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A Fact a Day about Canada November, 1937.

from the

Dominion Bureau of Statistics

No. 32 -- Bonds of Steel

A little over 50 years ago, the first Canadian Pacific train left Montreal. When one thinks of the mass of population seething about the platforms of Montreal's stations now at train time it seems hard to believe that this incident happened such a short time ago.

But Canada has travelled far in the matter of transportation in recent years, for, until the year 1785, the methods in vogue were almost as primitive as they were 250 years before when Jacques Cartier sailed up the St. Lawrence. Canoes, rafts, flat-boats, barges and small sailing craft, the horse and mule, the oxcart and covered wagon and a few stage coaches were the only means by which people and property could be transported.

The real start in railway construction began at the middle of the last century. Many short railways were in existence but it became necessary to stretch bands of steel from coast to coast. Railways had much to do with Confederation. When the World War began Canadian railways spanned the continent by means of six different routes. The mileage in Canada within a century increased from 16 miles to over 42,000.

As the railroads pushed ahead of the settlers, thus becoming colonization roads or linking up thinly populated districts, the private owners found that they needed financial assistance. Thus it became necessary for the Dominion, Provincial and even municipal governments to extend some sort of help. In the early days grants of land other than right of way were made and another form of assistance was a bonus of a fixed amount per mile of railway constructed.

As the land-grant method became impracticable when the country became settled, aid in the form of cash was given, such as subsidies per mile of line, a loan or a subscription to the shares in the railway. A more recent type of assistance given to private railways is by guaranteeing their bonds or of the interest thereon.

At the end of 1935 the aid given to railways had amounted to $178,000,000 from the Dominion, $33,000,000 from the Provinces and $13,000,000 from the municipalities. Land grants had reached the total of 47,000,000 acres and railway bonds guaranteed are over $817,000,000 according to the Transportation Branch of the Dominion Bureau of Statistics.

No. 33 -- "The Graveyard of the Atlantic"

Sable Island, a low-lying piece of ground, lies 118 miles southeast of Halifax, Nova Scotia, and is familiarly known as "The Graveyard of the Atlantic". It consists of two parallel sand ridges with a lagoon between them. The sand bars extend several miles from each end of the island.

Since 1873, the Canadian government has built three lighthouses on Sable Island, two of which have been swept away and the third undermined, as the island is gradually sinking. Less than a century ago, its length was 40 miles, but at the present time it is 18 miles long with sand hills reaching a height of 100 feet. In 1901, over 80,000 trees were planted to check the shifting of the sands.

In addition to two first-class lighthouses, watch-towers and life-saving stations are maintained along this dangerous section of the Atlantic. In clear weather the entire coastline is under observation from the lighthouses and watch-towers and in fog or thick weather, mounted men patrol every mile of the island.

Another well-known lighthouse is the one at Cape Race, on the coast of Newfoundland. It towers 180 feet above the ground and its flashing light of over one million candle power has been seen a distance of 76 miles. The optical apparatus and lantern weigh 42 tons. The elctricity for the light is generated on the premises and the fog signal, which has been heard 45 miles away, is operated by compressed air. Four lightkeepers keep continuous watch day and night throughout the year.

There are thirteen lighthouses maintained on the coasts of Newfoundland and Newfoundland-Labrador by the Canadian Government to aid Trans-Atlantic shipping.

With approximately 50,000 miles of coastline along the Pacific and Atlantic Oceans, the Great Lakes and other lakes within the boundaries of the Dominion, extensive lighthouse service is necessary. It requires, during the season of navigation, 2,000 lights, 400 fog signals, 600 gas and signal buoys, 12 lightships, 32 radio stations, 9,000 unlighted buoys, beacons and day marks to prevent accidents.

According to Census reports, there are over 2,000 persons employed in the lighthouse service of Canada who know by experience that the price of safety for shipping is eternal vigilance.

No. 34 -- A Future Fur Coat

Out of the laboratories of the National Research Council at Ottawa comes an interesting bit of information. The staff working on chemical research has touched on many things from the saving of clothes in laundries to the preparation of wool. Now it indicates a possible future for buffalo hides in making ladies' fur coats.

Experimental work on the present but unsatisfactory methods of treating the skins has been undertaken in the tanning and dyeing processes. The dyed and plucked skins produced have a most pleasing lustre and appearance. Anyone who in the future possesses a coat from this animal will be surrounded more or less with an atmosphere of romance, for the buffalo has been the object of interest ever since the day when white men discovered this continent.

In the early history of our Dominion are accounts of the large herds of bison, popularly called buffalo, charging across the western plains and pursued by Indian hunters. At times these animals travelled in solid columns of thousands and tens of thousands. The Indians depended upon them for food, the fat provided tallow, the skins, clothing or tent and canoe covers and the hair, cloth. The slight hump was especially prized for pemmican. Continued hunting resulted in almost extinction of the species until both the United States and Candian governments sought to protect them. As a result the herds have so increased that in Canada there are about 1,500 buffalo hides now available annually.

Last month two female buffaloes were shipped from Elk Island Park, Alberta, to the Dudley Zoological Society in England.

Should the buffalo enter the commercial market for fur-bearing animals, it would bring the total of animals for this purpose up to 22. Already the list contains such species as the badger, bear, beaver, coyote, weasel, fisher, fitch,

fox, lynx, marten, mink, muskrat, otter, rabbit, raccoon, skunk, squirrel, wildcat, wolf, wolverine and domestic cat.

Figures supplies by the Fur Statistics Branch of the Dominion Bureau of Statistics show that nearly five million pelts were used in the 1934-35 season and their value was nearly 13 million dollars.

No. 35 — International Ties

The majority of articles and things we handle and see every day do not always strike us as being of any particular interest, but nevertheless back of every commodity lies some human interest. Maybe it is the fisherman who caught the salmon you had for lunch or the husky bushman who cut the tree for the paper you are reading. A story is told about the ordinary little grain of wheat which gives us a feeling of fellowship with other nations.

When the Pilgrims were visiting Vimy Ridge last year for the unveiling of the great Memorial, a casket of wheat grown there was presented to the Canadian Legion on behalf of the French Government by Marshal Petain. This wheat produced on Vimy Ridge, which Canadian troops immortalised for all time in the War, was to be planted in the Gaspe Peninsula where Jacques Cartier landed four hundred years ago. Thus the growing of these little, insignificant kernels of wheat will be a perpetual reminder of the tie of friendship between France and Canada.

Wheat also forms a friendly relationship between China and Canada, not only from a commercial angle but from the more human side of life. The farmer who watches the field of grain ripening under Canadian skies is also producing bread for little Hum and his sister in China.

For years the United Kingdom was the only country in the world which exceeded China as a market for Canadian flour. Before 1922 the value of the flour exported to China by the Dominion was negligible, but by 1929 the sales had topped the $10,000,000 mark. They accounted for not less than 40 per cent of the whole export trade of the Dominion to China, and for 15 per cent of Canada's flour exports to the world.

Last year, according to figures supplied by the External Trade Branch of the Dominion Bureau of Statistics, 117,000 bushels of Canada's golden wheat went to help feed the teeming population in China, an amount about double that of the year before. Along with it went over 73,000 barrels of flour which brings us back to the thought that even hard-hearted little grains of wheat carry with them stories of joy or sorrow.

No. 36 -- Languages in High Schools

It is a common thing to hear boys and girls who have just entered high school trying to invent excuses why they should not 'take up' Latin, and occasionally they object to French. A report just issued by the Education Branch of the Dominion Bureau of Statistics gives some idea of the extent to which languages are being taught in our Canadian schools.

The predominant second language in the high schools of every province other than Quebec is French and about three-quarters of the high school students studying English are also learning French. The proportion is as high as two-thirds in every province.

That this situation is essentially Canadian, influenced in large measure by the place of the French language in the life of the Dominion, is suggested by the fact that in the United States less than one-eighth of high school students study French, and that in only one-fifth of the individual states is French the second language. Although usually it is a reading knowledge rather than a speaking knowledge of French that is gained, better understanding between the two language groups is fostered.

One half of the high school students study Latin which is much more than the number learning it in the United States. At one time United States students studied Latin in greater numbers but a steady reduction since 1910 has resulted in less than one-fifth learning the "dead language". It has been declining in Canada too, during this time, but not at as fast a rate.

Less than four per cent of Canadian high school students learn German; Spanish, which is offered as a subject in Ontario, Nova Scotia and Quebec has attracted few students. Only about 500 students in the whole country study Greek, most of them in Ontario. Classical Greek is given in the universities and the affiliated theological colleges give modern Greek.

A few students avail themselves of courses offered in Gaelic in Nova Scotia, Italian in Ontario, Icelandic and Swedish in Manitoba.

No. 37 — Treaty Payments

Shortly after Confederation, the Indians ceded their title to the vast areas east of the Rocky Mountains to the Dominion government and in return were to received annual gifts of cash with promises of assistance in agriculture, hunting, education and protection. The Indians were given special tracts of land known as reserves where they could hunt, fish and learn to farm. The coast Indians of British Columbia were also given reserves but no attempt to take away their title has been made and in the meantime they have become an important labour factor in the fisheries of the Fraser and Skeena Rivers.

The people on the reserves, estimated at around 123,000 in 1931, earn over six million dollars a year. In addition the Dominion holds in trust on their behalf something like fourteen million dollars, while schooling and numerous other services are given free. Fifty thousand of the Indians receive pensions under the terms of various treaties, the earliest being made in 1850 and the latest in 1930. The payment of these annuities, which amount to four or five dollars a head a year, is always made the subject of a definite ritual.

Early in February, notices are sent out notifying the Indians to gather at various points at a certain date to receive their annuity. Then a party of government officials starts out in seaplanes to cover a certain territory. For instance, the group covering Treaty 9 journeys across New Ontario, travelling from Ottawa to Fort Severn, Moose Factory and into Quebec to Nemaska and Neeskweskau, a total distance of some 4,000 miles.

In addition to making payments, questions regarding education, relief and numerous difficulties have to be investigated. The doctor is kept busy vaccinating, inoculating, examining and treating patients from the year before and others who have developed sickness or disease since his last visit.

Figures published by the Vital Statistics Branch of the Dominion Bureau of Statistics for 1935 show that there were over 4,000 little papooses born but over 600 of

them died before they were one year old. Altogether more than 2,400 Indians died in 1935; seven old ladies and four old men were over 100 years old.

No. 38 — November's Birthstone

The mellow, yellow light of an autumn afternoon and the golden brown of the dancing leaves are held imprisoned in the topaz, November's birthstone. A legend told by Pliny suggests that the name topaz came from the name "topazein", meaning "to seek" because the first locality in which it was found was an island, Topazas in the Red Sea, which was often surrounded by fog and difficult for sailors to find.

Countrary to the general idea, topaz is usually colorless or very pale in shade. Yellow hues of different degrees, from pale to a bright sherry tint, are common as are pale blue and pale green stones. The brownish-yellow stones from Brazil are altered to a lovely rose-pink by heating. The red, green, rose, pink, and violet topaz are very rare when found in their natural colour.

The Braganza, a stone of 1,680 carats, was once listed as the largest of the famous diamonds of the world but the fact now accepted is that it is not a diamond at all but a topaz. A colourless stone can be cut and polished in such a way as to make it look like a diamond, especially at night. These colourless gems are known sometimes as "Slaves Diamonds".

The topaz has a rare velvety body appearance which fascinates its admirers, and its wide range of pale colours offers a charming selection of birthstones to those born in November. When highly polished, it has a slippery feeling and when rubbed has the ability — like amber — to pick up pieces of paper. These qualities assist in determining the genuineness of the gem.

Brazil is the principal source of topaz while yellow and colourless stones are found in Ceylon. Fine blue stones come from Russia and California. Some of the less important sources are Scotland, Ireland, Africa, Australia, Japan and Mexico.

Our imports of precious stones increased over $12,000 last year, according to the External Trade Branch of the Dominion Bureau of Statistics.

No. 39 — Private Schools in Canada

Most of our boys and girls attend public schools but some go to private ones. There are several reasons for wishing to have children educated in this way, sometimes because of religion, sometimes because of family traditions and often because it solves the question of boarding pupils away from home.

In England the public schools are private, that is they are not open to everyone, the pupils pay a tuition charge of $500 to $750 a year. What we in Canada call the public school is known as a "board school" in the United Kingdom. They are so-named because the local municipal Council or board votes the money to run them. Boys and girls are supplied free education until they are 14 years of age. A child may enter a board school at the age of five and he is said to be a member of the "infant department" until he is seven.

If the child is to go further in his studies after leaving the board shcool his parents must pay a fee. From this sytem we have become familiar with the name of

Eton, Rugby, Harrow, Aldenham, Uppingham and Worksop, famous public schools in England. The boys who attend them are between the ages of 13 and 19 and for the most part, sons of wealthy families. Some public schools date back more than 500 years.

In Canada, the private elementary and secondary schools have an enrolment of about 33,000 which is about two per cent of the number attending public elementary and secondary schools. Private schools are more numerous in Quebec than in the other provinces combined.

High school departments of colleges had 5,000 private students in attendance. Commercial schools, or business colleges, number about 140 in the eight provinces. They have recently had about 10,000 day students and between 4,000 and 5,000 evening students in a year..

The majority of private elementary and secondary schools in Canada are under Roman Catholic control and about one half their number are listed as non-sectarian. There are 25 controlled by the Anglican Church, half that number by the Lutheran and seven by the United Church. There are others under the jurisdiction of the Presbyterian, Seventh Day Adventist, Baptist, Hebrew, Hutterite and Mennonite denominations.

This information is taken from a bulletin issued by the Education Branch of the Dominion Bureau of Statistics.

No. 40 -- The Mop

The next time you use a mop, probably this little story might lighten the household duty and give that particular weapon a personality all of its own.

Every year, in the city where Shakespeare was born, Stratford-on-Avon, there is a fair held called "The Mop". Like our own fairs, there are all sorts of amusements with fortune-tellers and side-shows. But in addition there are usually fine roasts -- two oxen and three pigs -- the fires for which are lighted about 6 o'clock in the morning. The mayor of Stratford opens the Mop and off it goes into full swing.

But this programme has greatly changed since the first Mops were held. The old custom served a very different purpose, more business than pleasure, and was a means for servants to obtain new employment or for people to procure new help.

In the autumn, a certain day was set aside for the Mop. The household servants who desired new homes went to the fair and employers and employees bargained and settled yearly wages. One sign that a woman was willing to work, and work hard, was her mop, for when she left her mistress the mop went with her. Sometimes the bucket accompanied the mop.

That was the big fair. Ten days later a smaller one was held called the "Runaway Mop". Servants or mistresses who were not satisfied with their bargaining at the big Mop had a chance to make readjustments.

The General Manufacturing Branch of the Dominion Bureau of Statistics tells us that last year there were 140,000 mops made in Canada. So when you use one of these useful articles, you may be doing your own housework but at least you have in your hand something in common with the English women of many years ago for the mop is the symbol of hard work.

No. 41 — Up in Smoke

During last year a crop produced in Canada and valued at over nine million dollars was grown to be sent up in smoke. As it was tobacco, however, the loss was a substantial gain for in the conflagration there were about 125 million cigars, five billion cigarettes and 23 million tons of tobacco.

"Tobacco is a horrid weed; I like it." So begins the well-known doggerel about the famous species of flora known to botanists as Nicotiana Tabacum. Tobacco is a weed but one which demands expert knowledge of soils, fertilizers, if it is to be grown profitably. Hordes of insect pests, late frosts, sand blown about, all are bugbears of the planter.

The tiny seeds, which are no bigger than grains of pepper, are able to produce stong broad-leaved plants, four to five feet tall. They are planted in a greenhouse in soil which has been especially prepared and sterilized with steam to destroy weed seeds and fungi. In a couple of weeks time the young plants are peeping above the soil and in four to six weeks more are ready for transplanting. The seedlings are planted by hand, the distance they are set apart depending on the type of tobacco being grown.

Two months later the plants are nearly three feet high and the first flower-buds have begun to appear. These buds are picked off, with the exception of a few of the finest which are kept for seed, to preserve the growing strength of the plant.

About the middle of August the leaves begin to ripen. This usually begins at the bottom of the plant. In growing Burley and dark tobacco, the whole plant is cut down to the ground when the leaves at the middle have turned yellow, but in flue-cured tobacco the leaves are removed as they ripen.

Following the picking the leaves must be dried and cured before being baled up and delivered to the manufacturer. According to the General Manufacturing Branch of the Dominion Bureau of Statistics, there are 149 establishments in Canada making cigars, cigarettes and tobacco for smoking.

No. 42 — Who Were the Canadian Soldiers?

We cannot forget the slaughtering of 60,000 of our young Canadians in the Great War nor the maiming of an additiona 173,000. It does not make us hate other nations for they, too, lost heavily in man power, but it does force us to realize that men can be made to hate each other. But when the cosmopolitan nature of Canada's war dead is considered, we know that different races, creeds, and tongues can live as brothers.

Canada is a land of many racial origins. The Census Branch of the Dominion Bureau of Statistics gives 23 racial origins in Canada. The largest group is British, then French, German, Scandinavian and Ukrainian follow in order. When the war broke out, these various races rallied to the flag of their adopted land.

There were 156,000 English-born, 47,000 Scots, 36,000 Americans, 19,000 Irish, 5,000 Welsh and 3,000 Newfoundlanders. The enlistment in Canada of 1,200 Australians, 1,100 from British India, and 3,000 others from British South Africa, New Zealand, British Guiana, Tasmania, Fiji, Hong Kong, Isle of Man, Malta, the Falkland Islands and Aden, was rather remarkable. Among the recruits were men from most of the islands of the West Indies and others from seventy-five outlying spots in British Africa, along along with 350 natives of South American countries, who claimed British ancestry.

In addition to the Empire-born and the American-born, there were 23,000 natives of continental Europe in the Canadian army. There were over 7,000 Russian-born and close to 6,000 Scandinavians, 2,000 from Austria-Hungary, 2,000 from Italy, 1,500 natives of France, 1,300 Belgians, 400 Roumanians, 400 Greeks and 260 Servians. Most remarkable of all was the line-up of 245 natives of Germany. Eight of the German-born and eight of the Austrian-born were officers. Every country in Europe was represented in the Canadian army. There were over one hundred Turks.

There were 700 Asiatics, 280 being natives of Japan and over one hundred natives of China. There were some from Arabia, Bhutan, Cochin-China, Siam, Siberia, Manchuria, India, Ceylon, Afghanistan, Persia and the Straits Settlements. There were thirty-two Africans.

Such was the cosmopolitan nature of the Canadian Army during the Great War. Armistice Day recalls these things to us.

No. 43 -- Canada's National War Memorial

The National War Memorial will soon be erected in Ottawa. This sturcture, occupying 35 large crates, was shipped from England in parts this year. It was fashioned by seven brothers and a sister in studios at Farnborough, Kent. It is the result of ten years' work.

When it was decided that Canada should have a memorial of her own in her capital city, architects and sculptors were invited to submit designs. Over one hundred entries were received, among them that of an English sculptor, Vernon March. Later he heard from his radio that a Kent sculptor, namely himself, had won an International competition for the Candian War Memorial. He and his six brothers and their sister at once set to work on the full-scale design. That was in 1926, but in 1930 tragedy overtook the family, for Vernon March died. The work, however, went continuously forward, the brothers and sister basing their labours on the small soft-clay model made by their brother. It is now kept under a glass case in their home in Kent.

When completed, the memorial was erected temporarily in Hyde Park, where it made a deep and lasting impression on all who saw it, a silent reminder of the sacrifice made by 60,000 Canadians.

Consisting of a tall granite arch, surmounted by huge bronze figures of Liberty and Victory, the memorial symbolises the triumph of peace over war. At the base of the arch are 22 figures representing every branch of the war service hurrying towards the new dawn and leaving behind them an unlimbered gun. The only inscription on it is simply "1914-1918". All told, the memorial reaches a height of 70 feet.

Sculptures by the March family are already well-known in Canada. In Hamilton, for example, there is the famous memorial to the United Empire Loyalists, executed by Sidney March; in front of the Parliament Buildings in Victoria, British Columbia, stands the Provincial War Memorial, also the product of the March workshops, while in Orillia, Ontario, stands Vernon March's fine statue of Champlain.

No. 44 — Ups and Downs of Life

How many of us realize the dependence of modern civilization upon vertical transportation or that the elevators of a great city, like New York, carry more passengers per day than all street cars, bus and urban railway services combined? The Empire State Building, is equipped with 58 main passenger elevators, designed and scheduled to transport 15,000 people between 5 p.m. and 5.30 p.m. daily.

Another surprise. In Canada there has sprung up a novel industry which not only supplies the domestic market but also exports its product to thirty-two foreign countries. And that particular product is steel doors for elevators, an important item when it is remembered that a modern elevator is just as good as its doors.

It began this way. When an architect in Shanghai, China, came to get doors for his 102 elevators in the great Joint Savings Bank Building, he had two things to consider. First they had to be fireproof, rot-proof, non-shrinking, unaffected by heat or humidity and impervious to vermin. Secondly, he had to design them in a way so as to fit in with the colour schemes of the fourteen different floors. So the Shanghai bankers came to Canada and in Hamilton they found doors -- steel elevator doors upon which Canadian craftsmen made play with blacks, browns, reds, tans, greens and creams to intrigue the eyes of Chinese mandarins in Shanghai.

Today steel doors from Hamilton are carried on mule pack trains through the Andean passes to the interior of Colombia in South America. They are in service in Panama and Peru, Bolivia and Chile. They have been used to withstand the humidity of Bermuda and the dryness of Morocco. Europe, France, England and Roumania are using them. They go to Japan, Australia and New Zealand and nearer home to Newfoundland, Cuba and Mexico.

In Canada at the last census there were between four and five hundred elevator tenders whose safety as well as that of the passengers depends upon the reliability of elevator doors.

No. 45 — Radium

Radium is the most precious substance marketed in the world today. The price of one gramme is about $30,000 while the same amount of gold is worth a little over one dollar. Each gramme of radium has energy equivalent to that of 3,000 tons of coal and the penetrating powers of its rays are very great. The common standard of measurement is by the milligramme which is one-thousandth part of a gramme. A gramme is a weight sufficiently minute to be used in weighing pinheads. Ninety milligrammes of refined radium can be sealed in a tube smaller than a match.

When the radium-bearing ores were first discovered in Canada, there was no one in the country who knew the method of treating them. Belgium held a virtual monopoly on world radium markets with sources of supply in the Congo, so Belgian assistance was not to be expected. A French scientist, who began his radium career in the Curie laboratory, came to Canada's assistance and, although it took months to produce the first gramme, the output gradually increased.

The silver-radium ores are separated and concentrated at the mines in the North and the resulting pitchblende concentrates are shipped to Port Hope, Ontario, in small bags that have been specially made and treated for their precious contents. The pitchblende itself looks like tiny lumps of anthracite coal but lacking coal's hard lustre.

The next one hundred steps or so in producing radium are very involved, consisting largely of as strenuous and complicated a series of chemical reactions as ever imagined. The finished product looks something like common salt and is sealed in minute glass tubes not much bigger than the lead in a lead pencil. These are stored in a block of solid lead and in 24 to 48 hours the action of the radium discolours the glass completely. Fresh radium salts glow brightly in darkness but seem to lose some of this visibly luminous quality in a short time though the rays continue for nearly 1700 years.

From Port Hope, the radium goes to the National Research Council in Ottawa where its official strength label is attached, and then usually to Great Britain where it is changed to a sulphate and sealed in needles, plaques or bombs.

A report issued by the Mining Branch of the Dominion Bureau of Statistics says that 34 tons of pitchblende concentrate was flown 1,500 miles to the nearest railway during 1935 in the winter flying season. Although figures are not published for the amount of radium obtained, it is estimated that nearly two grammes per month are being produced in Canada.

No. 46 -- Honour for Dr. Craigie

Not quite fifteen years ago a very important step was taken by the Department of Agriculture in the saving of large quantities of wheat from the deadly rust disease. In June 1924, Dr. H. T. Gussow, Dominion Botanist, made an urgent plea for facilities to study this disease in the rust z one and presented his case to the Select Standing Committee on Agriculture and Colonization of the House of Commons, Ottawa.

Dr. Craigie's Association with the Rust Research Laboratory at Winnipeg commenced with its opening in 1925. A native of Nova Scotia, he had served during the war in France and India and has studied at three universities -- Harvard, Minnesota and Manitoba. He received his doctor's degree in 1930 for his researches in grain rust. He was presented with the Erickson Award by the International Botanical Congress in England and in 1936 was elected a Fellow of the Royal Society of Canada.

On November 15, he was presented with the new official medal by the Professional Institute of the Civil Service of Canada, for meritorious work in the general interest of the public. Dr. Craigie is the first recipient of the medal.

Now to come back to the particular enemy he conquered. The rust disease was scattered by spores but all the phases in its life history were not certain knowledge. In one particular stage the parasite lived on barberry leaves and at other stages on the stems and leaves of wheat, oats, and various wild grasses. The spores lived over during the winter. Dr. Craigie discovered the missing link in the life story.

From this discovery plant breeders may be able to produce rust resistant varieties of grain. Furthermore, the far-reaching importance of this discovery at once attracted world-wide attention and set in motion a new cycle of investigation.

No. 47 -- Registered Money

In 1879, James Ritty of Dayton, Ohio, went on a holiday trip to Europe but his trip was not a pleasant one. He kept thinking of the way his business was failing, not from the want of patronage but somehow the money was slipping away. His mind

centred on the old-fashioned cash register, the one which had a little bell that rang when the drawer was opened but had no way to show how much had been put in — or taken out.

While pondering over his trouble as he stood on the deck of the boat, he became fascinated by the action of the ship's propellers. Then a solution came to James Ritty.

He invented a new cash register. It was arranged so that when a key was pressed down the amount registered by punching a hole in a roll of paper upon which were columns of figures reading from one to nine dollars and multiples of five cents up to 95. At the end of the day, the drawer was unlocked and the roll taken out. Then started the job of multiplying the number of holes punched at the two-dollar mark, the number at the 25-cent mark and so on.

Ritty found practically no market for his machine and soon sold his patent rights. Then John H. Patterson of Dayton, took up the struggle and a fierce battle it was. Sales clerks did all kinds of things to discourage him. They made wrong change purposely to discredit the accuracy of the register. When he advertised his machine by mail, they destroyed the letters before their employers could see them. But the work went on and now the company which he founded 50 years ago markets its machines in every corner of the earth. A Toronto factory was opened last year to supply the Empire needs.

The modern cash register, adding machine and typewriter combined, is composed of 10,000 parts. It takes 17 hours to check its accuracy after it has been assembled, but there is no chance for a dishonest clerk to make a profit out of it.

The Internal Trade Branch of the Dominion Bureau of Statistics reports that in 1935 the total sales of retail merchandise trade amounted to over two billion dollars. No doubt practically every candy store, meat market, garage and furniture store which helped to make up this sum, had a machine to register its sales.

No. 48 — Home, Sweet Home in Canada

Home is a word which means everything to most of us, but which we are at a loss to define. From the oldest to the youngest, home is the place where we are known and accepted at our own value and above all loved and understood.

Out of the eleven million people in Canada, there are about two and a quarter million families, or small groups of people making a home.

As in practically every country in the world, the typical Canadian family is the father and mother with children. There are nearly one and a half million such homes in the Dominion.

Then, there are the families where the mother is left to look after the children. Most of the women are widows and they number 182,000. Some 40,000 are caring for their children while the father is away earning a living in a lumber camp or travelling over land or sea. Often the husband has to carry on as both father and mother to his children and we find there are 57,000 such homes.

Of course, there are families without children. A typical case might be a brother and two sisters living together, clinging to the memories of an earlier home, or a man and wife without children. Whatever the number or relationship of the

members to one another, there are at least two and a quarter million places that can be called home.

As the family goes, so goes the nation. All those who have families to support may be regarded as having the greatest responsibility in the economic life of the country. It is up to them to see that the next generation is properly fed, clothed, housed and educated. When all is said and done, the home is the rock upon which the state is built, and the family man is the corner stone.

The figures used in this information are from the Census Branch of the Dominion Bureau of Statistics.

No. 49 — Where Do You Work, John?

We work to live is true of the majority of people. Almost thirty per cent of what we earn is spent on food, fifteen per cent on maintenance of the home, and eight per cent on clothing. Considerably more than half of what we earn is expended on these three items alone.

Where does the money come from? Where does John earn his livelihood?

For the sake of convenience, the breadwinners may be divided into three classes -- the primary producers, the secondary producers and the growing community engaged in the rendering of services.

The primary producers are engaged in extracting goods from the resources supplied by the bountiful hand of Providence. Agriculture carried on by more than 730,000 farms produced one-sixth of the entire national income or about three-quarters of a billion dollars. Mineral products obtained from the earth by 70,000 workers amounted to 180 million dollars. Unmanufactured products of the forest were valued at 115 million dollars and gave employment to 80,000 men. The fisheries and allied industries required the services of 77,000 men.

The secondary producers turn the raw products into manufactured commodities. The mills and factories of Canada employ close to 600,000 persons and the value added to raw materials by the manufacturing process is now around one and a half billion dollars annually.

The services include a great variety of workers, from professional men to domestic help. No fewer than 200,000 females are engaged in domestic service.

Looking over the census figures of 1931 we find that there were over two and a half million persons employed and earning an income, large or small. The average earnings of males in a year is $927 and of females $559. Besides the two and one-half million workers, who constitute nearly one-quarter of our entire population, there are 400,000 employers of labour and 600,000 other persons who are engaged in business on their own account.

This information comes from the General Statistics Branch of the Dominion Bureau of Statistics, Department of Trade and Commerce.

No. 50 -- Canadian Potteries

Canada's present day pottery industry may be said to have got its start at the close of the 19th century when from out of the fiery interior of the Black Country kilns of England, a shipment of sanitary ware arrived at St. Johns, Quebec.

At the time, there were two pottery firms in St. John's which made tea-pots, jugs and other similar items. But Canadian-made tea-pots could not match those made in England, either in price or quality. So when the shipment of English-made ware arrived, a new vision came to the owners of the firms. An encouraging factor lay in the fact that there was a tremendous building boom in the West, while in the East, inside plumbing was virtually unknown. Within a few months both firms had switched from the manufacture of kitchen utensils to making sinks, tubs, etc.

Today, these small potteries have gone and in their place is a firm producing a complete line of vitreous or glassy china sanitary ware ranging from bathroom equipment and accessories to soda fountain jars and oven ware.

This is only one example of the strides made in the manufacture of clay products in Canada. Although most of our china dishes are imported, yet Canadian manufacturers are making progress along this line. The chief drawback lies in the fact that we lack the necessary clay for this particular product.

In Southern Saskatchewan there are deposits of ball clays which are used for bonding in making porcelain and other types of high-grade clays in Northern Ontario. But the only place that china clay has been produced commercially is near St. Remi, Quebec.

The clays produced in Canada are used for making building bricks, tiles for roofing and flooring, drain tiles and sewer pipes. There are over one hundred plants making products from domestic clay and their output was valued at over three million dollars in 1935.

Imported clay comes chiefly from England and the United States. In 1935 there were 20 factories making tableware, pottery, floor and wall tile, sanitary ware, earthenware, porcelain insulators and numerous other products valued at over two million dollars.

According to the External Trade Branch of the Dominion Bureau of Statistics there were 42 tons of china clay imported last year.

No. 51 - The Potter

The primitive potter took the clay as he found it on the surface of the ground or by some river bed, and spreading it out on a stone slab, picked out the rocky fragments and after beating it with his hands, or stones, or even his feet, fashioned it into such shapes as were needed or fancy dictated.

This is one industry whose methods have changed very little throughout the centuries. The tools and methods have remained in the simplest form, the potter's wheel and the use of fire instead of the sun for drying and hardening being the chief improvements.

The first operation is the mixing of the clays. Vitreous or glassy chinaware is made from five kinds of china clay, three from England and two from the United States with some feldspar and flint quarried in Canada added. This is an important step because clays behave differently in various geographical locations. Centuries of experience have gone into the formula used by each firm making pottery.

Water is used to make the clay into a liquid which is passed through screens to remove particles of stone or coal. One screen is magnetized to catch little bits of metal which would make tiny rusty freckles on someone's wash-bowl.

The mixture then has the water squeezed out of it and it emerges in moist slabs. These slabs are mixed with a measured amount of water and piped into moulds after being treated with chemicals which give the mixture greater drying powers.

All moulds are made of plaster-of-Paris which are one-eighth of an inch larger than the dried casting is intended to be. That is because of the shrinkage. The craftsman who makes the moulds from solid blocks of plaster uses blue prints and upon his skill depends the beauty and utility of each piece.

After a few hours in the moulds the casts are taken out. At this stage it is called "green ware" and is light brown in colour. A period of ten days drying on open racks makes the colour almost white. Then comes the final drying, a journey through the fiery heart of the kiln which lasts three days, progress being made at the rate of six feet every seventy minutes. So terrific is the heat that the wheels and tracks of the car carrying the casts are sunk in the sand and cool air pumped constantly between the car rails.

After a dip in a tub of glaze the article goes for another ride in the furnace. If colours are desired, they are sprayed on before the final baking and after six weeks in the making, each product is ready for the market.

At the last census, according to the Dominion Bureau of Statistics, there were nearly 1,300 people making earthenware and china, only 135 of them were women.

No. 52 -- Oil from the Maritimes

Remember how the teacher told us about the tidal bore on New Brunswick's Petitcodiac River caused twice every 24 hours by the playful tides of the Bay of Fundy? Like many others who visit this natural curiosity we should probably be impressed and let it go at that, but not so a mining engineer who visited there a few years ago with a certain idea in the back of his head.

In 1907 a group of people from New Brunswick who had been granted oil and gas rights over a large area of the province, went to a number of Old Country capitalists to ask for aid in developing oil fields. Among these gentlemen was Dr. Henderson who was interested enough to come to Canada and not until he arrived on the scene was any real exploration work undertaken.

What caught the eye of the experienced engineer was the fact that just before the bore came in, the level of the river was lower than at any other time and left exposed out-crops of black rocks in the rive bed of Stony Creek. The hair-breadth escapes from on-rushing tides and from mud, resulted in the discovery of the Stony Creek Gas and Oil Field in New Brunswick today.

Prior to this discovery, many geologists had definitely stated that oil and gas did not exist in the Maritime Provinces in any quantity worth mentioning. Dr. Henderson, however, had such faith in his own conviction, gathered from world-wide experience, that he put his own money into the venture.

The gasoline and oil from this field is sold chiefly to local industries, the government and the railways. No more than can be sold is produced although vast quantities are available. The crude oil burns without smoke or dirt and is much sought by bakeries, laundries, wall board plants and so on. Much of the gasoline is used by government road patrols.

At present the principal source of crude petroleum is the Turner Valley in Alberta. There are important fields in southern Alberta, 14 throughout Ontario and last but not least a recent discovery near Fort Norman in the Northwest Territories.

A report by the Mining Branch of the Dominion Bureau of Statistics shows a total of nearly one and a half million barrels of crude petroleum produced in Canada last year. Over one million barrels of it came from Alberta, 165,000 from Ontario and 17,000 from New Brunswick.

No. 53 — A Trout Nursery

In spite of some fishermen's tales, we are told by men who study fish that the speckled trout rarely weighs more than eight pounds, even though it may live to the ripe old age of fifteen summers.

If we make believe that all speckled trout weigh this much, then last year over 900,000 fish were caught — at least the Fisheries Branch of the Dominion Bureau of Statistics reports that that number were caught and landed for marketing. Of course, there is no way of knowing about the ones that were caught but not landed nor how many went the way of all fish caught by big boys and little boys. The year before over 800,000 were caught and marketed.

At this rate of depletion, the mother fish would be kept very busy raising a family to keep speckled trout from becoming extinct. However, human beings are realizing the value of keeping the brooks and streams supplied with trout, and piscatorial nurseries are established throughout the provinces by their governments.

The station at St. Faustin is the most recent and largest of six nurseries in Quebec. There a fish expert who, has thirty-five years of experience to his credit, raises the baby trout in artificial ponds and concrete tanks filled with water piped from springs.

The eggs are gathered about the fifteenth of October and remain during the winter in small black troughs where the spring water never freezes. Hatching takes place in March and in May the small fry are playing about in the cement tanks. During the first few months 650,000 little fish can eat every week, 2,000 pounds of beef liver served finely ground, three times a day. By September or October the fish are big enough to be transferred into public and private lakes.

One or two interesting events take place in the nurseries. First, the weekly tonic salt bath which keeps the fish's skin free from disease and second, marking of the trout by removing the front right fin. For this event, the fish are immersed, a few at a time, in an anaesthetic solution while the operation is being performed.

No. 54 -- A Globe Trotting Industry

Picture a neatly labelled bottle of medicine wrapped in cellophane in the hands of an ailing Borneo villager. In that bottle there is, more than likely, an herb or an oil that the sick man's head-hunting ancestors used long before they secured their first white trophy. From out of the deepest jungle and from polar seas come raw materials and back to the jungle and polar area they go all dressed up in neat bottles or boxes. They have been mixed and powdered, liquified and separated until experts give their approval.

The business of making medicine from botanical drugs has changed very little from what it was in the days when the world was young. Pharmacy is a social responsibility governed by a jealously guarded code of ethics which have for centuries proven to be the most practical. Every ingredient must be tested for purity and uniformity. Here are a few things which the agents of this globe trotting industry gather for the alleviation of suffering.

From across the seven seas dozens of different kinds of strange herbs and roots, fragrant barks and evil-smelling gums are brought. Bales of bachu leaves from the Hottentot country; aloes from Zanzibar; cinnamon and sandalwood from India; arrowroot from Jamaica, dandelion roots from Germany, rhubarb roots from China; evaporated gastric juices from cows and fungus from Russian rye, to say nothing of the drums of cod-liver and petroleum, bags of sugar and even tins of pineapple, all meeting in one place. Here they halt their long journeys for a while and then on they go again.

In 1935, there were 166 factories making patent and proprietary medicines, pharmaceuticals and similar products, valued at 21 million dollars. Ontario produced 63 per cent of the Canadian output and Quebec accounted for 30 per cent.

Imports into Canada of drugs, medicinals and pharmaceuticals in the same year were valued at nearly three million dollars; over one third came from the United States, the United Kingdom sent $853,000 worth and France $244,000.

This information is based on a report from the Chemical Branch of the Dominion Bureau of Statistics.

No. 55 -- A Rainbow in the Chimney

Strange though it may seem, brilliant scarlets, blues, greens and yellows may be going up through the chimney at this present moment. Of course this magic rainbow is not visible to the ordinary looker-on, but chemists have been able to produce these lovely colours by the persuasive powers of heat on coal.

Soft coal when heated in coke ovens, away from contact with air, makes coal gas and coke. One of the by-products is coal tar, which drops out as a liquid. It is black, sticky and evil-smelling, but this unromantic mass contains many lovely colours. The coal tar is heated and at different temperatures various coal tar products are separated. Then comes the excitement of mixing so many parts of each separated product to so many parts of another. Just like making a new kind of cake, the difference being that the chemist knows what he is likely to get while the cook takes a chance. Each desired dyestuff is built up according to a definite plan.

The term 'fast colour' means a colour which cannot be washed out or faded by light. These dyes or colours are more difficult and expensive to make and to apply to fabrics. They are insoluble in water and before being applied to the material,

must be made temporarily soluble to penetrate the fabric. When the cloth dries, the dye remains and no amount of washing will remove it. The reason why fast colours are more expensive than others can be readily understood.

In Canada during 1935 there were 23 establishments which reported to the Manufactures Branch of the Dominion Bureau of Statistics that about 31 million yards of fabrics and over one million pounds of cotton and artificial silk yarns had been dyed and finished by them. Over three million yards of fabrics had colours printed and painted on them, which all sounds like a lot of dyeing for 997 people.

This rainbow-making industry used 426,000 pounds of dyes in colouring fabrics and yarns to delight the eyes of Canadian people, especially the ladies.

No. 56 — Natural Resources of Japan

At the present time, Japan is causing a great deal of anxiety, especially to those who are responsible for our marketing of Canadian products. The average citizen is more concerned with the thought of conflict. So it might not be amiss to devote some space to facts about the Land of the Rising Sun.

Japan proper comprises the mainland, Shikoku, Kyusku, Hokkaido, Chishima, Ryukyu, and over 400 islands. In all the area is about 148,000 square miles and the population over 69 million. Canada is about 25 times greater in area and has only one-sixth of the population.

Mountain ranges and volcanic chains traverse the Japanese islands, the rivers are generally rapid, being used mostly for generating water-power. The plains, few in number, but fertile, contribute much to the development of industry. Numerous bays on the Pacific Coast are good harbours. The climate in general is mild but humid.

Only one-seventh of the area is fit for ploughing and more than half of it is rice or paddy fields. Intensive cultivation is practised, the average farm being two to two and a half acres in extent. Manual labour is employed with simple implements, although the ox and horse are used to some extent. The annual agricultural production is valued at three billion yen or about 840 million dollars. Canadian agricultural wealth amounts to about six billion dollars a year. The principal products raised in Japan are cereals, including rice, wheat and barley.

The forests of Japan cover 58 million acres or nearly 62 per cent of the total area of the country. Canadian forests occupy about 14 times as much space.

The principal mineral products include gold, silver, copper, iron, zinc, tin, lead, as well as coal, petroleum, sulphur, sand and stone, and are valued at 271 million dollars. Canada's mineral production was valued at 361 million dollars last year.

The fishing industry brought in about 140 million dollars in Japan while the same industry in Canada during the same year was valued at 34 million dollars.

No. 57 -- Selling Canadian Products to Japan

Every day existence seems to be made up of buying and selling. Individuals selling their services so that they can buy food, clothing and shelter; business firms selling their wares and, greater still, nations selling their products to each other, either raw or manufactured, maybe both. Japan is a great market for Canada's raw materials.

The Japanese market is a very difficult one owing to the difference in race, language, and methods of doing business. Advertising is an interesting phase. Newspapers and periodicals are used mostly by local dealers, who, with few exceptions, do not advertise as extensively as in other countries. Japanese magazines contain very few advertisements relating to foreign merchandise, and street car advertising space is mostly for Japanese products. However, window displays and frequent exhibitions have produced results. An excellent way of acquainting the Japanese with Canadian goods has been found to be through catalogues. The Japanese spend hours looking over these publications and, even though they do not understand English, the cuts and drawings appeal to them and they have friends who make translations for them.

In order to facilitate the preliminary details of selling products in Japan, the Canadian government has trade commissioners in that country, who, as in all foreign countries, find out the possible opportunities and just how to present the commodity. These men know the duty rates, the prices in the domestic market, the public demand and the intricate workings of foreign business customs.

All the large Japanese firms, and a great many of the smaller concerns, have members on their staff who have lived in the United Kingdom or North America, or who have studied English. This helps considerably.

A point seldom realized by Canadian exporters is the proximity of the Japanese market to Canada. Freight can be delivered in Yokohama nine days after it is put on board at Vancouver. From the eastern coast, however, is much longer. There are no direct steamship lines from Montreal, Halifax or Saint John to Japan. Goods are sent by coastwise steamers to Vancouver via the Panama Canal.

This information dealing with Japan has been based on information from the External Trade Branch of the Dominion Bureau of Statistics and the Commercial Intelligence Journal of the Department of Trade and Commerce.

No. 58 -- Canada's Trade with Japan

The basic aim of the industrial life of Japan is to build up her own industries and to manufacture everything possible at home. Hence, she is an importer primarily of raw and semi-manufactured products.

In 1935 there were over 85,000 factories employing two million workers. In addition, there are thousands of household industries -- each employing fewer than five persons -- for which statistics are not available. The cost of manufacturing is relatively cheap and manufactured articles are protected by a high tariff.

Raw cotton, wool, crude and heavy oil, and iron and steel make up about 50 per cent of Japan's imports. Other important imports are pulp, ores, wood, rubber, beans and peas, wheat, sulphate of ammonia, copper, lead, automobiles and parts, gasoline, etc. About forty per cent of Japan's exports consists of cotton tissues, raw silk and artificial silk tissues. Other exports are machinery and parts, iron, canned and

bottled goods, knitted goods, pottery, cotton yarns, vegetable fatty oils and toys.

With Japan's need for raw materials to feed the mouths of the 85,000 factories, where does Canada stand?

Last year close to 20 million dollars worth of products went to Japan from the Dominion. Non-ferrous metals, such as copper, nickel, lead and zinc and their products accounted for seven million dollars. Next in order of value were wood and paper at five million dollars, agricultural products about the same, non-metallic minerals such as asbestos and sulphur $950,000, animals and animal products $922,000, and iron and its products $656,000.

In return we bought from Japan imports to the value of four million dollars. Slightly over one million dollars worth of silk and cotton textiles and products, the same amount of agricultural and vegetable products, rice, oranges and tea being the chief items. Non-metallic minerals and their products, such as pottery, chinaware, window glass and celluloid amounted to $506,000. Animal products were valued at $350,000 and wood and paper products at $123,000.

No. 59 — Coronation Memories

Those who were fortunate enough to attend the Coronation celebrations in London very likely have many memories to cherish in the coming years. Many others, who were unable to be there in person, will recall getting out of bed early in the morning to hear the ceremony over the air direct from Westminster. Young people have had the privilege of sharing to a greater extent than ever before in this history-making episode. In days to come the impressions received on that occasion will have some influence upon the trend of their thinking.

As a whole, Canada spent somewhere in the neighbourhood of one million dollars to celebrate the Coronation. Every city, town and village held festivities of some kind, souvenir medals were distributed, churches held special services, guns fired salutes and even special flower beds were planted in public areas.

Among the tangible aids to memory is a consignment of four thousand acorns from King George's Park, Windsor, which were sent to Canada to be planted by Canadians who pledged themselves to tend them as they grow.

A glowing memory will be retained by some 86,000 boy scouts who took part in making the greatest beacon light chain in history. From Sydney, Nova Scotia, to the British Columbian coast and thence up to the North towards the Yukon, the beacons blazed.

The Royal Canadian Mounted Police, who received great praise for their magnificent appearance and for the excellent control of their mounts, will probably remember with a smile the stir of excitement they caused wherever they went.

The three hundred Canadian school children who were selected throughout the Dominion to attend the great event, are, no doubt, giving descriptions to the rest of the class of their adventure, how they went along with the rest of the seven thousand children to the great Rally of Youth in Westminster Hall on May 18 and to Westminster Abbey on May 19.

Even the trappers in the Far North will have something to remember. The great demand for Canadian furs for trimming court costumes caused prices to reach something like the 1929 levels, according to the Fur Statistics Branch of the Dominion Bureau of Statistics.

No. 60 — Tomato Juice for the Miners

In reading over a report supplied by the trade commissioners in England to the Department of Trade and Commerce regarding the market for Canadian canned goods, it is interesting to note "that the flavour of Canadian tomatoes is well liked and the extra juice contained in the tin is very popular with a certain section of the public in the North of England, especially the miners". And again "tomato juice is very gradually increasing in demand but as yet it is only rarely seen on hotel or restaurant menus in the West of England. In some hotels it is more frequently found in the bar than in the dining-room."

Tomatoes are having a time of their own in England. Spain at one time supplied England's market with considerable quantities and, when this source was curtailed by the war, the Canadian tomato came to the fore. Now, Italian packers are making a determined effort to capture the English trade which, in part, was lost for several seasons to Spain. Although the Italian tomato is considered by some to superior to the Spanish variety, the Canadian pack has a fine flavour, and local brokers are of the opinion that the increased business that has been done in Canadian tomatoes is not solely dependent upon the difficulties in Europe.

As for tomato products, several of the internationally known packing firms which supply this market from domestic or United States plants have their tomato products put up in Canada. This includes, in addition to canned tomatoes, tomato juice, catsup, chili sauce, and soup.

Exports of Canadian canned tomatoes increased from 28 million pounds for the year ended August 1936 to nearly 30 million for the year ended August 1937, according to the External Trade Branch of the Dominion Bureau of Statistics.

No. 61 — "My Heart's in the Highlands"

On November 30, Scotsmen and sons of Scotsmen the world over celebrate in memory of their patron saint, Andrew, son of Jonas, a fisherman of Bethsaida. There are more Scots outside of Scotland to sing "My Heart's in the Highlands" than in the Highlands themselves. In Canada, people of Scots origin have about tripled in number in the last sixty years or so and from this staunch race have come many prominent men and women.

Back in 1829 when a great many were leaving their homes in the Highlands and had crossed the ocean to make a living in Canada, a poem expressing their feelings over the severance of home ties became a well-known song. The most striking verse runs:

From the lone shieling on the misty island
Mountains divide us, and the waste of seas;
Yet still the blood is strong, the heart is Highland,
And we in dreams behold the Hebrides.

Whole villages at a time came to the new country carrying with them their language, their opinions, their songs and their traditions. They also retained their strong religious principles.

But while remembering to "tak' a cup o' kindness yet for auld lang syne", and for the land of their fathers, the allegiance of the Scots is to Canada, the land which welcomed the exiles and which continues to present opportunities to their sons and daughters.

Imperial Russia also claimed that Saint Andrew preached the Gospel there and Peter the Great founded the Russian Order of St. Andrew, the highest in the Russias of the Czars. However, the U.S.S.R. pays no attention to St. Andrew today.

But throughout the length and breadth of Canada as well as in all parts of the world, the Scots remain faithful to Saint Andrew's memory.

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