

## THE TOBACCO MANUFACTORIES IN BROOKLYN.

The manufacture of tobacco is carried on in the city of New York and its vicinity to a greater extent than in any other part of the United States, although there are factories for this business, of more or less importance, in every large city. In Brooklyn, there are several large factories for the production of plug tobacco for chewing, three of which give employment to about 1,600 hands, producing nearly 7,000,000 pounds per annum, and paying over \$2,000,000 tax. The *Brooklyn Daily Union* has recently made an investigation into the processes employed in the preparation, and gives, among much other interesting information on the subject, the following particulars:

The Pioneer Tobacco Company has a factory situated in Hicks street, occupying the space on the westside, between Warren and Baltic streets, connected with the New York office of the firm by a private telegraph. The visitor was permitted to witness the process of manufacturing plug tobacco in all its stages, from taking the tightly pressed leaf from the huge hogsheds in which it was packed after being dried on the Virginia plantation down to the pasting of the gaily colored label and the more important revenue stamp on the box in which the finished plugs are packed for final sale. It would be impracticable to give within the ordinary limits of a newspaper article a detailed description of all the various manipulations which the innocent "weed" is subjected to in this vast establishment, where five hundred and fifty employees, men and women, are busily occupied in preparing the coarse and brittle leaves into preparations designed to tempt the palates of men all over the earth; though everything is done with the utmost care and regularity, and the nicest system is everywhere discernible. The "hands," as the handfuls of tobacco leaves tied together at the stalk when picked are designated, go through innumerable processes of drying, moistening, extraction of stems, dipping in licorice juice—a beastly process, and sufficient to impart a permanent distaste for the article to any but the most hardened devotee—followed by more rolling, squeezing, flavoring, drying, and finally rolling and cutting into its desired shape of plugs. The flavoring process is a secret and mysterious feature of the tobacco transformation—defying even the scrutiny of the Government officials. The bunches of leaves, after a long series of torturings, are laid in a pile upon the floor, and each successive layer is sprinkled from a watering pot with some liquid mixture whose ingredients are one of the trade secrets of which every factory has its own peculiar one, and even to hazard a guess at which would probably be deemed an impertinence. Essences and volatile oils, and the mixer thereof only knows what else, are thus sprinkled upon the leaf already partly saturated with licorice, and are forever after blended with the delicate aromatic flavor of the tobacco. The delicacy referred to may be partially realized when it is stated that the odor in some of the apartments of the factory is almost powerful enough to raise a man's hat off his head unless it fits tightly. One of the pleasantest episodes of the tobacco's journey through the building is its brief visit to the "drying room," where it is hung upon racks and subjected to a degree of heat that speedily extracts all the moisture from it, and compared with which a Turkish bath is but a cold and chilling institution. It would be a dangerous place for an unpopular revenue officer—if there could be such an individual—to be entrapped into. For there are traditions among the operatives—though they have never yet been publicly recorded—of men who have been unwittingly locked up in the drying room late in the day when the hands were leaving for the night, and how upon opening the doors the next morning there was nothing left of them except the heels of their boots, the unhappy owners of which had been melted away like tallow dips in a hot oven.

When the tobacco has been thoroughly prepared, it is rolled by hand: women working with nimble fingers and extreme skill in this process: into long sausage shaped rolls, known technically as "lumps," and containing either one pound or one half pound, each of which is verified by actual weighing. These rolls are afterwards passed through a large machine, which presses them out into flat slabs nearly as hard as stone, and which squares them off at the edges and corners, and then they are ready to be packed for sale.

The second place visited was P. Lorillard & Company's factory in Sedgwick street, a huge establishment occupying an immense building on each side of the street, connected by a covered bridge at the second story. This factory is larger than that of the Pioneer Company already described, but the processes used are mainly the same, except some variations in the mechanical contrivances. There is also a private telegraph here connecting with the office in New York. The same courtesy, also, was displayed to the reporter, who was shown through all the apartments and permitted to witness the various manipulations.

The factory of Messrs. Buchanan & Lyall, in Degraw street, was next visited, with similar experience, the place giving evidence on all sides of able management, and a thorough and well regulated system, while the large force of operators testified to the immense amount of business done there.

The above mentioned are the three largest plug tobacco factories of this city, but not even a visit to their extensive workshops and laboratories, their "lump," "sorting," "dipping," "casing," and "rolling" rooms would give an adequate notion of the magnitude of the supply they furnish to the country's commerce. This will be best gained from the following statistical summary of the amount of business they have done during the few past years, and which is steadily increasing as each twelve months roll by.

P. Lorillard & Co. employ in their Brooklyn factory from four hundred to six hundred hands, paying them for salaries an average of over \$3,000 weekly. Their monthly sales are about 250,000 pounds of plug tobacco, the value of which is about \$70,000, and the revenue tax upon which is \$75,000. Their total sales in 1871 were 2,500,000 pounds, the net value of which, without adding the tax, was \$787,000. This, of course, represents only a portion of the business done by that large firm, it having other factories in other cities in the vicinity of New York.

The Pioneer Company employs about five hundred and fifty operatives, and manufactures about 2,250,000 pounds of plug tobacco per annum, paying the government therefor in taxes about \$730,000.

Messrs. Buchanan & Lyall employ about four hundred and fifty laborers, and manufacture about 1,800,000 pounds of tobacco yearly, paying about \$600,000 a year tax. Their weekly salary account is upwards of \$2,000.

A smaller establishment is Watson's factory, opposite Lorillard's, where from 75 to 125 employees are hired, manufacturing about 200,000 pounds of plug tobacco annually. The business done by this establishment is mostly foreign, its products being chiefly exported to South America—a trade in which it has almost a monopoly.

It will accordingly be seen, by referring to the above figures, that the three large Brooklyn plug tobacco factories employ constantly from fifteen to eighteen hundred operatives, paying them about \$350,000 per annum for wages, and that they manufacture seven million pounds of tobacco each year, upon which they pay the Government annually over two millions of dollars taxes. It is said that during the last five years, for the same article, the whole State of Virginia has not paid so much to the United States Treasury as these Brooklyn factories.

## THE GOVERNMENT WORKS AT HELL GATE.

The great work of removing the rocks at the dangerous pass in the East river, known as Hell Gate, City of New York, is progressing with great vigor. Engravings of the works were published last year in the *SCIENTIFIC AMERICAN*. A number of interesting illustrations are also to be found in *Science Record* for 1872. The mining, it will be remembered, is done by running out tunnels, into the rocks under the river, from a vertical shaft located on the shore at the margin of the river. The following recent particulars are from the *Evening Post*:

The work of removing the obstructions at Hell Gate, which was begun about two years ago, has been vigorously carried forward with but trifling interruption, and will, it is now estimated, be completed within a year and a half. One hundred and sixty five thousand cubic yards of rock were to be removed from the river, and of this amount at least forty-two thousand cubic yards have already been taken up. About two hundred and forty men are now employed in the work, nearly all of whom are Cornish miners of long experience. A much larger number were formerly employed, but the introduction of the diamond drill, and the increased use of machinery in all branches of the labor, has permitted a great reduction of the working force. A hundred of the workmen were discharged last week.

The immense bed of rock is now perforated by sixteen tunnels and seven concentric galleries, the floor line of which is thirty-two feet below the level of the river at mean low tide. It was originally designed to make the channel but twenty-five feet in depth, but subsequently it was determined to render it perfectly safe for vessels of the largest draught. The average height of the tunnels and galleries is twenty-two feet, and their width sixteen, leaving a roof from seven to ten feet thick, supported by numerous pillars. The length of the extreme gallery is six hundred feet, and of the grand tunnel two hundred and twelve feet and a half. There will ultimately be twenty-eight tunnel headings, some of which will extend three hundred and seventy-five feet.

## THE DIAMOND DRILL.

The work of boring is done wholly by machinery, the laborers serving only to trim and dress the rock after the rougher work has been executed, and to perform the operations connected with blasting. Of the six drills used, two are the diamond pointed drills and four Burleigh steel percussion drills. The diamond drill is the invention of Rodolphe Leschot, a French engineer, and was first used in the construction of the Mont Cenis tunnel, but is now worked by improved machinery under American patents. The two used at Hell Gate were introduced last October, and have proved so satisfactory that three more will be added in a few weeks. This drill consists of a hollow steel disk an inch and a half in diameter, the rim of which is studded with twelve bits of black carbon. Attached to an iron pipe of the same thickness, it is propelled by compressed air at a pressure of sixty pounds per square inch, and cuts its way through the hardest rock with marvellous rapidity. The motion is rotary, and the number of revolutions seven hundred and fifty per minute. Unlike percussion drills, it receives no wear except from friction, and hence is constantly in working order, and needs no sharpening.

Fifty-four feet and four inches have been tunneled by this drill in eight hours, through a mass of granite and quartz. By screwing on additional pieces of pipe, it can be propelled in one direction to an indefinite extent; but for blasting purposes it is seldom driven further than fifteen feet. Occasionally, however, through the intervention of a new process in blasting, it is expedient to continue a tunnel of this character for a long distance, thereby effecting a great saving of time. Sand or clay is then rammed into the bore until it is nearly full, to act as a recoil block to the charge, and the rock is blasted section by section.

## BLASTING WITH NITRO-GLYCERIN.

All the blasting at Hell Gate is done by nitro-glycerin, and has been so carefully managed that not an accident has yet occurred. The nitro-glycerin is made into cartridges from eight to fifteen inches in length, about an inch in diameter, and holding from four to eight ounces. They are coated with a glutinous composition which effectually protects them from water. When a blast is made, a little tube of fulminate is attached to the cartridge and a spark transmitted to it through a wire connecting with an electric battery. Though a large number of cartridges are often discharged in succession with great rapidity, they are never fired at once, as the vibration in this case might seriously jar the stone roof, opening seams for the admission of the water.

The explosions are of tremendous force, shattering the rock into fragments of a size convenient for removal. These are piled on cars drawn by mules, running on iron tracks which are laid in all the tunnels, and conveyed to the shaft, where they are hoisted up by a steam derrick. The masses already taken out form two immense embankments on the river front.

A building near the mouth of the shaft contains three large steam boilers and five air compressors, the latter furnishing the motive power for the drills. In working the compressors, lubricating oil is now used instead of water, thereby avoiding the formation of ice in the pipes during severe weather. Near by is a powerful steam pump, which drains all the tunnels comparatively dry through pipes radiating from its base.

Before blasting, it is necessary to use great care in ascertaining the line of resistance and quality of the rock, which is chiefly composed of granite, quartz, and gneiss. The strata embrace a great variety of minerals, however, including, besides various metallic deposits, veins of decomposed felspar that are as soft as clay. The testing is done with the diamond drill, which in two instances struck sand and water after boring twenty-eight and thirty-four feet respectively, rendering it necessary to abandon blasting in that direction and to have the bores tightly plugged up. In opening tunnel heading No. 3, a section of rock was struck so full of seams that the water poured through the roof at the rate of six hundred gallons per minute. This was effectually remedied by constructing a massive schilt of timber, oakum, and Roman cement, fourteen feet in length by twelve in width.

The work is carried forward almost constantly night and day, the men being divided into gangs which relieve each other at regular intervals. It is executed under the supervision of Major General John Newton, of the United States Engineer Corps, who planned it from the beginning. The Superintendent in immediate charge is G. C. Reitheimer, an engineer of wide experience in various countries, who has devoted himself especially to work of this kind.

When the rock is at length completely honeycombed, and nothing remains but the roof, its supporting pillars and the outer walls, it will be mined with seven thousand pounds of nitro-glycerin, which is equal in explosive power to seventy thousand pounds of gunpowder. All the charges will be connected by wires with an electric battery in the office of the superintendent, when, at the given signal, it is confidently expected that the whole vast mass will be blown into atoms, which will be entirely removed from the bed of the river.

**BROWN TINT FOR IRON AND STEEL.**—Dissolve, in four parts of water, two parts of crystallized chloride of iron, two parts of chloride of antimony and one part of gallic acid, and apply the solution with a sponge or cloth to the article, and dry it in the air. Repeat this any number of times, according to the depth of color which it is desired to produce. Wash with water and dry, and finally rub the articles over with boiled linseed oil. The metal thus receives a brown tint and resists moisture. The chloride of antimony should be as little acid as possible.

**A WORD TO BOYS.**—Boys, did you ever think that this world, with all its wealth and woe, with all its mines and mountains, oceans, seas and rivers; with all its steamboats, railroads and telegraphs; with all its millions of grouping men, and all the science and progress of ages, will soon be given over to the boys of the present age—boys like you? Believe it, and look abroad upon your inheritance, and get ready to enter upon its possession. The presidents, emperors, kings, governors, statesmen, philosophers, ministers, teachers, men of the future—all are boys now.

**ROUGH WEATHER.**—The captain of the steamship *Dorian* reports that he sailed on February 19th from Gibraltar and six days afterwards encountered a continuation of gales from W. S. W. to W. N. W. veering every few hours, and accompanied with squalls of terrific force. During 25 years' experience afloat, he never saw such weather. "In the squalls the water was actually torn up in sheets and hove in the air, rain pouring in torrents, the mastsheads enveloped in clouds, lightning fairly blinding, and the thunder cracking as it were among the masts, deafening all on board. Never in the tropics or near the line, have I seen such close proximity to the lightning. This weather continued more or less up to the 15th inst., when it gradually toned down, enabling us to make some headway."

The New York Mutual Gas Company, a new corporation is now laying pipes in this city. It will have new and improved appliances, use naphtha to enrich its products and supply its customers with gas of superior brilliancy—so they say. The present price of gas here is \$3.50 per thousand cubic feet; in Pittsburgh, Pa., \$1.80.