

IMPROVED THRASHING MACHINERY.

We publish herewith an elevation of the exterior and one in section of an improved thrashing machine, recently constructed by Messrs. Wallis and Stevens, of Basingstoke, England, and exhibited by them at the recent Christmas exhibition of the Smithfield Club, held at Islington, London. Fig. 2, the exterior view, shows the machine as it stands in the rick yard or the field, and Fig. 1, to which all the letters in the following description relate, shows the construction and working of the machine. This thrasher resembles very much a similar English machine illustrated in this paper last year, but agriculturists will observe that it is quite different in its internal construction.

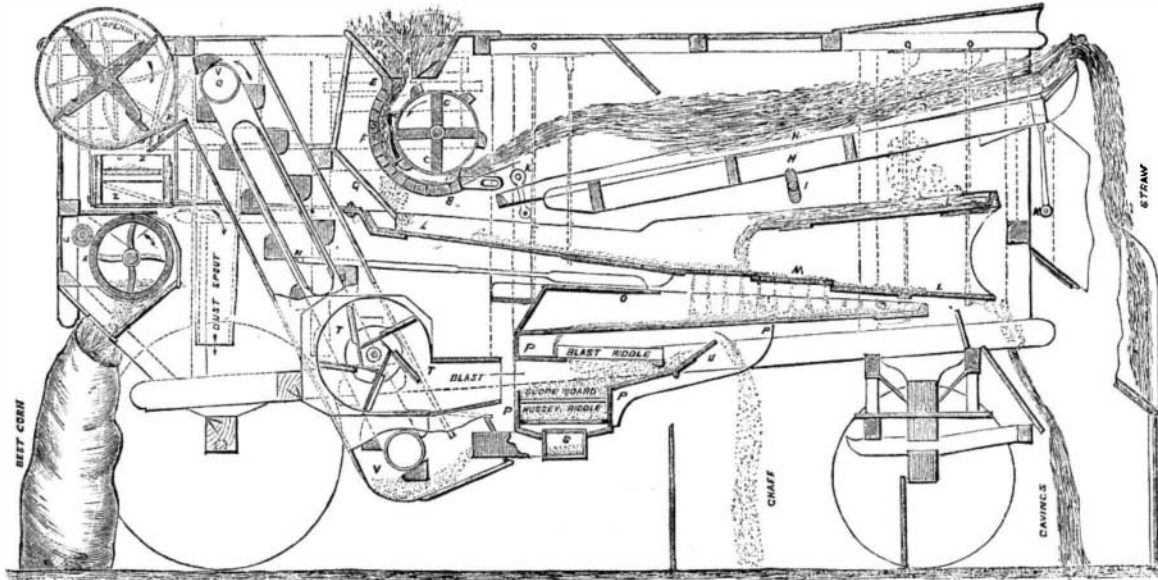
A is the feed mouth through which the unthrashed corn is fed into the machine. B B, adjustable mouthpieces for increasing or decreasing the size of the mouth to suit different descriptions of corn. C, the thrashing drum, which has a steel spindle, wrought iron head and rings, and either six or eight ash beaters—according to the size of the machine—fitted with Coucher's patent beater faces and plate iron fronts. D, the concave or breasting, made entirely of wrought iron, and provided with adjusting screws, E E, at the hinge, F, for regulating its distance from the drum. G G, casing behind concave which carries the thrashed corn as it passes through the bars of the concave down on the upper shoe on the riddle board, L. H H, the straw shakers worked by the shaker crank, I, each alternate shaker being attached at one end or the other by links, J J, turning on centers, K K. The shaker shakes out of the thrashed straw any loose corn which may be left in it. L, vibrating shoe on which the corn falls from the drum and shakers. In this shoe is fixed the perforated mahogany riddle, M, which separates the short broken straws—technically called "cavings"—from the corn. This, and also the lower shoe, is driven by connecting rods from the riddle crank, N. O, the lower vibrating shoe, to which is fixed the first winnowing machine, P. Both shoes are suspended from the framing of the machine on spring hangers, Q. P, the first winnowing machine, in which are placed an upper perforated zinc riddle marked "blast riddle," which assists the blast in separating the chaff from the corn, and a lower riddle marked "hussey riddle," for taking out the husks containing grains of corn—technically known as "husseys" or "chobs"—poppyheads, etc. S, spout for conveying the corn to the elevators. In the bottom of this spout is a third riddle—not shown in the section—for separating any small seeds which may be mixed with the corn. T, the fan which supplies the blast of air to the winnowing machine, P. Slides are provided to the openings in the center of the fan through which the air is drawn in, by opening or closing which the strength of the blast can be regulated to suit the particular sort of grain being thrashed; and by regulating these and raising or lowering the hinged flaps, U, at the back of the winnowing machine, the whole of the chaff can be blown over without carrying any of the corn with it. V, the elevator which carries the corn up and delivers it either into the barley horner, W, or else direct into the second winnowing machine without its passing through the barley horner at all. W, the barley horner, the steel blades of which are set at an angle so as to throw the corn out at the upper side of the horner casing, where it is marked "opening." By raising the hinge valve, X, by means of a handle outside the machine, the corn will then fall on the slope board, Y,

instead of on the valve, and so pass direct into the second winnowing machine without passing through the horner at all. This arrangement is of importance, as some sorts of grain, and beans and peas, would be injured by being passed through the horner. Z, the second winnowing machine, which has a set of hard wood riddles for thoroughly separating from the grain any chaff, husseys, etc., which may have passed the first winnowing machine, or have been rubbed off in the passage through the horner. It is suspended on spring hangers and vibrated by a connecting rod fixed to the end of the upper vibrating shoe, L. A blast of air is blown through the winnowing machine by a fan fixed outside the framing of the machine, shown by the dotted line behind the barley horner. The husseys, etc., removed from the sample by the winnowing machine, as well as the dust and awns from the barley horner, are carried into the pout marked "dust spout," to the bottom of which a sack

is attached to catch them. R, the Penny's patent adjustable rotary screen which separates the clean corn into three samples—namely, best corn, best tail, and small tail. A brush is used for keeping the rotary screen clean. Apparatus for lifting and bagging the chaff is often added, in which case the chaff can either be bagged or allowed to fall, as shown in the drawing, at pleasure. This apparatus is shown, in the external view, fixed to the side of the machine near the front end thereof.

The Chicago Stock Yards.

The business enterprise which characterizes the people of Chicago is best portrayed by the quick and substantial manner in which they have rebuilt their city. But some idea of the extent of the gigantic stock business of Chicago may be had from the following extracts from a recent article in the *Chicago Times*:



IMPROVED THRASHING MACHINE.—Fig. 1.

"Stock can now be got in condition for this and all eastern markets at these stock yards with a despatch and perfection unequalled anywhere on the face of the globe. The new works constructed make an imposing showing. A new exchange building has been finished, 50x137 feet in area, containing offices, restaurant, etc., heated by steam and otherwise comfortably arranged. There have also been built four yard offices, a hay barn, a corn crib, large horse sheds, a great stable, a post office, and a new printing press office. There has, however, been other and greater work even than this achieved. Think of twenty acres covered with new and superior cattle pens; and of ten acres of covered hog and sheep pens. There are also six new scale houses, equipped with Fairbanks' standard scales. Beside all this, over five acres of yards and alleys have been replanked. Over 5,000,000 feet of lumber has been consumed in this work of improvement. Twenty double-decked chutes have been made for the shipping division, twelve of these being

fourteen corn cribs and ten hay barns, besides the different weighing houses.

"A brief summary of figures will show how business at the stock yards has gone on during the progress of the improvements we have sketched. About four millions of live hogs have been received. Add to these about nine hundred thousand beef cattle and half a million sheep, and we have a total in round numbers of nearly five and a half million head of live stock received. Only about one fourth of that number has been shipped, the remainder having been consumed by the huge packing and other like interests having their headquarters in Chicago. The total valuation of live stock handled at the stock yards during the year 1875 is estimated to exceed a hundred millions of dollars."

A Good Suggestion.

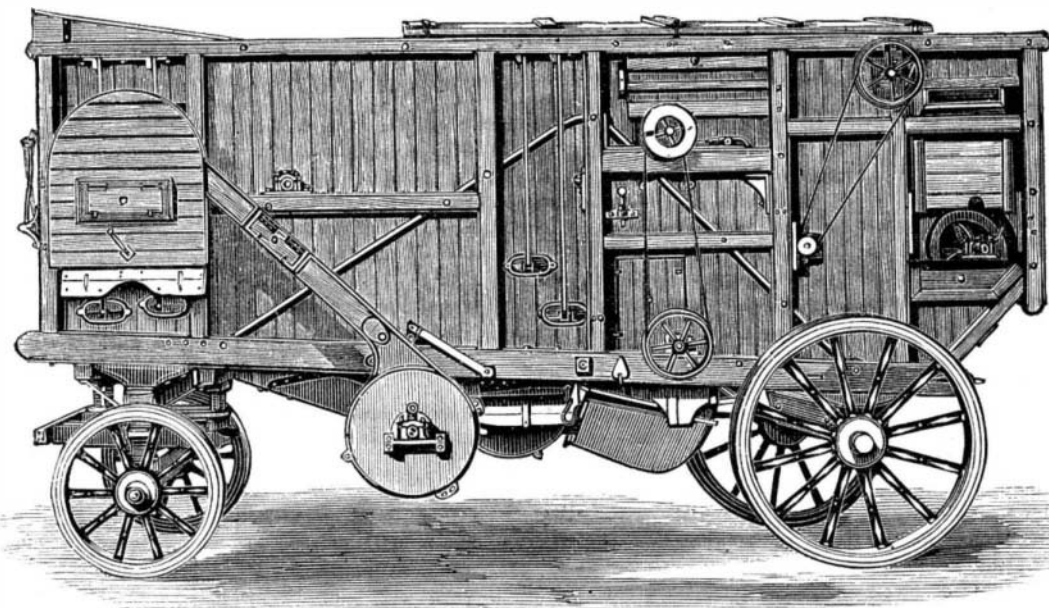
A writer in *Engineering* says: The inadequacy of the present means employed for saving life at sea has been sufficiently demonstrated. No doubt much has been done by inventors to mitigate the perils of the sea, and it does seem a little hard that their exertions should prove of no avail, just because their inventions have not been allowed to get a fair trial. To alleviate this evil he suggests that a competitive exhibition might be got up of apparatus for saving life at sea, to test the relative merits of such inventions, and to enable the Board of Trade to decide what a vessel ought to carry. He also suggests that a ship ought to be provided with means to save at least one third more than her complement of passengers and crew, as it often happens in such circumstances that a boat is rendered useless, and this

just means death to a certain number. Besides, did the passengers know that there was more than sufficient means to save all on board, it would help materially to allay any panic. As it is desirable to economize space on board ship, some of a ship's furniture might be utilized for saving life; for instance, the beds might be air beds of waterproof material, which, being provided with couplings, could easily be attached to one another and form a very good raft. Further, a raft provided with provisions and water might be kept in readiness to set adrift in any emergency, so that it could be picked up. He also advises that a whistle, or some such instrument, should be attached to each apparatus for saving life, in order that there might be some chance of those who are shipwrecked letting vessels know of their vicinity, especially at night. All these are good suggestions, applicable not only to England but to this country.

The Stereoscope as a Civilizer.

A "Quaker among the Indians" wishes that a good stereoscope, with suitable pictures, could be exhibited in every Indian camp and properly explained to the people, the effect of an exhibition of stereoscopic views among the Comanches being, according to his experience, most amusing as well as extremely salutary.

"As a body the Indians who have never been East, and, as a consequence, have seen but few white people, are disposed to disbelieve the accounts they receive respecting their numbers, the magnitude of their towns and cities, and the extent of the country they occupy. They believe that their own people who have been East have been duped by some kind of sorcery, or, as they would say, 'medicine.' They also think it impossible to make an imaginary picture. Hence a picture is to them 'proof positive' of the existence of an original. Consequently, exhibiting towns, buildings,



IMPROVED THRASHING MACHINE.—Fig. 2.

for the Baltimore and Ohio Railroad. A mile of new water pipes has been laid. Over five hundred new gates, and about the same number of water boxes, have been made. A half mile of eight-foot sidewalks has been completed. The cost of this improvement has been more than \$300,000. The company has about two hundred acres of land in active and continuous use for tracks, yards, roads, etc., the whole space covered by the demands of the place, roadway included, amounting to about three hundred and seventy acres. More than twenty-four miles of railroad track are operated at the stock yards; so that the company, in addition to its other features, is really a railway organization of no small pretensions. The rails used here are mostly of steel, and the equipment of the lines includes 160 frogs and switches connected with the various tracks. The stock yards proper contain 475 cattle yards, 675 covered hog and sheep pens, 375 chutes and pens, making a total of 1,525. There are also

rural scenes and soldiers has had a most convincing effect. This was much heightened by having some mountain scenes from Colorado, familiar to them, and which they recognized at once. This was, in fact, the strongest adducible evidence that the accounts they had received were so far from being exaggerations that the half had not been told them. One middle-aged man, who has always treated these reports with the utmost skepticism, was particularly struck with them. He could not sufficiently express his surprise, but beat upon his mouth in utter astonishment. Sun Boy, who had often told him what he saw in the East, would say to him in Kiowa: 'What do you think now? You think all lie now? You think all chiefs who have been to Washington fools now?' Again and again would he look them over, with his hand upon his mouth, dumb with amazement. After he had looked them over several times, being a war chief, he called in his warriors, and exhibited the pictures to them, talking

to them all the time. I could understand but a part, yet would gather such expressions as these: 'Look! see what a mighty powerful people they are!' meaning white people. 'We are fools! We don't know anything! We just like wolves running wild on the plains!' Such an effect on the war chiefs and warriors cannot but be very salutary, and must conduce much toward deterring them from going on the war path against such a 'mighty powerful people.'

SCIENTIFIC AND PRACTICAL INFORMATION.

THE LIGHTING OF LONDON.

The streets of London have an aggregate length of 2,500 miles, requiring about 5,000 miles of gas mains, and upwards of 54,000 public lamps, which consume something like 1,000,000,000 cubic feet of gas a year, or about 3,000,000 a day. The gas supply of the entire metropolis is about 14,000,000 cubic feet a year, or 38,500,000 cubic feet a day, requiring for its production the coking of 1,500,000 tons of Newcastle coal. The cost of the coal is reported to be \$8,750,000. The value of the residual products, such as coke, breeze, tar, and ammonia liquor is, as much as \$3,500,000. The gas rental of the city is \$15,000,000, of which \$1,250,000 goes for street lamps.

THE CUCUMBER IN RUSSIA

What the onion is to the Spaniard, or the potato to the Irishman, that the cucumber is to the native Russian. It is the indispensable part of every Russian peasant's every meal. In the account of his trip up the Volga to the great fair of Nijni Novgorod—which, by the way, packs the greatest amount of instructive and entertaining description in the smallest space of any book of travels printed the past season—Mr. Munro Butler Johnstone remarks the profusion of water melons and cucumbers everywhere offered for sale. At the fair and on the road thither, pyramids of melons, like cannon balls in an arsenal, were heaped up in every direction; and as for cucumbers, one couldn't help thinking that a plague of cucumbers, like locusts, had descended upon the earth. All along the Volga, from Astrakhan to Nijni, the whole population seemed engaged in eating water melons, which were sold for three copecks, equivalent to one English penny, two cents. At every station the trade in melons was rivaled only by the traffic in sunflowers.

But if the water melon and the sunflower are luxuries and pastimes, the cucumber is a law and a necessity. One never sees a Russian peasant at dinner without a lump of black bread and a cucumber. "A moujick's dinner may be said to consist of x + cucumber." The x will consist of his favorite cabbage soup, with or without meat in it, and sometimes, in addition to it, the famous grit porridge; sometimes the soup is without the porridge, sometimes the porridge without the soup, but in either case the cucumber is always there; and should x equal zero, then the ever-faithful cucumber does duty for all the rest.

In the hot and arid regions of Southern and Southwestern Asia, these succulent vegetables are highly appreciated, and with good reason. Juicy and cool, they cannot but be always refreshing where water is a rarity; but in a climate like that of Russia, the cucumber is the last thing one would expect for a national dish. Mr. Johnstone suggests that their price—about the fifteenth part of a cent—may help to explain the anomaly. We are rather inclined to think it likely that the Russian peasant eats cucumbers, not so much because they are cheap, as because his remote ancestors, who came from the South, were cucumber eaters. To the one the taste for cucumbers was the natural result of climatic conditions; with the other it remains an inheritance and a national eccentricity, in spite of a naturally unfavorable climate.

NEW MODE OF HARDENING SANDSTONE.

In Saxony, sandstone is soaked in a solution of alkaline silicates and of alumina. The liquid penetrates some inches into the stone, and renders the surface so hard that it resembles marble and will bear polishing. On being heated to a high degree, the surface vitrifies, and it may be colored at pleasure.

A PAVEMENT ANIMALCULE.

Professor Leidy, of the Academy of Natural Sciences, describes in recently published proceedings of that body a curious animalcule which he discovered on street pavements. It is named *gromis* and resembles a cream-colored ball about one sixteenth of a line in diameter. When placed in water, it in a few minutes projects, in all directions, a most wonderful and intricate net. Along the threads of this net (which are less than one thirty thousandth of an inch in diameter) float minute *naviculae* from the neighborhood, like boats in the current of a stream, until, reaching the central mass, they are swallowed. Professor Leidy states that during dry weather the creature remains quiet in the dust, and that when rain falls it spreads its net and gathers food.

PREPARING BAMBOO FOR PAPER.

We mentioned recently Mr. Thomas Routledge's investigations relative to the utilization of bamboo as a paper making stock. The following is the method in which he treats the young plants: The stems are first passed through heavy crushing rolls, in order to split and flatten them, and at the same time crush the nodes. The stems then go through a second series of rolls, which are channelled or grooved in order to divide them into strips. The latter, being cut into convenient lengths by a guillotine knife or shears, are delivered by an automatic feeder direct to the boiling pans. Both the boiling and washing processes ordinarily in vogue for producing half stuff or semi-pulp, Mr. Routledge conducts in a series of vessels connected by pipes and furnished with

valves, so that communication between the vessels may be regulated as desired, and in such method that the receptacles being charged in succession, the heated lye (composed of caustic alkali) can be conducted from vessel to vessel. The lyes are thus used over and over again until exhausted, fresh lye being continually supplied, until by degrees the extractive matters combined with the fiber have been rendered soluble. In the same manner hot water is admitted to remove the matters rendered soluble, leaving the fibers sufficiently cleansed. A final cooling stream of water is run on and through the fiber, which is drained and pressed. The semi-dry material is next submitted to the action of a "willow" or "devil," by means of which it is opened or teased out and converted readily into a tow-like condition, when it is dried by a current of heated air, induced by a fan blast. When baled up for storage, it may be kept for an indefinite length of time; and when received by the paper manufacturer, it has only to be soaked down and bleached in order to fit it for making paper.

WAFER CAPSULES FOR MEDICINES.

Among the latest devices for the administration of medicine is the wafer capsule, by means of which any dose, however unpalatable, can be taken without the slightest disagreeable taste. Capsules, generally speaking, are nothing new; but in the present case the novelty lies in the shape, which is much better than the gigantic elongated pill form ordinarily adopted, and also in the fact that the capsule is made of flour and water wafers, and may be supplied to druggists empty, and may be, by the latter, easily filled when medicines are dispensed. They are simple disks cut out of a thin wafer sheet by hollow punches. To render them concave, they are dampened between cloths and placed between two curved plates of tin, by which they are quickly shaped. The medicine is then placed between two wafers, the rims are brought together and moistened, and a slight pressure closes the edges tightly. Some simple apparatus for this purpose has been devised by Mr. E. M. Boring, of the Philadelphia College of Pharmacy.

ASTRONOMICAL NOTES.

OBSERVATORY OF VASSAR COLLEGE.

The computations and some of the observations in the following notes are from students in the astronomical department. The times of risings and settings of planets are approximate, but sufficiently accurate to enable an ordinary observer to find the objects mentioned. M. M.

Position of the Planets for February, 1875.

Mercury.

On the 1st of February, Mercury rises at 7h. 58m. A. M., and sets at 6h. 42m. P. M. On the 29th, Mercury rises at 5h. 31m. A. M., and sets at 8h. 41m. P. M.

Mercury, which was west of Saturn before January 28th, passes east of Saturn at that time, is again very near Saturn in right ascension on the 7th of February, but some degrees further north in declination, and too near the sun to be easily seen.

Venus.

Venus will be brilliant all through the month, setting at 7h. 50m. on the 1st of February, and at 8h. 55m. on the 29th. The moon will be in conjunction with Venus on the 28th.

Mars.

On the 1st of February, Mars rises at 9h. 41m. A. M., and sets at 10h. 13m. P. M. On the 29th, Mars rises at 8h. 36m. A. M., and sets at 10h. 4m. P. M. The moon will be in conjunction with Mars on the 29th.

Jupiter.

On the 1st of February, Jupiter rises at 2h. 15m. A. M., and sets at 11h. 52m. A. M. On the 29th Jupiter rises at 0h. 38m. A. M., and sets at 18h. 11m. A. M.

The most noticeable phenomenon connected with the motions of Jupiter in February is its near approach to the star β *Scorpii*, and the possible occultation of the star, by the planet, on the early morning of the 28th.

β *Scorpii* is a star of the second magnitude, and with an ordinary glass may be seen to have a companion star of the fifth magnitude.

Saturn.

On the 1st of February, Saturn rises at 8h. 3m. A. M., and sets at 6h. 21m. P. M. On the 29th Saturn rises at 6h. 21m. A. M., and sets at 4h. 49m. P. M.

Uranus.

On the 1st Uranus rises at 5h. 38m. P. M., and sets at 7h. 34m. A. M. of the next day. On the 29th, Uranus rises at 3h. 40m. P. M., and sets at 5h. 42m. the next morning. It is among the stars of *Leo*, and can be seen with an ordinary glass; its motion among the stars is toward the west.

Neptune.

Neptune can never be seen without a good telescope, and at present is not well situated.

Occultations.

On the 3d of February, the path of the moon will be among the beautiful stars of the *Pleiades*, and the moon will occult, or hide from our view, several of the small stars, and also γ *Tauri*, a star of the third magnitude. As the moon will be just past the first quarter in high northern declination, and the phenomena will occur in the evening hours, a fine opportunity will be afforded to those who love to watch these changes. To the astronomer, observations of occultations are valuable for determinations of differences of longitude.

Sun Spots.

The report is from December 18 to January 18 inclusive. Photography and observations have been much interrupted by clouds. Three pictures only have been taken, of the dates

December 22, December 23, and December 27. The photographs of December 22 and December 23 show, on the western limb, a large group or spots, which disappeared before the next picture, December 27. In the picture of this date, a pair of small spots was seen on the western limb. From December 27 to January 9, whenever observations could be made, the sun's disk, as seen through a glass of three inches aperture, was free from spots. On January 10 a very small group was observed on the western limb, but after that could not be found.

Success in Labor.

Mr. George W. Childs, of the *Philadelphia Ledger*, is one of the most successful newspaper publishers in the land. He is the friend of the laboring man, and practises himself the precepts which his paper advocates. The following editorial from a recent issue characterises the man—the publisher:

"There is nothing more essential to prosperity than the establishment in the popular mind of the intimate connection between efficient labor and true success. In one sense they are synonymous. Success consists not so much of the reward a man reaps from labor as the value of the labor itself. He who, by honest work of hand or head, is constantly enriching the world is intrinsically the successful man, whether riches or poverty fall to his lot; while he who amasses millions by speculation or fraud, leaving none to bless his memory when he is gone, has made his life a disastrous failure. We trust the time may arrive when this shall be the common acceptation of the word success, but at present it is not so. We usually measure it by what is gained—not by what is given; by the reward which labor brings—not by the intrinsic value of the labor itself. Even by this gage, however, the connection is still closely preserved. Eventually each one's personal welfare is strictly dependent upon his value to others. There may seem to be exceptions to this. Idleness and unfaithfulness may occasionally appear to reap the fruit that belongs of right only to honorable industry; but in the long run it is not so. The cheat is discovered, character is sifted, and justice is indemnified for her dishonored claims. Faithful, patient labor, of some sort that benefits mankind, is the only road to personal prosperity, and the success that seems to follow quicker and easier methods is short-lived and illusory.

"Few, however, believe this in their hearts. To many, work is only a disagreeable necessity, to be taken like medicine, in as small quantities as possible and dispensed with as soon as may be. They do not love it for its own sake, they do not care for its importance to mankind, or its reflex influence on their own characters. They do not specially desire to attain excellence in it, and they only put enough energy into its performance to accomplish immediate and necessary results. Their hearts are not in it; they are ever looking beyond and over it to find objects of interest. Other things excite, stimulate, and inspire them; their work alone is dull and irksome. Labor thus performed can never be of superior quality, can never greatly add to the happiness or progress of mankind, can never bloom into true success. It has no soul to animate, no hope to inspire, no vital power to develop it. A life spent thus, in unwilling and compelled labor, in which the heart has no place, is surely one of the saddest of failures. There are others again who fail in their life work because they are ashamed of it and think it beneath them. They blame fortune or circumstances for having condemned them to a toil which they conceive degrading. If their lot had been cast differently, they think, they might have made some mark in the world; if their work had been of a higher grade, they could have pursued it with energy and zeal; as it is, they only follow it from necessity and with no more assiduity than they are compelled to exert. Such persons make a fatal mistake. It is in them, not in their work, that the fault lies. For if they do not perform what is committed to them with fidelity and zeal, how can they be fitted for a higher post? Besides, this separation of work into ranks and grades is altogether artificial and unauthorized. Who can decide which labor is higher or lower than another, which is of more or less value to mankind? It is not the kind of work, but the manner in which it is done, that determines its value. The faithful day's work, in the field, the workshop, or the forge, in the kitchen or the factory, is far more honorable, useful, and elevating than that of the scheming politician or the flushed and eagers speculator, who count his votes or his gains by the thousands, but whose labors add nothing to the prosperity, happiness, or virtue of the community.

"It is certainly important for each one to find his own appointed work in the world, that which he loves best, and can do best, as far as practicable; but it is folly to sit down sullenly and give way to despair and lethargy because he imagines he ought to occupy a more prominent or important post. Nine tenths of the changes made under this delusion prove to be for the worst instead of the better. The character and capacity that fail of success in the one case fail yet more signally in the other. Froude well says: "You cannot dream yourself into a character—you must hammer and forge yourself one;" and it is only by laying hold earnestly and vigorously of the work that lies nearest to us, and raising its value by putting into it all the vigor and energy, all the patience and fidelity, all the thought and ability we can command, that we have any right to expect success in any of its meanings."

The simplest way to dye billiard balls red is to soak them for ten or fifteen minutes in very dilute nitric acid, wipe them dry, and place them for the same length of time in an ammoniacal infusion of cochineal; repeat this until the desired color is obtained.