

Willard make the rapids voyage in Graham's barrel, while Graham, protected by a life preserver, was to swim from the whirlpool to Lewiston, a feat never successfully performed up to that time.

On the afternoon referred to Miss Willard and the barrel were cast adrift above the lower bridges at 3:58 o'clock. Two minutes later she passed under the bridges, and at 4:04 P. M. the barrel entered the whirlpool. It had been the experience that barrels and boats were captured and withdrawn from the pool within an hour after entering there, but in Miss Willard's case the barrel was not caught until after 9 P. M., and she had been floating in the pool over five hours. When she entered the barrel she took her pet dog for company's sake. When the barrel was landed the dog was alive, but Miss Willard was dead. She is the first woman to lose her life in navigating the whirlpool rapids of Niagara. The day before Miss Willard's trip, Martha Wagenfuhrer made the trip and was taken from the pool alive. Miss Wagenfuhrer is the only woman who ever went through the whirlpool rapids alone. On November 28, 1886, Sadie Allen made the trip in a barrel of different construction with George Hazlett.

While Miss Willard was still floating in the pool, Carlisle D. Graham, in order to accommodate a moving picture machine present that day, left the pool and swam to Lewiston, making the trip in safety. He was attired as shown in the illustration. Between the whirlpool and Lewiston there is considerable rough water, but Graham passed the breakers in safety. Returning to the whirlpool after going to Lewiston, Graham made ineffectual efforts to rescue Miss Willard's barrel, and in doing so was frightfully battered and pounded by driftwood in the pool.

A DESTRUCTIVE BOLT OF LIGHTNING.

How erratic and how destructive lightning may often be was brought home to the cottagers who live in the vicinity of Saratoga in a way they will not readily forget. During a recent storm a dwelling was struck with effects that are vividly told by the photographs herewith reproduced. The lightning first struck the chimney, passed down into a bed chamber, wrecked the bed and turned it over, twisted a picture completely around so that it faced the wall, and finally broke through the side of the house, leaving a large gap. Fortunately the bed was unoccupied during the night of the storm.

The wall and ceiling of the parlor beneath the bed chamber were also badly damaged. A piano suffered considerably, and a violin, on top of the piano, was hurled across the room and broken. Many panes of glass were shattered. Strange to relate, a clock and hanging lamp almost directly in the path of the bolt were uninjured.

Balloon Ascension.

In a balloon ascension made on the 31st of July at Berlin, Messrs. Bersen and Suring, two German physicists, reached a height of 31,800 feet. The balloon had a capacity of 272,000 cubic feet, but only received 204,000 feet of pure hydrogen gas prepared by the electrolytic process at the Tempelhof aerostatic park. The hydrogen for filling the balloons is contained in steel tubes having a volume of 350 gallons each, in which the gas is under a pressure of 100 atmospheres. The balloon rose rapidly and at an altitude of 4,600 feet passed a cloud-bank of 1,000 feet thickness which did not hide the whole of the earth's surface from view, as they were able to see distinctly the river Spree as far as Niggel, and the Havel as far as Brandenburg. There were no more clouds up to a height of 30,000 feet, and at this point they were on a level with a second cloud-bank whose thickness could not be estimated. The aeronauts were protected against the cold by a special apparatus called "thermophore," the details of which have not yet been made public. The voyagers employed inhalations of pure oxygen, which protected them against the effects of the rarefaction of the air up to a certain point. It was only at a height of 27,000 feet that they began to suffer from the rarefaction, and this effect increased as they rose. At 31,000 feet the two aeronauts both became unconscious at about the same time, but previously to this M. Bersen had taken the precaution to open the escape-valve, so that after mounting to 31,800 feet the balloon began to descend. The aeronauts remained unconscious for 30 to 45 minutes, but they became quite restored upon reaching a lower level, and experienced no bad effects. It is probable that this unconsciousness was caused by the lowering of the

barometric pressure. The minimum temperature reached during the ascension was only -40 deg. C., which is less than was expected. The relatively high temperature at these altitudes is a fact which has been observed at different times in the tests made with sounding balloons. These have been sent up as high as 45,000 to 55,000 feet and have nowhere registered below -70 deg. Further study will be necessary in order to elucidate this question.

The Wastage of Shipping.

The tonnage launched in three months in the United Kingdom totaled 398,585 tons, the measurement of 177 vessels, and now an official report records the waste of shipping as 224 vessels of 171,996 tons, so that the tonnage added to credit is more than double that shown on the debit side. Moreover, while 392,864 tons of the new ships were steam-propelled, only 91,781 tons of the waste was in steamers, and thus the carrying efficiency of the new vessels is nearly four times that of the vessels removed from Lloyd's Registry, from which the returns are issued, says the Engineer. Obviously the difference means keener competition. The wastage indicated is much under the



EFFECTS OF LIGHTNING, SHOWING WHERE THE BOLT ENTERED AT THE ROOF AND WHERE IT LEFT THE HOUSE AT THE SIDE.



THE INTERIOR OF A ROOM WRECKED BY LIGHTNING.

average, for the twelve months' total usually is between 780,000 and 850,000 tons, or at the rate of 210,000 tons per quarter, as compared with the 171,996 tons now reported. We have indicated that the loss is fairly equally divided between steamers and sailing vessels; steel vessels account for one third, iron ships accounting for 61,390 tons, and wooden or composite vessels for 52,187 tons. Since few iron or wooden craft have been built for some years, it will be seen that most of the vessels lost were of some antiquity. Wrecks, as usual, accounted for the greater half of the waste—126 vessels, of 85,078 tons, being thus lost—while 28 vessels, of 24,754 tons, were broken up or condemned. Fires claimed 10 vessels, of 18,807 tons, most of them, curiously enough, being sailing ships; 15 vessels were posted "missing," the tonnage of these averaging nearly 1,000. Nineteen vessels, of 10,661 tons, were abandoned at sea. Collisions sent to the bottom 13 vessels, of 10,199 tons, most of them steamers. Eight vessels, of 7,137 tons, foundered, and five vessels, of 1,815 tons, were otherwise lost. It is gratifying to note that only 47 tons out of every 10,000 tons owned by Britain were lost during the quarter, whereas with other notable maritime powers

the proportions were: Italy, 216; Norway, 151; Spain, 135; Sweden, 68; United States, 67; France, 64; Russia, 49; and Germany, 36.

Attention to Pipes and Traps a Matter of Hygiene and Economy.

The Brooklyn Daily Eagle gives the following useful advice on household sanitation:

The plumber and the plumber's bill are bugbears in nearly every household, but frequently the visit of the mechanic is made necessary through carelessness or ignorance on the part of the members of the household, and many a dollar might be saved were the mistress of the house to look well to the usage of the pipes and traps. A rag, a bit of string, a burnt match or a strand or two of hair are not of much account in themselves, but they can create havoc where plumbing is concerned, and lay the foundation for a steep bill for repairs to the pipes that would naturally be expected to carry off such little things without any difficulty. But the rag hanging over the bend of the trap may prove instrumental in removing the water seal and thus subject the household to the danger of sewer gas invasion and subsequent disease. A string, if it becomes twisted, will accomplish the same result. Burnt matches are harmless enough unless they chance to get jammed into a crevice where they serve as a magnet for other solid particles and the result is a decaying mass that is dangerous as well as offensive. Hair, however, is calculated to produce the greatest amount of harm. It acts as a sort of strainer, catching and holding all that passes and is especially partial to bits of soap. In addition hair will lodge in the most inconvenient places and catch upon the least roughness inside the pipe, remaining there until by accretion the space is clogged.

Coffee and tea grounds should not be permitted to find their way into a pipe, for if they do not clog it they effect serious injury in a short time through a combination of mechanical and chemical action.

Not the smallest particle of grease should be allowed to go into the pipes, and frying utensils ought to be filled with very hot soda water and allowed to stand for some time before washing. Milky water, unless the pipes are frequently and thoroughly flushed with soda water or lime water, will foul the pipes even if but a small quantity be sent down daily.

Another point to be observed if the housewife would be spared worry is that the scouring grit be left out of the joints when the faucets are scoured. The particles, no matter how fine, quickly injure the screw threads. Care should be taken also in washing sandy vegetables to use a big pan and prevent the sand draining off with the dirty water. Even a spoonful of sand going down a pipe will injure it.

Sinks and closets should be treated to weekly flushing of boiling water with additional flushings of copperas water or chloride of lime solution. Set bowls should receive additional attention in the occasional swabbing out of the waste vent, using a swab of cotton attached to a coarse crochet hook. Bath tub drain vents may be cleaned in the same way.

Despite constant vigilance pipes will wear out and break, faucets will leak and the plumbing in general require overhauling, but much inconvenience and expense may be spared if careful supervision be kept over drain pipes and traps.

The Eiffel Tower of Paris has proved of immense value as a meteorological station. The extreme height of its topmost platform above the surrounding country has enabled some valuable data to be obtained regarding the wind velocity and atmospheric temperature at that altitude. A complete record of observations ever since the opening of the tower, in 1889, has been made. The meteorological instruments are situated on the uppermost platform, and are connected electrically with a station below. Hourly records are by this means obtained. A curious fact has been noticed in connection with these observations. It is impossible to obtain any record of the rainfall at the summit of the tower. The velocity of the wind at that altitude is so great that practically the rain drops travel in a horizontal direction, and thus the rain gages do not receive them. Even in a heavy storm, this peculiarity has been observed. According to the record, the velocity of the wind at the top of the tower is more than three times that at a height of 70 feet above the ground, and the normal velocity exceeds a speed of 18 miles per hour.