

A COTTON-PICKING MACHINE.

If the complex operations needed in cotton picking are successfully performed by mechanism, it would seem that the inventor need shrink from no problem. According to *Leffle Milling News*, the cotton picker has been patented and the following gives an idea of the machine and its task: Cotton plants vary in height from one foot to seven, and are planted in rows at various distances apart, but averaging about three and a half feet. The pods mature at varying times, and when they open, the cotton gradually unfolds itself and hangs down more and more, until, if not picked, it is finally shaken out by the wind, and falls on the ground. The picking season extends usually from the latter part of August to the first of December. From the knowledge of these facts some idea can be formed of the difficulties to be overcome before cotton can be successfully picked by machinery.

We now learn that an apparatus has been constructed and experimented with which promises to fulfill the requisite conditions. It is the invention of Mr. O. R. Smith, of Ithaca, N. C., and was patented April 10th, 1877. It consists of a frame, mounted on three wheels, and spanning two rows of plants, the single front wheel running between the rows, the rear wheels outside. The rear wheels are quite large, so as to carry the framework over the highest plants; the front wheel is much smaller, and works under the machine on a pivot joint, to which the horses are attached.

The picking is done by a series of flexible rubber rolls, bearded with fine spines pointing upward, which work alternately up and down through the plants as the machine advances. These rolls are fastened to levers, which vibrate alternately, so that as one roll is moving up the next is going down. The cotton adheres to the spines, and is stripped from the bolts on the up-stroke; and on the down-stroke the adjacent rolls pick off the cotton from the spines and carry it upward until it is removed at the top by brushes, as from the saws of the cotton gin. An endless apron then carries it into a receptacle at the rear, from which it is removed when sufficient has collected.

These picker rolls—of which there are about 200—are just sufficiently flexible to clear themselves from stalks or stumps, and do not, it is stated, injure the plants. The spines with which they are covered will not take hold of leaves or twigs, as nothing but the cotton will adhere to them, and they pick all that is opened, whether on the ground or at the top of the plant. The machine costs \$200, and is estimated to pick the cotton at an expense of one dollar per bale, a great saving over hand labor.

ACCELERATION OF BERKELEY.—The recent adulteration of yellow beehwax with resin has led to the invention of a new method for its detection. E. Schmidt recommends the following process for the rapid and accurate detection of relatively small quantities of pure resin. He heats five grammes (75 grains) of the wax to be tested in a flask with four or five times the quantity of nitric acid, specific gravity 1.31 to 1.33, until it boils; and it is kept boiling a minute, then an equal volume of cold water is added, and enough ammonia (which must be added very cautiously) put in and shaken to cause it to smell strongly of ammonia. The alkaline liquid is decanted from the precipitated wax into a cylindrical vessel. If the wax is pure the liquid will have a yellow color; if the wax was adulterated with resin, the liquid will have a more or less intensely reddish-brown color from the formation of nitro-products. This being a colorimetric test, it is well to have some perfectly pure wax for comparison. The reaction is much more violent during boiling if resin is present. As little as one per cent. can be detected in this way.

LOVE TIME.—Let any young man pass all the evening in vacant idleness, or in reading some silly tale, and compare the state of his mind, when he goes to sleep or gets up the next morning, with his state some other day, when he has spent some hours in going through the proofs, by facts and reasoning, of the great doctrines of natural science, learning truths wholly new to him, satisfying himself, by careful examination, of the grounds on which the known truths rest, so as to be not only acquainted with the doctrines themselves, but able to show why he believes them and to prove to others that they are true; he will find as great a difference as can exist in the same being—the difference between looking back upon time unprofitably wasted and time spent in self-improvement; he will feel himself, in one case, listless and dissatisfied, and in the other, comfortable and happy; in the one case, if he did not appear to himself humble, at least will not have earned any claim to his own respect; in the other case, he will enjoy a proud consciousness of having, by his own exertions, and therefore a more exalted opinion.—*Lord Brougham.*

TOUGHENING GLASS BY COMPRESSION.—In the Siemens glass works at Dresden, there is now manufactured a product which has the same properties as La Bastie's tempered glass, the strength being communicated by the pressure of metallic rolls. Plates can be made, by this method, of much larger dimensions than by La Bastie's. They have a beautiful look, and can be ornamented with the most complicated designs, at a less cost than ordinary glass. Siemens claims that glass manufactured by his process has a greater strength than tempered glass, in the ratio of five to three. When broken it shows a fibrous structure, while La Bastie's is crystalline.

SIGNALS FOR THE BENEFIT OF AGRICULTURE.—General Le Duc, the new Commissioner of Agriculture, has strongly endorsed and will give all possible aid for a fair test of the plan of storm and flood signals by means of the telegraph and camera to give certain, instant and general warning of coming storms, mainly for the benefit of agriculture during sowing and harvest, and also of commerce, and to give warning of sudden destructive floods on rapid rivers.

MOROSE TURKES DON'T CRY.—As readily as some folks suppose turkeys did

THE AVERAGE HEIGHT OF MEN.

The *Druggists' Circular*, in noticing the questionable statement "that we are becoming a degenerate race," discusses the tables prepared by Dr. Baxter from the records of the Provost-Marshal General's Bureau, made during the civil war. These examinations were made during the latter part of the war, after the finest fighting material had been enlisted, consequently these statistics do not overestimate the average development of the American people. From the tables of Dr. Baxter and those of Mr. Gould, gathered by the Sanitary Commission, the Indians are shown to be a tall race. In the comparison of States the Indians would rank as high as the ninth, though it is curious to see that they head the list of nationalities.

Here follows the table showing the superiority in stature of 201,068 men of the various nationalities—185,448 foreigners, three-fifths of whom were from Germany and Ireland—the former having a few thousand more than the latter:

Table with columns: NATION, MEAN HEIGHT IN INCHES, NATION, MEAN HEIGHT IN INCHES. Lists various nationalities and their average heights, such as U. S. Indians (67.20424), Wales (68.418), U. S. Whites (67.725), Russia (68.281), etc.

Graded according to the mean stature of the inhabitants (American born white), the different Northern States stand as follows:

ROOFING STREETS AND COOLING HOUSES.—The *Celestial Empire*, published in Shanghai, China, offers some suggestions, says the *Iron Age*, that might be of value on this side of the globe, as the temperature which calls forth the remarks is not higher than that of most American cities in midsummer. The Chinese practice of roofing their streets in hot weather with a temporary covering of matting is spoken of in terms of high approval. Streets thus shaded are said to furnish a most agreeable arcade. It is further suggested that the air beneath the matting might advantageously be kept in motion by out-door punkas. Indoors there are plenty of inventions for warming houses, but very few for cooling them. What a delightful convenience it would be, for instance, to be able, by merely turning the button of a register, to let a cool wind pour into a room at any moment! Must we wait till the next generation introduces the latest improvements before we can have both hot and cold air, as well as hot and cold water in our houses?

THE HAYDEN SURVEYS.—A telegram from Washington gives the following interesting information: James Stevenson, executive officer of Prof. Hayden's geological survey, has just returned from the field of exploration. Stevenson says that several divisions of the expedition are still at work and approaching the completion of their labor for the season. Each division has ten thousand square miles assigned it for examination, and reports just received from the seats of divisions indicate that they will finish their field work by the first of October. The result of this year's examinations will be equal in importance to that of any previous year. The work of survey in the present year will be in the Territories of Idaho, Wyoming, and Montana.

A FRAUD IN HOPS.—We read in the *London Farmer* that Swedish swindlers have invented a way of making spent hops better than new. Our producers will be interested to hear of the fraud. "The transactions of the Medical Society of Upsala contain an account of a new swindle in the hop trade that is practiced in that city on a considerable scale. Hops which have already been used for making extracts, or for brewing in the ordinary way, are damped with tincture of absinthe, or wormwood, freed from spirit by distillation, redried, and then placed upon the market as a genuine article, with or without the addition of a little fresh bloom. Owing to their increased bitterness they often command a better price than unadulterated hops.

SAPONIFY SOAP.—A manufacturer in Tiliat, instead of adding infusorial earth or ground quartz to the soap mass and thus producing a saponio, introduces a considerable quantity of very fine sand, previously ground and sifted. The wood fiber acts mechanically as a detergent, and besides cleaning rapidly and thoroughly, occasions a saving of one-third in the consumption of soap. The soap does not contain an excess of soda, and has no ill effect on the hands. An analysis of a specimen eight days old yielded—grease, 44%; soda, 6%; wood, glycerine, coloring matter, 10%; water, 40%. The price at the factory is about five cents per pound.

"I never felt so frightened in my life," she said to her lover; "I turned as white as your shirt front"—on inspection—"very much whiter."

The waiters at a Martha's Vineyard hotel struck just at dinner time. One half of the guests waited upon the other half. Come back to their old business, you know.

CONSIDERING the large amount of "itch" in their games, the Russians are slow in "coming up to the scratch." The "offski" counterattacks the itch they have for fighting.

BETTER to love a short girl than never to love a tall.

TO LOWER THE TEMPERATURE IN A SICK ROOM.

Dr. Henry N. Dodge, of Morristown, gives the following to the *Scientific American* as the result of his experience: A few weeks ago, while thinking with some anxiety of the dangers which the approaching hot weather might bring to his tottering child, the idea occurred to the writer that the temperature of a heated room might be lowered by keeping the window awnings saturated with water or any volatile fluid.

By this means not only would the air which entered the windows be cooled by contact with the cool wet surface of the canvas, but also by evaporation of the moisture from the awnings. Accordingly, on the following day, a brass tube having a diameter of one-quarter of an inch was so placed that it would lie across the outside surface of the awning at a distance of a few inches from the upper edge, which is attached by hooks and rings to the house. The ends of the tube, being bent at right angles to the tube, hung down by the sides of the awning about six inches. All along the side of the tube which touched the awning were drilled, at intervals of three inches, holes about the size of a pin. One end of the brass tube was closed and over the other end was slipped a small indiarubber tube. This tube was carried in at the open window and connected by an ordinary screw coupling to the nearest cold water faucet. The awnings of three windows of the nursery having been supplied with this simple apparatus, the water was turned on, and, after passing through the perforations in the metal tubes, and flowing evenly over the front and sides of the awnings, dripped upon the tin roof of the porch below the windows—a miniature summer shower. In a short time a refreshing coolness and moisture of the atmosphere reminded one of breezes blowing into the windows from off the surface of a lake. A thermometer hung outside of the window under the awning, while still dry, showed a temperature of 97½° Fah. Upon turning the water on, the mercury sunk in 15 minutes to 90° Fah, the thermometer still hanging below the awning, but protected from contact with the water. A still more marked effect might be produced by passing the rubber tube, in its passage, the amount of water used is small, while the comfort which it might bring to a sick child or a feeble invalid might be very great. The apparatus does not interfere with the rising or lowering of the awning; and should the dripping be objectionable where there is no roof below to receive it, a small gutter of canvas or metal could be readily attached to the lower edge of the awning to carry off the water; or a small flow of water may be used, enough only to keep the canvas moist.

ON FILES.—A writer for the *Polytechnic Review* notes the following points: In using a new file, the pressure employed at first should be comparatively light, until the very sharp edges of the teeth have been removed; after which, stronger pressure and deeper cut may be made without injury to the teeth. But if the teeth have hard usage put upon them while their edges are keen and penetrating, they are likely to take hold more strongly and become broken off at the root. A few careless strokes may damage a new file so as to take away half the "life" of the first cutting. The skins of castings are not only "chilled," and hence harder than the interior, but are often glazed with a vitreous surface, in which, also, gritty particles are imbedded. No new file should be used on such surfaces, nor on welds where borax or vitreous fluxes have been used, nor on oxidized surfaces; but a worn file should be used to attack such work, which will scarcely harm it. For filing steel, grades coarser than second cut are apt to be too "inghish," steel cannot be ripped off like brass or iron, and the same cut of file should not be used on steel and on iron, any more than on brass and iron, or horn and iron. In buying files, see that full weight is given, especially where recutting is to be done. While a light-weight file will hardly stand one recutting, one that is full weight will bear recutting two or three times.

NORDBENSJÖLDS NEXT EXPEDITION.—For Professor Nordenskjöld's expedition, which is to set out from Gothenburg, in Sweden, in June, 1878, a vessel has already been chartered for 150,000 Swedish crowns (about \$25,000). King Oscar has contributed 50,000 crowns from his personal revenue, but the burden of the expense will be borne by the friend and patron of Nordenskjöld, a merchant of Gothenburg named Dickson. The route of the expedition will be from its starting point to the North Cape, thence easterly through the Polar Sea to and through Behring's Strait; thence along the eastern and southern coasts of Asia, through the Red Sea, the Suez Canal, and the Mediterranean Sea to the Atlantic Ocean, and return home in the autumn of 1879. This looks like a voyage of general discovery, and if the North Pole should be struck, all the better. He can hang the Swedish flag upon it.

AGRICULTURAL IMPLEMENTS IN RUSSIA.—The United States Consul at Odessa recently wrote to the State Department at Washington that "implements of agriculture might come in great quantities to this country if our manufacturers would make an effort in that direction, and adapt their implements for the use of the peasantry of this country. The principal thing to be done is to make them exceedingly firm and strong. American reapers and mowers are now the favorites above all others, and have a large sale. In other machinery the English manufacturers have the field, and I have seen no article of their machinery that excels the American, unless expensiveness may be deemed an excellence. I am persuaded that there is a fine field here for the American threshing machine."

CLEANING IRON WIRE.—Betz, of St. Ingbert, has constructed an apparatus for freeing iron wire by mechanical means from forge scale. The process consists in drawing wire over rollers, which remove the scale from it on each side, and by mere pressure, the last step in the process being to pass it through a box containing sand and calf-hair, whence it is wound on bobbins. The wire is said not to suffer in quality by the manipulation it undergoes.

THE ORIGIN OF PETROLEUM.

At a recent meeting of the Chemical Society of St. Petersburg, Professor Mendeljeff sought to combat some of the old notions on the origin of petroleum, and to substitute a new theory on the subject. It has been maintained by many geologists that the decomposition of mineral matter in the lower strata of the earth was the source of petroleum.

Mendeljeff believes that the true source is to be found much lower down. The sandstone in which it is found were not its original source, as is shown from the fact that no carbonized animal remains are found in it. There ought also to be other products of animal decomposition, if that was the starting point; we must search lower down, even below the Silurian, as the mineral oil in the Caucasus is found in the Tertiary, and in Pennsylvania in the Devonian and Silurian. As, however, in the rocks below the Silurian there was very little organic life, the formation of such a great quantity of petroleum could scarcely be traced to such a limited source. Mendeljeff therefore proposes a substitute for the organic theory. He goes back to the nebular hypothesis of Laplace, and applies Dalton's law of the original gaseous condition of the material of the earth, and, taking into consideration the density of the earth and the vapor density of the elements, he arrives at the conclusion that the interior contains many metals, and that chief among them is iron; finally, he assumes the presence of carburetic compounds of the metals, and comes to the following conclusions: Through some of the fissures in the crust of the earth, occasioned by the upheaval and depression of the surface, the percolated to the carbureted metals, and acted upon them at high temperature and elevated pressure, thus forming metallic oxides and saturated hydro-carbons; the latter rose in the form of vapor to the upper strata, where they condensed to liquids in porous sandstones and other rocks having a tendency to absorb liquids. The internal heat of the earth occasioned the reduction of carbureted metals, and this gave rise to hydro-carbons. Other chemists than Mendeljeff have shown, experimentally, that something very like petroleum can be produced artificially by imitating in the laboratory the process above described.

DELICATE MACHINERY.—The mechanical machinery at the Bank of England, says the *British Trade Journal*, is marvellously perfect. It may not be generally known that the London bankers, when the standard weight of the working sovereigns is suspected, send these to the Bank of England, the suspected coins being kept separate and weighed one by one, and the light sovereigns charged to the debit of the banking house that delivered them. To large concerns like Glyn's, the London and Westminster, Barclay's, and the National Provincial, the debit account for light gold foots up at the end of the year to a large amount. The deficiency in the weight is caused by abrasion in the constant wear and fingering of the gold currency. The machines which weigh the sovereigns are numerous, about 12 or 14. They are driven by an air engine, and are fed through long tubes placed in an inclined position over the machines, and one by one these clever machines weigh them, and, like stern sentinels, pass the honest sovereigns to the right hand, but without ceremony, kick the light one, which is found wanting, into another basket. These machines are beautiful. Their perfect automatic action excites admiration. The sovereigns which pass this inflexible and equally inflexible judge are put into bags and have the honor of again asserting their honest value in the busy world. With regard to those which have been placed in this beautiful balance and found wanting, they are cut to pieces and afterwards cast into a burning fiery furnace at the Mint, and there regenerated in full weight and measure, made bright and beautiful, and impressed with the image of Queen Victoria.

WOMEN AS CHEMISTS.—The laboratories for women which were established six months ago by the Massachusetts Institute of Technology, appear to be successful. Some of the pupils are fitting themselves to teach; two have made a special study of some subject, for the purpose of assisting their husbands in business; others take the course as a part of their education, without definite plans for applying their knowledge, and others still take some subject that will enable them to understand and to make collections at home, and to give their children an intelligent interest in some form of science.

WATERPROOF LEATHER.—Melt one liter of boiled linseed oil, 125 grammes of suet, 46 grammes wax, and 32 grammes resin together over a slow fire, and apply it to the leather with a brush while warm. This composition keeps the leather very soft. The English fishermen have long been using it. They can remain in the water for hours ere it penetrates through the leather.

RUSTIC.—"Good-bye, Betty. We are going for good." Betty—"Then mind thee don't miss the way. It's the first time thee's ever been on that road. I'm thinkin'."

"Ah, parson, I wish I could carry my gold with me," said a dying man to his pastor. "It might melt!" was the consoling reply.

The Mayor of Boston puts both wine and water before his guests, and thus far in the season one pitcher of water has answered.

You had better learn to swim before you get drowned, as you will probably have no time afterwards.—*Fonbers Gazette.*

The latest invention is paper trunks. And now we suppose we may call the ruthless bag gageman the paper macher.

If the ends of Russian names were to be chopped "off," the last syllable, in many cases would be knocked "ski" high.

DEATH loves a shining mark, yet we seldom hear of the decease of a bootblack.—*Witchell Times.*