

Angus Car Works—Will Victoria Duplicate Them

Valuable Article Specially Prepared for Colonist Dealing With Great Montreal Industry

The movement for the establishment of car works in Victoria has not been by any means abandoned. Those interested are merely awaiting the receipt of reliable data as to the cost of a plant and information generally regarding the possibility of success of such a venture here, when the matter will be taken up again. It will be remembered that a public meeting held in the rooms of the Tourist association on April 30 to discuss the establishment of car works in Victoria the question was gone into at some length, but, owing to the lack of definite information, the meeting adjourned for two weeks, a committee being appointed to secure the data that was lacking. This committee has not yet been able to secure all the information that its members would like, but as soon as it does further action will be taken.

In the meantime the people of St. Thomas, Ontario, have taken up the matter of the establishment of car works in that city and a company has been formed with a capital of \$400,000 for the erection and equipment of the necessary plant. Of this amount \$200,000 will be invested in a plant at the start, the idea being to keep the balance in reserve for extensions which will be made as soon as the development of the industry warrants it. The output of the factory at the start will be five cars per day and the company have been offered a contract for all the cars it turns out at that rate of production for ten years from the time they commence operations. The establishment of a plant in St. Thomas would not, however, affect the success of a plant in Victoria. There is a ready market in Canada for the product of many such factories.

The Colonist, realizing the benefit the establishment of such a plant would be to Victoria, gave considerable publicity to the project previous to the meeting of April 30 and since then has not been idle. Realizing the benefit of definite and accurate information on the subject it has secured from J. T. Rolston of the staff of the Montreal Star a specially prepared article containing full information about the mammoth Angus shops of the C.P.R. at Montreal. This article gives an excellent description of the C.P.R.'s big plant, its method of operation, etc., as well as a mass of detailed information concerning car building that should prove most helpful to those interested in the establishment of car works in Victoria. Added interest is lent to the article by a number of photographs of the shops in the C.P.R.'s modern methods of car building are more clearly shown than could be done by any number of words. Mr. Rolston's article is as follows:

A complete railway train every day, is what they construct at the "Angus Shops," the immense locomotive and car building shops of the Canadian Pacific railway at Montreal. These shops situated on the north-eastern outskirts of the city, form one of the largest and most complete works of the nature on the continent. They say the age of miracles is past, but the visitor to this works will doubt the truth of the assertion, for here he finds seeming miracles being wrought every hour of the day.

In a sketch it is almost impossible to give an adequate description of these cyclopean workshops and statistics are always uninteresting, but in order that the reader may fully grasp the immensity of the creation that the Canadian Pacific railway have built up, a few will certainly be pardoned; they are interesting statistics too and well worth scanning.

The Angus shops cover an area of over two hundred acres of land, that is, the shops with their attendant track facilities and storage piles, or in other words the plot of land, is some 4,700 feet long and over 200 wide. This land is situated on an elevated plateau some 127 feet above the sea level and the works are about two and a half miles from the centre of the city. Between 4,500 and 5,000 men are employed and the establishment has a capacity of 7,000 freight cars and one hundred locomotives each year, that is, to make the fact even more impressive, twenty-four freight cars and two locomotives every day.

The dimensions of a few of the larger shops are as follows: Locomotive shop, 163 by 1,168 feet; general stores, 85 by 594 feet; smith and forge shop, 300 by 435 feet; Truck shop, 82 by 434 feet; freight car shop, 107 by 540 feet. Two passenger shops, each 100 by 872 feet. Planing mill, 135 by 500 feet, and cabinet shop and upholstery department 62 by 581 feet. These are only a few of the larger of the buildings and there are about a dozen more, large and small.

The buildings are all of the most modern and up-to-date construction. The walls are of hard red brick, running from a thickness of twelve inches at the top to from twelve to twenty at the base. They are all self-supporting and in nearly every case carry roof trusses, and are faced outside with red pressed brick, while the door and window sills are of bush hammered stone. The floors in all have a foundation of twelve inches of rammed

cinders, with a covering of 3x10 inch plank. The roofs are covered with tar and gravel over thick plank.

The shops are extremely well lighted and the principal ones have large windows taking up over half of the wall area and also large skylights. There is a complete system of sewerage and the fire protection is the best that could be obtained. There are two Northey's underwriter pumps, each with a capacity of 1,500 pounds per minute at 100 pounds pressure, and one

finished locomotive to the free tracks outside seems easy.

The different machinery by which immense pieces of metal take all sorts of curious shapes will soon catch the eye and the operations are so interesting that one could spend hours watching the workmen, but space will not permit a description, for there are many other features just as interesting as these.

The visitor soon has enough of the noise of the locomotive shops and steps

smaller vessels and the cauldron is tipped and each vessel filled, while the molten metal seems to splash around the bare heads and arms of the men who do not seem to mind it in the least. They carry their burdens to the moulds and it is dumped in and the frame is packed with dark grey moulding sand. There it is forced into the various shapes required and when the covering is lifted a dull black casting is revealed, very different in appearance from the fiery mass poured in a

the vast mass that has a moment before been descending with such force were sorry for the change it has wrought and was carressing the victim of its anger.

The pattern shops, the car machine shops and the truck shops come next and here there is less noise and one can breathe easier and watch with more pleasure the skill of the workmen. Here the unyielding metal is beaten into all kinds of shapes, but the operation seems less strenuous for the hammers

minutes. The statement seems highly improbable and few will believe it until they see it accomplished.

And how is it done? The car shop has five or six long tracks running its full length and through the doors at one end the wheels and trucks are rolled in with the bolsters ready in position. A squad of men at once put on the sills, the big beams that support the body. These are carried into place by a traveling crane and they are quickly bolted down and almost before they are in place the plank for the flooring it on top and a couple of men with sure strokes are rapidly spiking it into place. This is hardly finished before the framework is being put on and it is bolted into place, and hardly is this accomplished before more men are swarming over the sides and roof and sheathing the car and putting on the roof planks. The doors are put on and the completed car is sent through the doors into the paint room.

All this time the car has been moving up the track to the different gangs of men. Each of these gangs performs a part of the work and from the time the wheels and trucks are first placed in position until the finished car goes out of sight through the doors of the paint room, the work never slackens for a minute. Thus a whole string is constantly moving up the tracks and as fast as a gang of men have finished their particular part of the work on one car, another is waiting to take its place. The rapidity with which the work is accomplished is wonderful. Every piece of timber is sawn, squared and grooved to the required dimensions and a big pile of the material is constantly laying beside the track. There is no waiting and if the men are obliged to wait for a moment there is trouble, for helpers are there who are supposed to always keep plenty on hand.

After the lightning like work that was witnessed in the construction shop it would be ridiculous to think that the painting is done in the usually accepted manner with a brush. So the visitor experiences no feeling of surprise when he enters the paint room and finds the car which he has just seen constructed undergoing the process of painting. And the way it is painted, not with an ordinary brush, but the paint is carried through a hose and sprayed on and the painters are no more careful where the paint flies than is the small boy washing windows, while the passerby takes the other side of the street. The red fluid strikes impartially everywhere and if one is not careful he is likely to emerge as

drilled and dove tailings trimmed to exactitude. All the gangs of men have to do is to fit it together. So one must go to the planing works, where this work is done.

Here the pleasant aromatic smell of pine shavings greets the nostrils and the hum of circular and band saws fill the air. First one of the immense sticks used for car-sills is being put on a traveling carriage and it slides past a man standing before an array of fast twirling augurs. He pulls a lever and the bit sinks into the wood with an easy effort and the shavings fly. Up comes the lever again and the beam passes on ready to receive the bolts and stays necessary. A band saw of hardly perceptible thickness and only about half an inch wide is cutting its way through a bolster of hard pine and leaves so faint a mark that one would hardly believe the work is being done until the pieces fall apart. Everywhere shines the bright saws, and the huge timbers are passed from lathe to lathe each of them doing its own particular work, until the beams and planks are reduced to the proper size and sent on to the erecting shop.

Then comes the passenger shed, where the most elaborate work is done. Here are constructed the palaces that run across the continent, day coaches, sleepers and diners. The work seems less strenuous, however, for these cars require a great deal of material and patient labor and the men are experts in this work. But the work is much slower and there is none of the ceaseless bustle and noise that marks the other departments, for the progress towards completion is not so rapid. These shops consist of two buildings facing one another about one hundred yards apart and in the intervening space is a seventy-five foot transfer table allowing the cars if so desired to be moved from one shop to the other, if this is desired, or carrying them to the free tracks outside.

Cars in all stages of construction are on the tracks and the construction work is going on in the same manner as in the freight shops. Each gang of men have a different task to perform and the cars are moved on and up the track until they finally reach the doorway ready for the first trip.

In connection with the passenger is the cabinet shops where the complicated work of fitting and veneering is carried on. All are familiar with the interior of the modern parlor coach and know that the wood used is of the most expensive nature. The fitting is well worth watching for a time and the process of fitting together tiny pieces of wood until they make a panel of richness and beauty is one that requires infinite patience and skill. The gluing together of a number of sheets of wood and then the process of steaming to curve them into roof domes, the mouldings made by presses, and the polishing, sawing and rubbing of a thousand varieties are all wonderful to watch and one will be fascinated by the sight. Then the fret work performed by little saws that look as if they would break at the touch, whereby rare woods gathered from all parts of the world are fitted into beautiful patterns, and an innumerable variety of operations that require the most skilled workmen and the greatest care and attention.

Above is the upholstery department where the chairs, seats, mattresses, pillows and lounges and even the little camp stools used in the parlor cars and the boxes that the porter puts down on the cars are turned out in abundance. This department although it might seem small in comparison with some of the others still employs a large number of expert workmen. Then there are a dozen other departments that can be visited. The wheel foundry where the wheels are turned out in innumerable numbers and which at the time of casting resembles an inferno, the frog shop, the truck shop where the trucks are built and almost numberless others all forming a part of the tremendous whole and all doing their share of the work towards turning out the finished product.

But a visit would not be complete without a call at the power house, where is generated the energy that drives all these countless wheels and hammers and drills. This building is situated near the planing mills for all the refuse lumber and shavings are used as fuel. Experts say that the quantity of wood and shavings available for fuel when thirty cars a day are being built is equivalent in heating power to eighteen tons of soft coal. And this refuse is brought here in quantities that keep the furnaces roaring. Here will be found three 750 and one 915 high power Corliss engines making 150 revolutions per minute. The floor is spotless and every inch of the metal is polished to its utmost brightness and the whole atmosphere is charged with power.

Everything necessary for the construction of a car of any class is manufactured in some of these buildings, for that is the principle of the whole industry. The material is taken in its rawest form and worked up to meet the needs. Nothing manu-



Car Wheel Foundry.

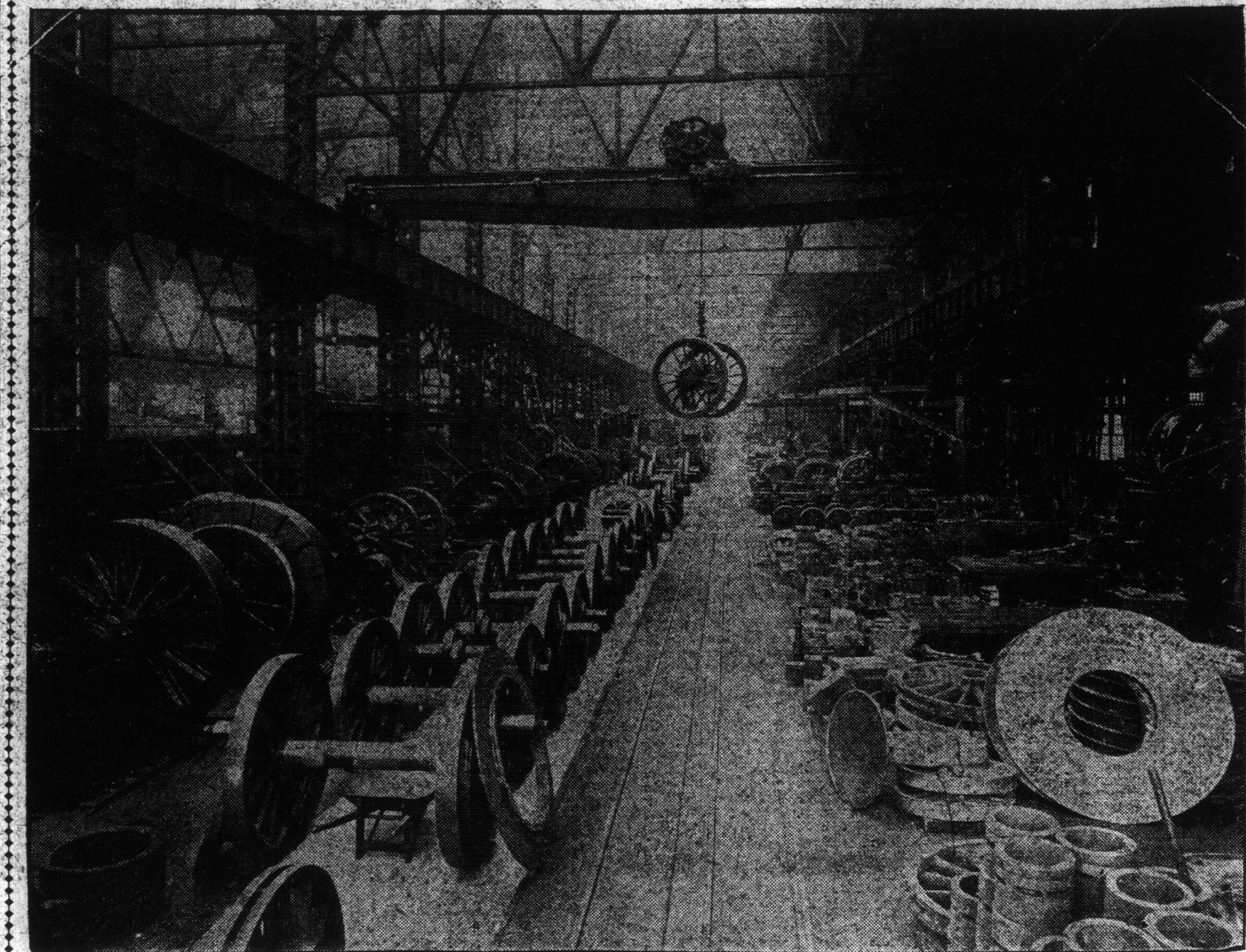
with a capacity of 25,000 gallons per hour, these being connected with the water supply, which consists of two 6-inch artesian wells, 550 feet deep, and for the fire service there is a 75,000 steel tank on top of a 70-foot tower.

The heating in the winter is of the hot blast system, and provides for a maintenance of a constant temperature of 65 degrees, even when the outside temperature is ten degrees or more below zero. Ventilation is provided by fans which can completely change the air of the buildings every twenty minutes.

This gives an idea of the size and extent of the works, and now for what is being accomplished. The visitor steps off the car at a gateway in the high fence which extends clear around the works and first proceeds to the general office where a pass is secured which allows him to go where he pleases and see all. And to see this all would take more than the half hour the casual visitor gives. To properly inspect the establishment and see its many wonders would take at least a full day.

As you come out of the office, to your left extends the immense locomotive shops, where they build the iron and steel monsters that carry the luxurious cars of the road across the prairies. Through the wide open doors comes the clang and clamor of the work. The shop itself is the largest of the group and is nearly twelve hundred feet long, or just a little under a quarter of a mile, transverse this in any shape you will and you will get some idea of the immense size. Standing at the front end the back is hidden in clouds of steam and smoke and for all you can see it might stretch a mile or more and for all this length it is crowded with locomotives in all stages of construction or repair. Here you will see the foundation of another mighty monster just being put in place while further on is an immense Mogul complete in every detail and ready for the fire to be lighted to take its place as one of the servants of the corporation that owns these works.

And the noise is terrific. A thousand hammers, steam, pneumatic and hand, are at work on the different metals making them into all kinds of shapes. To this is added the noise of the drills, the roar of the blast furnaces and the rumblings of the overhead cranes. These cranes instantly command attention, as they pick up an article weighing tons as though it were a feather and bear it away to the other end of the building. Anything from a bar of iron to the swinging of



Wheel Shop.

to the outer world again to give his ears a chance to stop tingling, and the next place that will be seen is the Grey machine shop. This is a much smaller building when compared to the one just left but the noise and confusion, if you are lucky enough to be there at a time when the blast furnaces have just been opened, is even worse. A stream of fiery metal is pouring from the mouth of the furnace falling into big cauldrons swung from the overhead crane. The crane carries the vessels to the moulds where men are waiting with

few minutes before.

Next right across the way is the blacksmith shop and here more noise is awaiting. The ponderous hammers are here an attraction, weighing as they do many tons and responding to the slightest touch of the operator in a manner wonderful to behold.

A block of iron will be put underneath and the hammer will descend with merciless force crushing it into the required shape and as it nears this shape the blows become lighter and lighter and at last it seems as though

are smaller and there is more light and air. Here are formed the metal scroll work of the railings, the brass fittings and the decorative work of the cars.

Next the visitor goes to the freight erecting sheds and here begins to see results. They say that they turn out a freight car every twenty minutes and this seems incredible but is a fact. They do not turn out a car every twenty minutes, but three gangs working simultaneously will turn out three an hour, an average of one every twenty

red and starting as the car itself.

Thus is the construction carried out almost as quickly as the tale can be told. After the paint is dried the numbering and lettering is done and the car inspected for any flaws and it is ready to take its place in the service of the railway.

As said before, the material comes to the freight shop all prepared and it is because of this that the work is done with such incredible swiftness. Everything is ready, sawn and cut, and shaped to its proportions, bolt holes already

factured elsewhere is possibly be produced by material comes from all world and it would be give an adequate idea of woods used for they are ties from the common of Canada. The company American her lands in various and the turning out of cars that are constructed takes a quantity of the scarcely be estimated.

The workmen look happy and the wages paid \$2.60 to \$4.00 per day. are skilled in their work and consequently command high wages, is done for their comfort among other things is excellent lunch room, with innum sum the employed with an excellent meal clean and well prepared in the door he sees long with stools beside the blackboard is inscribed for the day. For fifteen he can take care of, for a good meal for less. The consideration pany in providing this by the men and is in their efforts to promote the thousands of employ

A branch of the B is also located at the the men can deposit to have their wage check bank is used too, and employees have substantial credit there.

And now the visitor to keep the head in the next few hours. He has a maze of shops which seems tireless, where are on a scale of magnitude and where are of and where seem to be pushing wonders, in and clamor everything with a precision that for there seems to be cogs that keep the inment in motion. Ever know just what is r and proceeds to do it. The whole work moved well oiled machinery noise and clamor the in the air, something master hand of genius goes away with a feel admiration, thinking of work that has been h the hand of man.

Naval Reserve:

Toronto Mail and Express a writer in the N made some interesting for a fast line of all ships in connection with serve force. The fast land to Australia has received the colonial conference, tion of the steamship wants to make Black commercial and not to be incidentally help to conspire by drawing the Mother Co. together. It depends a the details of the plan be Imperial in the se of the word.

For Naval Res In the National Review stated that the ships colonial traffic between Country and the cold of a type suitable for the time of war. The that merchant steam main class are better charge some special than any vessel built poses can possibly be them." An essential scheme would be that the steamers should be the Royal Naval Reserve Colonial Naval Reserve upon whether or not was owned by the H or one of the colonies which the vessel strongly urged by the that only naval reserve the ships would extend on board, from the stokers. The steamship which the vessel leased would pay the regular marked the Government of who this in order to attract men in the mercantile Empire. Periodically be drilled, as on a man as quickly as the me be converted into a crew would be transferred and competent war

Against the Thus are the dr schemes set forth. The patriotism and not the distances between Australia and England, alth be achieved incidentally the writer the advantage government build the ships would be t their services in time be assured. That any be made in a subsid that would prevent the whose ownership was pany was doubted by mites of the House examined the matter render the right to n sale would be worth a company, and with the tainty on this vital scheme would fall to

A Decaying Mar To the writer in t view the most import plan outlined would influence upon the all the Empire. Without spirit, he declares the influence upon the love of the sea and th are decaying is asser tions. Figures prove industries in Australi ish mercantile marit up of Scandi nations have caused