

A curious fact bearing on the effect of age on iron and steel has been brought forward by Prof. Thurston. He says that about 1830 the first wrought iron T rails were laid on the Camden and Amboy railroad. They were of poor iron, and some years later were nearly all removed, but many still remained on the sidings, whence, however, they gradually disappeared; and it was found that when re-rolled into bars the metal came unusually good, the long exposure having material improved the quality of the iron.

#### THE STEAM SCREEN.

Our illustration on page 172, represents a very powerful fog-signal which was sent to England by the American Light house board to be tried with other instruments in the recent experiments at the South Foreland. It proved to be the most powerful of all the signals tried, making itself heard on one favourable occasion, a distance of 16½ miles. The instrument is called a siren because the sound is produced by means of a disk with twelve radial slits, being made to rotate in front of a fixed disk exactly similar. The moving disk revolves 2800 times a minute, and in each revolution there are, of course, twelve coincidences between the two disks, through the opening thus made steam or air at high pressure is allowed to pass so that there are actually twelve times 2800 (or 33,600) puffs of steam every minute. This cause causes a sound of very great power, which is compressed to a certain extent by a cast iron trumpet, 20 ft. in length. The siren was designed and manufactured by Mr. Brown, of Progress Works, New York.

#### THE BEZETHA VASE.

This vase, which has been the subject of so much public attention in Europe is the last, and in the opinion of savants, the most important result of the labours instituted by the subscribers to the Palestine Exploration Fund. It was found at a depth of about twenty-five feet in an excavation beside the Via Dolorosa. An accidental caving in of the side of this excavation revealed the existence of a series of chambers one above the other. It was in one of these chambers that the vase was found. It was broken to pieces by the falling rocks but after a careful search all the pieces were picked up and the vase restored to its original condition as shown in our engraving. The material is a very hard, grey, terra cotta and it is covered with a profusion of ornaments and sculptures in relief. Judging by these ornaments the vase is said to belong to a period of pure paganism, probably to the time of Hadrian when Judæa became a Roman colony under the name of Aelia Capitolina. Vases of this kind were used in pagan worship to contain wine and water for libations and it is not impossible that this very vase may have been used by the conquerors in offering libations to Jupiter Capitolinus in a temple which was built to that deity close to the spot where the vase was found.

The Chatham *Planet* is assured that the works, already far advanced, at the Round Eau Harbour will be made complete during the present season, by the erection of a light-house and light-house keeper's residence at the piers.

We (*Seattle Dispatch*) have been shown a despatch from Victoria, which states that the Los Angeles used Talbot coal on her trip from Seattle to that port, and that the engineer reports that the coal is excellent for steam purposes—that it is in every respect equal to the best Australia coal for that purpose.

#### DANGEROUS SCIENTIFIC RESEARCH.

Some time ago we commented on the fact that some branches of scientific research, in spite of the danger involved in them, had peculiar attractions for certain minds. Two of the latest items of news recall this fact very forcibly—we allude to the Arctic Expedition which has just started from Plymouth and to the horrible result which attended the recent balloon ascent in France. As to the former, while we are fully aware that there are many important scientific questions which an Arctic Expedition can help to solve, still it remains a question whether the amount of knowledge acquired by such explorations has at all corresponded to the loss of life and the amount of human suffering endured in its acquisition. It is, however useless to discuss the question, since there is no doubt but that while there is anything to learn men will be found who will risk their lives and their property in the noble cause. Just such a spirit animated the French savans whose daring attempts in the cause of science led to the tragedy, a description of which, from the *London Times*, we append.

"France is the country in which the balloon was first made practically efficient, and in the century since the first ascent of Joseph Montgolfier the annals of aerial voyages have presented, perhaps, no disaster more terrible than that of which Frenchmen have just been the victims. On Thursday week, M. Tissandier, the well-known aeronaut, accompanied by M. Crocé Spinelli, an engineer, aged about 30, and M. Sivel, a naval officer, somewhat older, ascended in the balloon "Zenith" from the gasworks at La Villette, a little village in the basin of the Canal de l'Oureq, a few miles north-east of Paris, and from which, it may be added, M. Tissandier set forth on a successful voyage in 1863. The balloon went up at 11.30 a.m., and after travelling about 150 miles S. W. by S. over the Departments of the Seine-et-Marne, Loiret, and Loire-et-Cher, descended about 4 p.m. at Ciron, a little place near LeBlanc, in the Department of the Indre. But during those four hours and a half it had soared through the atmosphere of this earth into regions where—at least, under these special conditions—human life could barely exist; and when the car reached the earth it bore but one living man; the other two were corpses.

"Such jottings as the survivor, M. Tissandier, was able to make during that dreadful time suggest the horrors through which he passed with a force in which fragments are sometimes superior to the completest records. At about 10 minutes to 12 they were close on two miles from the earth; the thermometer inside the balloon recorded 25° above zero; and within the car 15°; M. Tissandier's pulse was at 110, and M. Crocé-Spinelli's at 120. At 1 p.m., they were about 16,400 ft.—i.e., upwards of three miles from the earth; at 1.10 p.m., 19,680 ft., or about 3½ miles. Here the distress began.—"We are well. Now the height is 6,500 metres (close on four miles). A little oppression.... Hands slightly frozen..... We are better..... Hands frozen..... Crocé pants. We inhale the oxygen in the bag. Sivel and Crocé shut their eyes..... They are pale..... A little better, even gay. Crocé says to me, laughing, "You blow like a porpoise." 120.—We are at 7,000 metres (about 23,000 ft., or 4½ miles.) Sivel seems drowsy.... Sivel and Crocé are pale.... 7,400. Sleepy, 7,500 Sivel still throws out ballast.... Sivel throws out ballast. M. Tissandier felt weak, but inhaled some oxygen, which reanimated him for the moment. "M. Sivel turned to me and said, "We have a great deal of ballast; shall I throw out some?" I answered, "Do as you like; and Crocé nodded affirmatively in a very energetic way." There were still five or six bags of ballast, each weighing about 55 lb., in the car. M. Sivel took his knife, cut three ropes, three bags were emptied, and they rose rapidly. "All of a sudden I became so feeble that I could not even turn my head to look at my companions, who were, I believe, seated. I wished to take hold of the oxygen tube, but found it impossible to raise my arm. My brain was still quite clear. My eyes were fixed on the barometer, and I saw the needle point first to a pressure of 260, and then to 280 and over. I wished to call out, "We are at a height of 8,000