

METHOD OF LIGHTING THE GREAT WATER TANK AT THE NOUVEAU CIRQUE, PARIS.

The Nouveau Cirque is the only place of amusement in Paris where it is possible to present nautical spectacles, and, since its organization by M. Zoller in 1886, it seemed to have exhausted pretty much everything capable of interesting the public in this order of amusement until a couple of years ago. At this period, M. Houcke, the director, found a subject, which, although not new, served as a pretext for a very interesting stage setting, and in which M. Mercier, the skillful engineer of the house, was obliged to display all his knowledge of both hydraulics and electricity. It was a question of exhibiting to the spectators a fishman, or rather a diver, who remained under water as if he were at home in that element.

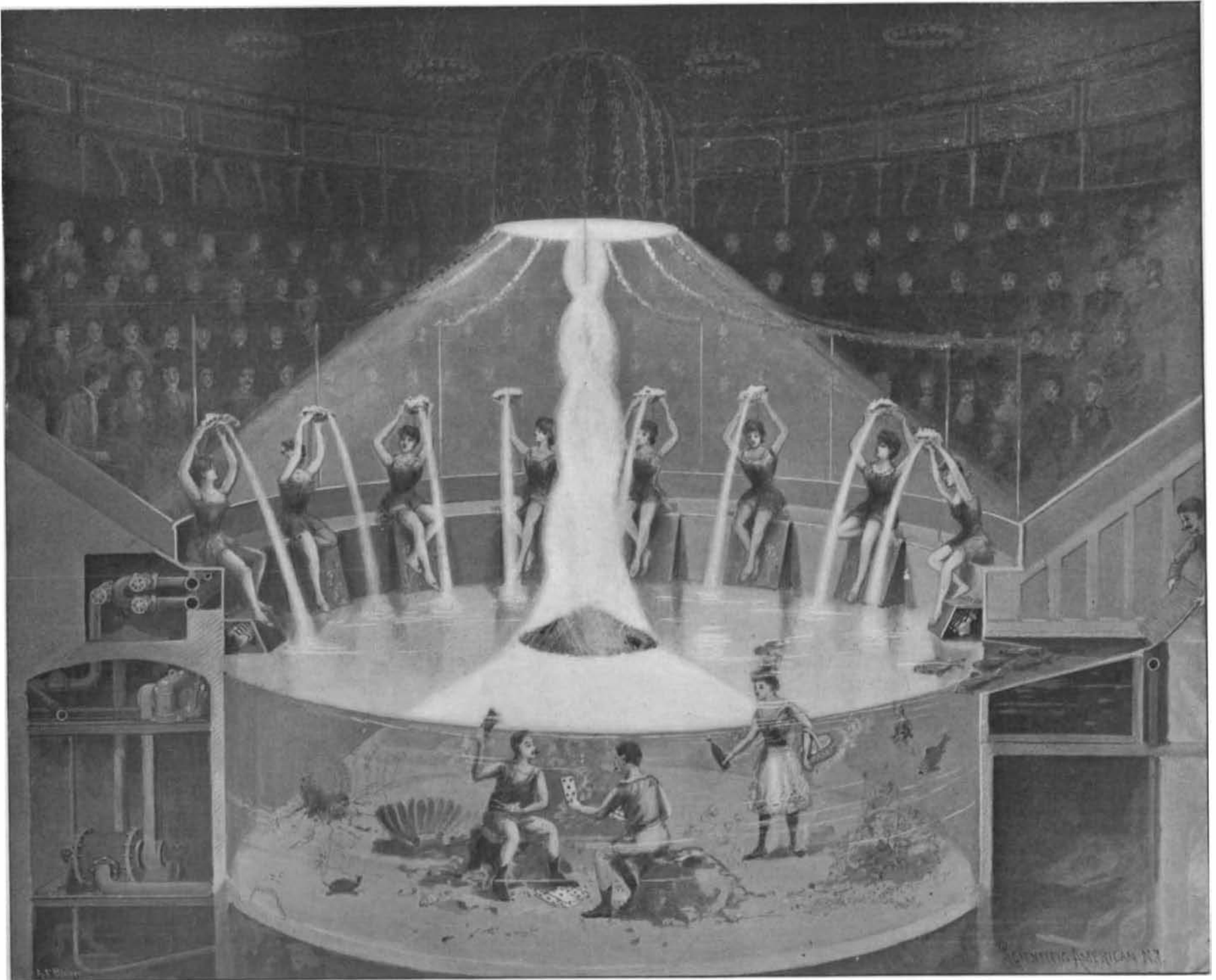
Good divers are not very rare. Those are considered very good who remain under water for two minutes, but some have been known to remain for five.

Respiration, physiologically speaking, does not consist solely in motions of inspiration and expiration of

utes playing cards with a companion who came to visit him, and pretending to partake of a breakfast brought to him by a young woman, who also was amphibious. A hundred or more large sized carp that swam about the group dispelled all suspicion as to any trickery. In order that these fish might remain "en scene," and not conceal themselves in the nooks and corners of the structure, the tank had to be surrounded by panels of open-work metal which they were unable to surmount. In the day time, they were kept in a sort of fish pond which communicated with the tank through a narrow aperture. At first, it was necessary to use nets to drive them from their pond and make them re-enter it, but, after a few representations, these actors got used to the "boards," and made their exit and entrance of their own accord.

In order to render it possible for the divers to remain at the bottom of the tank, which was 8 feet in depth, they were weighted with pieces of lead, from which they freed themselves when the moment arrived to regain the surface.

candles each, concealed in 18 boxes that rested upon the circumference of the tank, and were covered externally with movable painted canvases that were changed at the desired moment so as to form a decoration in harmony with the ballet scenes represented before the submersion of the stage. At the moment at which this operation was performed, the dancers arranged themselves upon the top of the railing surrounding the ring, and the boxes floated upon the water. The latter were ballasted in such a way that the lamps which they contained came very near the surface. They were connected with each other electrically, and the current was led to the circuit by a flexible cable that a plug permitted of branching at the desired moment upon the general distribution of the establishment. The interior of each box was provided with reflectors that sent all the light to the bottom, which was white. This latter was covered with rubber cloth cemented to the floor and provided with apertures for allowing the water to pass at the moment of the immersion. In order to light the center, 40



A SUBMARINE GAME OF CARDS AT THE NEW CIRCUS, PARIS.

the sides and diaphragm, for that is the mechanical side of the question merely. There is also a chemical side which is no less important, and which consists in the exchange that is effected between the oxygen and carbonic acid of the blood corpuscles that inundate the pulmonary surface.

Professional divers are drawn to the surface at the end of a time fixed in advance for each of them, and which is watched by their companions, chronometer or sand-glass in hand. Three-minute sand-glasses are quite frequent, while five-minute ones are very rare. Before submerging himself, the diver takes deep inspirations of air for about ten minutes, the object of which is to store up oxygen, not in the air cells of the lungs, but in the blood corpuscles. In this way there is obtained a special respiratory capacity of the blood.

The diver Benett, who appeared at the Nouveau Cirque, remained 5 minutes and 27 seconds under water on one occasion. Such a feat is very rare, however, and Benett was not allowed to perform it before the public lest it might prove fatal to him. He remained at the bottom of the tank for about three min-

In order that the spectators might not lose anything of what was going on, it became necessary to find a method of rendering luminous the mass of 184,800 gallons of water in which the divers maneuvered. This was not as easy a matter as might be thought.

At first, the idea suggested itself to install arc projectors under the water; but, since the light thus obtained would have been localized in the zone of propagation of the pencil emanating from the lens, and the effect would have been bad, recourse was had to a very large number of luminous centers given by incandescent lamps distributed around as well as in the middle of the tank. Care was taken not to submerge them, on account of the difficulty of maintaining an insulation under such conditions, especially in a movable material of which the place was changed every evening. They were therefore placed as near the surface as possible. Under such circumstances, the light was very intense, and was distributed in a homogeneous manner throughout the entire mass, and the spectator could not see whence it emanated. The electric installation comprised 250 incandescent lamps of 32

lamps were arranged on an inverted cone of metal suspended in such a manner as to graze the water, by means of a cable starting from the loft above the stage and leading the electric current. The effect obtained was very curious. The water seemed to become luminous of itself, as if it were phosphorescent, and the spectator lost no detail of what was going on in the tank. At the end of the representation, at the moment of the apotheosis, an arc lamp of 30 amperes was lighted at a height of 33 feet. This was concealed by a translucent fabric forming a sort of umbrella mounted upon a jointed frame that permitted of its being closed when it was not in use. Its proportions were so calculated that the luminous rays could not directly reach the spectator, who was thus immersed in a diffused light, while the surface of the tank and the jets of water were brilliantly illuminated. There was thus obtained a revolving jet that fell from the covering of the arc lamp, 32 wheat-sheaf jets that started from decorative motives that floated upon the water, and 20 jets that flowed from shells held by the dancers seated around the tank: