GOOD STORIES OF THE PRESENT DAY.

Hunting a Death Ship.

In the spring of the year 1865 a man named Alexander Cross, who was presumably an American, made his appearance at Rio de Janeiro and claimed to have made an astounding discovery on the African coast. His story was to the effect that he had landed at Cape Town two years before and made his way up the coast to the Hottentot country in search of gold. He had been captured by the natives and held prisoner for many months, and during that time had discovered a gold field so rich that a miner could dig enough in three days to make him rich for life. I am only giving you the skeleton of his story. He filled in the particulars so nicely that nobody could doubt his sincerity, and, to cap the climax, he exhibited several nuggets of gold which he claimed to have secured without the slightest trouble. His idea was to charter a ship and take out 100 gold hunters at so much per head, but such was the rush of adventurers that two ships were chartered. One of them was fitted up to carry 130 men, and the other had 120 aboard.

Cross was a bold and heartless villain, and his story was a lie from beginning to end. He intended to get possession of all the money he could and then disappear. He had no idea of sailing with either craft, but circumstances wrought a change in his plans. The gold seekers watched him so closely that he had no opportunity to abscond, and when the day of sailing came he found himself aboard the ship Magnet, an English merchantman chartered for the voyage. This ship was to sail a week in advance of the other, and wait for her at a point agreed upon. The second ship did not get away. The Magnet had been gone only two or three days when some English people arrived at Rio and stamped Cross as an adventurer and imposter who had been obliged to flee the country. Up to this time it was supposed that the money he had received from his victims had been deposited in a bank at Rio, but it was now ascertained that he had transferred it to Paris.

As to what occurred after the Magnet sailed much will never be known beyond a certain date. Four weeks after her departure from Rio her yawl was picked up at sea 700 miles south of her course for the Hottentot coast. There were three dead bodies in the boat, and they were fairly identified as those of Cross and the Captain and the mate of the ship. They had been sent adrift without oars, sail, food, or water, and the people aboard the ship must have been in vengeful mood to do such a thing as that. Three weeks after the boat was picked up a craft supposed to be the Magnet was sighted to the east of Tristan da Cunha Island. It was thought she was sighted twice further to the southeast. This time she was sadly wrecked aloft and was flying a signal of distress, but as a gale was blowing and night coming on no assistance could be rendered. Nothing further had been reported up to May, 1867, when the American bark Flying Davis, cruising far to the south of the Cape of Good Hope, touched at Marion Island to renew her supplies. It was there learned that a dismasted ship, supposed to be the Magnet, had been sighted to the south only three days before. We had newspapers on board the Davis giving the particulars as I have stated them, and when we left the island it was no cruise for the lost ship as well as for whales. She must be a death ship as well as a missing one. Every drop of water and every morsel of food must have been exhausted in the first ninety days, and if the ship had touched at any island or spoken any other craft the news would have been reported. We did not believe that the derelict described by the islanders could be the Magnet, which had not been heard of for twenty-two months, but nevertheless, hoped to find the hulk and solve a mystery.

Forty miles south of Marion Island we killed a whale and drifted off to the west as we tried out the blubber and cleaned up. We then made half a day's run to the south and changed our course to the east, and at the end of the fifth day after leaving the island we were about eighty miles to the southwest of it. Half an hour before sunset the man in the crow's nest sighted the derelict ahead of us, but she long way off. With the going down of the sun the wind died out, and as night came down the wreck was still four or five miles away. Her bearings were taken by compass, and we had no doubt of picking her up next morning. The night was perfectly calm and the sea quiet, but when daylight came the derelict was no longer in sight. There was nothing so very strange in that, however, as we were both drifting, and her drift would be the faster. A breeze lifted the sun out of his ocean bed, and we ran to the southeast, expecting to have the wreck in sight before noon. After two hours' sailing we knew that we must have overrun her, or that some mysterious current had drifted her in another direction. Our crew were beginning to shake their heads over it when we sighted a whale, and in the chase and capture that ensued the derelict was forgotten. We had the dead whale alongside and ready to cut in when the boats were lowered for a second, and three hours later the bark was drifting off with the carcass of a whale on either side of her and the crew working like beavers to get the blubber off before a change of weather.

I was aloft in the crow's nest when the second whale was towed alongside, and had been ordered down to bear a hand, when I took a last look through the glass. Down in the south, and not over four miles away, the derelict suddenly hove into view as if rising from the bottom of the ocean. I was sure I had carefully swept that quarter half a dozen times within an hour, but there she now lay in plain view, and I was a bit rattled as I focused the glass for a good look at her. What I made out was the hull of a ship with all her masts, yards, bowsprit, and standing rigging gone. She was nearly level on an even keel, so I could not make out how badly her bulwarks were damaged. The stump of the foremast was about twenty feet high, while the others had broken off lower down. The hull was very buoyant and floated high; but, as was to be expected, it presented a weather-beaten and forlorn appearance. The deckhouse and the cook's galley were still standing, and I thought I could make out a lot of wreckage floating alongside. It was now within an hour of sundown, and I had not been surveying the wreck over three minutes when a peremptory order to come down chucked me off. I reported the presence of the derelict to the Captain, but with so much blubber at hand he was indifferent to other things and asked no questions.

Four days later, when the oil was in the barrels, our position at noon showed that we were 300 miles southeast of the spot where we made the derelict our capture. An hour later the man in the crow's nest sighted the derelict to the north of us, and at 2 o'clock we were up with her. It was the hulk of the lost Magnet. From the time of sighting her up to the moment of heaving to we looked for some sort of signal to show that some one was yet living aboard of her, but no such signal was shown. When we had her under our lee, the crew ran aloft to look down upon her decks. The fall of the masts had crushed her bulwarks, but the damage had been repaired afterward, though the new work had not been painted. The water about was entirely clear of wreckage, and the hull was apparently as tight and buoyant as when it left Rio. It was terribly weather-beaten, however, and seemed to be sailing in a bed of weeds and grass. A musket was brought up and fired three or four times, and the crew shouted in chorus again and again, and the Captain ordered a boat lowered and said he would go in her himself. We boarded her at the bows, and when I followed the Captain over the rails I grew my nerves to meet a terrible spectacle. Nothing living or dead was in sight. Every bit of the wreck was gray-white in color because of long exposure to the weather, and here and there about the decks were black spots of decay. There were a few coils of rope, a heap of clothing and bedding little better than black mold, and three or four water casks had rolled about with the hull until demolished.

The door of the cook's galley was held open by its hook, and we looked in to find pots and pans hanging up and the stove in good condition. The Magnet left Rio with 120 adventurers and a crew of seventeen men. In the deckhouse, where the officers were quartered, we found bedding and clothing and sea chests, but nothing to show what had been the fate of the sailors. The between decks had been fitted for the passengers. I at least expected to find dead men down there, but no such grewsome spectacle met my eyes. There were bedding and clothing, firearms, knives, tobacco boxes, hatchets, cartridges, empty rugs and bottles, a great lot of cheap crockery and other stuff which the passengers wanted for use on the voyage or after they had landed. In some of the bunks the bedding was nicely arranged, but in others it was rolled in a heap. The lamps had been taken down and the oil poured out of them, and we found hanging on a nail some wicks which had been taken from candles. Neither here nor in the deckhouse above could we find so much as the bowl of a dead pipe.

From between decks we proceeded to the cabin, the doors of which were shut, but not fast. The first sight to greet our eyes was that of a human body hanging by a rope around its neck in the main cabin. There was no odor emanating from the dead. The body had simply shriveled up until it was hardly more than a skeleton. The frame was that of a large man, but the weight of the body was not above fifty pounds. On a table just beyond where the man was hanging was the ship's log, and near it an ink bottle and a pen. The Captain took the log on deck and very soon announced that it contained some particulars as to what had occurred aboard. We then made a search of the cabin and found the ship's papers, about $300 in gold pieces, a bag containing $120 in silver, several rifles and revolvers, three watches, some legal papers which had belonged to the Captain, and quite a number of other things. Neither the ship's log nor any charts were to be found, while not a compass, quadrant, or sextant could be turned up. The entries in the log book for the first two weeks were in the Captain's handwriting. Then came a note written in a different hand, and saying:

"We found out that they had deceived us and sent them adrift in one of the boats."

Ten days later another entry, in still another hand, referred to some of the people sailing away in the longboat. Later on there was an entry to the effect that the ship had been dismasted, and then not a line had been written for months. The man hanging by the neck and swinging to and fro like a pendulum with every roll of the ship had been the last survivor. He had written on a page of the log book in a trembling hand:

"I have been alone for the last ten days, and for the last four I have fasted—neither food nor drink."

On the next day, or the next, before he had grown too weak, he had arranged the rope and put an end to his sufferings. After the ship left Rio the gold hunters must have found out that Cross had deceived them. Perhaps the Captain and the mate interfered in his behalf and for that reason were sent adrift with him. The second mate was not a navigator, and even if he was attempting to return to Rio the loss of the masts put it out of his power. One would argue that the wreck ought to have been sighted and the men taken off, but if sighted by any craft beyond those mentioned they neither relieved nor reported her. It is likely that at least thirty people left her in the boats, but none of them was picked up nor reached an island. Every scrap of everything which could be used to sustain life had been picked up, and at last the sole survivor had found himself slowly dying for the want of food, and had ended his life a day or two sooner by means of the noose.

We took everything of value that we could find aboard the wreck and left her to drive with wind and wave. The Captain had a mind to scuttle her or set her afire, but finally decided to do neither. I think it was because he did not like to meddle with the corpse. It would have seemed heartless to burn it in the cabin or to know that it went to the bottom, hanging there like a murderer, and we simply rowed back to our ship and left the lonely hulk and its lonely burden to wander about until some terrible gale should hide them from the sight of other men.

Pith Reserve.

A body of cavalry sent out on a reconnoissance, to pass over the neutral ground between the two armies, to develop any recent earthworks thrown up, to locate the enemy's vedettes, to see if he is preparing the roads and bridges in his front, to observe everything which may have a possible bearing on the events of a week to come; more than that, to drive off horses and cattle, to load a score of wagons with provisions and forage, to add to the destitution and terror of helpless old men as they sit at their doors, and of the women and children as they work in the barren fields.

War is always sacrifice—never mercy. War demands death and wounds and destruction. He who can kill and wound and destroy most is the greatest hero. War respects nothing, venerates nothing, blackens everything. It moves in trails across a country as a venomous serpent winds through the grass. You follow the trails and look in vain for one single spot where mercy and pity stayed the hand of destruction. Blackness, desolation, death, and new-made graves are the milestones on the trails of war.

It was a May day, with the peach trees everywhere in blossom. Behind us were the smoke and flame of destruction; ahead the old farmhouses which sheltered no one who could march in the ranks and fight against us. The fragrant blossoms, the green hills, the sunny skies—everything told of peace, and yet war was at hand. The flaxen-haired children came running to the doors, just below a farmhouse we halt to water our thirsty horses at a brook flowing lazily across the road. A few men ride on to the house. We can hear children crying in affright. We can hear the voice of a woman raised in tearful protestation. We can see a gray-haired man with a child in his arms at the door, and though his voice is too weak to reach us we can see by his gestures that he resents the lawless invasion of the premises.

Some of us ride to the right to reach the barns, where the wagons are already drawn up: some to the left, where horses are at pasture; the remainder straight on up the road. Suddenly the bugles sound the alarm and then warn us to rally on the centre. In one minute the scene is changed from dreamy peace to active war. A body of the enemy, having the same object in view as ourselves, has come up from the south and halted when it saw us at sight. Many a saddle on our side is emptied before we check their fierce charge and push them back till we have room to form. Each side has a light battery. The guns get to work almost as soon as the carbines. The old farmhouse is the key of the battlefield. An old man and a gray-haired woman and children are in there, but what of it? This is war. No one gives them a thought. Shot and shell plough through the ancient structure—bullets search out every nook and corner. Now our right wing drives the enemy back with a cheer—now the enemy sweeps back our left and shouts in exultation. It is a hot fight for thirty minutes—time enough for the dead and wounded to number 150. The reverberation of the guns brings down a shower of blossoms at every discharge, and the black powder smoke floats up through the branches and smirches and discolors and leaves its grime.

"Rally on the centre! Forward—trot—gallop—charge!"

We have broken the enemy and sent him flying. We follow him for a mile or more, shooting and hacking, and then the bugles blow the recall, and we cease the pursuit. There are dead men on the dusty roadway, in the ditches, among the May weeds and the thistles, and dead horses almost block the way at certain points. Yes, a hot little fight, and we are proud of our victory as we return to the old farmhouse. We have our dead to bury and our wounded to look after, and it is only when an officer starts to enter the house to see that it must be turned into a shambles that the inmates are remembered. The officer cries out and starts back in horror. Under the peach tree growing close to the back door lies the body of an old gray-haired man—father and grandfather to the woman and children. He must have been in flight when struck by a solid shot which cut him almost in two at the hips. He was carrying a child not more than 2 years old hugged to his breast. Her little arms were around his neck, and her face was hidden in his bosom. We unclasped the old man's arms and took her up, but she was dead—dead without a wound. She had died of terror as he sank down with her, perhaps kissing her in his last breath.

And as we stood with uncovered heads the woman came out. Great heavens! but how white her face, how ghastly the color of her lips—how red the blood which dripped from her wounded shoulder on the pink blossoms at her feet! She looked at her father and gasped for breath. She looked at her youngest born, and her throat swelled up, and her eyes dilated until her look frightened us.

"Dead, both dead!" she asked in a whisper.

"Poor woman!" replied the officer as we turned our heads away.

"Go in," she hissed, pointing to the door; "go in and gaze upon the rest of your work!"

There they lay—the other three children—all killed and mangled by the same shell as it exploded in the house. Flaxen hair and chubby hands and little blue sunbonnets contrast strangely with the red blood of war. We uncovered and stood beside the mother, who had prostrated herself on the bodies of those so dear to her. She could not weep and wail, she could only moan and croon to them in the agony of her breaking heart.

"Poor woman, poor woman!" sighed one.

She rose up slowly, looked from face to face as if to picture it on her memory, and said:

"Leave me! May the God of Heaven take vengeance upon you to the uttermost!"

And we called it a hot little fight, and we felt proud of a victory won over a superior force, and we—well, each and every trooper prayed Heaven to be merciful and pitiful to that poor woman and to protect the graves of her dear ones a hundred rough and blood-stained hands scattered peach tree blossoms in atonement. We could do no more. War was impatient and angered even as we did that.

Why Cleopatra Hated Herod.

From the Washington Post.

A musty and stained volume rested upon the desk of Representative John De Witt Warner in the House the other day. It was an old edition of the works of Josephus printed in large type with the ample margin around its broad folio that bespoke its ancient workmanship. In this book Mr. Warner found a clue.

"Every student of Shakespeare, said Mr. Warner, "remembers that in the play of 'Antony and Cleopatra,' a singular reference occurs to King Herod. Alexas says to Cleopatra:

"'Good Majesty,
Herod of Jewry dare not look upon you
But when you are well pleased.'

"Immediately Cleopatra became very angry. 'That Herod's head I'll have,' she exclaims. Nobody, as far as I have been able to find, has ever explained why Cleopatra should become thus excited and resentful at the mention of Herod's name. Nearly all of the annotators of Shakespeare say that the reference is to a miracle play in which Herod, on account of the slaughter of the innocents, was pictured as a bogy, so to speak, and that Cleopatra shared this sentiment. But here is a paragraph in Josephus which makes the reference very clear. Herod was with Augustus Cæsar after the battle of Actium, and is talking to him about Antony. In the course of his speech he says: 'I gave him the best advice I was able when I was no longer able to assist him in the war. I told him that there was but one way for him to recover his affairs, and that was to kill Cleopatra, and I promised him that if she were dead, I would afford him money for his credit, but his affection for Cleopatra stopped his ears.'

"See how plain this makes it," said Mr. Warner. Herod had been advising Antony to leave Cleopatra, even if he had to kill her, and naturally Antony had confided to the Queen the opinion which Herod had of her. No wonder that when his name was mentioned she expressed herself as extremely anxious to have his head. After all, said Mr. Warner, as he closed the book, what a wonderful man was Shakespeare. A line which ever one has thought to be meaningless has its full value and shows that Shakespeare was acquainted even with the details of the lives of the characters whom he embodied in his play."

NOTES ON SCIENCE AND INDUSTRY.

Among the admirable mechanisms constituting the new equipment at the Charlestown (Mass.) Navy Yard is an immense hydraulic riveting machine, so arranged that one person can place the sheets in position, and with a single lever control the triple hydraulic arrangement of cylinders by which the sheets are first faced together, the rivet then driven, and, finally, the bar released. Its capacity is for closing a steel rivet of one and one-half inches in diameter through three steel plates of one and one-half inches in thickness each. The device will take a plate 124 inches wide, and is capable of riveting up a boiler sixteen feet in diameter. Connected with the tool is an hydraulic crane of thirty feet in height. The pressure on the rivet is variable, say all the way from thirty-five to seventy-five tons per square inch, is complete in its adaptation for rivets of all sizes, with a convenient supplementary attachment for different kinds of light work. Above this tool is the hydraulic crane, having a hoist of thirty-five feet and an overhead travel of twenty feet in two directions, the whole controlled by one man from the operating platform.

One of the most interesting railway devices lately brought to notice is that which has been adopted by the Union Pacific Railroad Company at its shops in Portland, Or., for cleaning the cars, which is likely to come into general use for that purpose. Compressed air, at a pressure of fifty pounds to the square inch, is carried to the cars by means of a flexible rubber hose with a small nozzle; the apparatus is used in precisely the same way that a water hose is used, the only difference being that a compact stream of air instead of water does the cleaning, accomplishing it in the most thorough manner. Not only is the object attained more satisfactory than by the usual beating with a stick and the application of brushes, but the car is cleaned in an exceedingly short time. The effect on plush cushions of this method is remarked as particularly good, the compressed air being, in fact, not only a beater, but a brush as well, and the searching current of the compressed air reaches everywhere.

An account is given in *Romen's Journal* of Doring's process for waterproofing cloth, by which such satisfactory results are obtained, when the tissue is subjected to a precipitate of salts of the fatty acids. The cloth is passed into a special machine, in which it is saturated with aluminum acetate, dried, and passed into a soap beck. A basic compound being necessary, equal weights of salts of aluminum and lead are employed; and care is taken not to introduce too large quantities of free acid with the aluminum sulphate, since the latter contains always a certain quantity of sulphuric acid, which, during dessication, displaces the acetic acid. To avoid this inconvenience, they are added per liter from ten to eighty grams of soda. The most favorable temperature for the saline mixture is 40 degrees. In preparing the soap bath the fact is utilized that an aqueous solution of soap forms true solutions with mixtures of fat and resins, wax, mineral oils, and even caoutchouc, and to this end a ten per cent. solution of gum Paraguay in oil of turpentine is taken. The proportions employed for a square meter of cloth are thirty grms. tallow soap, twenty-five Japan wax, 1.5 gum Paraguay, one grm. good varnish. The wax is first melted, the gum and varnish added, and for each kilo. of solid is put 0.5 grm. of a solution, saturated in heat, of potassium sulphide. The mixture is stirred and boiling hot, and sulphuretted hydrogen is liberated; a boiling solution of soap is added, when the bath is fit for use.

The artificial preparation of crystals of platinum and palladium is now, it would appear, a comparatively easy achievement in the sphere of chemistry. A ribbon of pure metal is stretched horizontally between two binding screws, and on the ribbon finely powdered topaz is dusted, an electric current being then passed through the ribbon of a degree of strength sufficient to raise it to a bright red heat. In the course of about half an hour, on examining the ribbon with a microscope, it is found that very small brilliant crystals, lying here and there to projecting points of the partially decomposed topaz. Under these conditions, if the heat be maintained, the crystals steadily increase in size, and in about two hours' time some will have attained to a growth of half a millimeter. The crystals are opaque and show a high metallic lustre, like that of clean mercury.

One of the most notable marine devices recently introduced in the engine room of first-class steamships is an arrangement by which the engineers are enabled to know whether that part of the shaft which extends outside the ship's hold is working smoothly or not. In all twin-screw ships this runs through a sort of tunnel fastened to the ship by big brackets. Of course, it is impossible to get at this shaft during a voyage. On the Paris, for instance, this is said to be forty feet long. To meet the objection in question, a little, fine tube is made to inclose the portion of the shaft which runs inside the ship, just over the shaft, and water is constantly running through this tube in a fine stream; the engineer on watch frequently tries the temperature of this water with his hand, so that, if the water were warm, he would know at once that something was wrong with the working of the shaft, and would be slowed down, or, this not remedying the trouble, the engines on that side would be stopped.

That the disintegration of rocks is accomplished by minute animal organisms as well as by atmospheric agencies is, by Prof. Atwater, considered as admitting of no doubt. The fact is, of course, well understood that plants of both the higher and lower orders, growing on the surfaces or in the fissures of rocks, tend to disintegrate them by the action of acid or other secretions as well as by mechanical means; but, according to Prof. Atwater's observations, microscopic organisms exert not only a similar, but a more subtile and far more general influence, for, being of microscopic size, they are able to penetrate the capillary pores of rock, and the nitric acid which they produce, acting as constant, through long periods of time, becomes an effective means of disintegration. By putting portions of disintegrating rock into sterilized tubes and making bacteria cultures with them, the presence of nitrifying organisms was detected in specimens of rocks of the Alps, Pyrenees, Auvergne, and Vosges. Rock of the most widely varying mineralogical character—granite, porphyry, gneiss, mica schist, volcanic rock, limestone, sandstone, &c.—have been thus shown to be covered with nitro-bacteria.

At a recent meeting of the Iron and Steel Institute, London, an improved iron process was brought to the attention of the members. Manganiferous molten pig, poor in sulphur, is added to sulphuretted pig iron, poor in manganese, the result of this combination being that the metal is desulphurized and a manganese sulphide slag is formed. The mixer in which the process is carried on is a large vessel, in appearance like a converter, and though the apparatus in the present case was of some seventy tons of molten pig metal, a vessel of about twice that size is represented as being desirable for the purpose. The details of the process as described to the institute evinced its peculiar value to steel makers working with phosphoric pig. In the discussion which took place as to the merits of this new process it was shown as probable that a saving of something like sixty cents per ton could be made by its adoption as compared with the process of remelting pig in the cupola—a step which has to be taken when it is desirable to combine the product of different blast furnaces. In the large mixer metal from two or more furnaces can be brought together.

Some most curious phenomena in the operations of applying coloring materials and chemicals to textile fabrics are described by a recent writer, and among these the blues appear very conspicuous. Thus, in the case of the vat blue, neither alkalies nor acids, except nitric acid, will take any effect on this color, while chlorine will destroy it; blue composed of indigo sulphuric, indigo extract, and indigo carmine is readily detached by application of hot water by soaking in a lye for a short time, or until a white surface appears; potash blue in fabrics is easily discovered by being attacked by lyes, whereas chlorine and all other acids are non-effective. In the case of cloth dyed with campeachy, detection is very easy, for all acids react on this coloring matter, turning it red; if another ground color has been used the campeachy must continue being extracted until the ground color, if the fabric or sample is then to be rinsed in clean water, when other ordinary tests can be used until the ground color is satisfactorily determined. Colors produced from cochineals, or Brazil wood, change into a dull, dirty red, when treated with hydrochloric acid; subsequent rinsing and soaking in a lime-milk solution produces a spurious violet; and this treatment in goods dyed with genuine increases the intensity of the colors, if, after the lime wash, the cloth is boiled in soapy water.

A successful method of compressing steel ingots by centrifugal force has been introduced, it is stated, at the Nykroppe iron works, Sweden. The apparatus consists of an upright shaft in the centre of a cylindrical casting pit, carrying a frame of four arms, to each of which is articulated a platform supporting four ingot moulds. While the shaft is at rest the moulds are upright and are filled in the usual way; but when it is set in rapid rotation they fly up into the horizontal position, and a pressure in the direction of the length of the ingot is developed equal to thirty times that due to the column of liquid metal in the mould, which drives the gases out and produces a perfect, solid casting, uniformity of composition being likewise produced, as, on account of the rapid cooling, liquation is prevented. This process, which has now been in use some time, has been applied to both the Bessemer converter and to the open-hearth furnace, the ingots produced showing entire freedom from external defects, while the loss by defective ends is diminished some forty per cent, and the metal being so compact as to bear rolling to finished sizes without the use of the cogging mill. The circumference described by the bottom of the moulds when spun up into the horizontal position is about sixty-seven feet, corresponding to the working speed adopted of 125 revolutions to a velocity of nearly 10,000 feet per minute. Some seventy-two ingots are cast by a single pouring from the ladle, which contains from four to six tons.

Some of the features in a new lifeboat recently exhibited in Baltimore appear to be a decided improvement upon the usual construction. The boat is made of galvanized iron; there is at each end a hooded cabin rising above the sides and closed by a water-tight dam; and, should the boat be overturned it would instantly right itself, by reason of the air contained in these compartments; ventilation is secured by air tubes, closed by valves to prevent the entrance of water when waves wash over the boat or it is overturned in the sea. Between the two end compartments the boat is decked over and has seats, also cockpits for rowers; beneath the deck is a tank for fresh water, with a tube leading to it, to which may be attached a pump; another tube leads to the bottom for pumping out any water which may be washed into the hold, and there is a third tube for holding a signal staff. A unique feature is a means of self-propulsion to and from a stranded vessel on the shore, as follows: a small tube runs from each end to the deck section, and through these tubes a rope may be passed and a turn taken around a reel and windlass in the middle of the deck. With one end of the rope fastened on board the vessel from which the boat is launched and the other fastened on shore after the boat is towed or has drifted through the breakers, it is claimed the little vessel may be easily propelled from one place to the other by turning the windlass.

In a recent paper on the subject of gold in the waters of the ocean, by Pickard, the well-known engineer, attention is called to the fact that, to arrive at an approximate estimate as to quantity in solution, account must be made of local conditions, such as the temperature of the water, &c. According to results obtained from the careful soundings made by the Challenger and similar scientific expeditions, it has been computed that the ocean has an average depth of 2,500 fathoms and that it contains 400,000,000 cubic miles of water, equivalent to 1,837,030,272,000 million tons, which upon the basis of five milligrams per ton, would represent 10,250 million tons of gold. In striking contrast to these figures is the statement made by Soetbeer, Lesoyne, and others, that the gold production of the world during the last four centuries—1493-1892—has amounted to but 5,020 tons, while the present output is estimated at about 200 tons per annum. It is an interesting chemical fact that gold in sea water is kept in solution as an iodide. The amount of free iodine present in the ocean is very minute, but a large proportion of that element occurs combined as an iodate of calcium; thus, from the results of his various series of experiments, Soetbeer found that a cubic mile of sea water contains about 11,000 tons of iodate of calcium, or 11,072 tons of iodine. The iodine which maintains the gold in solution is obtained from the iodate of calcium.

An ingenious device of special usefulness at the present season is the recently invented mechanism for clearing the inner sides of track rails from snow, which lies in the path of wheel flanges and ordinarily gets impacted. This contrivance, adapted to be secured directly forward of the engine trucks, comprises a transverse beam linked to hangers, the beam having at each end a peculiarly formed metallic scraper, with a snout or lip depending about half way down the rail, or somewhat deeper than the reach of the wheel flanges; this scraper point is inclined like a plough point, scooping up the snow, which is deflected outwardly from a curve in the plate. For raising the contrivance out of operative position when not required angle levers are pivoted in hangers from the main frame, connection being made from one of the angle arms by a rod to an air cylinder. In operation, the points of the shovels or ploughs travel along the inner side of the head of the rail and to a depth about equal to the rail's depth, greater than that of the wheel flange, their position being regulated by the swinging movement of the frame which carries them, so that they may not only be set to the required depth, but can be raised entirely out of the way when necessary. The normal position is an elevated one, in which they are entirely out of operation.

The manufacture of transparent leather, an article which has lately attracted some attention, may be accomplished, according to the *Magazin Pittoresque*, in the following manner: After the hair has been removed from the hide, the latter, tightly stretched upon a frame, is rubbed with a mixture consisting of one thousand parts glycerine, two parts salicylic acid, two parts picric acid, and twenty-five parts boric acid. Before the hide is absolutely dry it is placed in a room which the rays of the sun do not penetrate, and is saturated with a solution of bichromate of potash, and, on the hide becoming very dry, there is applied to its surface an alcoholic solution of tortoise shell, by which a transparent aspect is obtained. The leather is of an exceedingly flexible character, and is used for the manufacture of toilet articles, though it is said to be fairly adapted to the production of foot gear.

The idea broached a short time ago by Lord Rayleigh that the efficiency of the steam engine might conceivably be increased by adding some salt to the water in the boiler, which should have the effect of raising the boiling point of the solution, has led to considerable discussion in scientific journals. The objection offered to such a method is that to raise the boiling point of an aqueous solution does not necessarily imply a corresponding elevation of the temperature of the evolved vapor, which is simply that of water, and must accordingly possess only the temperature corresponding to the pressure. The difficulty named in obtaining reliable results in this class of experiments is the circumstance that, while the walls of the steam chamber must be at a temperature higher than that of boiling water, and yet below the temperature of the solution, a sufficient quantity of steam must be evolved to insure that those walls shall not exercise any appreciable cooling effect upon it. Lately, however, the difficulty in question is claimed to be overcome by a process devised by Prof. Sakurai, experiments with which have enabled it to be determined that the temperature of the steam escaping from boiling aqueous solutions of such salts as calcium chloride, sodium nitrate, and potassium nitrate is exactly the same as that of the solution itself—this, of course, establishing the Rayleigh proposition.

Sufficient importance appears to be attached to the recently invented apparatus for preventing collisions between trains to justify its description in the railway organs. In its now perfected form it is described as consisting essentially of a band of travelling paper impregnated with iodide of potassium; over this paper a platinum stylus moves, and, when a current of electricity passes through the stylus and the paper, the iodide is decomposed, leaving a blue mark, as in the Bain chemical telegraph. The current is supplied by the moving train by the following method: Two wheels press down levers placed at intervals along the rails, and complete the circuit of a battery connected with the platinum stylus and paper of the apparatus, which is situated in the signal cabin; the marks thus made on the paper indicate the position of the train, enabling the signal man to trace its course along the line, and, having this guide, as well as absolute control over the signals, the claim is that he is in a position to reduce the chances of collision to a minimum, if not to render it impossible.

A recent novelty in the manufacturing line is the aluminum button, the metal being highly polished and made to resemble silver, and has the great advantage of holding its color. These buttons, aside from the industrial or metallurgical interest pertaining to them, possess an appearance which has given them much popularity.

An ingenious device in the way of a wood pulley for a shaft has only one arm to support the nut from the rim; this is to give all the room wanted to remove a split wheel, in contrast from the one that must have been built at a brass factory, the spokes as well as the rim being composed of wire.

The susceptibility of iron to become brittle by picking and rusting is proved to be least in cast iron and silicon steel, and blistest in wrought iron and carbon steel. Combined carbon appears to increase the action and silicon to diminish it. The influence of manganese either way is a point not yet settled.

Various experiments are being made with the new Swedish smokeless powder called ballistite, and based upon highly nitrated cellulose. Some of these tests show the article to give an initial velocity of more than 2,100 feet per second, giving out no flame, and looking like common black powder.

CANADIAN RAILROADS.

The Canadian Pacific Wants Further Government Guarantee—It Was to Be Great Deeds, and It Got Its Pay in Advance, but the Deeds Are Undone, the Road Needs Help, and the Dominion Is Less Able Than Ever to Give It—The Future of the Road Lies in Its Stealing Business by Breaking the Commerce Laws.

MONTREAL, Jan. 3.—It is expected that when the Dominion Parliament meets in February the Canadian Pacific will ask the Government to guarantee its bonds to the amount of $15,000,000 or thereabouts. The original scheme was to get Parliament to transfer the Intercolonial Railroad to the Canadian Pacific, whereupon the Intercolonial would have been bonded for a large amount. That road was built by the Dominion; is 1,200 miles long, with its branches, has cost on capital account over $50,000,000, and until last year has never paid operating expenses. The Tory members from the seaboard provinces refused, however, to allow the Government to turn it over to the Canadian Pacific and so the Canadian Pacific is about to fall back on the Government for a guarantee of its own bonds.

One way and another, in cash and land bonuses and other favors, the Canadian Pacific has already received about $120,000,000 from the Canadian treasury, a sum equal to $24 per head of the whole population of the country. But that it should be hard up is not to be wondered at. The Canadian Northwest, which it was built to develop, has proved a failure. It was estimated some years ago that by 1891 there would be at least a million white men in that region, while British Columbia, on the other side of the mountains, was to have had 250,000; whereas from the Ottawa River to the Pacific Ocean, a distance of 3,000 miles, there are not to-day more than 400,000 whites. In a new country wisdom dictates the close association of the earlier settlers who are specially dependent upon cooperative labor, and more likely to thrive when they can readily exchange commodities and personal services. The Canadian Pacific set this bit of common sense at defiance, rushing construction from end to end of its line with the utmost haste, in order to obtain the Government bonuses and launch itself upon the money market as a completed undertaking as speedily as possible. The consequence is that the meagre population between the Ottawa and the Pacific is strung along in small, far-distant settlements, handicapped not only by a rigorous climate, but by an almost unbearable isolation.

Emigrants from the British Islands do not care to face this state of things. They prefer settling in the United States, where life is easier. A number of Icelanders and Russian Mennonites have done fairly well in Manitoba, but Swedes and Norwegians cannot be induced to enter. They appear to think that as Canada is a colony of an Old World kingdom, they would have the subjection of mixing with the Old World evils. The French Canadians are well adapted for the hard fare and semi-Arctic winter, and played a conspicuous part as trappers and voyagers when the old fur companies ruled the Northwest; but nowadays they go to the New England factories, within a day's ride of Montreal and Quebec. The mining fever of the seaboard provinces of Canada also go to New England, while those of Ontario go to the Western and Northwestern States in such numbers that the supply from which Manitoba can draw is very limited.

Then, again, in Manitoba and the Territories the business of wheat growing has received a severe check from low prices, high railroad rates, and summer frosts. The frosts leave the settler with a large quantity of grain that is only fit for feed; and, as he has to sell it at Toronto or Montreal, and pay just as much for transportation as if that were sound grain, he gets next to nothing for the labor and cost of growing it. The high rates to the seaboard are particularly galling for the reason that the Canadian Pacific gives lower rates from Minneapolis to the settlers of Dakota and Minnesota, who, of course, have not contributed a cent to the construction of the road. It makes these lower rates from Minneapolis in order to get a share of the traffic which belongs to American railroads, but by so doing discourages the colonization of its own lands on the Canadian side of the frontier and drives settlers away from Canadian territory.

The following are the predictions of a prodigious development in the Canadian Northwest has undoubtedly injured the credit both of the Dominion and of the Canadian Pacific in England. A colony of crofters from the Highlands of Scotland, sent out to Manitoba a few years ago by the British Government, have done very indifferently from them, and the British Government has resolved to send no more. This was made a sort of test case. The Canadian officials declared that the crofters were doing well and saving money, but imperial officials visited the settlements and found them in a wretched condition. Another fiction which has been knocked on the head is that respecting the so-called rush from Dakota, Wisconsin, and Minnesota to the Canadian Northwest, which has done service in England for a year or more. It appears that about 300 persons, some of them Canadians and other never-do-weels, have been brought from the United States and planted in Manitoba at a cost to the Dominion Government of $500 per head. The settlers on the American side get more for their crops owing to the lower transportation rates in vogue, and as a rule pay less for implements, furniture, clothing, binding twine, coal oil, and all articles of clothing except woollens. Under such circumstances a stampede from the border States into Manitoba is out of the question. The movement is all the other way. The border States, especially Minnesota and North Dakota, are full of settlers who have fled from Manitoba.

Manitoba and the huge region north and west of it will some day afford homes for millions of people, but not until the political boundary between the United States and Canada is torn down. At present the country is cut off from the nearest and best markets and forced to depend upon a single pair of rails. There is no money in raising such crops as barley, flax, and roots, because ther cannot be sold in Toronto or Montreal, from 1,700 to 2,000 miles distant, and are subject to duty at the frontier if shipped to Minneapolis or Duluth. For, for a reason, is there much if any profit in raising horses or cattle. The settler is thus thrown back on all wheat, a risky venture in such high latitudes. The immense deposits of petroleum and salt, which extend from the south Saskatchewan to the Arctic Ocean, cannot be worked under existing conditions, nor can the lake and sea fisheries be turned to account. A Political union would soon fill the Canadian Northwest with a thriving population, and insure the development of British Columbia, which is a perfect storehouse of minerals, fish, and timber. But for long as Canada remains tied to Europe those regions have little hope to enjoy any large measure of prosperity.

In its eastern field of operations the Canadian Pacific is not doing nearly so well as it expected to do. From Winnipeg to Sudbury, a distance of a thousand miles, the road runs through a country which it has extended its lands etc. Marie line from Minneapolis and Manitoba through North Dakota and across the international boundary to a point on its main line near Regina. This route will enable it to avoid the dead-horse haul from Winnipeg to Sudbury. East of Sudbury it has used its Dominion, provincial, and municipal bonuses, together with large sums raised in England to build lines in direct competition with those of the Grand Trunk. Over $25,000,000 of British money has been unproductively in the Grand Trunk, and it is probably certain that two roads cannot pay where one has failed. The Grand Trunk, built forty years ago, promised the English investor a dividend of 11 per cent. on the original shares, which are now practically worthless. Everybody in these days counted on Canada securing the lion's share of the surplus population of the United Kingdom. But the United States has got the lion's share, and has drained Canada of the best of her native-born people to boot. Many of the counties traversed by the Grand Trunk and Canadian Pacific show an actual decline of population during the last decade. In none is there any evidence of great prosperity. Both companies have to meet water competition by the St. Lawrence in summer, and both have long since come to the conclusion that their only chance of salvation lies in extending their lines and connections in the United States.

This brings up the question, for which Congressman Hitt and Congressman Hepburn are seeking a solution, namely, whether the two Canadian roads are to be permitted for all time to convert the United States into a thoroughfare without paying much regard to the provisions of the Inter-State commerce act. The Grand Trunk was built as an international road to connect Portland and Chicago, while at the same time serving the provinces of Ontario and Quebec. All the bonuses it has received do not exceed $3,000,000. It is not a political road in any sense. The Canadian Pacific is a political road and nothing else. It was built to connect Ontario and Quebec with the Canadian Northwest and British Columbia, to open up those two, and to be an imperial route for the transportation of troops and munitions of war to Asia in case the Suez Canal should be closed against British vessels. Its steamships running between Vancouver and China and Japan receive a year