CORKS AND CORK CUTTING.

The cork tree is a native of Spain and Portugal, being found in the latter country in large numbers in the vicinity of Lisbon. A recent visit to that capital afforded us an opportunity to inspect the method of obtaining this useful material directly from the trees, and a stroll through some of the cork cutting establishments in this city enables us to trace the progress of the bark from the time it is removed from the forest to its final entry into our American market.

Cork is the soft cellular interior bark found in a peculiar variety of the oak (*quercus suber*). It lies inside of the exterior woody covering, growing from year to year as the diameter of the tree increases. During the first fifteen or twenty years of its existence, the cork contains considerable wood, which impairs its elasticity and renders it unfit for use, so that until the tree has attained the above mentioned age, the material is not fit for the market. After that period, the cork begins to die. Its growth ceases, and the trunk, continuing to increase in diameter, splits it off in layers which are removed every eight or ten years, the quality of the material improving by age. The tree does not suffer from the process, as it generally lives from one to two hundred years.

The cork is removed by first making several longitudinal clefts up and down the trunk, and then girdling the latter by horizontal incisions. The bark is pounded, detaching it from the tree, so that afterwards it is easily removed by the wedge-shaped handle of the axe used for cutting. This labor is done almost entirely by a peculiar tribe of nondescript beings, either Indians or gypsies who, originally inhabiting the mountainous regions in the north of Portugal, seem at present to have abandoned their wild life, as they perform most of the menial work of the country.

The layers of bark as they are removed are first soaked in water and then blackened over a coal fire, the object of this proceeding being to make the surface smooth and at the same time to conceal any flaws in the shape of knots or cracks which may be visible thereon. They are then pressed and finally packed on lighters, for transportation down the Tagus river to the warehouses of Lisbon. These lighters are vessels of peculiar shape, as they are of very broad beam though having a sharp bow.

Thwartships the boat, poles are placed quite close together, on which the layers of cork are heaped to a hight of fifteen or twenty feet, often loading down the lighter until the water reaches her gunwale. The means of propulsion is a three cornered sail, and the crew consists usually of three men, dressed in a highly picturesque costume, who contrive by the aid of long oars to manage their craft, in spite of the strong tide which often renders navigation a matter of difficulty.

After being received at the warehouses, the large sheets are cut into pieces of about three and a half feet in length, eighteen inches in width, and ranging from one half inch to three inches in thickness. Drying and packing in bales weighing one hundred and fifty pounds each follows, and the cork is ready for exportation.

We next find it in the hands of the cork cutter in this country, who pays from five to twenty-five cents a pound for the rough material in the bale. As the latter is unpacked, the slabs are inspected and assorted according to their sizes and quality, those of the finest texture being of the greatest value. They are then placed in a steam chest and steamed, by which process the material is softened and rendered easy to cut. A vertical revolving circular knife, operated by steam power in the same manner as an ordinary circular saw, now divides the sheets into narrow lengths and again cuts them into small squares—the dimensions of the latter being governed by the size of the corks into which they are to be made. It is well known, that, in order to cut cork, a drawing motion must be given to the knife. Crushing strokes simply break off small pieces, and attempts to whittle the substance will show still more plainly that the knife edge must be drawn lengthwise and not forced downward. It is on this principle that cork cutting machines are constructed. Steel mandrels, made hollow, with cutting edges like those of a shoemaker's punch, are made to revolve with great rapidity. Pieces of cork pressed against their cutting edges become almost immediately smooth perfect cylinders. These are placed in grooves on the circumference of a wheel which, working automatically, carries each cork to a point where its ends are received by a small lathe. The cork is then revolved slowly, while a large circular knife removes a thin shaving, thus giving it the necessary taper and a surface as true and smooth as if sand-papered. As fast as a cork is finished by the automatic lathe, it is released and another substituted in its place.

Some manufactories do not make use of the mandrel and automatic lathe as above described, but employ another form of machine which is much simpler in arrangement though less efficacious in action. It consists of a horizontal revolving knife of some two feet in diameter arranged on a frame with belting, etc. The workman, sitting in front of the machine, places one of the square bits of cork, which have been previously cut of the required size, into a revolving spindle by which it is firmly held. This spindle is raised a measured distance and the edges of the cork come in contact with the revolving knife, which pares them off, leaving the cork in a perfectly cylindrical form.

The operation is performed with great rapidity, the machine turning out some fifty gross per day. The size of the cork depends upon the distance the above mentioned spindle is raised, and the consequent quantity of the square piece which the revolving knife is permitted to remove. All sizes can be made on this machine, from the tiny stopper of the homœopathic vial, scarcely one quarter of an inch in diameter, to the four or five inch flat cork used to close jars of chemicals, etc.

The shavings made by these machines are all utilized—either as stuffing for cushions or life preservers, linings for refrigerators—cork being an excellent non-conductor of heat or cold—or for placing between floors or walls of buildings to deaden sound. Ground finely and mixed with india rubber, they also make a durable floor covering, resembling oil cloth.

The finished corks are sold by the gross, the present prices being 10 cents for the smaller vial sizes, $3 to $5 for the fine qualities used for closing champagne bottles, and from $10 to $12 for the extra large varieties. The use of machinery for this industry, introduced in this country in 1853, has proved a great saving of hand labor. It has been estimated that it would require 4,000 men to be continually at work to supply New York alone with corks, if all had to be made by hand. There are at present 60 manufactories in the country, cutting and supplying corks to the value of $2,250,000 yearly.

THE NEW RAILROAD BRIDGE AT ALBANY.

The largest double track iron bridge ever built in this country has recently been completed, and now spans the Hudson river between East Albany and Albany. The work was commenced on May 24th, 1870, and the first stone of the substructure was laid on the succeeding June 25th.

The main bridge is 1,525 feet long, and consists of seven spans over the basin, thirteen feet three inches each from center to center of piers; four fixed spans over the main channel, 185 feet each, and a draw 274 feet long, with two openings of 111 feet each in the clear. The curve of the bridge over the basin is on a radius of 710 feet. The main bridge is thirty feet above low water, and eight feet above high water mark, and is constructed on a vertical curve having a rise in the middle of fifteen inches. The whole length of the bridge, together with its approaches, including an embankment crossing Van Rensselaer island, on the east side of the river, is 2,250 feet, thus being equal to 4,500 feet of single track bridge. The abutments and piers are built on pile foundations, 160,000 yards of stone being used in their construction. The draw weighs 700,000 pounds and can be worked either by steam or by hand, the engine and boiler of ten horse power being located beneath the roadway.

The superstructure consists of 2,000 tuns of iron, mostly wrought, its trusses being twenty-six feet apart in the clear. The tension bars are made of double refined iron, and the fabric is calculated to stand a load of 6,000 pounds per lineal foot, exclusive of its own weight. The strain to which the bridge would be subjected under this load would not exceed one sixth of the breaking weight. It is estimated that the structure would sustain a continuous train of locomotives on each track, reaching from end to end of the bridge.

The entire cost of the structure was one million dollars. It is at present used for the crossing of freight trains and also for foot passengers, pathways on either side of the tracks being provided. The regular trains of the Hudson River road will not discontinue crossing the old bridge until the new depot in Albany, which has just been begun, is completed.

Messrs Bagley and Hilt, both well known bridge builders were entrusted with the supervision of the work, and Mr. Charles Hilton of Albany was engineer-in-chief.

Hints on Coloring Photographs.

The increasing demand for colored photographs, either as *cartes de visite*, stereoscopic enlargements, or slides for the magic lantern, opens a suitable field of labor for the educated of either sex: in fact, they are the only fit persons to undertake it, as it requires a lightness of touch not generally possessed by those accustomed to labor. But none can hope to succeed without some degree of talent, and who have had a sufficient practice in the use of colors to enable them to paint a tolerable picture without a copy, not a vile travesty of some chromo-lithograph, which is often the only practice afforded to school pupils. No particular box of colors, however prepared, will bridge over the want of experience.

Should any wish to follow this branch of art, let them color a prepared photograph to the best of their ability, and then show it to some respectable publisher, who will, no doubt, give an honest opinion on its merits; and should this be adverse, unless the time and expense of further practice can be conveniently spared, it would be better to lay aside the idea, otherwise time might be wasted, during which opportunities might be lost that might never again be offered.

The greasiness of the surface of albumenized paper offers some obstacle to the uninitiated, but this is easily overcome by adding a little prepared ox gall to the colors used, or even by passing the tongue over the surface. The greatest drawback I have found has been the difficulty of obtaining purity of tints in the half shades and reflections of the flesh, owing to the muddy brown color to which the print has been toned, a sort of smudge, which no transparent color can remedy. This, and the tendency of silver prints to become yellow by age, has often caused me to consider whether it might not be better, when they are especially prepared for coloring, to use some other process which would give more favorable tint for working upon. As I believe any variety of tint can be given in carbon printing, this, with its permanence, would point it out as the most preferable, but would, probably greatly increase the expense of a single copy only.

When oil colors are to be used, two or three coatings of weak size, made of gelatin, should be given to the print beforehand, and allowed to dry. As in water, transparent colors can be used, and the effect much improved by touching the high lights with opaque ones.

In portraiture, should the painter be sufficiently master of his art to paint a good picture in the usual way, he will find it much better to use the photograph as a copy than as a substratum.

Transparencies on glass must always receive a weak coat of varnish before coloring, otherwise dabbing in the skies will do injury to the impression.

It should be understood that there is a great difference between coloring—that is tinting—a photographic print and painting upon one; the former requires little more than tasty manipulation, the latter the skill of a well trained artist.

Retouching negatives also offers suitable employment, especially for female artists, as it requires light and delicate handling. I should think that an artist capable of retouching from the life—that is, taking sittings from customers—would be considered a desideratum in many photographic establishments, and be liberally remunerated.—*Photographic News.*

How the California Fields are Plowed.

The fields are plowed with what are called gang plows, which are simply four, six or eight plow shares fastened to a stout frame of wood. On the lighter soil, eight horses draw a seven gang plow, and one such team is counted on to put in 640 acres of wheat in the sowing season; or from eight to ten acres per day. Captain Gray, near Merced, has put in this season 4,000 acres with five such teams—his own land and his own teams. A seed sower is fastened in front of the plow. It scatters the seed, the plows cover it—and the work is done. The plow has no handles, and the plowman is, in fact, only a driver; he guides the team; the plows do their own work. It is easy work, and a smart boy, if his legs are equal to the walk, is as good a plow man as anybody—for the team turns the corners, and the plow is not handled at all. It is a striking sight to see ten eight horse teams following each other, over a vast plain, cutting "lands" a mile long, and when all have passed, leaving a track, forty feet wide, of plowed ground. On the heavier soil, the process is somewhat different. An eight horse team moves a four gang plow, and gets over about six acres per day. The seed is then sown by a machine which scatters it forty feet, and sows from seventy-five to one hundred acres in a day, and the ground is then harrowed and cross harrowed. When the farmer in this valley has done his winter sowing, he turns his teams and men into other ground, which he is to summer fallow. This he can do from the first of March to the middle of May; and by it he secures a remunerative crop for the following year, even if the season is dry. This discovery is of inestimable importance to the farmers on the drier parts of these great plains. Experience has now demonstrated conclusively that, if they plow their land in the spring, let it lie until the winter rains come on, then sow their wheat and harrow it in, they are sure of a crop; and the summer will have killed every weed beside.

How Summer Suits should be Washed.

Summer suits are nearly all made of white or buff linen, pique, cambric, or muslin, and the art of preserving the new appearance after washing is a matter of the greatest importance. Common washerwomen spoil everything with soda, and nothing is more frequent than to see the delicate tints of lawns and percales turned into dark blotches and muddy streaks by the ignorance and vandalism of a laundress. It is worth while for ladies to pay attention to this, and insist upon having their summer dresses washed according to the directions which they should be prepared to give their laundresses themselves. In the first place, the water should be tepid, the soap should not be allowed to touch the fabric; it should be washed and rinsed quick, turned upon the wrong side, and hung in the shade to dry, and when starched (in thin boiled but not boiling starch) should be folded in sheets or towels, and ironed upon the wrong side as soon as possible. But linen should be washed in water in which hay or a quart bag of bran has been boiled. This last will be found to answer for starch as well, and is excellent for print dresses of all kinds, but a handful of salt is very useful also to set the colors of light cambrics and dotted lawns: and a little ox gall will not only set but brighten yellow and purple tints, and has a good effect upon green.

Boiler Explosions.

Our esteemed correspondent, John Wise, of Philadelphia, Pa., in the course of a letter on this subject, makes the following communication:

"Why not make boilers egg-shaped? At all events, make them strong enough, as are made the big guns of warfare, so that they may bear, not double or treble their nominally guaranteed pressure, but strong enough, like Perkins', to bear a red heat, and then we shall no longer call for daily coroners' juries to inquest the steam boiler slain.

"It is seldom we hear of a steam chambered fire box explosion. And why? Because they are well braced and staybolted. Brace and staybolt the boiler, with equal precaution as to form and material as to its work and incidents, and then, and not until then, will explosions of steam boilers become rare."

AN exchange says: "Cleveland has invented a patent bug buster, worked with an air pump. All the apertures in a room are stopped but one, at which the deadly bug buster is placed. By exhausting the receiver, a current of air is produced strong enough to draw all the vermin out of the room, through the air pump, into the hopper, where they are put under the influence of chloroform, and stabbed in the back with a pitchfork."

WE regret to hear of the death of Dr. Perry Prettyman who was one of the pioneers of civilization in Oregon territory. He migrated thither in 1847, and continued to reside there till the day of his death, March 27, ult. His age was 76, and his life has been made useful to his country by many inventions and improvements.