Measuring the Rise and Fall in Waterways.

Mr. F. J. Smith describes in *Nature* a unique method of observing the rate at which a river was rising after a fall of rain, as follows: The river was a considerable distance from the spot where its height was to be known. By means of the combination of two organ pipes and a telephonic circuit described in the following lines, I have been able to make the required measurements within rather closer limits. At the river station an organ pipe was fixed vertically in an inverted position, so that the water in the river acted as a stopper to the pipe, and the rise or fall of the water determined the note it gave when blown by a small bellows driven by a very small water wheel. A microphone was attached to the upper end of the organ pipe: this was in circuit with a wire leading to a town station at some distance; at the town station there was an exactly similar organ pipe, which could be lowered into a vessel full of water while it was sounding. By means of a telephone the note given by the pipe at the river was clearly heard at the town station; then the organ pipe at this station was lowered or raised by hand until it gave the same note. The lengths of organ pipe under water at the two stations were then equal, so that the height of the water in the distant river was shown. The determination can be made in less than a minute by any one who can recognize the agreement of two similar notes. The arrangement when first tested was so placed that the height of water at two places near together might be easily compared. I found that a lad with an average ear for musical sounds was able to get the two heights to agree within one-eighth of an inch of each other, while a person with an educated ear adjusted the instrument immediately to almost exact agreement. The total height to be measured was 17 in. A difference of temperature at the two stations would make a small difference in the observed heights. For instance, taking a note caused by 250 vibrations per second, a difference of 10° C. between the temperature of the two stations (one not likely to occur) would make a difference of about 0·02 ft. in height, a quantity of no moment in such a class of measurements. The organ pipes were of square section and made of metal to resist the action of the water.

Hook Swinging in India.

In the SCIENTIFIC AMERICAN of March 5, 1892, we gave engravings of the hook swinging festival as practiced by the heathen at Madura, in India, with a description of the proceedings by the American missionary Rev. J. S. Chandler. We have lately received some additional photographs of the same performances, from Mr. H. C. Van Ingen, artist and photographer, at Coonoor, Nilgiris, S. India. The further practice of this barbarous rite has been prohibited by the government. Mr. Van Ingen, who took the photographs from which our engravings were made, has also sent us some fine photographs of the Indian bison, the domestication of which is now being attempted.

AN AERIAL AND SUB-AQUATIC TORPEDO.

A torpedo designed to be guided in its flight on leaving the gun after the manner of an arrow from the bow, and to continue its course on or near the surface, should it strike the water, is shown in the accompanying pictures. The piece of ordnance for starting the torpedo, shown in Fig. 1, is preferably a breech-loading gun, the torpedo, shown in Fig. 2, being loaded in from the muzzle. Fig. 3 is a cross section through the front part of the projectile, showing the wings on top of the main tube, and below a weighted piece similar to the keel of a boat, while Fig. 4 is a cross section of the rear wings, the latter sliding forward on the body when the projectile is placed in the gun, as represented in the principal view, but slipping back to the rear as the projectile commences its flight. The shape and inclination of the wings are such as is designed to uphold and direct the projectile in a straight course through the air, retaining it also near the surface after it strikes the water, until its propelling power is completely exhausted. In addition to the propelling force supplied by the gun at the time of discharge, in the usual manner, this torpedo is provided with further means of propulsion, concealed within the rear portion of its body, the combination being designed to give the projectile a great range and high speed through either the air or water. A 12 inch torpedo of this construction is adapted to carry 350 pounds of a high explosive. The improvement is the invention of Mr. L. Gathmann, a mechanical engineer of Chicago, who has made a number of tests on Lake Michigan with projectiles up to ten feet in length, and is said to have demonstrated that they will carry several miles with great accuracy of aim.

THE GATHMANN TORPEDO—Fig. 2.

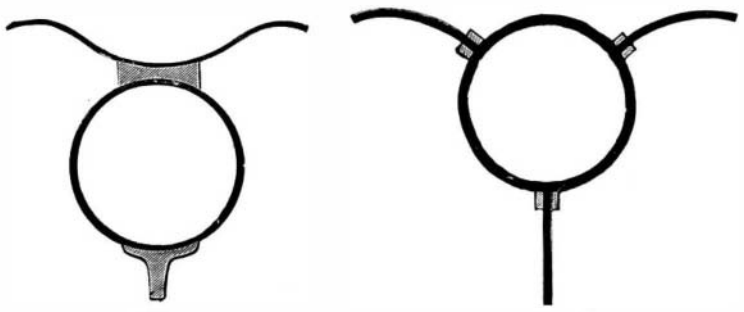


Fig. 3. Fig. 4.

THE GATHMANN TORPEDO—SECTIONAL VIEWS.

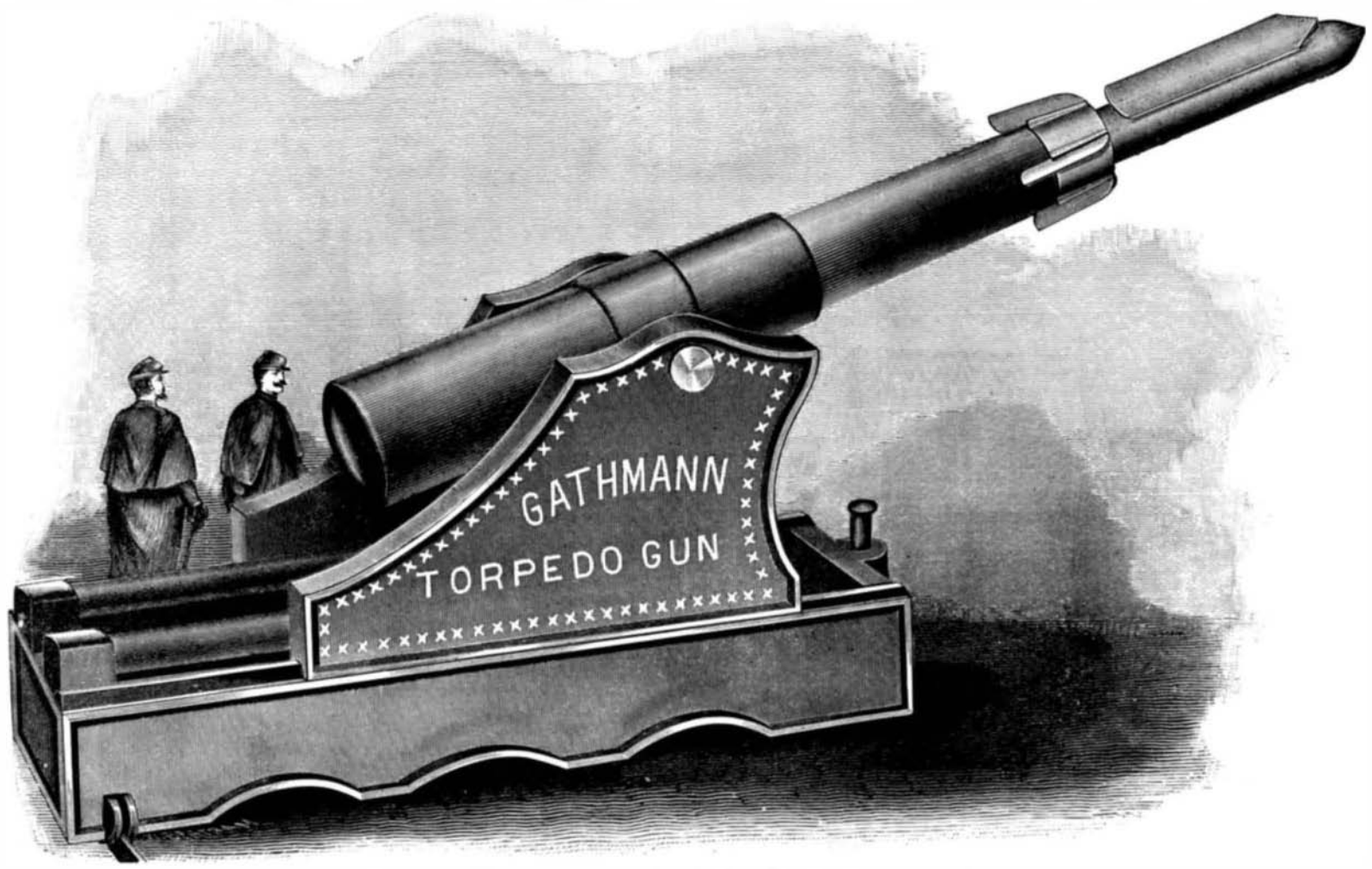
The New Packing House, Kansas City.

The new Armour packing house at Kansas City was started up "for business" on October 1, with between 600 and 700 men at work, which force will be enlarged to between 2,000 and 3,000 when in full operation, and as the old house (Armour Packing Company) employs nearly as many men, the total force in the employ of the Armours in the city will be between 5,000 and 6,000 men.

One of the most interesting features of this plant is the cooling machinery for the two cold storage houses, one 178 × 135 feet and the other 178 × 118 feet, each four stories high, with capacity for 10,000 beeves daily. The refrigerating machinery cost $250,000, and was furnished by the Frick Company, of Waynesboro, Pa. The machines are their single-acting vertical compressors with horizontal engines. The power is furnished by two 150 horse power tandem compound condensing Corliss engines, and each of the two refrigerator machines has a capacity of 200 tons per day. This is sufficient to reduce to the freezing point a space of 4,000,000 cubic feet. Each cooler is supplied individually with large steel ammonia pipes, and the system by which they are connected with the ice machine is such that the full pressure can be turned upon any one cooler if necessary. In case one of the ammonia tanks becomes disabled, by a system of pipes and shut-off valves the pressure can be transferred to the other tank without any loss of cooling power whatever. There are over 200,000 feet of ammonia pipes in the several coolers. The machines were set up under the direction of Thomas Shipley, who had 250 men under his direction for thirty days, the machines and materials used having required 150 cars in their transportation from the works in Pennsylvania to the packing house.—*Ice and Refrigeration.*

How to Get Rid of Mosquitoes.

In a late number of *Insect Life*, Mr. L. O. Howard publishes a note upon the use of kerosene against them, the substance of which is as follows: On the surface of a pool of water, containing about 60 square feet, he poured four ounces of kerosene. This formed a very thin oily film on the surface of the water. On the 5th of July the pool was teeming with animal life, but for the next ten days that the pool was under observation no living insects were observed. At the end of this time, a count of the insects on a small portion of the surface, from which was estimated the total number, showed 7,400—370 of which were mosquitoes. The kerosene remedy was tried this last summer on the swamp meadow pools of Stratford, Conn., with much success.



THE GATHMANN TORPEDO AND TORPEDO GUN—Fig. 1.