

the water being at low tide, about twelve fathoms at not more than a ship's length from the shore. When about seventy-five yards from the point the stern commenced to settle rapidly. A hawser was thrown out and attached to a tree upon the point, but so great was the tension created by the rapidly sinking vessel, that the tree was snapped asunder, and the attempt to warp the vessel failed. A general stampede ensued, and it was only by the most urgent efforts that the crew and the officers reached the shore. The prisoners of war, manacled and helpless, all perished. The officers were received at the house of Gouverneur Morris, where they remained during the night, the disaster having taken place at about 5 o'clock, P. M. So great had been their haste that their swords were left in the cabin, and no attempts were made to save the treasure, supposed to have been placed in her run and walled in with brick, as was the custom at that time in the shipment of treasure.

For eighty-eight years the waves have rolled over the wreck, and shrouded the remains of the unfortunate men so suddenly engulfed. The treasure amounted to 900,000 guineas, worth about 5,000,000 dollars in American gold. The English government fitted out two brigs, and sent them to the spot, in 1794, to attempt its recovery; it having been previously proved, by the united testimony of the officers, before the Court of Admiralty, that it went down with the vessel; and so far from being able to make any efforts to save it, they could not, from the rapidity with which the vessel sunk, even rescue the prisoners or save their most ordinary personal effects. This evidence is corroborated by the fact that the swords of the officers, guineas, and other articles, have been rescued since, from her cabin. Many of these articles are now preserved in historical collections and museums. Porter bottles, corked, and probably containing the original fluid more or less changed, have been obtained from time to time. Some of these bottles were exhibited in Barnum's collection previous to its destruction by fire. In 1848 a company was formed, under charter from the State of New York, to attempt the recovery of the bullion. This company was called the "Frigate Hussar Company," and, under their direction, divers have visited the wreck, daily, from June first to September first of each year since 1848 to the present time. They have succeeded in removing her decks, and have hoisted up twenty-six cannons, 4,000 balls, and buckets bearing the name "Hussar." The bones of the arms of the drowned prisoners, with the manacles attached, have in some instances been recovered. The perseverance of this company, and the positive knowledge that the treasure was sunk in the vessel derived from the circumstances of the case, the testimony of the officers as recorded in the British archives, added to a second attempt on the part of that Government to recover the treasure in 1819, at which time they were ordered off by the American Government, have kept the stock of this company from ever selling at less than twenty-five per cent. The company have this season made a contract with Wm. R. Taylor and Dr. J. A. Weisse, owners of the improved Submarine Explorer, to raise the treasure at a salvage of thirty per cent. They are now at work, and, by invitation, were permitted to witness the operation, of the "Explorer," on Thursday, July 30th.

Before describing this machine, however, it may not be amiss to refer briefly to some features of marine exploration as hitherto conducted. The first attempts at penetrating below the surface of water were confined to diving; and many marvelous stories of the feats of divers, the depths reached by them, and the time they could remain beneath the surface, have been handed down, bearing the impress of romance rather than sober fact. The truth is, that two minutes is probably the utmost limit of time at which any unaided diver has remained under water. Admiral Hood tested the powers of the famed Indian divers with watch in hand, but found that none of them could remain under water more than one minute at a time. It is probable that ten or twelve feet is the greatest depth to which divers unaided by apparatus can reach, and remain so as to perform any useful service. We have not room to notice the different kinds of submarine armor which have been devised to enable divers to remain at greater depths, and for longer periods under water. They all have for their object the supplying of air for respiration, and the protection of the body from external pressure; and are more or less cumbersome to the wearer, and inimical to freedom of motion. In many of them the air contained within the walls of the armor prevents the stooping of the diver, as when he attempts to stoop it rises suddenly to those parts of the apparatus which are higher than his head, thus destroying his equipoise, and making him unwillingly perform a somersault. The only remedy is to get down upon his knees, and, in this awkward position, his working efficiency is necessarily much impaired.

The substitution of the diving-bell for such apparatus leaves the operator unencumbered to make observations at length, to drill rocks, to make excavations, and to perform any of the engineering operations, or other work for which submergence is necessary. The diving-bells hitherto used have, however, been attended by some objections; the principal of which was the fact that the divers were entirely dependent upon their assistants above for the supply of air as it was required, and also in case of emergency the ascent of the bell was a slow and tedious process. The pressure also varying with the depth reached, was beyond their control, and they were unable to graduate it to suit the circumstances of the case. The accumulation of carbonic acid gas from respiration was also imperfectly removed, and caused much inconvenience to the divers. The absorption of the gas by water forced into the cavity of the bell by pumping removed the gas, but the water was itself a great inconvenience. In case communication with the surface should become interrupted, they

could neither rise, sink, nor change the position of the bell.

The Submarine Explorer, invented by William Mont Storm, and improved by Wm. R. Taylor, was built at Secor's Iron Works. Its exterior consists of a cylinder, also of boiler iron, surmounted by a truncated cone of the same material. Within this cylinder is another concentric cylinder, of boiler iron, surmounted by another truncated cone which meets the external cone at the top, the inclination of its sides being less than the sides of the external cone. The distance from the bottom of the cylinders to their junction with the cones, is about seven feet. The top of the double cone has a man-hole provided with a tight cover. The space between the concentric cylinders is separated by an iron diaphragm into two compartments. The lower of these compartments forms a hollow ring entirely around the bell, and is called the "ballast ring." It communicates freely with the external water, and of course when the air it contains is allowed to escape, it becomes filled with the water which replaces the air. The upper of these two chambers, which is called the "air-chamber," communicates with the "ballast-ring" by means of a stop-cock, worked from the interior of the inner cylinder, and it also is connected by a stout, one and a quarter-inch hose to two powerful air-pumps placed upon the deck of the attendant vessel or dock, or otherwise situated according to circumstances. The pumps are worked by steam power, which constantly force air into the air chamber while the bell is descending or rising, as well as when it remains at the bottom. That portion of the bell within the interior cylinder is separated by a circular iron floor into two compartments, an upper chamber in which the workmen place themselves in ascending or descending, and a lower or "working chamber," into which they descend through a man-hole, after they have arrived at the bottom. These chambers have a lining of felt, four inches thick, upon the inside of which is placed a lining of perforated zinc. Water is admitted through a pipe leading from the ballast-ring to the upper portions of the felt, and filtering through it, oozes through the perforations in the zinc, and trickles down along its surface, absorbing in its progress the carbonic acid without subjecting the occupants to a continual shower bath. The air, as it is rendered unfit for breathing, is discharged through a cock provided for that purpose, and rises to the surface with great violence; its place being supplied from the air-chamber, which is kept constantly filled with condensed air by the action of the air-pumps above the surface.

The capacities of these chambers are as follows: "Ballast-ring," 109 cubic feet; "air-chamber," 135 cubic feet; "working-chamber," 304 cubic feet. The entire height of the bell is 10½ feet, its diameter at the bottom 9 feet, and the height of the working-chamber about 7 feet. The bell operates on the same principle by which a fish raises or lowers himself in water, by altering the specific gravity. The air-chamber takes the place of the bladder in the fish. It will now be readily seen how the divers in this bell can rise or descend at their option. The air-chamber contains 135 cubic feet of air compressed to four atmospheres; this pressure is more than equal to a pressure of a column of water 90 feet in depth, and the additional pressure of the atmosphere upon its surface. Communication between it and the ballast-ring being established by the opening of the stop-cock above described, the expansion of the compressed air will force out the water from the ballast-ring, so that the specific gravity of the entire mass of iron, occupants, and contained air, becomes less than water, and it will consequently rise. A suitable stop-cock being opened to allow the air to escape from the ballast-ring, at the same time closing the stop-cock between the air-chamber and the ballast-ring, the water replaces the air in the latter, and the specific gravity of the mass is thus increased until it will descend at the required rate. When at the bottom, they can so nicely poise the bell as to be able to easily shift it from place to place, notwithstanding its entire weight in air is 32,000 lbs.

The operation of this bell, as we witnessed it, was interesting in the extreme. The sloop *Confidence*, anchored over the wreck, was thronged by eager spectators. The time fixed upon for its descent having arrived, Mr. Owen Kenny and two workmen, provided with picks, sperm candles in glass lanterns, bags, and the other paraphernalia for prosecuting their labors, descended into the bell. To those on deck it seemed almost like descending into a tomb. The iron cap was adjusted to its place, and, for a few moments, silence reigned. Soon, however, the water at the side of the bell became violently agitated by a jet of ascending air. Mr. Taylor explained that they were now taking in ballast. Slowly and steadily the bell disappeared from sight, and continued its descent until, at seventy-five feet, the signal rope announced that the bottom had been reached. The descent was made in fifteen minutes. A more rapid descent is painful to the divers, who do not in that case have time to become accustomed to the pressure. An hour elapsed, during which period nothing was heard from the divers, except the occasional agitation of the water as it was disturbed by the escape of the foul air. Then the signal announced that the bell was about to rise. At the suggestion of Dr. Weisse, it was signaled to the divers that, when they were about thirty feet from the surface, they should allow the bell to rise rapidly. When this distance was reached, the motion began to increase so rapidly that it was with difficulty the men upon the deck could take in the tackle. Suddenly the monster reared its head, and shot up out of the water half its length, or more, preserving its equipoise admirably, and finally came to rest where, an hour and a-half previous, it had disappeared. The cap was raised, and the divers came forth—not dripping with perspiration like those who awaited them, but fresh and cool and without the slightest symptom of exhaustion.

The contents of their bags were some undoubted English shore ballast, copper and iron nails, and some gun flints bearing marks of use in the guns of the revolutionary period. They also reported having struck some of the timbers of the vessel.

This experiment satisfied all present of the value of the Submarine Explorer, and of its entire applicability to submarine blasting, sponge and pearl fisheries, etc. We were informed by Mr. Taylor that the Rothschilds, having heard of this machine some two years since, sent an agent to negotiate for its use in the Mediterranean sea, in the gathering of sponges, they being largely interested in that industry; but the Sultan would not permit its use, as it was thought its introduction would produce discontent among the divers, and the transaction remains still in abeyance.

At the place where these experiments are progressing, the tide runs seven knots per hour, and rises to the height of nine feet. The divers say the force of the tidal wave is distinctly felt at the bottom, but perhaps they regard as the tidal wave, currents arising from other causes. The bell has a lifting power of 6,000 lbs; it could therefore be used to great advantage in lifting blocks of stone after blasting, and dropping them where they would not interfere with navigation. Its application to removing the obstructions at Hell Gate seems feasible, and it is to be hoped that it may be tested with a view to its employment for that purpose.

WHAT CONSTITUTES A GREAT INVENTOR.

The faculty of invention is possessed by very few in an eminent degree, and originators of great mechanical ideas are only rarely found recorded in the history of the world's progress. There are many who can seize upon and develop the ideas of others, who never were able to conceive an original idea for themselves, and such men are usually unable to distinguish the difference between an original conception and the appropriation of the conceptions of others.

It is said that Columbus, to illustrate how easy it was for men to follow in a path once marked out, or to do apparently simple operations when once some man of genius has shown the right way to do them, puzzled his hearers by a demand that they should attempt to stand an egg on end. After all tried and failed he, by a slight blow, cracked the shell, and in this simple manner solved the problem. The class of men to which we have alluded, taught to balance an egg, would conceive themselves equal to the discovery of new worlds. In their arrogance and insufferable self-conceit they assume equality with the mental giants to whose stature they can no more approach than could the frog in the fable, that burst itself in vain emulation of the ox. Lacking the modesty which usually accompanies real genius, they are always foremost in giving expression to their opinions, and inattentive to the claims of genuine merit.

These may be called the parasites of genius. Another class of men are those who, while recognizing and admiring inventive genius, are willing to admit that they do not themselves possess it, and to confine themselves within the sphere for which their peculiar gifts fit them. In *Read and Boucault's* celebrated story, "Foul Play," when Hazel is credited with great inventive genius, at the time he was puzzling his brains over the problem, "How to diffuse intelligence from a fixed island over a hundred leagues of water," notwithstanding he had done some very skillful planning and adroit execution, he disclaimed all pretension to the character of a great inventor. He said, "I do things that look like acts of invention, but they are acts of memory. I could show you plates and engravings of all the things I have seemed to invent. A man who studies books instead of skinning them, can cut a dash in a desert island until the fatal word goes forth—*invent*; and then you find him out. * * * Ah, if James Watt were only here, instead of John Hazel—James Watt from the Abbey, with a head as big as a pumpkin—he would not have gone groping about the island, writing on rocks and erecting signals. No; he would have had some grand and bold idea, worthy of the proposition."

A great inventor combines in one mind the imagination of the poet and the painter, and the logic of the mathematician, with perceptive faculties which enable him to trace from a cause its effect, with a rapidity and certainty that seems almost like intuition. He is ready for unforeseen emergencies, and undaunted by unexpected obstacles. He never abandons an idea once conceived, until he has proved either its impossibility, or that it is of no practical value. He cannot abandon ideas; they will not leave him; they haunt him by night, and press upon his mind for solution by day; his only relief is "to work them out." This is one reason why so many inventors die poor. They are men of ideas, and ideas are expensive things. They demand apparatus and time and energy, and they are persistent in their demands. Such men are, after all, to be envied. They have resources which are not shared by the many. We know of one such—an old man, stooped and bowed with infirmity, but with a mind as placid as a summer sea. We verily believe that a pecuniary loss, which to most men would be a catastrophe, would be forgotten by him in an hour, or dismissed from his mind as unworthy of further thought. Such men are glorious examples of the triumphs of mind over physical infirmity. What a noble spectacle is a Humboldt, at upwards of threescore, working sixteen hours a day, his feeble age upheld by the sheer force of mental power; forgetful of physical discomforts, his mind soaring far above the petty cares of life, and reveling in the contemplation of Nature's mighty works.

JOSEPH BEAUMONT, of Canton, Mass., who built the first cotton mill in that State 68 years ago, is still alive, 90 years old, and of remarkably sound mind for fourscore years and ten.