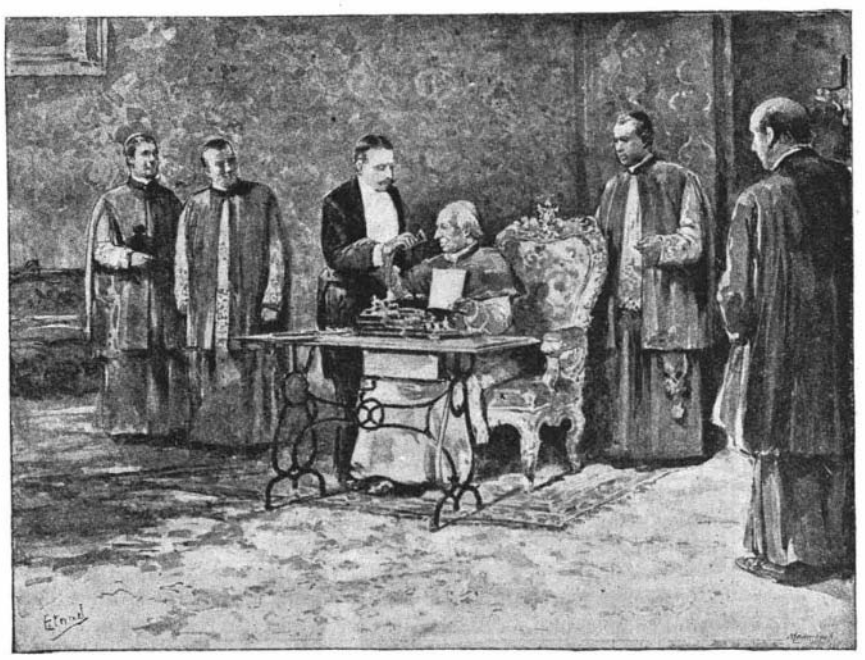
THE WORLD'S COLUMBIAN EXPOSITION—THE POPE'S PHONOGRAPHIC MESSAGE TO AMERICA.

We recently gave a description of the first trial of a phonograph by his Holiness the Pope at Rome, and we now present an engraving of the scene as given in the London *Graphic*.

The Pope gave a private audience on March 19, in his study, to Mr. Stephen Moriarty, who was introduced by Mgr. Merry del Val, the papal chamberlain. Mr. Moriarty had with him a phonograph, by means of which he delivered an address in Italian congratulating the Pope on the occasion of his episcopal jubilee. He went on to say that he felt deeply honored in being the bearer of two messages—one from the late Cardinal Manning and the other from Cardinal Gibbons, Archbishop of Baltimore, who would in their own words express their devotion to his person. He concluded by begging his Holiness to speak into the phonograph some expression of love and his blessing, which might be delivered to the German Catholics of America on the occasion of the opening of the Columbian Exhibition. He pointed out that if the Pope granted his request, it would be the first time in the history of the Papacy that the voice of the reigning Pontiff had been heard in America.

The Pope then listened to the message from the late Cardinal Manning, in which his Eminence asked for a blessing and expressed a hope that the Catholic faith would soon spread over the whole world. The Pope was visibly affected when he heard the voice of the dead cardinal. He then heard the message of Cardinal Gibbons, who asked for the blessing of God upon the Pope. His Holiness promised to send a phonographic message to the United States, and invited Mr. Moriarty to return for another audience. This was given on Monday, in the Pope's private study, the members of the Papal Court being present. At the request of his Holiness, the messages of Cardinal Manning and Cardinal Gibbons were repeated on the phonograph. The members of the Papal Court were amazed at hearing the voices of the two cardinals loudly and clearly reproduced, while the Pope sat back on his throne laughing at their astonishment. The Pope then said: "I will now send my message to the people of the United States," and bending over the phonograph, he spoke into it. Then, turning to Mr. Moriarty, he said: "I hand you this message; guard it carefully, for it is the expression of my love for all the people of the United States. I wish you to deliver it with your own hand to the President." This message, which is in Latin, by the Pope's special request will not be published before it has been reproduced in America.



THE POPE'S PHONOGRAPHIC MESSAGE TO AMERICA.

THE CROSSING OF RIVERS BY MEANS OF LEATHERN BOTTLES.

The advantages that an army in campaign can obtain from the use of leathern bottles as floating supports cannot be overestimated. A leathern bottle made from an ox hide is capable of sustaining upon the surface of the water a weight exceeding that of two men, and may be easily used for the creation of rapidly manufactured rafts. Although the subject is somewhat technical, it appears to us of interest to show how it is possible to make these bottles *in situ* by means of the hides of the animals which serve for the feeding of the soldiers, and which the troops themselves daily slaughter in considerable numbers. As concerns this, the *Journal du Genie Russe* contains some detailed information that we shall analyze.

"An ox may be slaughtered in three ways. The first, and most imperfect, method consists in striking it in the forehead with a felling ax. Two men then seize the animal by the horns, throw it down and cut its throat. The second, which is less cruel and more expeditious, requires a little more skill on the part of the men who are called upon to apply it. A two-edged knife is arranged between the nape and the first vertebra and driven in with a blow of the fist, and the operation is then finished as above. The third comprises the following operations. The fore legs of the ox are first tied together, and then the hind ones. On causing the former and latter to approach each other, the animal is thrown down. Its four legs are then tied together and its throat is cut. This process is the easiest to put in practice by inexperienced men. It has the advantage over the preceding that it is applicable to horses.

After the animal has been killed, its head is cut off according to the line, C D, and an incision is made from D to J (Fig. 1). Afterward, the skin is cut from the legs below the knees and the bones are removed by a disarticulation of the knee joints. The skinning is begun at the neck. An incision is made with a knife, and the hide is turned up on one side of the paunch so as to disengage the shoulder blade, which is then detached. Next, the corresponding leg is skinned. After this the same operation is performed on the other side. Then the hide of both sides is acted upon at the same time, and the lungs, liver, stomach, spleen and intestines are removed in order to facilitate the rest of the skinning. For the posterior part of the body, one operates in the same order, first on the back and sides and then on the legs. When the tail is reached, only 12 inches of it are preserved. Care must be taken not to cut the hide. The right hand, open or closed according to the stress to be exerted, is used for separating the flesh from the hide, while the left hand acts upon the latter.

It is now a question of closing the apertures that the hide presents. To this effect, holes 2 inches in width and 3 inches apart are made around the apertures and upon the two thicknesses at once (Fig. 2). Then the skin is turned inside out and a wooden pin 5 or 6 inches in length and ¾ inch in diameter is inserted in the holes, and with five or six turns of twine, a tight ligature is made behind the pin, which holds it in place. This done, the skin is turned right side out and the tying of the neck is begun. A blunt pointed pin about 12 inches in length and 1½ inches in diameter is introduced into the holes in such a way as to perforate the two sides of the hide and bend them alternately to the right and left, and then a ligature is made with eight or ten turns of strong twine. In order to tie the legs, eight or ten turns of twine are made, but no pin is employed. Before closing the fourth leg, the hide is inflated either with a bellows or the mouth. In the latter case, a reed pipe, T (Fig. 2), is used. The raft is formed of logs and cross ties from 12 to 14 feet in length and about 3 inches in diameter, assembled with tenons, or more simply with ligatures. The bottles, to the number of from four to six, are connected by the legs, which turn up over the cross pieces and are tied thereto with twine. Fig. 3 represents a raft thus formed, carrying Russian troops. Holes are arranged for the oars, and, finally, the frame is covered with 5 inch planks for the carriage of infantry and with 14 inch ones for campaign artillery. A leathern bottle made of an ox hide weighs about 26 pounds. When it is inflated, it has a sustaining power sensibly equal to the weight of the animal from which it is derived, say about 440 pounds. A raft of four bottles is capable of supporting ten men while still preserving a projection of 6 inches above the surface of the water. With six bottles it will sustain twenty men and project from 3 to 4 inches above the surface. Among these men, there are four oarsmen, who sit at the sides.

These bottles can be used immediately after their manufacture, but a few precautions are necessary in order to preserve them for a certain length of time. In the first place, at the time of preparation, the flesh side is treated with 13 pounds of marine salt, and the hide is then dried for three or four days under a shed. After this, the same side is covered with a hot mixture of tallow and birch tar. This coating is renewed when some time is to intervene before the bottles are used. They are always preserved with the hairy side within, under well ventilated sheds, and they are inspected from time to time in order to make sure that rodents are not injuring them. During the course of practical exercises, it is well to take them out of the water every day, without discharging the air from them, and to place them upon planks under shelter from the sun. It is necessary also, every week or two, to renew the cords with which they are attached.—*La Nature.*

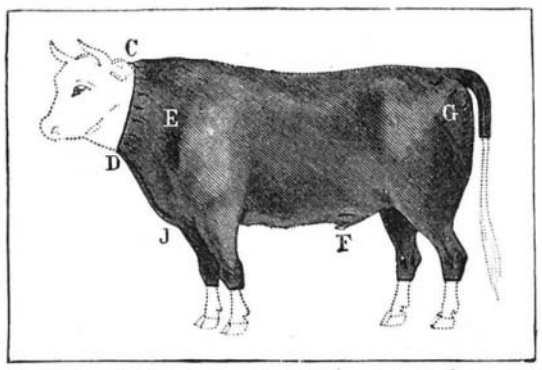


Fig. 1.—MANNER OF CUTTING THE OX.

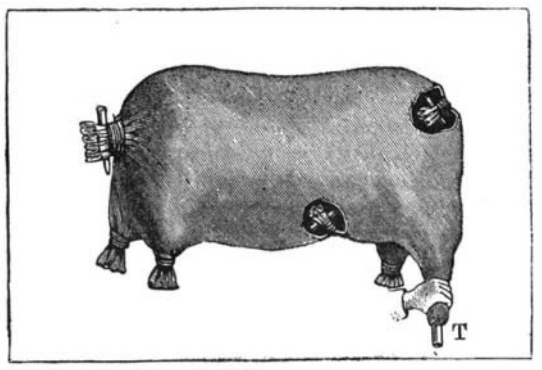


Fig. 2.—MANUFACTURE OF THE LEATHERN BOTTLE.

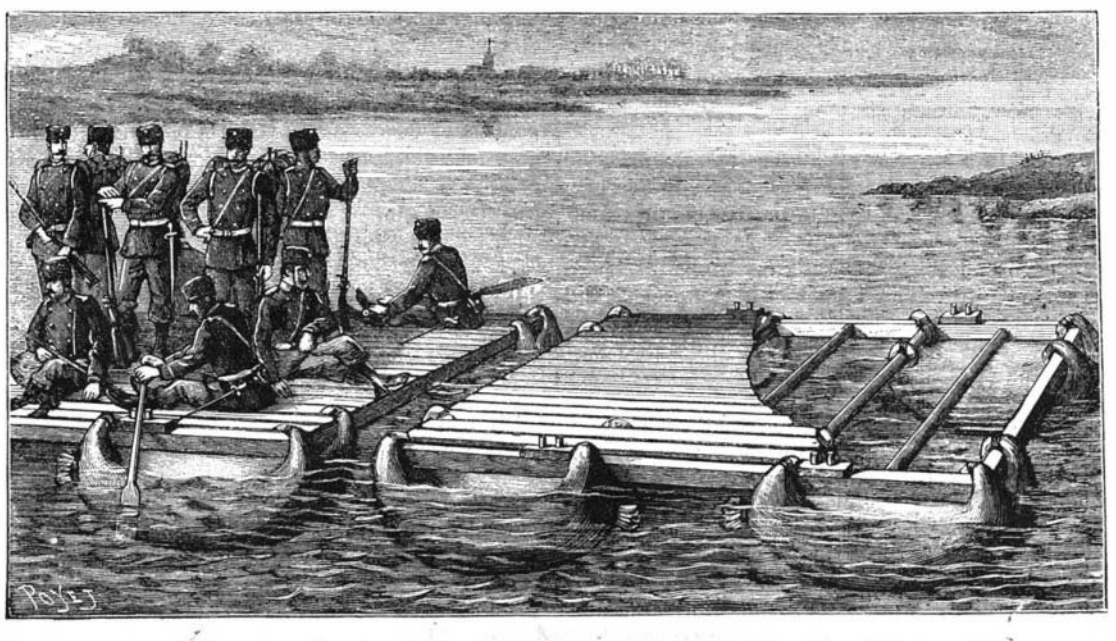


Fig. 3.—MILITARY RAFTS FORMED OF LEATHERN BOTTLES.

THE Master Car Builders' Association recommend a drop test for ascertaining the strength of car couplers. The Buckeye Malleable Iron Co. has constructed a drop machine for testing the Buckeye coupler made by them. One or two couplers out of every heat are tested in this drop, and the lot is rejected if those selected do not stand. The machine consists of an upright frame, in which a 1,640 lb. weight moves, something like a pile driver. Three drops of 10 ft. and two of 15 ft. are used. The coupling iron is placed in the machine, knuckle up, and the weight drops upon it.