

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

137 "The American News Company," Agents, 121 Nassau street, New York
137 "The New York News Company," 2 Spruce street.
Messrs. Sampson, Low, Son & Marston, Booksellers, Crown Building, 158 Fleet street, London, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.

VOL. XIX., No. 7....[NEW SERIES.]...Twenty-third Year.

NEW YORK, WEDNESDAY, AUGUST 12, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

*Improvement in Cooling Mill-stones and Flour.....	97	Recent American and Foreign Patents.....	102
Learning to Telegraph.....	97	Answers to Correspondents.....	103
New Brunswick Hematite Iron.....	97	Inventions Patented in England by Americans.....	103
*Foote's Patent Porcelain Lined Ice Fitcher.....	97	*Improved Self-acting Gate.....	104
Future Prospects of Machine Manufacturing in Russia.....	97	*Method of Locking the Nuts of Fish Plates.....	104
The Amos, or Hairy Men, of Yesso and Saghalien.....	98	Perseverance One Great Element of Success.....	104
*The Balance.....	100	An Engineering Feat.....	104
*Cupworth's Revolving Carriage Wheel, Feeder and Steep.....	100	The Chemistry of Sunstrokes.....	104
Provincial Protection to Inventors.....	100	Beaching and Granulating Sugars.....	104
Water Test for Boilers.....	100	Athletic Sports and Collegiate Institutions.....	105
*Marine Aeronautics.....	100	Water on the Planets.....	105
Plan for Index Plates.....	101	The New Commissioner of Patents.....	105
Breech-loading Cannon in Russia.....	101	Preservation of Brick Structures.....	105
*Thomas & Raymond's Patent Adjustable Ladder.....	101	Care of Grindstones.....	105
Dyspepsia—Its Symptoms and Causes.....	101	Submarine Exploration—Wreck of the Frigate <i>Hussar</i>	105
The Aniline Blue—An Instructive Lesson.....	102	What Constitutes a Great Inventor.....	106
Editorial Summary.....	102	The Atlantic Cable.....	107
Manufacturing, Mining, and Railroad Items.....	102	Planchette.....	107
		Patent Claims.....	107, 108, 109, 110
		Extension Notices.....	110

ATHLETIC SPORTS AND COLLEGIATE INSTITUTIONS.

Since Milo of Crotona astonished the ancients by his six victories at the Olympic games, the world has been spasmodically given to getting on its muscle. We are now in the midst of one of these spasms. Base ball, rowing matches, and feats of pedestrianism seem to rival in the public prints the attention which is claimed by political conventions, elections, and—scandal. We have a suspicion that many of those who engage in these matches, and who plead in their favor the old cant about the general promotion of health, and all the rest of it, will find in the end that in their particular cases they have been otherwise than beneficial. Exercise is useful and necessary, but like every thing else it becomes injurious when carried to excess.

No one supposes that a horse driven until he drops, has his strength or powers of endurance increased by such usage, and a man who should, except in emergency, thus use his horse, would justly merit the indignation which, in this humane age, he would receive. Is the constitution of man so vastly superior to that of the horse, or do the laws of physical development, exhibit such variations in his favor that he can violate them with impunity? All the exhibitions of muscular power and skill at the present, seem to have for their chief end the display of the utmost endurance which is possible, and the training which is undergone preparatory to such displays is of a severe and excessive character. By such training men are able to attain to superior power over their fellows, but it is a power which leaves them in middle age with stiffened sinews and rheumatic joints, hobbling about, like broken-down canal horses. The fact is simply that these public matches are exercising no more good influence upon the public health or morals than the races at Saratoga or Fordham. Violent exercise exhausts, it does not permanently strengthen, although perhaps it may give a temporary accession of strength. To use the language of a cotemporary: "We always like to seize the opportunity, or even to make opportunity, to say a word for physical sports, and for all manly rivalry in athletic games. Whether it be shooting, or yachting, or rowing, or riding, or whatever else that gives strength, nerve, grace, address, to our American youth, we support it, believing that this is what they sorely need. For the physical training of the people, we must rely on the popular national sports."

It is the vicious system of matching that we complain of, from its very nature leading to excess. Most of these matches are made at the hottest season of the year, when excesses in anything are most dangerous, and we regret to add that they are too often accompanied by adjuncts of betting and gambling. Their tendency is to lead young men into expensive habits, and to absorb the time which they ought to give to business or study. No false coloring that can be thrown upon this subject can disguise these facts, and the verification of their demoralizing influences is at hand in the reports of the rowdiness, lawlessness, and utter disregard of other people's rights and privileges shown at the recent regatta at Worcester.

The formation of boat clubs in the colleges and seminaries of the United States has, in our opinion, indirectly done more to injure them in public estimation, by their effect upon the morals and habits of the young men who congregate within them, than any other cause. The effect is not confined to the clubs themselves, but extends to those who are outside of their immediate organizations, and leads not only to the pernicious practice of betting, but the other concomitant evils—neglect of study and dissipation. The fact is becoming every day more apparent, that a man who sends a son to one of these institutions is exposing him, to the worst temptations,

while he is, at the same time, removing him from the safeguards which parental supervision and the sacred influences of home throw around the critical period of transition from youth to manhood. The chances are vastly against his returning with any acquirements that will be an equivalent for the four years of time and the money expended upon his collegiate career. There is no hope for these institutions except in immediate and thorough reform. If the ends which they were originally intended to subserve are kept constantly and persistently in view in their discipline, and all things calculated to obstruct or defeat their accomplishment rigidly proscribed, they may regain the confidence which (we speak advisedly) they have been of late rapidly losing. But unless the public can see something else in them than mere training schools for physical contests and other results than the riotous conduct which is the pest of almost every town in which one of them chances to be located, they will soon meet with the condemnation of all right-minded citizens.

WATER ON THE PLANETS.

In an article in our last number we stated that hereafter the use of the spectroscope was destined to throw light upon the nature of cometary matter. Prof. Hinrichs, of the Iowa State University, thus describes its application to the determination of water upon the surfaces of the planets.

When the sunlight passes through a glass prism it is transferred into a beautifully colored band of light, the so-called *solar spectrum*. When observing this by means of a spectroscope, a multitude of dark lines are observed. These lines are called *Fraunhofer's Lines*.

A considerable portion of these dark lines are produced by the light passing through the atmosphere. They are accordingly most prominent when the sun is low, and they are almost invisible when the observations are made on the top of a high mountain. But the greater number of dark lines are always equally prominent. They have, by Bunsen and Kirchhoff, been proved to be produced by the various substances constituting the atmosphere of the sun.

We may at some other time refer to the latter kind of dark lines and the unity of matter in the universe which they prove. Here we only intend to give some of the results obtained by a close study of the former or the atmospheric lines in the spectrum.

Among the lines produced by the earth's atmosphere, some have long ago been ascribed to the presence of watery vapor in the atmosphere.

To identify these lines, Janssen took a large iron tube of somewhat more than one hundred feet in length, and closed at both ends by means of strong glass plates. The whole tube was packed in sawdust and filled with steam under a pressure of seven atmospheres. At the one extremity sixteen gas jets sent their light into the tube. At the other extremity of this tube a proper apparatus for the accurate observation of the spectrum of these gas flames was placed. Janssen found that the spectrum of these gas flames contained all the lines peculiar to the solar spectrum at sunset.

By observations in localities distinguished for a very transparent atmosphere (such as Marseilles, Palermo, Athens), and by observations on the summit of Mount Etna, Janssen has proved the absence of water from the atmosphere of the sun, but its presence in the atmospheres of Mars and Saturn.

This latter result is particularly interesting. It may be remembered, that the planet Mars shows bright areas at its poles, alternately increasing and decreasing, appearing precisely in the same manner as our own earth would look at a great distance; having, during the winter season, its northern polar region covered with snow and ice much farther toward the equator than during our summer season. Hence it has long been concluded that the planet Mars is covered with water, just like our earth. From other observations it has long been known that Mars, Jupiter, and Saturn are surrounded by gaseous atmospheres. By the above observations of Janssen, the presence of water on Mars is now finally proved; as the seasons change on the planet, its polar regions are more or less enveloped in ice, just as here on the earth, and at all times the watery vapor in the atmosphere of Mars is seen in the spectrum of the planet as we notice the vapor of our atmosphere in the spectrum of the setting sun.

Janssen concludes his report with the following remarks: "To the close analogies which already unite the planets of our system, a new and important character has just been added. All these planets form accordingly but one family; they revolve around the same central body giving them heat and light. They have each a year, seasons, an atmosphere, and on many of the planets clouds have been observed in these atmospheres. Finally, *water*, which plays so important a part in all organized beings, is also an element common to the planets. These are powerful reasons to think that life is no exclusive privilege of our little earth, the younger sister in the great planetary family.

THE NEW COMMISSIONER OF PATENTS.

Hon. Elisha Foote, of New York, who, for some time past, has filled the important position of Examiner-in-Chief, has been appointed and confirmed Commissioner of Patents. The appointment is an excellent one in every respect. Judge Foote is not only a high-toned gentleman, well qualified to discharge the duties of the Commissionership, but he is in full sympathy with inventors, and will see to it that their interests are well cared for. We speak in this matter from a personal acquaintance with the new Commissioner of many years' standing, and we anticipate an energetic and popular administration of the duties of the office, which need a most prompt and careful revision.

PRESERVATION OF BRICK STRUCTURES.

We are in receipt of several communications desiring information upon the subject of the preservation of brick walls, chimneys, etc.; also, in regard to the use of soluble glass as a protective coating, and its effect upon the strength and durability of different kinds of mortars. It has been supposed that the use of the latter material would confer hydraulic energy upon lime, or upon mortars containing lime deficient in silica. Experiments have, however, proved that it is of little value. Gilmore, in his Practical Treatise on Limes, Cements, and Mortars, says, "It may and probably can be advantageously applied to the reclamation of the intermediate limes (those in which the hydraulic energy is exerted powerfully and rapidly when first mixed, but which soon yield and fall down under the action of the sluggish free lime present), but for fat limes it is unsuitable. When added to the intermediate limes, it appears to exert its influence by giving up its silica to the free lime present, thus neutralizing or perhaps only retarding its action, until the hydraulic principle has time to exert its indurating power." From extensive experiments, the following conclusions have been arrived at:

The addition of soluble glass to common mortar, while it renders it hydraulic, injures its strength and adhesive properties. It is at the same time greatly inferior to cement as an hydraulic agent, in both efficiency and economy. It may, however, be applied to hardening soft and porous stones, and concrete walls or stucco work, after these are well dried, but its utility depends so much upon the peculiar nature of the material to which it is applied, that the utmost care and judgment are needed in its application, not to say some chemical knowledge of the nature of the alkaline silicates, and their reactions upon clays, limes, etc. Most cases in which its use has been attempted for such purposes have secured unsatisfactory results, and it is therefore not to be generally recommended. For walls of concrete brick, a paint made by mixing hydraulic cement with oil is highly recommended, and it is also a good water proof paint for roofs and walls of cisterns. The action of the acids produced by combustion of wood, coal, and other fuels upon the mortar of chimneys, often act as disintegrating agents, and for this we know of no efficient remedy.

Large chimneys may have their interior surfaces painted white which, being a non-radiant surface, tends to promote a draft, while at the same time the mortar or cement is protected from the action of the gases of combustion.

CARE OF GRINDSTONES.

A correspondent, who writes himself a farmer, complains that his grindstone, which for several years has proved of uniform grit, has deteriorated in this necessary quality. He has kept it heretofore under a shed, but lately removed it to an open space in his back yard, and asks whether this exposure has changed the character of the stone. One side is soft, as the whole stone was formerly, but the other side is hard and rigid.

We think the removal of the stone is the cause of its change of character. Exposure to sunlight is always injurious to a grindstone. The substance of the stone is porous, and it contains a considerable amount of water; this being evaporated, the stone becomes granulated, harsh, and hard. It is not altogether for personal comfort that the farmer places his grindstone under the friendly protection of a wide-spreading apple tree or elm. He knows, almost intuitively, that the summer's sun's rays are inimical to the qualities of the stone, and he shelters it from this too fervid light and heat. The stone that in the shop of the mechanic runs in water through all the hours of daylight, will preserve its homogeneity better than one that is used only occasionally, and is exposed to the sunlight.

The red or brown freestone, so much used in New York city, New Jersey, and Connecticut, is a sandstone similar in structure to the ordinary grindstone, differing, mainly, in being of coarser texture and colored with an oxide of iron. It is an aggregation of particles of sand, agglutinated by clay, and compressed. Yet this stone, which is such a resistant to the action of the elements on exposure, may be easily cut with a knife when first removed from the quarry. In fact it is so saturated with water, that, when quarried in the fall, it must be preserved from the action of frost during the winter, by being sunk under water or otherwise protected, else it will burst by the freezing of the water contained in it. Exposure to heat, or to the sun's rays, evaporates the water and leaves it quite hard.

So with the grindstone, and, in a lesser degree, with the oilstone. Notwithstanding the close grain of the best oilstones, they deteriorate by long exposure to the sunlight.

SUB-MARINE EXPLORATION—THE WRECK OF THE FRIGATE "HUSSAR."

Nov. 25th, 1780, was a day of rejoicing to American patriots. The French fleet had approached the harbor of New York, and were preparing to enter. The British forces were obliged to evacuate the city. In their haste, the whole of the treasure for their army was placed on board the frigate *Hussar*, which, with its rich freight, a number of British officers, and eighty American prisoners of war, started up the East River, her only avenue of escape. In passing Hell Gate she struck what is commonly known as "Pot Rock," and stove her bottom. The injury was not, at first, considered very serious, and the vessel pursued her course. After proceeding about a mile, however, she was found to be filling, and her head was turned toward Stony Point, upon which, at that time, stood the mansion of Gouverneur Morris, that being the nearest land, and, as they supposed, a sloping, sandy shore. Upon nearing the point, however, they realized their mistake,

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.