davoust*, and with it Lieutenant Hourst intends to set out on a survey expedition on the Niger. This craft affords additional proof of the great suitability of aluminum as the structural mate-

rial for boats intended for exceptional purposes, such as river survey and exploration. The boat complete only weighs 18 cwt., a fact which sufficiently indicates the extreme portability of the craft when overland transport is involved.

THE Gates Iron Works, Chicago, manufacturers of the gyratory rock and ore breaker, known as the Gates Crusher, have recently purchased the entire plant—tools, machinery, stock, patterns, drawings, etc.—of the Chicago Iron Works. With this valuable addition to their plant, the Gates Iron Works are in a better position than ever before to build any kind of machinery required for the reduction and treatment of ores of whatever nature. The Gates Company have had half a century of experience in this line of manufactures, and furnish modern machinery of the highest merit, both as regards material and workmanship.



BICYCLE BOAT OF THE BOIS DE BOULOGNE.