THE CHENANGO DISASTER.

Conclusion of the Investigation and Charge of the Coroner.

The investigation into the causes of the disaster on board the United States gunboat Chenango, which has occupied the attention of Coroner Norris and a jury for two weeks, was finally concluded yesterday. The jury were called together at ten o'clock A. M., when they were addressed by the Coroner as follows, in which all the leading facts as brought forth by the evidence are distinctly set forth:—

GENTLEMEN OF THE JURY—The law has imposed upon us the duty of investigating the causes which produced the death of twenty-eight of our fellow citizens, who were hurried into eternity without warning, and suffering from tortures which appalled us all, whose painful duty it was to witness them. In the enjoyment of health, elated with the prospect of an honorable service in the cause of their country, these unfortunate victims of some most shameful incapacity, were suddenly destroyed; not by the hand of the enemy, but by causes which they had a right to expect could not occur on a man-of-war, built by the government without limitation of expense, and managed by a large number of persons, whose sole duty it was to guard against any accident which human skill could avert. As the cause of this terrible calamity might, upon one view of the case, be inherent in the organization of the machinery itself, and therefore would exist in a great number of other vessels belonging to the United States just like the Chenango, and as an investigation into that cause must of necessity require the knowledge of scientific men, I thought it my duty to ask the aid of engineers of well known ability to examine the boiler and to give us the benefit of their knowledge and opinion; and you have heard the testimony of some of them. The facts which have been proved before us without dispute or contradiction are as follows:—The Navy Department of the United States requiring some thirty sidewheel light draught gunboats, prepared the plans for the engines and boilers of these vessels, and called upon contractors to build their machinery according to these plans, under the superintendence of the United States engineers. Among others, Mr. Quintard undertook to build two sets of these engines and boilers, of which the machinery of the Chenango was one. The material out of which these boilers were made was ordered according to specification, and the evidence of the gentlemen who furnished the iron, as well as of those who have tested samples of it since the explosion of it, proves, without contradiction, that it was of the best quality. The boilers were tested according to contract, with a cold water pressure, and endured sixty to sixty five pounds to the square inch without yielding. The braces were then examined and found to be perfect; and the boilers were accepted by the United States Inspector as satisfactory and according to contract. The engine was then run for ninety-six hours at the deck, in order to comply with the contract, and the whole machine was accepted by the government and delivered out of the hands of the contractor. The ship then went into commission, and was proceeding to sea on her first voyage in the charge of a young man by the name of Cahill, a second assistant engineer in the United States Navy, acting as chief engineer on this occasion. The vessel proceeded down the bay, and when below Governor's Island Captain Fillebrown visited the engine room and found twenty-six and a half pounds pressure of steam on the boilers, as indicated on the gauge. Mr. Cahill then told the captain that the fires were burning well, and that there was no need to use the blowers. The captain went on deck and did not return to the engine room until the vessel was in the narrows, when he again went below. Up to this time the speed of the vessel was between eight and nine knots an hour. The captain had a conversation with Mr. Cahill at the end of the cylinder—a long distance from the boilers—and Mr. Cahill told him the engine was running well. The captain then said that the vessel had about eleven miles more to go, and he went on deck, leaving Mr. Cahill by his desk at the cylinder end of the engine; and as he stepped on deck the boiler exploded, scalding thirty-two men, of whom twenty-eight have since died from the effects of the injuries then received. The question now before us is, what was the cause of the rupture? It appears that boilers are ruptured from two causes—one of which is the gradual accumulation of pressure, until the resisting power of the boiler is overcome in its weakest part and it gives way, which is called a "burst" or "bursting;" and the other is the instantaneous generation of an enormous pressure on the boiler, from causes which attend low water, and which is called an "explosion." The first branch of the inquiry is whether the boiler burst from weakness of material, or a defect in its construction, when carrying the pressure of steam which it was intended to bear. We have the means of knowing exactly how much pressure was on the boilers immediately before the explosion. The pressure was thirty-four and a half pounds to the inch, as shown by the indicator card endorsed by Mr. Cahill himself; so that it was made certain that if the boiler did burst from weakness, it yielded to a pressure a little more than one-half it had endured from the hydraulic press, and five pounds less than it had borne from the steam when running at the dock for ninety-six hours, and when forty pounds to the inch had been carried. It is also proved by Mr. DeLuce, the chief engineer of the Navy Yard, that he measured the safety valve immediately after the accident, and found that it would blow off steam at thirty-nine and a half pounds; so that the boiler was protected by that means against the possibility of a steam pressure equal to that which already had been used with safety. The question is, then, whether it is possible for a boiler to burst under a pressure of steam to day five pounds less than it endured under steam yesterday, and twenty-five pounds less than it endured from cold water last week. On this subject we have the opinion of Mr. Maxon, the United States boiler maker, who swore that he would consider the boiler perfectly safe to carry forty pounds after it had been tested at sixty pounds of cold water, and it appears that the statute law, under which all passenger steamers are run, permits the boilers to carry forty-five pounds to the inch after a cold water pressure of sixty, and that the experience of many years has shown it to be perfectly safe. On the contrary, Mr. DeLuce and Mr. Sewell, United States engineers, and Mr. Rowland, express the opinion that a boiler is quite likely to burst under a much less pressure than it had been tested with cold water; and Mr. Rowland fixed the amount as low as fifteen pounds to the inch in this case, and these witnesses are of opinion that the cold water test is of no practical value. It is not suggested that there is any other means known of insuring the safety of the boiler except this cold water test; and if these isolated opinions, unsupported by any instance of the kind, are well founded, it is obvious that no one can be properly charged with the consequences of an explosion, since no human skill can make sure in advance that the required strength existed; and it is equally obvious that all the thousands of boilers now running, and relying upon the safety of this test, are instruments of destruction, acting upon some capricious impulse impossible to be foreseen, and likely to scatter death around them at any moment. Fortunately, however, experience proved that boilers so tested are safe against any less pressure. No witness has denied that this boiler was tested to sixty pounds; no witness has said that it was not strong enough to bear sixty pounds when built and delivered, and the only suggestion which has been made (and this is merely a suggestion) is, either that some of the braces had been removed by the engineers and not replaced, whereby the strength was diminished, or that in testing the braces might have been reduced in strength, so as to burst at thirty-five or forty five pounds to the inch. The first suggestion is met by the proof that all the braces were in place, and were actually carried away by the explosion, and the second one by the proof that after the test the braces were examined and found all right, and conclusively by the proof that forty pounds of steam were carried on the boiler after this test, which was much more than the pressure immediately before the explosion. You are, therefore, left without any proof, either deduced from the well known calculations based on the ascertained strength of iron or from any experience in regard to the testing of boilers, from which to infer that the boiler did burst at the low pressure of steam which was being carried. You will then consider whether the boiler was burst by gradually accumulating upon it a pressure greater than it had shown itself capable of bearing; or whether it was exploded by those causes which do constantly produce explosions in boilers, and which when they are called into action overcome all resistance and devastate in proportion to the strength of the boiler which has in vain struggled to restrain their destructive force. It is not a part of our duty to speculate upon the best way of bracing or securing boilers, if we find no proof that the bracing in this particular case was too weak to endure the load it was designed to bear. The evidence shows that a great variety of opinions upon the best methods of bracing exist among men equally experienced in the business; and as there is no standard fixed by law or universal custom, it must at last come back to the simple question in each case, whether the method of bracing used in that case was sufficient for the purpose intended, and if it be sufficient it is of no consequence that some other constructor would have used some other method. No boiler would probably ever be built if the different views of all men about the best way of constructing it had first to be reconciled. The specifications under which these boilers were built particularly provides for the manner in which their braces shall be secured to the roof of the boilers; but it leaves to the superintendence and control of the United States engineer in charge, and the discretion of the boiler maker, how they shall be secured at their lower ends, subject, however, to the condition that they shall be able to stand a water pressure of sixty pounds. In this case it appears that the specification is complied with so far as it prescribes the exact number of points of support overhead, and that the manner of securing the lower ends of the braces was the same as had been used on about eighteen others of these boilers with entire success, and such as was approved by the United States Inspector, and accepted by the department, and that it was sufficient to endure the test required by the contract. It is proved that more braces could have been put in, and that the boiler could have been made to endure two or three hundred pounds to the inch, if such had been the requisition of the specification; but if it had been, the calamity now so dreadful would have been intensified in horror, and we should probably have had no one living to tell the tale; for when explosions do occur, their destructive force is in proportion to the strength of the boiler, which restrained the pressure until it accumulated to the bursting point. In the absence, then, of any evidence that the boiler was too weak to bear the pressure it was designed to carry, you will next inquire whether the pressure was gradually accumulated upon it above what it was able to endure. The testimony is conclusive. There certainly were not more than thirty-five pounds of pressure immediately before the explosion as proved by the indication diagram; and if there had been 50 lbs. the safety valve would have blown off the steam. Pressure rises very slowly when an engine is running, and in the short time between Governor's Island and the Narrows, with the engine working, it would seem impossible that a bursting pressure could have been raised from 25 lbs. pounds of steam, and if it were possible it would warn every one, first by the gauge, secondly by blowing off at the safety valve below 40 pounds, and thirdly by blowing out the mercury gauge at about 50 pounds, none of which events occurred. You are then brought to the only other explanation, and that is that the boiler exploded in the usual way in which such accidents do occur, and in consequence of low water. I don't propose to recapitulate the scientific testimony which you have heard in regard to the precise manner in which low water does lead to an explosion. It is conceded by all that when the water is low in a boiler a great intensity of heat is accumulated in the steam which has been brought into contact with metallic surfaces highly heated, and that in that state it is called superheated steam and is extremely dangerous, and that such a condition of the water and steam is always found to precedes an explosion. It is enough for us to know that low water will produce an explosion, even though science may not be able to trace with entire certainty every step of the process by which the result is produced. The circumstances which attend an explosion are so instantaneous and irresistible development of steam, which produces its effects "as if by the explosion of gunpowder" (to use the language of the distinguished Tyndall), and does its work of destruction before its victims have time to escape, leaving its traces in the terrific energy with which it has torn apart the tho of iron which upon all known calculation were capable of bearing many times the strain that ordinary quantities of steam could impose upon them. Do we find these circumstances here? The boiler exploded within ten seconds after Captain Fillebrown and the chief engineer stood by the guage at the end of the cylinder, not noticing any unusual pressure, and when the very moderate speed of the vessel (between eight and nine knots an hour) gave evidence of a very small amount of power in action upon the engine itself. The blowers were not running on the fires, and the chief engineer, who was in a position where he could not observe the indications of the water guage on the boilers, said that the engine was working very well. Up to this time the engine had been run partly throttled off, and the steam, which was at twenty six and a half pounds pressure at Governor's Island, had run up to thirty-four pounds and a half at the Narrows. Under these circumstances it is admitted by Mr. Sewell, the United States engineer, and otherwise proved, that the engineer must have done one of three things—either allowed the pressure to exceed the limit allowed, or opened the furnace doors, or opened the throttle valve so as to still further increase speed, and which he did would seem to be free from doubt in the the nature of things. The evidence is, and it seems to be a matter of common knowledge, that explosions from low water occur when the throttle valve is opened, so as to increase the demand for steam upon the boiler, and so far at least to diminish the pressure, and apparently the chances of an explosion; and all agree that under these circumstances the water which yet remain in the boilers rises into the superheated atmosphere above it, and is thrown upon the heated plates, which either by the direct action of the fire or by deriving their heat from the superheated steam itself, have acquired an excess of temperature above that which saturated steam itself possesses, and which are, therefore, able to yield some of their surplus heat to the finely divided water which rises in the shape of foam. As is usual in cases of explosions, the men who either innocently or carelessly produced them no longer bear witness on earth, and we must infer their probable conduct from the circumstances in which they were known to be placed, and the inducements which operated upon them. In this case the engine had been shut off to a certain extent in order to gain steam, and of course Mr. Cahill could have had no other object in accumulating pressure except to use it when accumulated, and so to find out the capacity of his engine when its powers were to be tested for the first time. In opening the valve, if he did it, Mr. Cahill would have been diminishing the pressure on his boilers, and if the water had been at its proper height the operation would have been entirely safe. He himself did not know where the water was in the boilers, as he had been conversing with the captain for some time, and, as it appears, taking indicator cards from the engine at a place where he could not possibly have known the condition of the water in the boilers, as Mr. Lawton has told us; and he had a right perhaps to infer that the boilers were as they should be, and more particularly so as it seems that he had not seen them operate on the trial at the dock, and might not have known their tendency to throw out their water with great rapidity. This brings us to the consideration of the probability that the water was low in the boilers. There has been no witness before us qualified, from his own knowledge, to give any testimony as to the exact condition of the water gauges at the time of the accident, and we must look to circumstantial evidence in this regard also. Of that we are furnished with a great abundance, and of a most conclusive character. This boiler and engine were used at the dock for ninety-six hours, during which time the most extraordinary results were exhibited. The water worked out of the boilers into the engine, and so overboard, so freely that sometimes over a third of the cylinder would be filled with water, and the momentum of the machine would be suddenly arrested, as is proved by Mr. Mason, who had charge of the trial. On one occasion the quantity which suddenly came over from the boiler to the cylinder was so great that the piston was driven up the piston rod about the sixteenth of an inch by compressing the water between the cylinder head and the piston, as proved by Mr. Riggin, who assisted on the trial. The danger of an explosion from low water at the dock was so great that the last witness refused to open the throttle valve when requested to do so by the United States engineers on board, who represented that the contract required the engine to be run wide open. The witness said that he considered his own safety endangered, and should act on his own judgment. Mr. Bell, who took indicator diagrams at times during the trial, from the engine, says that the water worked out of the boilers so as to be heard striking in the cylinder frequently when he was on board. Although the engines are arranged with a fresh water or "surface condenser," whose office it is to keep the boilers supplied with fresh water, the water became salt very soon and had to be blown out, as if the engine had no "surface condenser." This was the condition of the Chenango when she was delivered into the charge of a second assistant engineer, with assistants, who, it appears, had not witnessed these operations, in order to go to sea on duty. There is no difference of opinion among the engineers who have been examined on the subject that a boiler in that condition was unsafe, and required extraordinary skill to avert an accident; and the question is whether that extraordinary skill was employed upon them. The young men in charge are not pretended to have possessed anything more than ordinary skill in their business, as their rank shows. In addition to these probabilities, thus established, there are other facts which cannot be concealed or deceive others in regard to this matter. The mercury gauge, which was fitted and adjusted with the tell-tale set at zero, and from which no mercury could be expelled until the pressure exceeded forty-eight pounds to the square inch, was found by Mr. Powers, the boiler inspector of the city of Brooklyn, and by Mr. Dickerson, the witnesses who examined it in the presence of the jury, to have lost about five inches of mercury; so that the tell-tale stood about two and a half inches above the zero on the scale; while at the same time the water which is generally in the small pipe connecting the gauge with the boiler had been all blown out, and was found on the atmospheric end of the mercury and in the tube above it. There is no way in which this mercury could have been expelled from this tube unless by a pressure of steam more than forty-eight pounds high; unless between the time of the explosion and the time of the examination in our presence the gauge had been taken down, some of the mercury poured out, and some dirty water poured into it; which possibility is negatived by the testimony of Mr. Sullivan, who swore that nothing had been touched until it was examined in our presence. The hair felt which covered the top of the boiler where it was ruptured was found burnt black and shriveled by excessive heat, a sample of which is produced before us, while the wood in immediate contact with it shows no scorching, and the witness told us that steam which is superheated by contact with hot iron will shrivel up animal fibers, like hair or leather, while it would not yet be hot enough to set fire to wood; but that saturated steam or steam no hotter than the water out of which it is made, would only be 289 Fah. hot at the pressure of forty pounds, and therefore not hot enough to burn hair. This is said to prove to a demonstration that the steam must have been superheated to a high degree; and it is admitted that unless the water was low no such effect could have been produced. It is also in evidence before you that the lead covering, which was laid upon the outside of the boiler and outside of the felt, was melted by the heat of the steam; and specimens have been shown you which were taken from the sheet lead immediately at the edge of the rupture, and which bear evidence of having been subjected to a melting heat. Steam at 600 Fah. will melt lead, and it is said by witnesses that it is common in cases of explosions, and in cases where no water has not been followed by explosion, to find lead and solder melted by the hot steam. It is to be remarked that this boiler has been the subject of an official examination and report by engineers of the United States Navy, and had been inspected by great numbers of persons, including Mr. Martin (whose arrangement of it is charged as the cause of the explosion), yet no witness has attempted to explain how the lead could have been melted (unless, indeed, the suggestion of Chief Engineer Sewell, that the tearing of the sheet created friction enough to melt itself, may be considered an explanation) or the felt charred, unless by superheated steam; and Mr. Martin himself remarked that the only evidence of low water which he had seen was in the fact of burnt felt, of which he had picked up a sample and then had it in his pocket. It is apparent that the Engineer corps of the navy, as well as the persons whose plans are involved, have a deep interest in assigning some other cause than low water, since if it were low, it must have been so either from carelessness of engineers or from inherent defects in the organization which baffled the ordinary skill of such persons as had the machine in charge; yet no attempt has been made to explain away the melted lead, or to reconcile its presence with the fact that there was enough water in the boiler. And as this is the ordinary cause of explosion, it would seem consequently the true one here—particularly since no evidence of any sort has been produced to substitute any other cause, and we are left to the mere suggestion, without proof, that possibly the braces might have been taken out by Mr. Cahill and not replaced, or possibly the cold water test, which experience has shown to be infallible, has in this case proven a snare. Unfortunately there are other facts which point out very clearly the existence of an organic disease in these vessels, requiring the utmost vigilance to guard against—the presence of which is abundantly proved. A number of these vessels are just now coming out, and it so happened that on Saturday, the 16th, the day after this explosion, the Pawtuxet, having been run for ninety six hours at the dock, was taken out on a trial trip from Providence. In the course of the run it became necessary to shut off the steam from the engine from some cause, and thus the fact appeared that the water which had seemed to be abundant in the gauge was low. Mr. Baker, an experienced engineer, who, set up and ran the engine on her ninety-six hours' trial, at once had the fires drawn from the furnaces as a measure of safety, the necessity of which, under the circumstances, Mr. Sewell admitted to you when on the stand; and it was found that the steam pump required twenty-two minutes to resupply the boiler with the water found wanting, although the gauges had given no warning of its absence. But for Mr. Baker this accident would have probably had its counterpart; and so convinced of the danger of the machine was Mr. Baker that he refused to come to New York in the vessel unless he had the control given him, and he has told us these facts, and sworn to the danger. On the Chenango, the experienced engineers who ran the engine at the dock, have told us that they considered their lives in danger from the liability to low water, and so convinced were they of it that they refused to open wide the throttle valve, though the United States engineers who were present insisted that the contract required the engine to be run wide open. Mr. Smith, the engineer who erected and ran the engine of the Metacomet, another of the same class, has proved here that the water could only be kept in her boilers by so getting the valves that they would not fully open when the engine worked, and that when those valves were opened by Mr. Sewell to be set so as to open wider and the vessel was run from the dock up to the Navy Yard, the water worked so that the valves had to be put back to their original position, which was done by himself at the Navy Yard, under orders from the Chief Engineer of the ship. The drawings of these engines had been produced before us, and the measurements made of the cubic feet of vacant space which existed in these cylinders between the valves when they are closed, and the piston when at the extreme end of the cylinder nearest the closed valves, and it appears that those spaces are great enough to hold more than 1,600 pounds of water at a revolution before they will be filled so as to arrest the motion of the piston as it approaches the end of the cylinder and compel the opening of the relief valves, which are placed in each end of the cylinder to prevent the destruction of the engine by the confinement of the solid water in the cylinder; yet it appears here that even more than this quantity of water would at times come over from the boiler at a revolution, and that these self acting relief valves had to be opened constantly by hand to permit the escape of this enormous quantity of water more freely than it could be voided by the self-acting valves. When it is considered that only about nine pounds of water in the shape of steam are needed to make the ordinary revolution of these engines, and that at times they draw even more than three quarters of a ton of water at a revolution, it is very easy to see how the boilers might be robbed of their water in a very few minutes and the attention of an ordinary man be eluded. The coal burned by the Chenango on her trial has been proved, and the amount of steam which that coal produced has been measured on the indicator diagrams which were taken on the trials, by which it is proved that in the form of steam these boilers only evaporate from three to four pounds of water to the pound of coal, whereas if they did not use up the heat by carrying it off from the boiler in hot water, they would evaporate seven or eight pounds of water into steam; and it is testified to here, and the calculations show upon the indicator diagrams themselves, that these engines must have been working out of the boilers, in water, on an average during the ninety-six hours of the trial, about six times as much hot water as steam. Of the accuracy of such calculation, based upon comparing the weight of coal burned with the cubic feet of steam used by the engine, you are perhaps better judges than I am; but it is to be remarked that these calculations have been on the table for several days challenging contradiction, and that they are not disputed. It is further proved here that a considerable number of these vessels, exactly like the Chenango, have been recently built and tried, and that they are now awaiting orders for sea; yet no witness has appeared before us to say that any of the others of these vessels have operated differently from those whose performance has been proved; although there is no want of proof that when these boilers are arranged with a high steam space above the ends of the tubes, and a steam chimney, they do not work out their water. It would have been much more instructive to us if the engineers who have run so many of these low roofed boilers had been produced, instead of those whose only experience has been with boilers not liable to that difficulty. We are informed by Mr. Sewell that a superheating apparatus has been applied to one of these double-enders, called the Eutaw, and it appears that a larger number of such appliances are being manufactured by order of the Navy Department, to be combined with these boilers in naval vessels, while at the same time a publication had been given in evidence, issued in 1863, under the authority of the Navy Department, in which this proposition is made: "The advantageous use of superheated steam appears to be confined to the case of bad boilers, * * * * and which prime badly," and this proposition is followed by the declaration that "There are insuperable objections to the use of superheated steam, even with bad boilers, * * * * particularly on account of its danger, and the complicated system of valves, thereby entailed; for provision must be made for shutting off at a moment's notice, and resorting to the use of saturated steam." It would seem, therefore, that when the department resorts to the use of an apparatus pronounced dangerous, there could have been no less urgent reason for it than the one that is suggested in the book, which is to convert the water which is "primed," or worked over from the boiler into steam on its passage to the engine; and this of course admits the presence of a large amount of water between the boiler and the engine. The Secretary of the Navy was kind enough, in answer to my application, to promise me that Mr. Isherwood, the Engineer-in-Chief of the Navy, should attend us and give us the benefit of his knowledge and experience in our efforts to reach the cause of this melancholy disaster; and in reply to my subpœna Mr. Isherwood himself sent me a telegram, fixing last Thursday as the day when we might expect him. On that day he was in New York as he had promised; but unfortunately he found the pressure of his onerous duties elsewhere too great to permit him to afford us the time for an examination. This I the more regret, as Mr. Isherwood might have satisfactorily explained to us the very urgent reasons which must have controlled him in selecting this species of boiler, which by their height are more liable to be struck by shot in action than if the tubes which are used to aid in the production of steam were placed behind or on one side of the furnace, as is usual, instead of on the top of the furnace, as in this case; and I was the more desirous of receiving that explanation after having heard read the report of the Board of eminent engineers who were called by the Secretary of the Navy in January, 1863, to pronounce their opinion on these double-ender boilers, then to be constructed, and whose report has been produced before us, in which they say that "on the whole we are compelled to consider the type of boiler used in these steamers, as inferior to the horizontal tubular boiler, which is generally used by other nations, and by this country in the mercantile marine." But as Mr. Isherwood has been deprived of the opportunity of giving us this information by the pressure of his duties elsewhere, I am unable to give you any assistance in solving this difficulty. With these remarks upon the testimony, I propose to submit the further consideration of this sad case to your judgment. The effect of this investigation cannot fail to be very important in any aspect it may assume. The whole country is interested in knowing the true reason of this explosion. The victims of the disaster exceed in number those who have perished from any explosion which I can now recall to memory; and according to the opinion of both scientific and practical men, a repetition of it may be expected at any time to occur, so long as the combination which existed in the Chenango is used. Mr. Dickerson wrote a letter to Hon. Winter Davis, warning him of the danger when a trial trip was to be made on one of these vessels. Mr. Baker narrowly escaped destruction by explosion on another one, the very day after this accident, and he refused to go on the vessel unless with entire control; and the practical men who ran this engine at the dock absolutely refused to incur the risk which would be encountered in opening the boiler freely to the engine. Under these circumstances, we would be false to our duty either as citizens or officers of the law, if we shrank from placing the responsibility where it belongs. You must guard your minds from being induced by any other considerations than the testimony itself; and you have no right to find any verdict except one based upon established facts and according to established natural laws. If we should listen to other reasons than these, we might give any number of explanations which imagination could suggest. We find from the published statements that the Board of United States Engineers, which was convened by order of the Secretary of the Navy to give their opinion on the cause of the calamity, reported that a defective vein in the sheet of boiler iron caused the accident, and I wished Mr. Isherwood's judgment on that if we could have had it; yet no witness here has suggested that explanation as possibly true, any more than that board suggested weakened braces the cause. And some have gone so far as to propose the possibility that foul means had been resorted to, such as the use of gunpowder. But we all know that boilers constantly do explode from low water, and that there are but few other causes for explosions known to the world than those which depend upon low water. It is not very surprising, perhaps, that among the great numbers of vessels used by the United States and placed in the hands of young men, who have had but little experience, and who are employed when there is a scarcity of engineers, on account of the great demand for the services of such men suddenly made by the navy, that an explosion should occur at some time; and if the machinery were of the ordinary kind the accident would create no unusual interest. But there are machinery peculiar in its construction, and which had been condemned as inferior by an official board of the most eminent engineers in the country; and when it appears that those peculiarities have so exhibited their dangerous qualities as to alarm practical and scientific men, and to induce them to foretell an accident of this kind; and when we find these peculiarities existing on a great number of other vessels just now coming into use, upon which the lives of our fellow citizens are to be entrusted, then it is of serious consequence, and demands of us to raise a voice of warning in time to prevent any more such horrors as we have witnessed. Our brave men, who are willing to expose their bosoms to the enemy's shot, ought not to be subjected to the chances of a horrible death at the hands of their own friends, and in their own floating homes. It is due to you, gentlemen, that I should refer to the treatment which you have received at the hands of the Police Commissioners. I believe all of you are tax payers, and most of you are large property owners. You were commanded in the name of the people of the State of New York to investigate this case and you obeyed. For over two weeks, night and day, you have given your valuable services to the people without a murmur. You had a right to expect that every assistance that could be rendered by the police would be given; but the Commissioners scorned your mandates and defied the law under which they hold office. In the name of common sense, what are our people taxed to pay policemen for if they are at liberty to refuse to assist in such cases as this? The law on this subject is so plain that I am astonished the Commissioners permitted themselves to disregard it. Here it is:—"All criminal process issuing out of any court, or from any judge or justice of the peace, in the city of Brooklyn, shall be served by a member of the police force, and not otherwise." This, you perceive, prevents all other officers from serving such processes; but the fact is, this office of coroner has for years been so disgraced that nearly all respect for it has ceased, and the police, as well as others, regard it as a burlesque. I wish them to understand now that so long as I am in the office it must be respected and its authority obeyed.

After the delivery of the Coroner's charge the jury retired to deliberate, and consumed a portion of the afternoon and the entire evening until ten o'clock in dissecting and discussing the immense mass of evidence elicited during the inquisition. They are determined to consider the matter with deliberation, and are thus prepared to devote two or three evenings more—or until they fully agree upon a verdict.

Base Ball.

OPENING DAY OF THE EAGLE AND GOTHAM CLUBS AT HOBOKEN.

Yesterday a large turnout of the members of the above associations met on their respective grounds at Hoboken to play the inaugural game of the season. The Eagles were numerous in attendance, selected sides, and played quite a lively game. After the termination of play the members and friends adjourned to a sociable entertainment provided for the occasion, when a good time was had and appropriate speeches made. This club ranks A No. 1, mustering on their roll from eighty to ninety members, most of whom are in affluent circumstances, and play the game for the exercise thereof. The Gotham did not muster quite as large, but nevertheless indulged in a good "scrub" game. On Thursday next the famous Atlantic club will commence play at their new ground, the Capitoline, Bedford, L. I.

To day the St. George Cricket Club will play their opening match at Hoboken. Wickets pitched at ten o'clock A. M.

DANCING ACADEMIES.

BROOKES' DANCING ACADEMY, 501 BROOME ST. OPEN ALL THE YEAR. SOIREE EVERY WEDNESDAY EVENING DURING MAY AND JUNE.

INSURANCE.

SPECIAL NOTICE.—PERSONS CONTEMPLATING INSURING their lives, and those already interested in life insurance, would do well to communicate with the advertiser and obtain information highly important to them. Address A. Andrews, box 5,583 Post office, N. Y.

NEWSPAPERS.

WAR NEWS.—FOR SALE, A COMPLETE FILE OF the Daily Herald from June 1, 1861, up to May 1, 1864. Address H. V., box 128 Herald office.

MISCELLANEOUS.

AMERICAN ENAMELLED METALLIC COLLAR CO.'S AND AMERICAN ENAMELLED STEEL COLLAR CO.'S splendid Collars, the most durable, most pliable, best finished collar made in metals. They do not rust, and are instantaneously cleaned with a cloth and water. Send your orders to C. H. WELLING, 94 Pine street, N. Y.

A sample collar sent by return mail, postage prepaid, by enclosing your measure and one dollar for a "turnover," or seventy-five cents for a "choker," as above.

AN AMERICAN ENAMELLED METALLIC COLLAR.—The best manufactured, does not rust your linen as does the steel. Sent by mail, prepaid, on receipt of one dollar for a "turn over," or seventy-five cents for a "choker." Send your measure to C. H. WELLING, 94 Pine street, N. Y.

BRADY'S "MERCURY" STORIES,

NOW READY—COMPLETE,

THE VENDETTA;

OR,

A LESSON OF LIFE.

BY SEPTIMUS R. URBAN.

ILLUSTRATIONS BY DARLEY.

PRICE 25 CENTS.

The striking peculiarity of Mr. Urban's stories is, that he successfully sustains the mystery of denouement to the last—sustains it so adroitly as to puzzle the conjectures of even determined novel readers who are familiar with the unravelment of ordinary plots; and, though there is a certain degree of mystery in his plots, there never is the slightest improbability.

Mailed, free of postage, on receipt of price.

FREDERIC A. BRADY, Publisher, 27 Ann street, N. Y.

COSTAR'S EXTERMINATORS.

"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,
"COSTAR'S" EXTERMINATORS,

FOR RATS, ROACHES, ANTS, BEDBUGS, MOTHS IN FURS, INSECTS ON PLANTS, FOWLS AND ANIMALS.

"15 years established in New York city."
"Only infallible remedies known."
"Free from poisons."
"Not dangerous to the human family."
"Rats come out of their holes to die."

Sold by all druggists everywhere.
Beware of all worthless imitations.
"COSTAR'S" Depot, No. 482 Broadway, N. Y.

CORNS, BUNIONS, BAD NAILS, TENDER FEET, &C., cured without pain by Dr. RICE, Chiropodist, No. 58 Bowery, over Citizens' Bank. Rice's Annihilator cures Corns, Bunions, Chilblains, &c. By mail, 50 cents.

DEMOREST'S NEW YORK ILLUSTRATED NEWS.—Graphic May Scene in Central Park, in colors; May Scene in Olden Time, and May Moving in New York; valuable and Original Music; Fashions by Mme. Demorest, with other interesting Illustrations, and spicy Political and Literary Matter in this week's number. Ready on Thursday. Single copies mailed free on receipt of price, ten cents. No. 39 Beekman street.

SAVE YOUR MONEY.—THOMAS R. AGNEW, THE great grocer, tea and flour dealer of this city, corner of Greenwich and Murray streets, is now selling Teas, Coffees, Flour, Wines, Sugars, Molasses, Syrups and everything else used in every family, cheaper than any other dealer in the United States. One price cash house. Wholesale department 262 Greenwich street; retail, corner of Greenwich and Murray streets.

COPARTNERSHIP.

A MAN, HAVING HAD TWO YEARS' EXPERIENCE in the produce and provision trade, would invest $500 with some one having a good trade; is not afraid to work. Address B. C., Herald office.

AN ENERGETIC PARTY, WITH $600, HAS AN OPPORTUNITY of joining the advertiser in a strictly legitimate business, paying a good living. Address Alpha, care P. O. Godfrey, 831 Broadway.

DISSOLUTION.—THE FIRM OF JEROME KELLOGG & CO., is this day dissolved by mutual consent. John Kellogg or A. G. Jerome, Jr., will settle up the business and sign in liquidation for the firm.

A. G. JEROME, JR.,
JOHN KELLOGG,
JOHN A. CONDIT,
HENRY FITCH,
GEORGE W. VER VALEN.

New York, April 25, 1864.

DISSOLUTION.—THE COPARTNERSHIP BETWEEN Mark Celler, N. M. Dunn & Samuel M. Levy, heretofore existing under the firm of Celler, Dunn & Levy, is this day dissolved by its own limitation. Mark Celler and N. M. Dunn will settle all the affairs of the late firm, and they alone are authorized to sign the late firm's name in liquidation.

M. CELLER,
N. M. DUNN,
SAMUEL M. LEY.

NEW YORK, April 30, 1864. 16 Warren street.

M. Celler and N. M. Dunn will continue the business at 16 Warren street as heretofore.

M. CELLER,
N. M. DUNN.

MAY 2, 1864.

DISSOLUTION.—THE COPARTNERSHIP HERETOfore existing between the subscribers, under the name of Britton & Warner, expired by its limitation on the 1st inst. Either partner will sign in liquidation.

NEW YORK, May 3, 1864. L. L. BRITTON, T. F. WARNER.

DISSOLUTION.—THE COPARTNERSHIP HITHERTO existing between Addison A. Pond and Timothy Hives, commission merchants, of 101 Barclay street, New York, is this day dissolved by mutual consent. All the affairs of the late firm will be settled by Addison A. Pond, who continues the business at 97 Barclay street. ADDISON A. POND, TIMOTHY HIVES.

NEW YORK, May 2, 1864.

DRUGGIST.—WANTED, A YOUNG MAN, WITH $400 or $500, to take an interest in a retail drug store, and devote all his time to the business. An unusual opportunity is now open to the right man. Address M., Herald office, for one week.

NOTICE OF DISSOLUTION OF PARTNERSHIP.—THE partnership heretofore existing under the firm of Jackson & Purdy is this day dissolved by mutual consent, Mr. George A. Jackson retiring. Mr. Edward H. Purdy, late partner, will sign the name of the firm in liquidation, and will continue the business at the old stand, 647 Broadway.

GEO. A. JACKSON.
EDWARD H. PURDY.

NEW YORK, May 1, 1864.

BUSINESS NOTICE.

The undersigned takes pleasure in informing his friends and the public that he has secured the services of his late partner, Mr. Jackson, when in Europe, for the purchasing of his goods, whereby he will be enabled to offer everything novel in style, selection and quality that appears in the English and French markets—inducements unavailable by any other house in the trade.

EDWARD H. PURDY, 647 Broadway.

NOTICE OF DISSOLUTION.—THE COPARTNERSHIP heretofore existing between the subscribers, in the liquor business, at 439 Greenwich street, under the firm name of C. Cordes & Co., is hereby dissolved by mutual consent, from this date. Dated New York, April 28, 1864.

CATHARINE CORDES.
F. C. D. KLIEM.

COPARTNERSHIP.—The subscribers have formed a copartnership, under the firm name of Kleim & Meyer, of the late firm of C. Cordes & Co., and the business will hereafter be carried on by them at the said store, 439 Greenwich street. Dated April 28, 1864.

F. C. D. KLIEM.
HERMANN MEYER.

NEW YORK, MAY 2, 1864.—SAMUEL H. PENDEXter and William Lummis have an interest in our business from this date. We have removed our office to No. 58 Wall street, opposite Hanover. WM. & JNO. O'BRIEN.

NOTICE.—MR. JULES RILLIET, BY MUTUAL AGREEment, has retired from our firm.

NEW YORK, May 1, 1864. A. C. ROSSIRE & CO.

NOTICE.—THE COPARTNERSHIP HERETOFORE existing under the firm of G. R. DOWNING & CO., wherein George R. Downing, George R. Downing, Jr., and Theodore B. Downing were the partners, was this day dissolved. The business will be settled by George R. Downing, who is authorized to sign in liquidation.

G. R. DOWNING,
G. R. DOWNING, JR.,
T. B. DOWNING.

NEW YORK, May 3, 1864.

PARTNER WANTED—$1,000—IN A PROFITABLE cash business, that will pay well, and can be much extended. Every satisfaction given. J. E. IRELAND & CO., No. 1 Tryon row, corner Centre st.

THE UNDERSIGNED HAVE THIS DAY FORMED A copartnership under the firm of Mills, Knickerbacker & Co., for the transaction of a stock commission business, at No. 17 William street.

JOSEPH O. MILLS,
HENRY KNICKERBACKER,
CHAS. P. CURRIE.

NEW YORK, April 30, 1864.

THE PARTNERSHIP OF THE UNDERSIGNED, UNder the name of Green & Degraw, expired by its own limitation on the 11th day of April instant. The business will be closed up. JOHN DEGRAW, J. W. GREEN.

NEW YORK, April 12, 1864.

WANTED—A PARTNER, WITH TWENTY-THOUSAND dollars to invest in the best claim agency business in the city of Washington, long established. Address Claim Agency, Post office box 962, Washington, D. C.

WANTED—A PARTNER, WITH $4,000 TO $5,000; must be thoroughly acquainted with the blank book and stationery business, a practical bookbinder preferred. Address, with name, I. B. L., Herald office.

$2,000 WANTED.—TO LIQUOR DEALERS AND others.—An excellent opportunity is offered to any one having this amount to invest in the manufacture and sale of a new and very beneficial Tonic Stimulant, now being