

HOW PAPER IS MADE.

Processes by Which Various Crude Materials Are Converted Into AN ARTICLE OF UNIVERSAL USE.

Glimpse of a Factory Where Wonder-Working Machinery Abounds.

FACTS ABOUT THE PAPER BAG INDUSTRY

(WRITTEN FOR THE DISPATCH.)

HERE is probably no manufactured article more useful to the world than paper, nor any substance that is capable of being utilized in a greater variety of ways. Aside from its common uses in writing and printing, which alone render it indispensable to civilized man, it is found to be of the highest utility and value for hundreds of other practical purposes. It is made into car wheels, cars, boats and scores of other serviceable articles. The house builder finds it useful in the walls, roofs and interiors of dwellings; boxes, barrels, bags and similar receptacles are made from it in almost limitless sizes, styles and varieties; in the form of paper mache it is made into a material for molds and for architectural ornaments; while as a substitute for heavy and expensive metals, it enters into the construction of many different kinds of machinery. It is lighter than the lightest wood and as durable as the hardest of metallic compounds in many of the forms in which it is employed. A long essay might be written on the serviceableness of this material alone, but as the well-informed reader is doubtless already familiar with this subject it is quite needless to pursue it further.

The materials from which paper are made are almost as numerous and as various as the articles manufactured from the paper itself. The most common of these are, straw, waste paper and wood pulp. But straw, waste paper and wood pulp are not the only materials used in the manufacture of paper. Cotton, jute and manilla are also used extensively. Paper has been made from the bark of several kinds of trees, from corn-stalks, potato vines, rice straw, hop vines, reeds, bulrushes, cattails, palms and a great number of other vegetable products. An industry, paper-making is over 1,000 years old. Yet it is still making rapid progress, and perhaps no other, like a manufacture affords a better example of constant and

steadily improving in the machinery used, which is now very intricate and very costly. Making paper by hand is now wholly out of date in this country. It is a fact worth noting that the first paper mill in America was established in Pennsylvania nearly 200 years ago. It was managed by William Rittenhouse and located near Philadelphia. Paper making was also among the earliest manufacturing enterprises of Western Pennsylvania, where it still continues to flourish.

Having a curiosity to learn something about the process by which the raw material is transformed into the finished article, I visited the paper mill of Godfrey & Clark, at Farmington, a few days ago. This establishment is devoted to the manufacture of express wrapping paper and the stock from which paper bags and flour sacks are made. As the method of manufacturing paper is nearly the same in its principal features in every paper mill, a description of this one may enable those to whom the interior of such a place is a mystery, to understand something of the means and machinery employed in producing an article of such universal utility and value. The materials used in the manufacture of the kinds of paper mentioned are hempen rope, jute bagging and wood pulp. The rope and the bagging, either old or worn and broken that they are no longer fit for their original uses, are largely imported. They are brought to the mill by the carload, tied in packages and bundles of convenient size for handling. The wood pulp, of which the quantity used is comparatively small, is ground and prepared in a part of the mill especially devoted to that kind of work.

A visit to the heating department, where steam power is furnished to the mill gives an idea of the immense force required to drive the machinery. Steam, and a good supply of it, too, is an indispensable requisite in a paper mill. There are 16 huge boilers, heated by strong fires of

steel. The cylinder is turned by a shaft resting upon journals at the side. Beneath the cylinders is a block armed with blunt knives similar to those of the millstones, and the action of the two is to tear and separate the fibre. On the other side of the vat is a hollow drum, or many-sided prism, covered with wire gauze at the end, for the purpose of removing the water from the machine. The prism slowly revolves, raising the water into the hollow shaft, and discharging it. This is the usual construction of the machine, which is used in nearly the same form for three distinct purposes of washing, bleaching and reducing the hemp into pulp.

The material is first subjected to the action of the washing engine or beater, and afterward to that of the second beater which reduces it still finer. An engine has a capacity of receiving 1,200 pounds of stock. When the material goes into the first set of beaters it colors the water with its dirt, but when it has been washed, and bleached by the action of chemicals, it is of a delicate creamy shade. The stock from which bag paper is made is about 24 hours in passing through the two sets of beaters. It is carried by a system of pipes from one beater to the other, and finally from the engines to the tanks or stuff chests below, whence it is pumped up as required for making into paper.

Pure water and a generous supply of it being a necessity, an ingenious method has been taken to secure it. Cisterns, located in the middle of the Allegheny, below the bend of the river, first receive the water after it has been filtered through the sand and gravel. Thence it is pumped into the reservoir tank at the mill and filtered again, after which it is supplied to the various departments.

Standing at the side of the mill where the washing and beater are, I saw a large vat which had an excellent view of the entire establishment. Flaring jets of natural gas, a dozen or more in number, light up

the interior, otherwise made dim by the escaping steam. The rumble of the heavy machinery, the hiss of the steam pipes, the roar of the water, the hum of the electric lights, and the odor of the escaping steam, all pervade the entire place. Near me are the vats containing the raw and un-washed material on the other side of the river, emerging from a long train of machines, the finished paper is being received by the workmen and put in form for use.

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THE NEW ELDORADO.

A Glance at the Geography and Resources of Lower California.

THE SCENE OF THE EXCITEMENT.

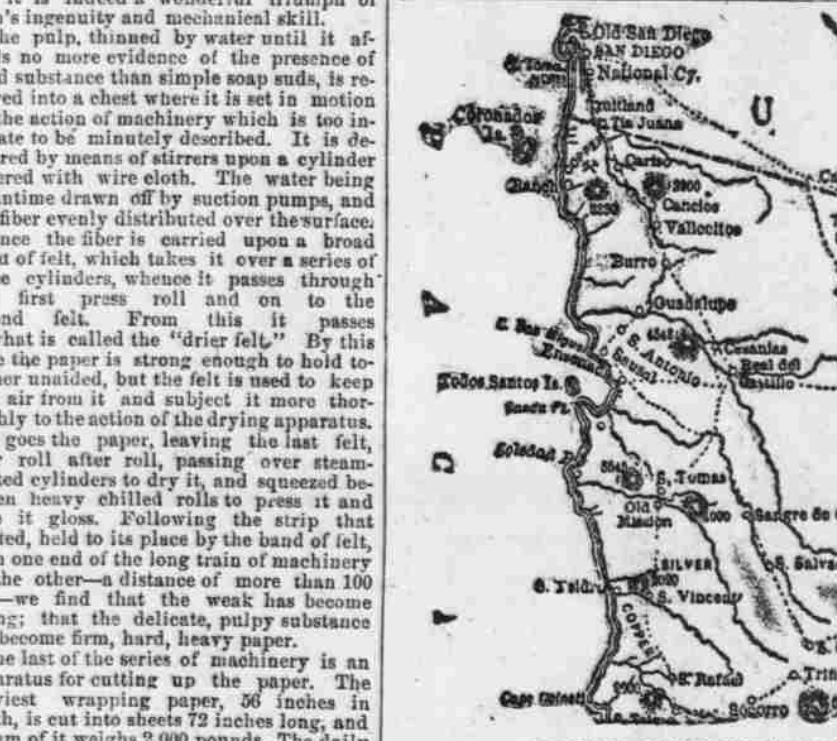
A Territory Rich With Mineral and Agricultural Wealth.

FUTURE PROSPECTS OF THE REGION

HE accompanying map shows the location of the recent gold placer discoveries in Lower California, east of Escondido, in the region which is now known as the Santa Clara district. The territory, or so much of it as is not in private ownership and occupation, of the peninsula of Lower California, extending from the boundary line two-thirds the length of the peninsula, has been granted, under certain conditions, by the Republic of Mexico to the International Company of Mexico, a company incorporated in Connecticut and with headquarters in New York.

The bay of San Diego is almost adjacent to the boundary line, which is about 10 miles to the south of the city of San Diego, situated at the Northern end of the bay. San Diego, being the only port of consequence south of San Francisco, has served, and must in the future serve, as the base of supplies for Lower California. Escondido is the Lower California headquarters of the International Company, and is situated on a small open bay, in which a pier has been constructed. This bay affords access for vessels of light draft, but offers little protection from stress of weather, and any considerable shipping for the district of Lower California must find at San Diego its nearest harbor of safety and importance.

HOW TO GET THERE. What is known as the mining district of Santa Clara lies some 60 miles to the east of Escondido, and, beginning at the foot of the great mountain range which forms the backbone of the peninsula, runs back 50 or 60 miles to the sea, and about 100 miles to the south, comprising four or more canons, in the lower levels of which placer deposits have been found. It is also reported that quartz leads have been located at the upper end of the canons. Food and water are said to be ample at the present time, although it is probable that the



LOCATION OF THE RECENT GOLD PLACER DISCOVERIES.

streams in the lower canons will cease running about July 1, but water can be brought by flumes from the perennial supplies in the upper canons, if the extent and permanence of the working shall be assured. The prospect for these mines is overland from Escondido, a distance of about 60 miles, or from San Diego overland. From San Diego the National City and Olay railway runs a distance of about 20 miles to the boundary line at La Jolla, where it is located a small town on each side of the line, including both the nationalities. From the terminus of the National City and Olay at La Jolla the mining district can be reached over roads which are said to afford easier travel than the roads from the shore at Escondido. The Custom House facilities at La Jolla are also such that this method of travel is preferred by the parties going into the mines.

THE PRESENCE OF GOLD in this district has long been known, and it has in times past been extensively worked. Even previous to the present development, Mexicans have found steady employment in pan washings on a small scale, and it has been regarded as a legitimate industry. Another source of employment has been the reduction of waste material from the mills, which has been sold to grocers and their customers. This industry is no less interesting than the other. Its machinery is of a lighter sort, but it is equally ingeniously contrived and admirable in its working. The paper comes from the mill in rolls and is first subjected to the action of the "tuber," or machine for making the paper into tubs, which are served before the bottoms are made. The tuber is a wonderful contrivance. It unwinds the paper from the roll, applies the paste to the edges, folds it into a tub, and then, by means of a lever, fastens one securely over the other, cuts the bottom ready to be folded, creases the top and finally cuts the tube to the desired size, depositing it in a small car and counts it. Could human hands do more? And, most remarkable of all is the rapidity with which the work is performed. 120 tubs of quarter barrel sacks being made in a minute, or two every second!

From the tuber the bags, after being arranged in bundles, go to the printing department. Here are presented a complete printing office, supplied with wood and celluloid type, wood cuts, electro plates, etc., for printing designs in colored ink. The sacks are printed according to the buyer's order, some on one side, some on both, and some on both sides and bottom. Where several colors of ink are used the bags have to run through the press once for each kind of ink used. The average number of impressions made is 120,000 for a day of ten hours, or about 40,000 completely printed bags. Elsewhere are machines for finishing the bottoms of the bags, which fold and paste them with great rapidity, each bottoming 30,000 sacks a day. A hundred thousand finished sacks a day is the capacity of the mill. W. BARTLETT.

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is due mainly to the high mountain ranges, which affect the climate favorably, and also gather and store water for the streams. There is a great mountain range about 100 miles south of Escondido; a range 150 miles long, rising from 11,000 to 13,500 feet above the sea level, furnishing an abundance of water, and with extensive forests of pine, cedar and fir, said to be worth many millions of dollars. The climate of the northern part of the peninsula varies, of course, with the altitude, but, although it is described as one of the most delightful, salubrious and equable in the world, adapted to most of the fruits and other products of both the tropical and temperate regions.

THE Mexican laws, which formerly forbade foreigners to own real estate within 50 miles of the boundary, or three leagues of the seashore, kept the country closed until their modification a few years ago, since which the region is rapidly opening up to settlement. Rich deposits of mineral in various parts of the peninsula have long been known, and in the southern portion various mining enterprises have been successfully worked for many years. Among these are the Triunfo mine, operated by an English company, southwest of La Paz, the capital of the territory of Lower California, and on the Gulf side are also the Santa Rosalia and Polpa mines, owned by a French company, controlled by the Rothschilds, of Paris, the mines being so rich that several million dollars have been expended on them, including the building of a town and a railway.

As attention is called to the agricultural resources of the country by the looking of large numbers of people there in search of gold, it seems likely that Lower California will in this respect have an experience similar to that of Upper California, where mining has become a small interest in comparison to that of agriculture.

FUTURE PROSPECTS. Many statements have been made to the effect that the stories concerning the rich finds were untrue, having been started by the International Company for the sake of bringing a large number of men into Lower California, in order to save its concession from the Mexican Government. Another report was to the effect that the International Company is endeavoring to gain control of the mines for itself. Parties here who are familiar with Southern California, say that, while they do not believe in the exaggerated statements concerning the fabulous amounts of treasure to be found, as is usually the case during such excitement, they believe there is undoubtedly a vast mineral wealth in that and adjoining regions, for the amounts of gold actually brought in from there by various parties prove this. They point to the fact that the report of there being no gold there comes from Los Angeles, a city which is a rival of San Diego, and very jealous of the latter place, which is profiting by the excitement. There may be nothing in the reports about the extortions of Mexican officials, and enable the discoverer to take up a claim on the land, and giving security

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