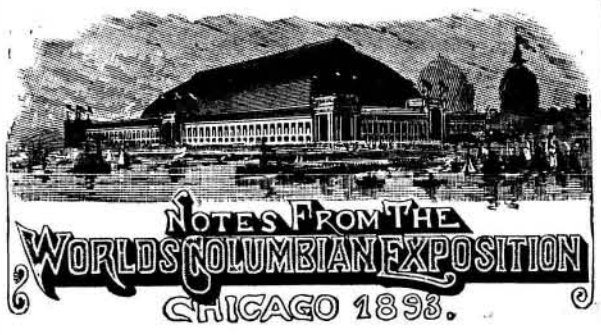


In the Leather and Shoe Trades building a shoe factory with a capacity to make 1,000 pairs of shoes a day is in operation in the gallery. All of the latest improved machines and devices for making shoes are exhibited here in full operation, each serving its part as it would in a large and complete factory. Many of the machines shown are of quite recent invention, and the most ingenious machines used in the business here can be seen. Among the most interesting of these machines is the welt machine, which will sew a welt more skillfully and at much less expense than by hand, so that "hand-sewed shoes" do not possess the superior merit they did a few years ago. There are sewing machines that make shoe button holes, and other machines that "sew on your buttons while you wait." The shoe goes from one machine to another until completed. This gallery also contains considerable machinery in operation relating to harness work and other industries in which leather is used. The Singer Sewing Machine Company has a large and handsome pavilion where many sewing machines are exhibited, designed for working on leather.

The galleries of the Agricultural Palace are occupied very largely by exhibits of food stuffs, some of which are very striking. One of the most unique is the pavilion erected by the Imperial Mills, Duluth, Minn. It is a reproduction of an old flouring mill, built near Reading, Pa., 150 years ago, and which is still in operation. The structure is of hewn logs, and at one end is an overshot water wheel; a supply of water keeps the wheel in motion. Within this structure is a model of the plant of the Imperial Mills. This establishment has a capacity of 6,000 barrels a day, while the original mill, which the pavilion represents, could grind but three or four barrels of flour a day. The contrast shown by these two models is striking when it is considered that the old mill would require about four years to make as much flour as the new mill makes in one day. Adjoining this exhibit is a fine display of flour made by the South Dakota Millers' Association. At one end of this pavilion is a windmill, the structure of which is made by piling up bags of flour. This represents the flour mill of 1492, or the "old process mill." At the other end sacks of flour are piled up to represent a modern or the "new process mill." Adjoining this exhibit is another flour display, in which is a large barrel of such ample size as to be used for an office of the exhibit, but which is open to visitors. Pancakes are given away here, and the exhibit has the appearance of a free lunch counter all day.

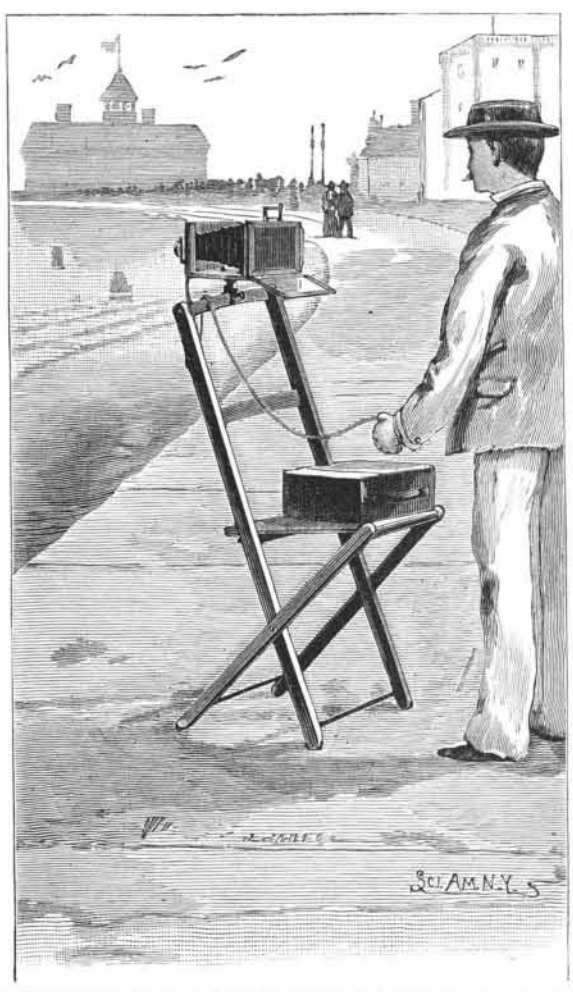
The immense mills of Washburn, Crosby & Co., at Minneapolis, are reproduced in miniature, and 10,500 barrels, about 2 inches in size, are piled up in the form of a barrel to show the number of barrels of flour that these mills manufacture every day. An interesting feature of this exhibit is a large painting, showing a farm of 2,500 acres, in which the various operations of harvesting wheat are depicted. Other parts of the galleries are devoted to food stuffs, gelatine, breakfast cereals, yeast, baking powders, pickles, preserves, soups, and beef extracts. Many of these exhibits give away samples, and there is a constant crowd of visitors, especially women, filling these galleries, tasting first of soup, then munching a roll, piece of bread or pancake, later on sampling butterine and pickles, then ending the repast with a small dish of oatmeal or other breakfast cereals. The galleries in the western part are given over mostly to milk and bakery exhibits in one, chocolate and confectionery in another, and tobacco, mineral waters, liquors, etc., in the others.

An exhibit in the Palace of Mechanic Arts that is particularly attractive to women is a display of dish-washing machines. These machines are in constant operation, and are the source of many dreams of halcyon days yet to come, when kitchen drudgery is done away with.

On the ground floor of the Agricultural Palace is an exhibit of Swift & Co., consisting of a car in which fresh meat is transported. This car is made entirely of plate glass and the arrangement of the interior is an exact reproduction of a meat car, showing how meat is hung when transported. It gives an excellent idea of the manner in which Chicago beef is carried to all parts of the country. The temperature of this car is kept at about forty degrees at all times. Surrounding the car are barrels with glass heads showing the manner in which salted meat is packed and also different grades of meat. Pepsin, beef extracts, glue, articles made of horn and bone and other things are exhibited by this company, showing the complete manner in which every particle of the animals slaughtered is utilized. Similar exhibits are made by other packing companies. The Cudahy Company occupies a large pavilion filled mostly with packages of lard, hams, sausages and canned meats. Nelson, Morris & Co. make a large show of hams, beef extract and other provisions, while in the center of the pavilion is a golden chariot, the wheels of which are in operation. A small pig occupies the chariot and is driving four pigs abreast, the whole affair being in miniature. The Anglo-American Company shows provisions that are exported largely. Armour & Co. have four showcases, one at each corner of their pavilion, exhibiting glue, lard, sausages and hams, luncheon delicacies of meat in glass jars, beef extracts, soups, etc. In the center of the pavilion is a counter where samples of beef extract are given away. The Fairbank Company has a pavilion constructed entirely of canned meats and provisions of all kinds, which is an object lesson in the extent to which the canning business is carried.

Free popular concerts are given by the Exposition orchestra in Festival Hall every day at 12 o'clock. This orchestra comprises 114 pieces and is under the leadership of Mr. Theodore Thomas.

In one of the towers of the Palace of Mechanic Arts is a chime of bells which is rung every day, morning, noon, and evening. Within the Palace of Manufactures and Liberal Arts are the chimes of the Self-Winding Clock Co.'s tower, which are played at regular intervals and which were fully described in the SCIENTIFIC AMERICAN of July 29.



PHOTOGRAPHING AT THE FAIR WITHOUT A TRIPOD.

In addition to this music, band concerts are given every day from music stands in the Court of Honor and from the stand east of the Manufactures and Liberal Arts building on the lake shore. Another musical feature is concerts by a band of Indian students from the government Indian school at Lawrence, Kan. This band is stationed at the Indian school near the Krupp building at the south loop of the Intramural Railway.

About the only vehicle seen in the Exposition grounds outside of the watering carts and an occasional appearance of an ambulance or police patrol wagon is an electric carriage, exhibited in the Electricity building. This is an ordinary covered carriage with three seats and is operated by storage batteries. This vehicle makes occasional runs on the promenade adjacent to the Electricity building. To a casual observer there is nothing extraordinary in the construction of this carriage. The electric energy is derived from storage batteries placed under the seats.

One of the most absurd and disastrous rules made by the directors of the Fair prohibited the taking of any photographs by visitors except very small pictures by hand-carried cameras. For license to do this two dollars a day is charged, and a tripod must not be used. A correspondent writes as follows:

"While on the Fair grounds the other day I saw an ingenious way of setting up a camera without the use of a tripod. The camera was mounted on the top of a small folding chair, which are let on the grounds for ten cents a day. I approached the gentleman, asking him if that was his invention. He said it was simply a bicycle clamp used for holding cameras on bicycles. As I was leaving he said: 'I expect to be put in the Bastile before night for using this, but I am sure it is not a tripod.' I send you a little picture."

When recently the Liberian pavilion in the Agricultural building was opened, the extent of the display was unexpected. Considerable taste was manifested by the arrangement. A fence of rope of Liberian manufacture surrounded the section. This rope was held in place by posts, on the tops of which were cones of fine ivory, and the draping of these posts with mottled skins of wild animals was both effective and suggestive. Immense stacks of coffee represented one of the chief agricultural productions of Liberia. The display of domestic utensils and other furnishings was good. The collection of weapons used in war and in the chase was very large, and, in some instances, of fine workmanship. It is said that the Liberian commissioners lately received the offer of a handsome amount from the officials of the Armour Institute for the purchase of the complete exhibit. At the conclusion of the opening day a dinner was given at the Park Gate Hotel to celebrate the anniversary of the independence of Liberia.

In the East India building the atmosphere is decidedly Oriental, as one who has ever had the fortune to live a long or short time in India will perceive at once. To begin with, the nostrils are greeted with fragrant odors of spices and naturally scented wood, while a refreshing feeling steals over one from the coolness at which the temperature is preserved. In the tea room divans and not chairs are the comforting places where the weary limbs may find rest. Hospitality is not unrepresented, for the faint and thirsty guest is offered a delicious cup of tea, and no one has been heard to complain of the price for it costs nothing, and frequently, at the guest's own option, a second and a third cup will be cheerfully supplied at the same rate. The only return asked of those thus entertained is that the quality of the tea be remembered, and that the addresses of the firms where India teas may be purchased may not escape the memory, a neat card is presented as a souvenir. Thus soothed and recuperated, the Oriental rugs, cotton goods, pottery, and carved and engraved articles combining utility and beauty can be inspected with satisfaction, and souvenirs for gifts to friends selected and purchased. Nor is this the only place in the Fair where, in spite of all that has been wantonly said about the cupidity of exhibitors, similar generous surprises may be experienced.

There is one place in the Midway Plaisance that one likes to visit, and where, while almost every time learning something new and interesting, there is little indeed to shock or offend. That place is the Javanese village. The uniform cheerfulness of the small brown men and their still smaller wives is contagious. As they cheerily smile, whether at work or at leisure, the visitor is ashamed of any petulance or complaining on his part. One must observe for himself the dignity and courtesy of these remarkable little people to appreciate them fully. No doubt much may be learned from books of the Javanese and their manners and customs; but to go to the village and make personal researches, supplemented by the information of the courteous manager, is, it may easily be imagined, the best possible substitute for a visit of exploration in Java itself. The Javanese work in their village just as they do in their native country. They spin and weave, and paint upon their cloths complex and beautiful designs. They carve wood also; if not so artistically as the Swiss or Swedes, in such a way as to afford themselves pleasure. The mats, sunshades, and hats which they make out of split bamboo are wonderful in design and striking in color. The manager kindly gives an account of the Javanese at home. An attempt to introduce Western methods and implements in agriculture in Java has been a failure. For one reason or another, the Javanese resumed their ancient customs and primitive tools. At harvest time marriages are most frequent. Both women and men do out-of-door work on farms; but the men take great care to assign the lighter labor to the women, and do all the heavier work themselves. When a woman marries, her teeth are blackened by a process so tedious and painful that some girls for this reason refused to be married. This is how the manager said that the rite is performed: The bride is delivered over to the hands of the native surgeons. Of course the enamel has to be removed from the teeth to permit the dye "to take." For this purpose coarse-grained flinty stones are used. The operators, working by turns, rub off the enamel with these barbarous tools from each tooth of the poor woman. When the osseous structure is exposed, the dye, made of the juices of certain plants, is freely applied and the teeth remain black until time causes them to come out by the root. Both women and men are inveterate cigarette smokers, and their custom is to cause the smoke to be emitted from the nostrils as well as from the mouth. Of all the out-of-the-way people that have been brought to add attractions to

(*Continued on page 102.*)

WORLD'S FAIR NOTES.

(*Continued from page 99.*)

Jackson Park, the Javanese are the greatest favorites with the people of this country.

Lady Aberdeen's Irish village, which nestles at the foot of Blarney Castle, has been so successful that the Midway Plaisance has been beautified by the erection of a new gateway, which is a reproduction of the famous gateway at Clonmel. There is an intense rivalry between two Irish villages, Lady Aberdeen's Blarney Castle and Mrs. Hart's Donegal Castle. Both were erected to obtain funds to be used for charitable purposes in the "Emerald Isle." A model of the memorial church now being erected to the memory of Daniel O'Connell, at Cahirciveen, County Kerry, Ireland, will shortly be unveiled in the Donegal Castle inclosure.

A new ambulance has been put in commission; it is exhibited by the St. John's Ambulance Association, of London, of which the Prince of Wales is president. The new ambulance is called the Prince of Wales, and is most complete. The wagon is lit by electric light, is well ventilated, and has two or three stretchers, which are prevented from being jostled by rubber pads, while the wheels have rubber tires to relieve the patient from jolting.

Half of the Fair will be closed after six P. M. for economic reasons. At six all the buildings will be closed with the exception of the Electricity and Administration buildings, Machinery Hall and one other building which will be selected in turn from the Exposition buildings. This closing will save large sums of money and will doubtless not put the public to very great inconvenience.

An interesting party of excursionists arrived July 31 on the Berlin. The party was composed of forty members of the Society of Arts, London. This society was established in 1754 "for the encouragement of arts, manufactures and commerce." In Great Britain the Society exerted its influence in favor of the Chicago Exposition.

Karl Kahler, who exhibits a canvas in the German section of the Art Gallery, became dissatisfied, and slashed his $20,000 painting, "In my Studio." It is said that he slashed his picture because he was offered $12,500 for it, and lest he should be tempted to part with it for less than its value, he cut it. The cut has certainly reduced its value, although it is shrewdly suggested that the cut can be remedied with a little white lead paint and a hot iron.

Mr. J. G. Pangborn voiced the woes of exhibitors before the World's Columbian Commission on July 29. His criticisms were just and stinging. He intimated that the Exposition was an architectural exposition, but not a fair. He said, among other things, that the present was not the only "White City" that had been built, hinting that Jackson Park, like a number of beautiful cemeteries, might become the burial ground of the hopes of the managers of the Fair. Mr. Pangborn, who is president of the Associated American Exhibitors, complains of the galleries, the ventilation and the total inadequacy of transportation in the grounds. The exhibitors wish carettes run from the gates to the entrances of the various buildings. In regard to the Plaisance, Mr. Pangborn said: "The nations which have spent $100,000,000 in bringing their exhibits to the Fair are forced to compete for attention with the attractions of the Midway Plaisance. England is compelled to compete for attention against the Street in Cairo, and France vies with dancing girls, the scum of the Orient." Director-General Davis made an attempt to answer Mr. Pangborn, but the exhibitors had rather the best of the argument.

The prettiest effect in illumination that has yet been seen at the Exposition was provided on Monday evening, July 31. Hundreds of paper Japanese lanterns were stretched over the winding walks of the Wooded Island and miniature glass globes in which were small candles were scattered about the flower beds. Altogether there were 25,000 or more candles ablaze at the same time. The bright colors of the Japanese lanterns was a fine color effect seen through the trees and from the promenades surrounding the lagoon and opposite the island, while the flower beds seemed to be covered with myriads of fire-flies of many colors and of unusual size. Considerable colored fire was burned, and the illumination closed with a fine display of fireworks. During the holding of this illumination the Columbus chorus rendered quite a programme of well known airs.

Our valued correspondent, Mr. J. E. Emerson, sends us the following:

AT THE COLUMBIAN EXPOSITION—AMONG THE SAW MILLS.

To me the saw mill department is most interesting. As I took the elevated railroad and rode through the park, turning and twisting around the many short curves, getting a most splendid view of the exterior structures and magnificent and massive buildings, passing the caves and mounds, in good imitation of the relics of some prehistoric races of ancient diggers of caverns and builders of mud huts, which I have seen as they now exist, and the low, straw-covered roofs of the poor man's house, with Mother Earth for a floor, such as I saw in Ireland, in 1869, the mind wonders at the grand achievements of art and science of a high advancement of civilization and scientific developments.

Professor Tyndall says that, in all probability, there was a period when prehistoric man, naked, wandered along our seashores, eating the raw oyster as he went, never dreaming that the tree under which he took shelter from the raging storm contained elements that would warm his shivering frame; and also says that human skeletons are found in rock caverns beside that of some wild beast, where both were probably slain in combat for the possession of the cavern for a dwelling.

Before the saw mill came the mud hut and mound and nature's caves. But the saw mill came, and the ax and saw leveled the forests and converted them into comfortable and finally beautiful houses, and with the use of rocks and logs, massive buildings beautifully decorated. And here in this grand display one has it all, from the first locomotive of 12 miles an hour to that of 60 and even 70 miles per hour. I remember 60 years ago, when I worked in an old flutter wheel saw mill run by water, when it took five minutes to gig back the carriage of a long log, to the lightning saw mill of to-day, that will and has with a single circular saw cut 19 boards 16 feet in length inside of one minute. And here now in the saw mill department is the 12 inch band saw mill, such as I saw at Humboldt Bay cut redwood boards 10 feet wide, an achievement that I am indeed proud of.

Here in this saw mill department is to be seen the scroll band saw of ⅛ inch wide to that of 12 inches in width, dividing up timber of the hardest black ebony and harder South American logs into quarters and the gnarled white oaks and Western white pine, and the monster sled loads of logs, just as they are hauled in the logging regions to mills or river banks for floating to the great mills on the Saginaw and other rivers. And here is the logging camp, such as I worked in when a young man in the logging camp of old Maine, my birthplace. The astonishing wonder is how so much has been done in so short a time as can be seen here. Probably no one living to-day will ever see the like again. It may come in one hundred years from now, for civilization will never forget the great discovery of 1492. In place of America, for Americus Vespucius, our country should have been named Columbia. I have a great liking for art, design, structure, and architecture, but a greater love of useful inventions, which add to common comforts of life. And prominent among these is the saw mill.

J. E. EMERSON.

Impressions of the World's Fair.

BY T. C. CLARKE.

This is the greatest architectural display that the world has ever seen. Not the hill of the Acropolis of Athens, when covered with marble temples, nor the Roman forum in the days of Augustus, ever showed such an artistic grouping of columns, arches and long lines of facade. People who, from indifference, do not come here while this fleeting pageant lasts, will regret it, for it will never be repeated in our generation. We cross the ocean to see Venice, but here is a greater Venice at our doors.

This is my first impression; the second is of wonder that the genius which could create such marvels should be so lacking in common sense as to carry the buildings up to the outer edge of the park, and leave no neutral zone to protect them in case of fire breaking out in the nests of wooden boxes which surround them on three sides. Given a heavy wind from the south, north or west, and a fire breaking out just outside the line of the grounds, it would take a much better organized fire department than that which contended with the fire in the cold storage building the other day to save the whole Exposition from being wiped out. Therefore, my advice is to everybody to come. See it before this possible catastrophe takes place.

The wonderful architectural display of the Columbian Exposition would not make it a success, unless the buildings were also well contrived and arranged in the display of exhibits. I have seen all the world's fairs, except the fine one in London and that at Vienna, and I am sure I am right in saying that these buildings, considered as merely for the display of exhibits, far surpass any of their predecessors. They are well and fully lighted, without that glare which in former expositions has been found to be so painful. Their great height and good ventilation makes them cooler in a hot, still day than any place out of doors. Tired and hot people appreciate this. The classification is admirable; by which I mean that it is easy to find anything you want, and to see it when you do find it, unless its great popularity draws such a crowd that you cannot get near it. In these three most important respects the Chicago Exposition is far and away the best. There are so many buildings that the great divisions of Art, Manufactures, Machinery, Mining, Fisheries, etc., can be easily kept separate. By visiting those on separate days the visitor does not have that confused feeling in his mind which smaller expositions give him.

In each world's fair there has been some exhibit which has played a great part in human affairs. At the English Exhibition it was the sewing machine; at the Philadelphia Exhibition it was the telephone; and, unless I greatly mistake, at this Exhibition it is the electric elevated system called "Intramural." Rapid transit in cities and suburban towns is among the most important questions of the day, and any invention or plan which promises to assist in its solution is of vital importance.

Compare the Intramural Electric with the Southside Elevated (locomotive) system. The electric line runs trains of four cars, seating 384 persons, with no standing room. The train weighs, with motor on forward car, about forty tons. On a line properly constructed for speed, and without the sharp curves, the same speed could be attained between stations as with locomotive service, although now it is less. The electric motor can accelerate its trains quicker than the locomotive, so that on similar tracks it would make better speed, including stops.

The Southside locomotive train consists of five cars. To compare with the electric line, we assume four, or we might have increased that of the electric train to five cars. These four-car trains seat 192 persons, and, by dint of cramming in standing passengers, could carry the same number as the electric, or 384. Train and engine weigh more than double the other, or about eighty-eight tons. It averages fifteen miles an hour, including three stops per mile. On an equally good track the electric trains could beat this, on account of quicker acceleration.

For drawing long, heavy trains, with few stops, nothing yet devised can beat the steam locomotive. In rapid transit and suburban service, the greatest carrying capacity comes from small trains running very frequently and stopping very often. Other things being equal, that line which gives its passengers seats will take the traffic away from that one which makes half of them stand up.

The locomotive train has to suffer a loss of energy due to stopping and starting over eighty tons every third of a mile, or one and one-third minutes apart. The light electric train can afford to stop and start its forty tons every sixth of a mile, or once in forty seconds at no greater cost. The electric line costs a little more than the locomotive line for power and equipment, but this is more than made up by the low fixed charges on a lighter and less expensive structure. The dead weight per passenger of the locomotive train is about 400 pounds, that of the electric train about 175 pounds. Will not this difference tell in running expenses?

The whole question may be summed up as follows:

The use of the present style of cars and the economy of running as many cars in a train as the locomotive can start induce the managers of locomotive lines to run heavy trains at longer intervals apart, both for suburban and intramural traffic. Consequently, we see wherever the surface electric trolley car, with its one-minute intervals and no time table, competes with a steam locomotive line, with trains even twenty minutes apart, it always draws away the traffic from it. The elevated electric line should not have more than four cars, nor intervals greater than one minute in the heart of a city or five minutes in suburban traffic. Give people this service and seats instead of standing room, and it will take all the traffic.

The Illinois Central Railroad runs eight-car express trains, seats ninety-six people each, on cross seats, with doors at the sides, from Van Buren Street to the Fair grounds by locomotives. This is better than an electric service would be, because there are no stops. If, after the Fair is over, they would run four-car trains every five minutes on their suburban lines, either by electric motors or locomotives, they would build up a business in a few years equal to that of one of the Manhattan lines.

It has been often disputed whether it is better to use an electric locomotive or put motors on the cars. For city and suburban traffic we have said that frequent and light trains are the best; consequently, it follows that if a motor on the car like that on the Intramural line can haul the light train satisfactorily, that is the cheapest; but where grades are heavy a second motor on another car, connected electrically and mechanically with the five, would be necessary. Locomotives for long trains and electric motors on cars for light trains is the best practice.—*Railroad Gazette.*

A RUBBER compound especially adapted for use in valves where a high temperature is necessary has been perfected by Messrs. Jenkins Brothers, valve and packing manufacturers, New York City. This compound has been thoroughly tested in practical use for nearly two years, with results which are said to have been in every way entirely satisfactory. A new manner of holding the disk holder in place in these well known valves has also been adopted, the thickness of the flanges and the number of bolts in the valve bonnets being increased.