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## THE Industrial World

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## CHINESE QUESTION IN THE UNITED STATES AND IN CANADA.

have a "Chinese Question" arising and coming front in Canada, but so far neither our legisla- tor the general public appear to have realized it. For three years the public mind has been occupied with other matters that this has escaped notice; but the time is fast approaching when it will compel our best regards, and not with any gentle knock, either, but with the hard knocks of un- pleasant experience. In 1878 we were occupied with the general election, to the comparative exclusion of public issues. Soon after the opening of 1879 we were busy wrangling away until near the close of 1880. Then the Pacific Railway question came to the front as the great issue of the day, and it has since been the absorbing topic of public discussion and discussion. During all this time a question has been growing upon us, in the Province, but we have been too much occupied with other matters to notice it. We had better notice it, and give our attention to it, otherwise some unpleasant reminders of our neglect may follow. We are sleeping over our Chinese question, our ears are wide awake and bringing theirs to a point. Early in the present month General and Mr. Tasscor, American Commissioners, had been sent to China to negotiate, along with the American Minister resident there, a treaty, arrived at San Francisco, bringing with the draft of what had been agreed upon; and two weeks ago the treaty and supplementary articles connected therewith were laid before the Senate at Washington. These documents include a list of the negotiations from the first day of the last, when the representatives of the two countries met in Peking and exchanged full powers, to the departure of the two American Commissioners. On the 13th of that month, after a long day of talk and written communication had been had, the American Commissioners laid before the Senate the following minute of each day of the negotiation of existing treaties as was thought necessary to secure the object of the mission:—

**First.**—The United States of America and the Empire of China recognize the mutual benefit which results from the proper intercourse of the citizens and subjects of the two countries, and, in order to encourage such intercourse, the two countries, agree that citizens of the United States residing in China, and subjects of China residing in the United States, for the purpose of study or curiosity, shall enjoy in the respective countries all the rights, privileges, immunities and exemptions which are granted by either country to the citizens and subjects of the most favored nation.

**Second.**—Whenever, in the opinion of the Government of the United States, the coming of Chinese laborers to the United States, or their residence therein, affects or may affect the interest of that country, or to endanger the order of the said country, or of any locality or territory thereof, the Government of the United States may regulate, limit, suspend or prohibit such coming

or residence, after giving timely notice of such regulation, limitation, suspension or prohibition to the Government of China, and the words "Chinese laborers" are herein used to signify all immigration other than that for teaching, trade, travel, study and curiosity heretofore referred to, and authorized and provided for in existing treaties.

**Third.**—But it is distinctly understood between the contracting parties that all Chinese subjects who, under the faith of existing treaties, have gone into or are now residing in the United States shall be guaranteed all the protection, rights, immunities and exemptions to which they are now entitled under the provision of said treaties.

From the experience of the American Government in dealing with the Chinese, we may learn something that may be useful to ourselves, and, therefore, we think that a brief account of what passed may be of interest here, as well as in the States. On the 23rd of October another interview took place, at which there was a full discussion of the foregoing project for a treaty, and a preliminary proposition by the Chinese Commission in reply. There were three points of difference. The Chinese Commissioners proposed that the treaty should apply only to Chinese immigration into California, that the limitation should apply only to the entry of such immigrants, and should not impose penalties or disabilities of any kind, and that artisans should not be included in the class of immigrants prohibited. The result of this interview was regarded by the American Commissioners as satisfactory. On the 31st of October, the Chinese Commissioners submitted a project for a treaty in brief as follows:—

**First.**—The United States to limit, but not prohibit, the entry of Chinese immigrants into California ports, only such immigrants to be included in the limitation as should be actual laborers; no disability of any kind to be imposed upon such laborers, and regulations to be of such a nature only as to hinder the entry of such laborers.

**Second.**—Chinese laborers to be accorded free entry into all parts of the United States except California; all other classes—teachers, students, travellers, traders or artisans—to be allowed free entry into California, as well as other States, and all Chinese laborers now in California to be protected and not included in limitations.

**Third.**—All Chinese laborers permanently or temporarily residing in California to be protected, and the United States to exert all its power to secure to them the same privileges, immunities and exemptions that are enjoyed by the citizens or subjects of the most favored nation.

**Fourth.**—Limitations placed upon immigration of Chinese laborers to be temporary in their nature; the number of immigrants allowed not to be excessively small, nor the term of years excessively long; the limitations to apply only to Chinese laborers employed by American citizens.

**Fifth.**—Provides that regulations shall be submitted to the Chinese Government for its approval.

Some of the propositions contained in this project the American Commissioners decided to be entirely inadmissible, and on the 2nd of November they submitted a treaty project of their own, which, in every essential particular, was finally embodied in the treaty signed on the 6th of November. The only concession made by the American Commissioners was to substitute the phrase: "The Government of the United States may regulate, limit or suspend such coming," etc., for "The Government of the United States may prohibit," etc. In return for this, the Chinese Government concedes to the United States the right to use its own discretion as to what regulations shall be made within the provisions of the treaty. Much interest attaches, also, to that part of the treaty which deals with commercial relations between the two countries; and, according to the American Commissioners, two points have been gained, namely:—

**First.**—It makes the Imperial Government directly responsible for any maladministration of the Chinese customs laws and regulations.

**Second.**—It tends to diminish the power of provincial officers, and increases that of the Imperial Government, in the administration of the customs laws. These concessions obtained in the first article of the treaty would not have been secured had it not been for the anxiety of the Chinese Government to have an additional article adopted prohibiting the traffic in opium. There are still other questions relating to commercial intercourse between the United States which remain unsettled, and which are the subjects of discussion at the present time between the Chinese Government and the representatives of the various treaty-making powers in China. The principal subject of discussion now remaining is that of the tariff, including the system of transit passes and kindred regulations. The Chinese Government seems disposed to accept the rule that the import duty, once paid at the port of entry, shall protect foreign importations from any other duties in the interior, no matter where the goods may be sent. There is a wide difference between the Chinese Government and the representatives of the foreign powers to what the amount of such duties shall be.

The New York Tribune says that in the report of a conference between Sir Thomas Wade, the British Minister, and the Chinese authorities, held on the 13th of November, the British representative was pressed to indicate what was the utmost increase of tariff duty that foreign representatives might consent should be imposed. He replied that taking the tariff duty and the half duty at a rate of one-half of 1 per cent, or, at the most, of 1 per cent, would be regarded as a very liberal concession. An addition of one-half, of 1 per cent would have

been given in 1879, a total of 3,619,677 taels, of 1 per cent 3,847,900. The Chinese Ministers were confident that this arrangement would not be satisfactory to the Provincial Governments, and if not that it would fail of its end. In some provinces, at this time the Li Kio equalled three tariff payments, that is to say, including the tariff, imports paid 29 per cent. In other provinces they paid 15 per cent. Finally, the Chinese Ministers expressed the belief that 12 per cent was the minimum that would satisfy the provinces. A Tribune correspondent was assured by a Senator that the treaty would undoubtedly be ratified, and he made the significant addition—that soon after ratification a Bill would be introduced, limiting Chinese immigration in accordance with the new treaty. Our neighbors will lose no time in acting upon the freedom from the obligations of the old treaty which they have just gained, after much and wearisome "haggling" with the diplomatists of the Flowery Land. One of the Commissioners, it may be mentioned, decried the report that the Chinese met the American negotiators half way, and says that the points demanded by himself and colleagues were only gained by persistent efforts. As for the prevailing public opinion outside of Congress, it is to the effect, not that the treaty gives too much power to the American Government to limit or to stop Chinese immigration, but that it is not sufficiently definite on this point and does not go far enough. The feeling among Californians is indicated in the following despatch from Washington:—

"The California delegation in Congress is divided in opinion as to the merits of the proposed new Chinese treaty. The Democratic members from the Pacific Coast, however, are united in their opposition to it, and seem disposed to oppose the treaty from partisan grounds. They do not wish to have it appear that any branch of the Republican Administration can do anything to settle the Chinese question in a manner that shall be satisfactory to the Pacific Coast. It appears also that Republican Congressmen from the Pacific Coast are not wholly in favor of the measure. They point to what they consider two defects in it: first, the possible construction of the word 'laborers'; second, the fact that the treaty in effect permits the naturalization of the Chinese. The word 'laborers,' as used in the treaty, some of the Republican members from the coast say, is not sufficiently specific, and it might be so construed as to give rise to misunderstanding or to defeat the real object of the treaty."

Among public men of the first rank in the United States, no one has taken so conspicuous a stand against Chinese immigration as Mr. BLAINE. Current rumor says that he will almost certainly be Secretary of State in the new Administration, and, should this prove true, we may depend upon it that the powers of limitation or prohibition will be exercised to the utmost verge that the letter of the treaty allows. Now, has this important change in American policy, with regard to Chinese immigration, no bearing at all on the same question with ourselves? We believe that it has a very important bearing indeed on the Chinese question in British Columbia, and that no very long time will be required to demonstrate the fact. The American Government has been taking steps to secure a new treaty with China for the express purpose of getting rid of the disagreeable obligations of the old treaty, under which Chinamen had the privilege of coming into the States in numbers unlimited. The effort has been successful, and no time will be lost in making use to the full of the power of limitation, or even prohibition, which the new treaty confers. These being the circumstances, what would any reasonable man expect to follow? This, without doubt: that the tide of Chinese immigration, turned back from the United States, will begin to flow in upon Canada, at a rate to which our experience of the last few years will bear no comparison. Shut out from California, the Celestials, "like grasshoppers for multitude," will pour their tens or even hundreds of thousands into British Columbia. This is no mere bugbear of the imagination, but something that our cool common sense must regard as a reality near at hand, if we do not take efficient measures of prevention. Further, the building of our great national railway, and the expected impetus to the development of the Pacific Province in consequence, will be like a loadstone to draw armies of Chinamen to our shores. It will be said by some amongst us—let them come; we shall then have plenty of cheap labor to build the railway. The reply is, and should be, that we do not want cheap labor, and that cheap labor, with workmen living on a miserable pittance, is a curse to any civilized country. A country where labor is cheap may be a paradise for a few rich men, but we want to make this a desirable country for the masses of the people to live in. In proportion as high wages and a high standard of living are maintained in any country, in just such proportion is the ideal of a perfect State and a truly civilized people realized. Millions of miser- able toilers, kept down with their noses to the grind-

stone, and officered by a small class of wealthy educated men, do not constitute a perfect State; nor do they, in the proper sense of the term, constitute a civilized community at all. Compared with what people claiming to be civilized ought to be, they are in a condition of urban barbarism—the barbarism of the city, which is scarcely any more desirable than that of the forest or the prairie. The objections which this position suggests are obvious enough, and they are plausible, too; but the show they make is upon the surface merely. Unless we have cheap labor, it will be said, farewell to all our dreams of manufacturing for foreign markets. The reply to which is that we had better not dream too much of manufacturing for foreign markets, except in a few specialties. If the existence amongst us of a wretchedly paid and overworked factory operative class be a necessary condition of our having a large foreign custom for factory products, then, we say, far better that we should manufacture for ourselves only, and maintain a high average status of comfort and character together in our community. "Better fifty years of Europe than a cycle of Cathay," says the poet. Better five or ten millions of intelligent Canadian freemen, than fifty millions sunk down to a level approximating to that of Chinamen. And let us not fail to grasp this tenth, that any great influx of Chinese amongst us would infallibly lower the general level of the community, and that most seriously. The mere pecuniary loss to our working people, through the lowering of wages, would not be the only or even the principal evil. There would be, besides, the greater evil of a lowering of the character and moral of our whole working class—the deterioration of the average man amongst us—a process exactly the reverse of the development of man on the Darwinian theory. We want no such backward departure from civilization and progress; and therefore we want no Chinese amongst us to lower our general character and standing as a community. Again, it may be said: You condemn urban barbarism, but yet you are seeking, through protection to home manufactures, to develop this very thing. It is infinitely more desirable that we should be a nation of independent farmers and owners of the soil, than a nation of factory operatives. True enough, we admit. Of the two alternatives, the former is the better one by all odds. But we are not pinned down to any such alternative. We are so happily situated as to have it within our power to develop that desirable combination of both conditions, with sufficient variety of employment to suit all individual adaptations; in other words, a rightly divided and well proportioned community. Pictures have been drawn of Canadian cities and factory towns, densely peopled with poorly-paid operatives, and in a condition resembling that of some towns in the old country, where social phenomena of the most unwelcome kind drive statesmen and philanthropists to their wits' end. But, to show how visionary all such apprehensions are, let us suppose a case. Let us suppose that manufactures in Canada had reached the point of supplying all our own consumption of articles produced in mills, factories and workshops of all kinds. Would the mass of operatives congregated in these establishments bear any very alarming proportion to that of the whole population? We know that even then it would not, in fact Free Traders make this one of their points—that with any possible development of manufactures in Canada, the number of persons employed in them must be very limited indeed, as compared with the whole population. Where they go wrong is, in not taking into account the far greater number of persons to whom home manufactures in prosperous condition bring employment indirectly; a consideration to be full justice to which would require volumes. And let it be noted that those to whom factories bring indirect employment need not be, except from choice, afflicted with any of those peculiar evils, the development of which has been charged upon factory life. Again, the case of a people of whom only one-tenth are directly employed in mills and factories, is materially different from that of another people, of whom half or more are so employed. Not only is the case different as regards the average of the whole mass, but the case of the factory operatives themselves is different. Being comparatively few in number, and living among the far larger mass of people of other occupations, they take on more of the desirable average character than would be the case were their numbers in excess. We come to this practical conclusion, that under no circumstances can the number of factory operatives in Canada increase beyond what is necessary to give sufficient variety of employment within our own borders, and to maintain a happy balance of occupations in the community—agricultural,

trading and manufacturing together. We may safely assume all the... of people employed in the manufacturing industry in Canada, in proportion to the number employed in other occupations. Our kindred in both sides of the Atlantic—in England and America—will see to it that our export of manufactured goods to foreign countries... of our people employed in them—may be looked for about the time yet to distant when the flying airship of some future inventor starts with her full quota of passengers on the voyage to the moon.

About that time, as the almanac says, look for able artists in the penicillin of the day, lamenting the neglect of agriculture and the alarming rush of the Canadian people into mill and factories. Seriously, however, we have enough real dangers to engage our attention, without conjuring up one that is wholly imaginary. With the general public, perhaps the most effective argument in favor of Chinese immigration is the assumed religious one. We have heard a reverend gentleman, well known in both Canada and the States for his eloquence, make this a part of his subject in a popular lecture, strongly urging that the Chinese should be allowed, nay, invited, to come into America in numbers unlimited. He treated Chinese immigration as if promoting it to the best of our ability were a duty incumbent upon Christian people. In obedience to the command in the last two verses of St. Matthew's Gospel—the marching orders, as the Duke of Warrington called them, for all Christian ministers. It surely is not irrelevant to point out that the command is to go and convert the heathen in their own homes; while the idea of bringing them into our country, in order to convert them, is not suggested in even the slightest degree. East of the Mississippi and the Red River, among the Protestant clergy and religious public generally, there exists a vague, indefinite notion that, by bringing millions of Chinese into the Republic and the Dominion, we should in some way or other be promoting the cause of Christianity. No experience whatever, at all events none worth mentioning, during the last twenty years in California, or during the last half-dozen years in British Columbia—can be cited in favor of the view that bringing the Chinese in amongst ourselves may be a successful means for their conversion. Some Chinese converts, of the scholar class, have been educated in American colleges, but where is the record of conversions among the laboring class, who seek employment in mining, railway building, laundry work, and domestic service? Even when living under the shadows of our churches, that class remain heathens, they die heathens, and their bones are carried back to their native country. The blank impassability of the Chinese character forms a dead wall of obstruction, against which our utmost persuasion is powerless. The Chinese do not argue religion with us, as the Hindus are so ready to do, they are simply so stolid and unimpressionable that we cannot make anything of them. Our failure to convert the Chinese resident amongst us is the dearest failure—the most utter, blank failure—in the whole history of Christian effort to convert the world during eighteen hundred years. We must believe in the fulfillment of prophecy, that the whole earth, China included, will some day be converted; but evidently the bringing of the Chinese into America has proved itself to be emphatically not the appointed means towards this great end. Further, if conversions have been almost unknown among the laboring class of Chinese living in America, while their numbers have been comparatively small, how would the case stand were their numbers greater? If a few thousands form a stolid, unimpressionable phalanx of heathenism, against which our efforts are but as beating the wind, what success would we have with a mass of millions of the same character? The larger the mass the greater its power of cohesion, as a mass by itself, and the greater its power of resistance to all outside influences. If an attempt at conversion we have failed—so utterly and conspicuously failed—with a few thousands, shall we succeed with millions? This is a most important consideration, and it deserves to be considered. Nor is the matter one that will brook delay. Those who ought to know say that there are now about five thousand Chinese in the Pacific province; not a very alarming number, it may be said, but still large in proportion to the whole population of our own race. But to this the significant intimation is appended that three thousand more are expected to arrive early in the ensuing summer, which would be an addition at once of sixty per cent.; an ominous circumstance, suggestive of the rash to Canadian soil that will take place when California shall have been closed against the invaders. If we sleep on this question now, there will be a rude awakening for us some day. Prevention is better than cure; let us strangle at its birth what threatens to become a giant evil for Canada, ere yet it grows to giant proportions, and becomes too strong for us. If it be allowed to grow unchecked, then years after this, ourselves or those who are to come after us will wish most earnestly that we had been wise in time. Shall we take no lesson at all from the bitter experience of California and the Australian colonies? Shall we remain bewitched by the gooey, gooey talk of tea-table sentimentalists, and the visionary conceits of Free Trade cosmopolitans, of whom it has been truly said that they are the friends of every country but

the known. Let us be wise in time, we say, and save this new Dominion from a tremendous calamity, the magnitude of whose consequences with which it is just beginning. Besides the objections already referred to, there is another which we may as well anticipate. It may be said that many thousands of the black race have been brought hither from Africa and there are now in North America some few millions of them who are nominally Christian—do not as much so, perhaps, as the majority of ourselves. Bringing the blacks to live here has resulted in their conversion as a mass, they quickly drop their heathenism, and "take" with great alacrity to revival meetings and such like. Why not, therefore, by the same plan for the conversion of the Chinese? The reply to this is twofold and perfectly conclusive. First, the inability to convert the influences of the black when living in a Christian land only renders more startling and more striking the utter failure of such influences on the Chinese, making it all the more clear and certain that, as we have already said, immigration into our midst is not the appointed way for the conversion of the latter, by whatever other agency this is to be brought about some day. Secondly, to whatever extent the gigantic crime of stealing men from Africa to make slaves of them in America may have been overruled by Providence for ultimate good, we do not continue it, it has ceased under the reprobation of the civilized world. We who are the heirs of the crimes and blunders, as well of the glorious achievements of our ancestors, have determined that there shall be no more importations of native Africans into America, or anywhere else in the world, indeed, as far as we can prevent it. By the common consent of civilized peoples the thing has ceased, we would not continue it any more, even did it promise the conversion of every heathen black man carried away from Africa. Against a thousand plausible arguments, the fact that we have felt compelled to cease from this thing is conclusive. Join to this the other fact, that residence in a Christian land utterly fails as a means of converting the Chinese laboring class, and the last support of the assumed religious plea for Chinese immigration falls to the ground.

**BRITISH CRIMINAL STATISTICS.**

From an analysis of the report of the British Commissioners of Prisons, we learn that on the 31st of March, 1880, in all the local prisons of England and Wales, there was a united population of 18,352 males and 3,627 females. Of these, 32 males were under 12, 339, between 12 and 16, and 3,181 between 16 and 21, making altogether no less than 3,551 who were under 21. There were also 6,854 between 21 and 30 years of age, so that 58.9 per cent of the whole male prison population were between 16 and 30 years of age. As the proportion of males in England and Wales between 16 and 30 is only 41.4 per cent of the total male population, the proportion of younger criminals to the total number is largely in excess. The number of criminals between 30 and 40 years of age is not much more than half the number between 21 and 30, and is about equal to the total number of those who are 40 years of age and upwards. The statistics showing the proportion of female prisoners in the various periods of life tend to show that there is some truth in the common belief that women who have once adopted a criminal life are less likely to be reclaimed from it than men. The proportion of male to female prisoners between the ages of 16 and 21 is 4,181 to 604; but while in the case of men between 41 and 60 years of age the proportion has fallen off about one-half viz., to 1,569, the number of female prisoners remains almost stationary, being as high as 534. The proportion of male prisoners diminishes after the age of 30 by nearly one-half, while the proportion of female prisoners of the more advanced age remains nearly stationary. The report remarks that a similar inference may be drawn from the records of previous convictions of the two sexes. Taking the returns of several years, it appears that out of a total average of 124,013 males 82,372 had never been committed before, and could not therefore be regarded as habitual criminals. On the other hand, of 49,194 females, as many as 25,320, or more than one half had been committed before, and were probably leading a life of crime. The statistics of crime reveal the fact that there has been a marvellous change for the better during the last forty years. In 1849 the number of prisoners committed for trial in the United Kingdom was 54,892, the number convicted was 34,030, and the number acquitted was 20,776. The population in 1849 was 20,487,000. In 1879, with a population of 34,155,000, the number of criminals in the United Kingdom was only 23,450, the number of convictions was 16,822, and of acquittals 6,587. It is true, no doubt, that the comparison thus suggested is modified by the fact that many offences are now dealt with summarily which were in 1849 sent to trial, but, on the other hand, it cannot be denied that the increased efficiency of the police, both in burghs and counties, now brings to light a multitude of offences which were formerly wholly overlooked. Perhaps the most startling facts disclosed by a comparison of our criminal statistics are those which refer to Ireland. In the year 1849 the condition of Ireland was something deplorable—famine and disease had diminished the population by about a million and a half, and the number of persons sent to trial for criminal offences was 41,989. Of this number 21,203 were convicted, and 20,787 were acquitted. In 1879 the total number of criminals was 4,362, not much more than a tenth of the number thirty years before, and of these 2,207 were convicted and 2,155 acquitted.

**SOME CARDINAL LAWS OF TRADE.**

It is a fact as yet little understood by the masses that the interests of a community with their customers, that a system of cooperation should exist between the producer and his customers. It is a common error to suppose that the average dealer in the market is a man who has a wide and liberal view of his business, and that he will sell his goods to the highest bidder, and then the value of his goods will be determined by the market. In fact, the dealer in the market is a man who has a very narrow view of his business, and who will sell his goods to the highest bidder, and then the value of his goods will be determined by the market. This is a very narrow view of his business, and who will sell his goods to the highest bidder, and then the value of his goods will be determined by the market. This is a very narrow view of his business, and who will sell his goods to the highest bidder, and then the value of his goods will be determined by the market.

**THE AMERICAN PROTECTIONIST.**—We have received the first number of the *American Protectionist*, a weekly journal, published in New York, the aim of which is indicated by its title. Our new contemporary makes a capital beginning, both editorially and in selections being exceptionally good, and interesting because they deal with live topics of the day. Among the contributions is a very good one on the general question of Protection vs. Free Trade, over the signature of Dr. Edward Young, formerly chief of the Statistical Bureau at Washington, recently employed for a time in the Department of Finance and Customs here, and now resident in New York. The new journal has our best wishes for its success, and we add the following notice of it from the *New York Tribune*—

"The title explains the purpose of the *American Protectionist*, a weekly paper, the first number of which appeared yesterday. Its basis of action is the belief that the best interests of all classes and of all sections demand a careful and scientific treatment of the tariff question; that the welfare of the people is not a proper subject for doubtful experiments; that facts, not theories, must be considered; that the public sentiment is in favor of a policy strongly national; that the Free Trade system, so indispensable to the industrial life of England, would be fatal to the development of our manufacturing capabilities; that even our agriculturists shall always have to rely principally on our home markets for a profitable sale of their products, and as our exports of any commodity whatever, except cotton, are insignificant compared to the home consumption of that same commodity—that the permanent well-being of every trade is essentially dependent on the solid prosperity of all the others." One of its leading features will be the publication, from time to time, of the prices paid for labor in every kind of industry throughout Europe and America. To this particular and highly interesting subject, Dr. Edward Young, ex-Chief of the Bureau of Statistics of the Treasury Department, has given considerable attention; and his contributions relating to this important factor in international exchange will not prove the least valuable. It is needless to add that this new journal has the best wishes of the *Tribune*.

**EDITORIAL COMMENTS.**

The village of St. Gabriel O., has voted to establish a cotton company, established here.

During the year 1879, 4,999,999 bushels of the product of which was 18,771,999 pounds of spirits were consumed by the distillers of the year.

The net increase of the earnings of the Pacific Railway for the year 1880 amounts to \$1,000,000 over the earnings of 1879. In 1880 the earnings were \$19,999,244, in 1879, \$18,999,244.

The weekly returns of the Grand Trunk Railway and its railways continue to show a steady increase. The growing prosperity of the Grand Trunk is favorably commented upon in English journals.

American inventors are wonderfully prolific of new devices. The secretary of the Western Railway Association states that the United States Patent Office has issued 167,033 patents since 1865, or an average of 11,812 per annum for 16 years, there being on the 1st December, 1880, 197,753 letters patent still alive. The secretary cautions inventors to use great care in selecting a competent solicitor to prepare their applications, adding that a majority of the patents issued from the patent office are either insufficient, incompetent, or invalid.

According to the annual report of WALLA, FERRIS & CO., the production of precious metals west of the Missouri River, including British Columbia, for the year, were.—Gold, \$33,622,182, silver, \$30,295,351, lead, \$5,752,399; copper, \$808,000. Colorado leads with a total valuation of \$31,284,989; California follows with \$18,276,166; Nevada, \$15,931,169; Utah, \$6,450,933; and Arizona, \$4,472,471. In comparison with the product in 1879, California shows an increase in gold of \$674,579, and a decrease in silver of \$35,873; and Nevada shows a total falling of \$3,926,993.

The *Pall Mall Gazette* quotes from Messrs. FAY & ABELL'S review of the gold and silver markets during 1880, the following statements of the imports and exports of gold during the last five years:—

IMPORTS.				
1875.	1877.	1878.	1879.	1880.
£21,244,670	£15,251,051	£20,700,000	£18,100,000	£ 2,100,000
16,219,570	19,908,095	15,000,000	17,700,000	11,800,000

The imports of gold from Australia and the United States for the same periods are also given:—

AUSTRALIA.				
UNITED STATES.				
4,011,100	6,266,000	5,200,000	3,200,000	3,300,000
4,353,740	2,099,000	867,000	600,000	800,000

It will be seen that practically imports from Australia have ceased for two years, and have dwindled away greatly from Australia. The effect on the money markets of Europe cannot fail to make itself felt. Indeed, it is being felt already.

The *Globe* of Saturday last, in a long review of the trade of Toronto, said:—The year just closed shows a marked improvement in the commerce of Toronto. In all branches of business there has been a steady growth, and our citizens have before them what would seem a prosperous career. The trade of the latter part of the year specially has been wonderfully free from speculation booms, and the condition of trade is apparently healthier than for a number of years past. The large number of business houses that we are forced to the wall by their creditors, and those who are in the advantage of the bankruptcy law before its repeal in April, left the field comparatively clear of weak houses. We are pleased to note the attempts made by our manufacturers and wholesale merchants in shortening credits. Although they have not partly succeeded, this step in the right direction will eventually have its beneficial effect. The 'cash' system, or, thirdly, wherever adopted, has proved the most satisfactory, and we look forward to the time when it will be generally enforced by our merchants.

Reviewing the British export trade for last year, the *St. James's Gazette* says:—"The exports during the past year show an increase in value over 1879 of £31,279,000, or equal to 16 1/2 per cent. Almost every article we produce shows additions, but the principal gains have been achieved by the cotton and iron trades. In cotton goods the augmentation amounts to £11,790,000, while iron and its cognate industries have an aggregate increase of £11,303,000. Pig iron shows an additional value of £2,057,000; rail-iron, £2,207,000; bar, plate, and hoop iron, £2,087,000; and tin plate and cast iron, £1,179,000. Mill work and machinery of all kinds have increased by £1,900,000, and hardware by £490,000. In some respects the iron trade is the most profitable of all our industries, and the above large increase is therefore peculiarly welcome. Every pound of cotton is imported, and we gain is just the difference between the raw and manufactured article; but in the iron trade the gains are nearly altogether gain, very little foreign material being imported to mix with native ores. Coal also shows a large and satisfactory increase, the additional value being £1,172,000.

The following statement in a British journal respecting the financial condition of Australia is based on official returns: Containing as they do a total area of upwards 3,000,000 square miles, and carrying a population estimated at the close of 1879 at 2,715,762

the importance of these colonies, thus taken together, strikes the attention far more vividly than is the case when they are discussed piecemeal. From this population was raised in 1879 an aggregate revenue of £1,927,488, or at the rate of £178 7d per head of the population—the public expenditure in the same year amounting to £1,854,151, or at the rate of £174 8d per head. The public debt at the close of 1879 was returned at £7,032,184, showing an increase of some £1,000,000 during twelve months, and representing an indebtedness of about £28 13s per head of the population. At the close of 1879 the amount of the funded and unfunded debt of the United Kingdom represented a sum of something over £24 10s per head, the revenue for that year having been £294,214, and the expenditure £210,000. It is when we get down to the food question that the advantage possessed by these colonies is most felt. In 1879 the wheat raised in Australia would have sufficed to feed a population more than double of that which at present exists. At the same time the amount of land available is only about 1 per cent of the whole available area.

SPECIAL NOTICES.

SAW MANUFACTORY

A correspondent of the Industrial World recently paid a visit to the establishment of Messrs. R. H. Smith & Co., St. Catharines, Ont., who are the proprietors of the largest saw manufactory in the Dominion. By the courtesy of Mr. Smith, who conducted the writer through the several departments of the factory, he was enabled to view the many different and intricate processes through which a steel plate must pass before it is finally packed for shipment as a highly polished and finished saw, and also, the many complex machines used to secure the mathematical exactness necessary in a really first-class saw of any description. The principal feature, however, of the saw made by this firm is the unvarying evenness and uniformity of their temper, which is secured by a process patented by Symonds & Co., of Fitchburg, Mass., and the Canadian right of which Messrs. Smith & Co. control, having paid upwards of \$100,000 for the privilege and necessary machinery. The quality of the raw material is another important feature, the same brand of steel being used in their saws as used by Messrs. Gillott & Co. in the manufacture of their steel pens. A proof of the excellence of their goods is given in the fact that a United States firm have shipped to this market in imitation of their popular cross-cut saw, "The Hanlan." The genuine Hanlan saw has a beautiful sheen of the champion, sitting in his boat, waiting for the word "go," while the counterfeit has only a dull pat on the plate. The hand saw made by this firm are a credit to any concern, embracing, as they do, a full line, from the cheapest to the very best that can be produced, some of them we saw being polished nearly equal to a mirror. Between fifty and sixty hands are now employed in this factory, mostly skilled mechanics, and many of whom are working overtime to keep pace with the orders ahead.

THE PACIFIC RAILWAY CONTRACT.

On Tuesday of last week the Hon. Edward Blake moved a long amendment to Sir Charles Tupper's motion for the second reading of his Pacific Railway Contract resolutions, as reported from the Committee of the Whole. The following is a summary of the amendment:—

That the Government invited tenders for the construction and work of the railway under the Act of 1874; that no tenders were received; that the policy of 1879 was to obtain Imperial aid; that the policy of 1880 was to construct the railway as a Government work; that during recess the Government determined to attempt to make a contract on wholly new conditions; that the Railway Act provides that work shall not be given out unless tenders shall have been received; that the Government did not invite tenders; that the new conditions were not made known prior to the making of the contract, nor until it was laid on the table on the 10th December; that the new conditions were not authorized or contemplated by the Railway Act, and that they are of the most vital importance (the objectionable provisions, pointed out in Opposition speech, are then enumerated); that such conditions wholly alter the basis for tendering; that no opportunity was given to Canadian capitalists or to the public to tender; that the Railway Act provides that no contract shall be binding until it shall have been laid before the House of Commons for one month without being disapproved unless sooner approved by resolution; that under the circumstances the contract is not binding and that Parliament is under no obligation to ratify it, and that the public interests require its rejection; and that the conditions of the contract are onerous and disadvantageous to the country; that terms much more favorable can be obtained; that on the 14th of January a new offer was laid on the table (the provisions of the offer are recited in detail), and that it is not in the public interest that the contract on the table should be legalized.

The debate continued from day to day, Saturday and Sunday excepted. According to an agreement entered into between Sir John A. Macdonald and Mr. Blake, that the vote should be taken before the end of the sitting which commenced on Tuesday afternoon, the long-looked-for event took place about half past five o'clock on Wednesday morning. Mr. Blake's amendment being lost on a vote of 140 to 84. Five additional amendments were defeated on Wednesday, and many others have to be disposed of.

THE BRITISH TRADE RETURNS OF 1880.

The Board of Trade returns for December which have just been published give the statistics of imports and exports for the whole of the past year, and they present several features of interest. They show a substantial increase in the volume of trade done, which goes far to confirm the opinion entertained during the year there has been considerable revival of business. The following figures show a comparison between the three past years.

Table with 4 columns: Year, Imports, Exports, Total. Rows for 1878, 1879, and 1880.

INSURANCE LEGISLATION IN CALIFORNIA

From the San Francisco Chronicle of the 8th inst. we obtain the following with regard to proposed insurance legislation in California. It is mainly interesting reading for companies doing business in that State.

Several bills relative to insurance have already been introduced this session. Johnson has brought forward his measure on the 1st inst. with regard to deposits of foreign companies. Lane has presented a similar bill in the assembly. They require of all insurance companies except those already organized in the State to have a capital or a deposit of at least \$500,000 in the United States. This project especially concerns the British companies already organized in California, on the \$200,000 basis, and to the latter eastern and foreign companies, who can easily fill the conditions of the proposed law. It is not so favorably regarded by the smaller foreign and eastern companies, who declare its purpose to be to create a monopoly in insurance, which will result in an increase of rates to the policy holder. Johnson's bill of last year brought upon a large delegation of insurance men from San Francisco and the old faces will probably soon again be seen here. Howards bill is especially intended to relieve the Western and British America companies of Toronto from some of the consequences of the Canadian insurance law. By that law foreign companies doing business in Canada are required to make a deposit of \$100,000. This allows each of the States of the American Union to impose like conditions on Canadian companies transacting business within their jurisdiction. If carried out it would result in driving Canadian companies out of the country by tying up their assets. To relieve the Toronto companies named Howard has introduced his bill, which will permit Canadian insurance companies to do business in this State, provided they have deposits of \$300,000 in the United States.

An insurance bill of a different character from the one was introduced in the assembly today by McCullion. It asserts the principle of the individual liability of stockholders. The first section of the McCullion bill provides that no insurance company not organized under the laws of the State shall be allowed to appoint agents or transact business unless each stockholder, by the laws of the State or the country where his company is organized, is personally responsible for his proportion of its debts and liabilities. The second section provides that insurance companies applying for admission to the State must produce a verification of the individual liability of its stockholders. The third section makes the bill take effect within sixty days after its passage. It also makes it the duty of the insurance commissioner to inform insurance companies that unless they comply with the provisions of the act on or before sixty days after its passage their certificates will be revoked, and in case of such failure to proceed to revoke the certificate.

Williamore, of San Francisco, has also introduced an insurance bill. It contains the \$500,000 and the \$300,000 clauses, and is in concert with the Johnson Kelly and Lane measures. A bill to regulate insurance companies was introduced in the Senate today, by Kelly, of San Francisco. It requires State companies to have a subscribed capital stock of \$500,000, 25 per cent of which must be paid in. Other State and foreign companies are obliged to have an unimpaired paid up capital stock of \$500,000 with a deposit of \$300,000 in the United States. Five per cent of the cash value of the paid up capital stock is made the limit of any one risk. Companies organized outside of this State are to pay an income tax of 3 per cent on the \$100, to be paid into the school fund. The bill is made to take effect ninety days after its passage.

THE BRITISH GRAIN TRADE.

The Mark Lane Express, of January 17, in its review of the British grain trade, during the past week, says: "The lower temperature, with the protection afforded by the snow, benefits the growing crops. The dry frost favors threshing. The deliveries of breadstuffs were greatly improved in quality and quantity, and consequently trade was little changed during the week. The demand was slow, and an attempt to raise prices failed. In London prices were maintained, but trade throughout was dull and limited. Other descriptions of British grain were exceptionally quiet. Foreign breadstuffs were dull and quiet. Off-coast hung on hand until Saturday, when there was a better inquiry. Cargoes were slow and weak, but rather firmer at the close. Spot demand was a little improved, but rates were unchanged. Business has been of the quietest. Foreign flour was unchanged. Buyers operate slowly. The expected supplies from America and Russia largely exceed the consumption demand. Rates, therefore, are likely to decline. The last milling barleys have been in request, but rates were unchanged. Inferior descriptions were slow. Foreign was slow and holders were firm. At the close forward positions slightly improved. Oats were quiet, but values improved 3d @ 6d. Foreign was firm, but the demand was slow at a similar advance. Malts was in better spot supply. The prospective supply is large. Values improved 3d at London and Liverpool. Round corn was unchanged and slow. The sales of English wheat during the week were 29,010 qrs at 4s 7d, against 32,871 at 4s 11d for the corresponding period last year. The imports into the United Kingdom during the week ending January 8 were 1,150,882 cwt. of wheat and 324,318 cwt. of flour."

THE PHOSPHATE TRADE.

The trade in Canadian phosphate during the past year has been fairly satisfactory, considering that this important branch of our exports is as yet only in its embryo state. The shipments of phosphate from Montreal to England and the States during the past season aggregated about 13,000 tons, against 11,000 tons for the previous year. Next season is expected to witness much greater activity in phosphates, as our ore is beginning to be better known in the European markets. A great many of the objections to Canadian phosphates on the other side are gradually wearing away, so much so that English capitalists are now seeking investments in our mines. We have to report the sale during the past few days of 500 to 700 tons of green phosphate, guaranteed 80 per cent, at \$13.00, delivered on cars at Buckingham Station, Q. M., O. & O. Railway.

The largest chestnut tree in the U. S. is growing on the farm of Solomon Merkle, at Herks, Pa., and is nearly 400 feet in circumference at the base. The top of the tree is reached without danger by steps that are fastened between the limbs. It is estimated that this tree contains about 17 cords of wood. It will yield about 300 bushels of chestnuts annually.

GENERAL INDUSTRIAL NOTES.

—Great quantities of phosphate are being brought into Kingston. It is worth from \$10.50 to \$12 per ton.

—Applications for loans to the extent of \$20,000,000 have already been received by the Credit Foncier Franco-Canadien.

—A new railway to the Mountain Park is projected at Montreal, with a capital of \$1,000,000. The motor will be used on the line, with a dummy engine.

—In Toronto, last week, a petition is being largely signed, asking the Dominion Government to issue to a company the Old Fort grounds, at the Queen's wharf, for the purpose of erecting a cotton factory, which will employ one thousand people.

—A new pulp factory is about to be established in the county of Charlottetown by Mr. Cram. Mr. Cram has just returned from a visit to the Sherbrooke mills, where he has been getting information concerning the manufacture of this article, which it is his intention to ship to England for the manufacture of paper.

—There appears to be a prospect of the Extra carpet factory being taken hold of vigorously. A manufacturer from Oldham, Mr. Campbell, visited the factory the other day with a view of purchasing. If the property should become his, some \$75,000 would be expended on new machinery, and the yearly product greatly increased.

—The Bellefleur Intelligence says:—A patent has been issued to Messrs. Sager & Wright of this city on an improved table, known as Wright's patent folding table and writing table combined. The invention seems to be one of great utility. The new firm have started a manufactory here and have already received a large number of orders.

—The Hespeler Manufacturing Company asks for letters patent to enable it to manufacture cotton and woolen goods. The capital stock is fixed at \$300,000. And the first directors of the company are to be Jonathan Schleif, James Lockhart, and John Buntin Young. Incorporation is also asked by the Canada Felt Hat Company at Hamilton.

—The hog products handled last season by members of the Ontario Pork Packers' and Provision Dealers' Association, according to statistics presented at the last meeting of the association, amounted in value to over \$1,000,000. The following are the newly-elected officers:—J. Dawson, Toronto, President; J. York, Aylmer, Vice-President; and James E. Bailie, Toronto, Secretary-Treasurer.

—The Pioneer Beet Root Sugar Co., at Coaticook, are not idle. At a meeting of the directors last week it was shown that sufficient shares had been taken to guarantee the want of the company. Four thousand cords of hardwood have been contracted for, and the machinery for the works are now being manufactured. A competent overseer has been secured. In addition to this Coaticook has voted to take \$7,000 worth of Beet Root Company's stock.—Sherbrooke Gazette.

—Berlin Daily News: The glue factory was sold a few days ago by the trustees of the estate of V. Fisher & Co. and purchased by C. J. Fisher, who will carry on the business with increased energy. We are pleased to learn that a very good business is at present being done by the establishment, and, now that it has got into a more satisfactory shape, everything will go ahead. We wish Mr. C. J. Fisher every success and prosperity. The glue factory is one of our most valuable Berlin industries.

—We had handed to us lately by Mr. Brown, of the firm of Brown & Palmer, some samples of bookbinders' leather, of their own manufacture, which the foreman of our bindery pronounced to be equal to the best imported stock. The samples include: law and rough calf and sheep, colored roans, and Russia leather. Messrs. Brown & Palmer are now exporting thousands of skins of law calf and sheep annually to Montreal and Toronto. They are enlarging their tannery.—Fredericton Capital.

—Parks' Cotton Mills at St. John, N.B., are undergoing extensive improvements and additions. A large wing is being added, and another engine of 90 horse power has been added. It has already in operation 14,000 spindles, and gives employment to 325 hands, all told. The factory is principally employed in the manufacture of cotton yarn, although its 80 looms yield some excellent fabrics, for which a market is found all over the Maritime Provinces, Ontario, Manitoba, and even British Columbia. Mr. Parks may justly feel proud of the success which has attended this enterprise.

—In the years 1836 to 1848, the yearly consumption of tea of all kinds in England was between only 1,000,000 lbs. and 4,000,000 lbs., by the year 1863 it had increased to 7,104,000 lbs., and since then it has been nearly doubled to 13,500,000 lbs., the amount estimated for 1880. From 1860, when Indian tea claimed greater attention, to 1865, the average monthly consumption of that growth increased from 100,000 lbs. to 250,000 lbs., in 1868 it had reached 623,000 lbs.; in 1871 as much as 1,163,000 lbs.; by the year 1876 it rose to 2,146,000 lbs.; and so on up to the present time, when it is computed to be about 3,400,000 lbs.

—Kingston Whig:—Mr. William Harty to-day called the attention of the gentlemen attending the Agricultural Society's meeting to the fact that he had an interview with Mr. Legre, who is now promoting the growing of sugar beets in Lower Canada, and who is erecting a large sugar manufactory in that province, to cost \$200,000. Mr. Harty asked him to make the county of Frontenac a visit, as its soil was adapted to the production of sugar beets, giving him at the same time names of several prominent Kingstonians who were willing to assist by capital in the establishment of such an industry in Kingston. Mr. Legre will visit Kingston shortly. The statements of Mr. Harty were received with cheers.

—A meeting of the patrons of the Roseville cheese factory was held in the Town Hall, Montague, recently. Mr. Peter Clark was appointed chairman, and Mr. Edward Chambers, secretary. The chairman made a statement of the business done in the factory last year as follows:—812,947 pounds of milk delivered at the factory, \$7,971.33 received for cheese sold, 78,358 pounds of cheese made, \$1,077.42 for manufacturing, leaving a balance of \$13.23 in the hands of the treasurer. Moved, seconded and carried, that the patrons form themselves into a joint stock company and build a new factory, if Messrs. Strong & Algire do not sell them the factory at a fair price, or put it in a proper state of repair for this season's business.

—The construction of the proposed new mill at Chambly has been commenced. The building is to be 180 feet long, 56 feet wide, and four stories high, with basement; there will be a capacity for eight sets of flannel machinery, although it is proposed for the present to add only four sets, which will be ready when the building is completed, making, when com-

plete, a first class mill, the capacity of the machinery now in operation being six hundred thousand yards per annum. When the new mill is put in operation the output will be increased to one million yards of flannel per annum and building capacity and power to add to the further production of four hundred thousand yards, should the market require it.

—The Galt Review says that another large manufacturing firm is soon to begin operations in that town—a knitting factory, to employ some 60 hands. The head men are from Montreal and Cohoes, N.Y. They decided to purchase the large factory formerly occupied by Robinson & Howell, which has been idle for some years, and a three set mill is to be started for the manufacture of the light qualities of under clothing. At least sixty hands will be employed at first, and this number will, it is expected, be supplemented ere very long. The names of the principal movers in this matter are given as Messrs. Sweet, of Cohoes; Caxton, of Montreal; A. Warner, H. McCulloch, D. Splere, Wm. Robison, of Galt, and Mr. R. Proctor. One of these gentlemen left at once to purchase the necessary machinery, and the renting of the property will be begun immediately. At a special meeting of the Town Council an exemption from taxation for ten years was unanimously granted.

—A Montreal despatch says:—The following story shows how merchants are often deceived by dishonest traders. A merchant doing business about forty miles from Montreal was indebted to two of our city millers to the extent of \$1200, and getting behind in his payments, was invited to settle up. Yesterday he came to the city, and being ignorant of the repeal of the insolvent law, insisted that he was not solvent, and offered his creditors 25 cents on the dollar. One of his creditors, being satisfied of his solvency, despatched one of his clerks for a bailiff and for the necessary papers, and in the meantime kept his customer engaged. In due time the bailiff appeared, and was introduced to the would-be insolvent in his official character, much to the surprise of the latter. The insolvent immediately put his hand in his pocket and pulled out a pocketbook containing \$1,400, and was glad to pay his debt in full, plus the amount of the costs occasioned by his attempt at insolvency. He remarked that he had been badly treated, because he knew a great many people who had managed to settle up their accounts by paying 25c on the dollar.

STRIKES AND STRIKERS.

An interesting collation of facts concerning strikes and strikers appears in the recently published report of the commissioner of the Bureau of Labor Statistics of the State of Ohio, from which we gather the following:—

During the year 1880 there were 105 strikes inaugurated in the state; of these 41 were coal mining operatives, and of the whole number, in 43 the strikers were successful in obtaining their demands; in 34 they failed; 23 were compromised, and at the close of the year 3 were yet undecided. Of the 41 coal mining strikes, the strikers won in 15 cases and lost in 17; 8 were compromised and 1 undecided. Among the causes of these strikes were against reduction of wages 14; for advances, 5; for check-weighman, 3; for re-employment of discharged men, 2; the balance miscellaneous. In Cincinnati there were 16 strikes, of which 10 were won, 3 lost and 3 compromised. There are 42 trade unions in that city, and in 14 out of the 16 strikes, the strikers were members of them. In Cleveland there were 20 strikes, of which 8 were successful, 8 were compromised, and 3 compromised. Twelve of the 20 were by members of trade unions. Of the 105 strikes, 73 were on account of wages, distributed as follows: at coal mines, 22; Cincinnati, 17; Cleveland, 14; miscellaneous, 23. Of these 27 were won, 23 lost; 18 compromised and 3 undecided. By occupation the strikers were distributed as follows: coal miners, 41; moulder, 10; iron workers, 7; the balance being distributed among almost all the various walks of life wherever manual labor is employed.

A COLOSSAL MORTGAGE.

Chicago, Jan. 22nd.—A colossal mortgage was filed for record in the Recorder's Office yesterday. By its terms the Wabash, St. Louis & Pacific Railway pledges its entire property for the payment of a mortgage of \$30,000,000 to the Central Trust Company, of New York, and James Cheny, of Indiana. The instrument states in its preamble that the outstanding indebtedness amounts to \$30,000,000. A further indebtedness, incurred by the purchase of equipments and the assumption of obligations of various lines of the road consolidated with the main line exists to the amount of \$4,000,000. The company desires to acquire additional extensions and lines, for which an indebtedness of \$11,000,000 was created. To liquidate various debts the stockholders, at a meeting on May 5th, decided to issue bonds to the amount of \$50,000,000, bearing six per cent per annum, payable in 1920. The mortgage is dated June 1st, 1880, and has been filed for record in the courts of Ohio, Indiana, Illinois and Missouri, through which the road of the company runs.

AMERICAN SALT.

The Saginaw salt region in Michigan is now the largest salt-producing district in America, and the Western States are largely supplied from there. The English dairy salt being largely superseded by the Michigan article. It appears that the works which used to produce 10,000 to 20,000 blbls. now produce 40,000 to 60,000 by reason of improvements, and the cost of manufacture has been reduced from \$1.50 per barrel to 45 to 60 cents. With but few exceptions the blocks are connected with saw mills, and quantities of refuse are utilized in the manufacture of salt, furnishing the best and cheapest fuel. The evaporation by the steam process is now producing the bulk of Michigan salt. A comparison of the Saginaw product with that of Onondaga in bushels, makes a showing about as follows:

Table with 3 columns: Year, Bush, Bush. Rows for 1877, 1878, 1879, 1880.

—According to a London journal, the orange specks of the galleits along the Thames embankment were seen to shine dimly through a recent fog, while the brilliant white glare of the electric lamps was indistinguishable.

—The population of Berlin including the military element, now numbers 1,118,630, or an increase of 154,390, or 16 per cent, on the figures of 1875, which were only 964,240. Since 1860, therefore, when the census gave 528,000, Berlin has more than doubled the number of its inhabitants.

SPIRIT OF THE COMMERCIAL AND INDUSTRIAL PRESS.

THE COMPARATIVE VALUE OF COAL.

So many paper-mills, in common with other manuf-

To-day, more than fifty per cent of the horse power

The duration of anthracite at a high temperature,

With one pound he evaporated between eight

The pressure I am not able to state.

The statements relative to the practical use of coal which I

Cards were taken each day since the first of July,

Another gentleman present at this meeting differed

"We went through a test some years ago, under a

We reduced our expenses more than one half.

Taking the additional dirt of the boilers, it

Coal, and I believe, where the draft is sufficient with-

PROTECTION—THE FIRST LAW OF NATURE.

(Clean Journal of Commerce.)

Vegetable, animal and spiritual life is conceived,

The author of all life has thus demonstrated that lack

The brain is encased in the hardest bone.

Determination, on the part of man, to be freed from

The top-roof of free trade is selfishness.

While a section of the people of Canada are doing

While the report of the Missouri commissioner on the

While a section of the people of Canada are doing

Such magnificent results are attained by another peo-

Every pound of cotton thus handled. All this

FREE TRADE.

(Philadelphia Trade Journal.)

Free trade has long been the subject of

GRAND TRUNK RAILWAY COMPANY.

(Bell Mail Gazette, January 11th.)

The rapid and uninterrupted development of this

RAILWAY DEVELOPMENT.

(Shareholder and Insurance Gazette.)

While a section of the people of Canada are doing

ple, not by home capital, but by enterprise (for a

PROTECTION IN FRANCE.

(Iron Age.)

The course taken by the government and the

MACHINERY AND LABOR.

(Missouri Republican.)

The report of the Missouri commissioner on the

TORONTO PRICES CURRENT.

Table of Groceries prices including items like Flour, Sugar, Coffee, Tea, and various oils.

Table of various commodities including Paints, Petroleum, Wool, Hides and Skins, Leather, Produce, Provisions, Salt, etc., and Boots and Shoes.

WEEKLY REVIEW.

Toronto, January 26th, 1891.

Wheat - The wheat market today has quieted down, with but few transactions, but the past week has been a fairly active one with prices well maintained. The closing prices today are given in our Toronto report.

HOURS FOR MARRIAGES.

It remains to be seen whether in the coming all-embracing session on "Coercion in Ireland" and "Irish Land," Mr. R. P. Blennerhassett, M.P. for the county of Kerry, Ireland, will this year (and for the third time) reintroduce his Marriage Law Amendment Bill, to enable all marriages in the future to be celebrated up to five o'clock each afternoon.

Table titled 'REPORTS FROM GREAT BRITAIN TO BRITISH NORTH AMERICA' showing trade data for 1890 and 1879.

There are no new features in the local trade of this city, and no change in prices from last week. The general business, however, is fairly active, and travellers are sending in satisfactory returns.

Wool - Some large lots of combing fleeces have been offered during the past week, but buyers seem unwilling to operate at present prices, and are asking that concessions be made.

Hides, Skins, Etc. - This market is quiet, and without any new features to report. The total quantity of hides handled in this city for the year 1890 numbered 40,000 sheepskins, 150,000 calfskins, 20,000 which are estimated at a total value of \$445,000.

Ferries - The Grand Trunk Railway rates are firm and unchanged; on four from this city they are as follows: To Belleville, 24c; Shannonville to Kingston, inclusive, 30c; Gananoque to Prescott, 33c; Edwardburg to Cornwall, 40c; Summersville to Montreal, 40c; St. Lambert to St. John's, Q., 47c; St. Madeline to Acton, 55c; Waterville to Coaticook, 60c; Island Pond to Portland, 65c; Danville to Chaudiere and Aston, 55c; Doucet's Landing, 51c; Point Levi, 60c; Quebec, 60c; Island Pond to Falmouth, 65c; St. Henri to L'Islet, inclusive, 65c; St. Jean Port Joli to Riviere du Loup, inclusive, 73c; Cacouna to Moncton, inclusive, 80c; Point du Cheno (for gulf ports and Prince Edward Island, traffic only) 76c; Humphries to Amherst and Point du Cheno, Boundary Creek to Coldbrook, inclusive (except Fishery Junction), 85c; Napan to Richmond and Fishery's Grant to Valley, inclusive (Truro excepted) 85c; Picton, Truro, Halifax, New Glasgow Junction (for Halifax and C. B. railway traffic) 80c; Windsor Junction (for Windsor and Annapolis railway traffic only) 75c; St. John, N. B., 75c; McAdam Junction and Fredericton Junction, 75c; Carleton, N. B., 75c; St. Stephen, N. B., St. Andrews, N. B., 75c.

Mr. W. N. Stockington states that of three hundred and eight species of fishes, mostly marine, occurring on the Pacific coast, all but thirty-seven are found in California. Of the three hundred and forty fresh water species known in the United States, but thirty-seven are found in California.

Advertisement for WINANS & CO. featuring wool products and contact information at 18 Church St., Toronto.

RAILWAY MATTERS.

LOCOMOTIVES OF 1880

(W. Barrett Esq in American Mechanist)

The past year has been a fruitful one for the locomotive builder, and the demands upon both for home consumption and for export have been greater than ever before.

The Baldwin Locomotive Works, of Philadelphia, have turned out 617 locomotives, and have orders on their books to run them at their full capacity for more than twelve months to come. Notably amongst their productions is that of a single-driver locomotive, No. 56,000, the five thousandth of their build which was originally intended for the Philadelphia and Reading Railroad Company, to run on the Round Brook route, between Philadelphia and New York. It has made the 69.4 miles in 53 minutes, being at the rate of 75 miles an hour. It was finally sold to Mr. F. W. Keese, of the James Vacuum Brake Company, to be taken to England for experimental purposes. This is the first locomotive, with but a single pair of driving wheels, that has of late years been built in the United States. The Baldwin Works are also employed in making, after the design of E. A. L. Roberts, of Titusville, Pa., his patented piston and cylinder locomotive, which he claims to be able to run 80 miles per hour with perfect ease. E. A. L. Roberts' improvement is in the construction of the cylinder and piston. The cylinder has the exhaust port formed of slots circumferentially around the centre, and penetrates the interior of the cylinder. This slot is covered by an annular covering or pipe, so as to form a free exit of the exhaust steam, and is connected with the usual slide valve, as in cylinders, having steam ports on each end. The piston occupies half the length of the cylinder. When the steam is admitted on one end of the cylinder, the piston immediately covers the exhaust in its movement, and remains closed until the steam side of the piston reaches the exhaust port at the end of its travel when it uncovers it; which, in the ordinary cylinders, the exhaust commences to open when the piston has performed about two-thirds of its stroke, causing a loss of power on the balance of the stroke. The inventor claims that his device immediately relieves the steam pressure at the end of the whole stroke and passes it off through the annular slots, causing no back pressure as in the ordinary cylinders. The inventor says: "By means of this improved construction I am enabled to use the full elastic force of the steam during nineteen-twentieths of the stroke." He also claims that "as the piston uncovers the central slot at the end of each stroke, when it is on its dead centre, the piston is at that moment theoretically at rest, allowing an appreciable time for the escape of the exhaust steam." The inventor claims that by his improvements his locomotives with 16x20 inch cylinders and 54 inch diameter drivers will be capable of running sixty miles an hour with an ordinary passenger train on a good, straight track, with a saving of from 20 to 30 per cent. of fuel.

There has also been turned out from the Grant Locomotive Works, of Paterson, New Jersey, a locomotive, from the designs of Eugene Fontaine, who claims that it can be made to run 80 miles an hour, while the machinery is running no faster than that of an ordinary locomotive travelling at the rate of 60 miles. The crank axle is placed on top of the boiler instead of under, as usual; on the crank axle are two frictional wheels, 5 1/2 feet in diameter, which are in contact on the top of two other frictional wheels of 4 feet diameter, which are secured concentric on the outside of the driving wheels, 5 1/2 feet in diameter, which rest on the rail. The motion of the driving wheels thus communicated is increased in the ratio of their respective diameters, as 1 to 1.38; that is to say, that, providing there is no slip, the drivers proper will run one-third faster than the first driven wheel. It is not to be presumed that the inventor, with his experience in locomotives produced, has carefully studied the production of power, otherwise he would not have wasted the amount of money necessary to produce this abortion, as it is well known to engineers that power is speed (velocity) multiplied by pressure (force) and especially in locomotives it is an increased piston speed that is wanted for rapid transit, in connection with high steam pressure, so as to reduce the boiler capacity to a minimum. This locomotive is running on the Pittsburgh, Fort Wayne and Chicago Railroad.

At Concord, New Hampshire, it is said, a locomotive is building, with a flat boiler—2 feet by 7 by 12 feet, are the dimensions given—with the fire box in the middle. The engineer's position, like that of the pilot's on a steamboat, is to be at the front, and the fireman as now. The idea is to bring a large portion of the boiler over the fire, and increase its steaming capacity.

A noteworthy feature of the year's record has been the construction of a number of locomotives, both passenger and freight, with the improved fire box of Mr. I. E. Wooten, general manager of the Philadelphia and Reading Railroad, on which road they are in service, and have given very satisfactory results. This improvement consists in providing a very large grate area, by extending the fire box laterally above the driving wheels without raising the waist of the boiler to any material extent. Insufficient grate area has been the defect of all locomotive boilers, and the veteran Ross Winans, years ago, took the lead in remedying it. Mr. Wooten's improvement would seem to have fully covered the ground in this direction, and is applicable to locomotives of all construction, and free from the objection and limitation inherent to former efforts. The consolidation engine on this plan, with 20 x 24 inch cylinders, have fire boxes 94 x 114 inches, and among the express passenger engines, with fire boxes of about the same size, there is one having cylinders 21 x 21 inches. The schedule time of the latter locomotive on the fast express from 9th and Green streets, Philadelphia, to Bound Brook, 59.2 miles, including 3 stops, is 74 minutes, portions of the run being made at the rate of 70 miles an hour; and as an instance of these capabilities, it may be stated that a gentleman of this city left his house near Broad and Arch streets, Philadelphia, a short time ago, at 8 p. m., travelled to New York city behind one of them, transacted his business, and was at home and in bed at midnight.

The Pennsylvania Railroad Company have turned out from their Altoona shops a coupled locomotive, having cylinders 18x24 inches, 6 feet drivers, and a slab frame of the English type. It was designed to run the 69.2 miles between Philadelphia and Jersey city in 90 minutes, but from all accounts it has not proved a success. Some time in July last it was placed on the road and attached to a freight train, so as to be limbered up. It is now in the fast passenger service between Jersey city and Philadelphia. They still have difficulty in keeping cool its main boxes. They are of wrought iron, as also are the journals. They now have in course of construction another fast express locomotive, with cylinders 18x24 inches, and 6

feet drivers, which is expected to reduce the time between the two cities to 80 minutes.

No material advance has been made during the year towards the attainment of the smoke and cinder nuisance, which still continues to be the bane of the traveller. There is no valid reason why the partial use of non-consumed coal clipped off by the force of the exhaust and carried through the tubes should not be returned to the fire box and usefully disposed of by being turned instead of, as is now the case, being thrown out over the roads and into the car windows. Locomotives provided with apparatus for the purpose are now in service, and are working with an economy of fuel in addition to the exemption from throwing into the air or burning coal, but the merits of the system, which is a reasonable and practical one, have not met the recognition they deserve. On the other hand, some railroad managers violate a well-established theory, and continue an unwise and unprofitable, and objectionable practice of which should have long ago rendered it obsolete, namely the use of an extended smoke box which, under no circumstances, can do anything but uselessly transport a small quantity of hot cinders while the rest are thrown out just as they are before. These blind guides have their halftone who prefer to follow the lead of some one else than think for themselves, and the adoption of the more than useless device, as a so-called spark arrester, is to be recorded as a backward step, which has been taken during the year by several railroad companies.

In locomotives we are greatly behind the English. Not that we have not the facilities, but that we are so completely enveloped in the dazzling cloud of American greatness, as to be indifferent to the progress of other nations. In England the greatest attention is paid to the arrangement of the boiler for the admission of air in comminuted jets over the coal, and by the use of fire-brick bridges. In this country but few combine these simple and common expedients. Coal burning is well known to be solely a chemical question, that of combining carbon and carburetted hydrogen with oxygen, in certain equivalents—not a mechanical consideration, as is generally treated. In England some locomotives run with as low as 15 pounds of coal per mile. The average consumption of fuel in England is but little more than half as great as in this country. This indicates a wide field for improvement in our locomotive boilers. True, the loads in England are 20 per cent. lighter, but the speed is 25 per cent. higher. What is wanted in this country is a locomotive boiler, made with express reference to the admission and mixture of air in coal in combustion. Chemistry teaches us that this admission and mixture is all man can accomplish, nature effecting the rest. Charles Wye Williams showed us that a brick arch and a few air holes sufficed for the required purpose of a "smoke burner." That is to say: Place a brick arch in the fire box, so placed as to deflect back the air from the tubes, so as to make the upper part of the fire box effective as a combustion chamber, and supply air through hollow stay bolts. This is done in the United States in some instances, but only to a comparatively small extent. The English locomotive engines cut off much earlier and use much larger boiler nozzles than we do, by which latter means a less back pressure is the result. The application of the indicator to their locomotives is as common with them as its application to stationary engines is with us; in fact, in this country the application of the indicator to locomotives is the exception, not the rule, and if railway superintendents, in ordering locomotives, would insist upon these being, when finished, accompanied with indicator diagrams of their cylinder steam action, at the speed they were to run at, better and more economical locomotives would be the result.

The economy of a locomotive is not, as yet, understood. With the majority of those now in practical operation, the power depends on the boiler pressure and the piston speed, as before stated. What is wanted for economical locomotives is a minimum weight with maximum power. To produce this, we must have high piston speed, and a corresponding boiler pressure. For, as we reduce the weight of our locomotives, we reduce its adhesion. This latter must be provided for by a higher boiler pressure. To illustrate this, let us take the standard size locomotive for fast passenger service, using steam of 125 pounds to the square inch, with 54-foot drivers, cylinders 17x24 inches, and making 300 revolutions per minute, and assuming the point of cut-off to be at half-stroke, the tractive force will be:

$$T = \frac{17^2 \times 7854 \times 24 \times 103}{69} = 8,493$$

Now substitute a 15x21 inch cylinder, with 6-foot drivers, and 200 pounds per square inch, and making 420 revolutions per minute, cutting off at half stroke, we have:

$$T = \frac{15^2 \times 7854 \times 21 \times 167}{72} = 8,607 \text{ pounds.}$$

and the horse power of the latter will be 50 per cent more than the former.

$$\begin{aligned} & \frac{220 \times 1,200 \times 103}{33,000} = 850 \\ & \frac{170 \times 1,500 \times 167}{33,000} = 1,413 \end{aligned}$$

The only limit to the speed of the piston is that at which the piston packing begins to "cut" the bore of the cylinder, and with the very hard iron of which cylinders are now made, and with the light steel packing rings now in use, it is certain that a mean piston speed of 2,000 feet per minute may be maintained, not only with safety, but with great advantage. Small-cylinder locomotives would have less condensation, and hence expansion could be advantageously carried to a greater extent than with large cylinders, working with the same quantity of steam. The loss by condensation (and this is the great drawback of expensive working) would be relatively still less also, because the short interval for cooling at the increased speed of the smaller piston. With fast-running engines a given quantity of steam would be discharged in smaller quantities, but at more frequent intervals up the chimney, the blast thus approaching to a more continuous flow of steam. In fact, mere frequent exhausts of steam into the chimney enables a smaller boiler to evaporate more water from a given heating surface in an hour than a larger boiler with less number of exhausts in the same time. Our difficulty is not in knowing what is the proper thing, but it is in not putting into practice what we do know. Wait know the whole thing of expansion, and almost how much power could be got out of a given weight of steam expanded to a given extent, and protected from condensation during expansion. Oliver Evans and Woolf adapted the principle to high-pressure steam, and today our most approved steam marine and pumping engines are on the Woolf plan. Why have not our locomotive superintendents followed in their foot-

step? It is not for the want of education or intelligence, nor is it for the want of money. Let them go to any of our leading locomotive builders and say they want a locomotive that will make sixty miles an hour with a consumption of 25 pounds of coal per mile run, pulling a train of not less than 120 tons, and stipulate that, as a guarantee, the builder must produce indicator diagrams at this rate of speed, cutting off at not over 1/2 of the stroke with a moderate amount of back pressure, and in initial steam pressure in the cylinders within five points of the boiler pressure. Let them state in case the above is complied with, that steam will be paid at that of the market rate. They will not have to call upon more than one or two builders before their offer will be accepted. The result will be that at the end of the first year's run orders will be given under these conditions.

In regard to the indicator, the diagrams taken on locomotives running at miles an hour show an excessive wire drawing due to the working of the link which is defective and now is the time, in these days of high speeds, for the production of a better valve gear. The rail is a great deal of some additional completion of this structure would be justifiable. In our fast-running passenger engines, with 125 pounds boiler pressure, the diagram will show perhaps 10 to 150 pounds at the beginning of the stroke. This falls when the piston has moved above 4 inches of its stroke to about 60 pounds, and the actual point of cutting off is altogether lost in the rapid fall of the expansion line towards the exhaust end of the cylinder. The average pressure throughout the stroke, does not exceed 40 pounds, and the real gain from expansion will be about the same. If steam of 15 pounds had been admitted for about one-half the stroke and then cut off, it will be seen that in our present construction of slide valve, one-half the boiler power is expended in forcing it through the narrow opening to reach the pistons, and, according to the mechanical theory of heat, a corresponding part of the steam must be condensed and lost. This great defect is due to the scant opening which the link motion gives in the notches after we leave the centre notch. In the locomotive "3,000" the Allen valve was used, but as the indicator was not applied we have no knowledge of its working. The Allen stationary high speed engine also uses a valve with double openings, and, judging from the diagrams produced by this engine, no doubt would answer locomotive purposes. Unless something of this character is adopted and a more expeditious entrance into the cylinder is obtained for the steam, it is a question if not some radical change shall have to be made in locomotive valve gear. The link is undoubtedly the simplest gear known for locomotives, but its mere simplicity is not sufficient to justify such a considerable waste of boiler power, especially for the high speeds now demanded for our flying trains. What is wanted is an automatic cut-off arrangement similar to the modern high-speed cut-off engines now in general use. When the indicator is more generally employed—that is to say, when locomotives are accepted on diagrams produced by them in making the speed and pulling the load expected of them, this evil, as above stated, will be recognized, and its correction will eventually follow, as has been the case in our portable and stationary engines, by the means of the indicator. As steel rails and tires have added so much to our railway improvement, we must go farther, and in our locomotives adopt steel axles and boilers. So, too, must all other details be observed for an economical maintenance of present and increased speeds.

CAPTAIN EADS' SHIP RAILWAY.

(Mexican Correspondence New York Tribune) Captain Eads has completed his negotiations with the Mexican Government for the construction of his ship-railway across the Isthmus of Tehuantepec, and has received from it the most liberal concession which it has ever granted. It gives him the right to construct the ship-railway on such line as he may determine, and he is to be entirely untrammelled in the plans and execution of the work, which is to be commenced within two years from the date of the grant and completed within twelve years. The concession grants a right of way across the Isthmus half a mile in width, which width is increased, wherever stations are required, to one mile. It gives him the right to improve such rivers and harbors as he may deem proper and to collect liberal tonnage tolls from vessels entering them. It permits him to collect \$5 per cubic metre of the displacement of each vessel transported on the railway; the amount of tolls to be determined in the following manner: The greatest length and greatest width of the vessel, measured at the surface of the water, are multiplied by the greatest depth of immersion, and for each cubic metre or fraction of a metre contained in such parallelepiped of these dimensions, he is entitled to charge \$5 toll. He is also entitled to charge \$15 for each passenger on the ship and 1 per cent on the value of gold or silver coin or bullion or precious stones; and, in the event of such valuables not being declared to his agent, to collect 10 per cent on their value, and to detain the ship until the sum is paid. He is also entitled to such compensation as may be agreed upon between his agents and any vessels in transit, for dockage, repairs, or cleaning when needed by them, and to operate a telegraph line and an auxiliary freight and passenger railway line in connection with the ship-railway. In addition, the governments grant him a subsidy equal to 1,000,000 acres of public lands, to be located on the Isthmus or elsewhere, in aid of the construction of a suitable harbor on the Pacific Ocean. It also gives him the right to consolidate the Tehuantepec Railway, now being constructed by M. Learnard and others, with the ship-railway on such terms as may be agreed upon between them, and in such event, the location of the Tehuantepec Railway may be altered, as desired by Captain Eads. The Tehuantepec Railway Company has a subvention amounting to about \$1,500,000, to be paid by the Mexican Government in Custom House certificates, and has also a large land grant. In case of the acquisition of this railway its obligations to the Mexican Government are to cease and determine, and the subvention would then attach to the ship-railway. The duration of the grant is ninety-nine years, at the termination of which the government is to take possession of the works and pay two-thirds of their value. Captain Eads, on his part, agrees to transport the ships, property and troops of the Mexican Government without compensation during the existence of the grant. He has the right to export, free of all duties, all moneys required to pay dividends or to purchase materials of any kind for the use of the road, and likewise to import, free of duty, during the entire period of the grant, all materials, coal, and articles of every kind required for the construction, repair and operation of the road. The most remarkable feature, however, of this liberal concession is that which gives to Captain Eads the right to hypothecate the revenues of the road to any other government which he may select to aid him by money or guarantees in its construction. It gives to such gov-

ernment, in case of any default on the part of the company to such government, the right to take it through the courts of Mexico and have recovery pointed to insure the faithful application of its revenues in accordance with the terms that may be agreed upon. No hypothecation or conveyance of the property of the work is to be made, or of the funds, except to the order of the Mexican Government without its validating the concession. The jurisdiction to the concession of another government is to be exercised by the Mexican Government to give to the United States the privilege of co-operation with Mexico in aid of the construction and control of the work. This is provided by the leading men in Mexico, a European route across the Isthmus, and the one which the two Republics are most vitally and directly interested. The route across Panama, which is distant 1,200 miles from Tehuantepec, is called in Mexico the French or European route. Since the New York to San Francisco would save about 1,100 miles by going by way of Tehuantepec, instead of Panama. The one route is through the Gulf of Mexico and the other through the Caribbean Sea. From the mouth of the Mississippi to California, Tehuantepec is 2,000 miles closer than Panama. The following Captain Eads' (railroad) charges are given: Three ton cargo as those which are allowed by the Colombian grant to the De-Leseparty. This is for two reasons: First, the railway across the Mexican Isthmus will need to be about 112 miles in length, against 45 miles at Panama, and, second, the pressure in an distance in favor of Tehuantepec will justify much higher rates of toll. The tolls, however, Captain Eads, even assuming that the actual tolls will be only one-third as much as that estimated in the Paris Convention, will, it is thought, insure a profit as will enable him to secure sufficient capital to construct the railway. A canal at Panama at the lowest estimates that have been made for will be largely more than double the cost of the ship-railway at Tehuantepec, which Captain Eads estimates will be \$75,000,000. He, however, proposes to give the United States the right to lower these tolls to a point deemed advantageous to the interests of American commerce and to transport its ships, property, oilers and soldiers gratis, on condition that it will guarantee 6 per cent dividends on \$50,000,000 of the stock of the company. He insisted on the insertion of a clause which would permit the United States Government to lend its aid to this work, and declare to the President and Cabinet of Mexico and to the leading members of its Senate and House that such a clause would be looked upon by the United States as an evidence on the part of Mexico of confidence, like wise as an evidence and a desire to cultivate the kindest relations with the United States. The greatest delay in obtaining the concession resulted from Captain Eads' insisting that such a clause should be inserted in the grant from his declaration that he would not consent to appeal to capitalists or to any other Government without first giving to the United States this opportunity. The utmost unanimity prevails in this country with regard to the practicability of the ship-railway. Not a word has appeared in any of the papers of Mexico expressing a doubt of its success. I have heard such doubt expressed by anyone in the country. The people seem to accept the success which has attended the engineering works of Captain Eads as an ample guarantee of his ability to carry out what he proposes, and while his reception here has been devoid of any theatrical display, the manner in which he has been received and treated by the Mexican Government and people has been a source of the liveliest gratification to American residents in Mexico. At his request a costly expedition, comprising about 50 individuals—engineers, assistants, laborers and soldiers—to assist him in making a survey of the Isthmus, to determine the most practical route for the ship-railway, has been prepared by the Mexican Government and has started for the Isthmus. This commission is under the direction of the eminent Civil Engineer, Francisco De Oary, who is in charge of the drainage of the Valley of Mexico, and who was commissioned to represent the Mexican Government at the Paris Canal Convention. He is directed by the Government to assist the engineers of Captain Eads in the instrumental survey of such routes as he may designate. Messrs. Williams and Corthell will direct the survey during the absence of Captain Eads, who has started with the expedition to the Isthmus to inspect the rivers and harbors, and give the party such instructions regarding the work as he may deem necessary. As an additional evidence of the respect of the Government for Captain Eads, it has ordered one of its war vessels, the Independence, to take him from the Isthmus to the port of New Orleans on his way to Washington.

A VALUABLE INVENTION.

New Combined Box Car.

We have had the pleasure of examining the combination car designed for carrying grain in bulk, lumber flour and general merchandise. It is the invention of Mr. T. L. Wilson, of this town, one of the most experienced car-builders in the Dominion. The standard box car now in general use on our railways carries 10 gross tons of paying freight, while the car itself weighs 10 gross tons or thereabout. Thus the engine is compelled to haul one ton of dead weight, or non-paying freight, for every ten of cargo, or paying freight. This new idea of a box car is designed to and will carry 20 gross tons of load, or paying freight, while the car itself weighs only 27,000 lbs., or nearly 6,000 lbs. heavier than the ordinary standard box car. To accomplish this desirable object, there is introduced with the framing of the car a new principle of trussing, trussing, etc., so that the framing of the car can carry double the load with perfect safety. By an ingenious method of placing duplicate uppers in combination with a skeleton frame placed in a position with the said uppers, the inventor has accomplished strength and solidity, whereby he secures, with the system of trussing and trussing in connection with the main framing of the body of the car, a most satisfactory result. The grain in bulk discharges itself automatically, obviating waste in discharging cargo, and saving time in unloading, a great desideratum in handling grain in bulk. For lumber there is no alteration needed. When the cars are not required for grain transportation, the cars are ready at a moment's notice to be used for lumber, flour, or other merchandise. The capacity of this car in comparison with the box car now in use is: Present box car, wheat, 450 bushels; combination car, 1,000 bushels. Present box car, lumber, 8,000 feet; combination car, 16,000 feet. Present box car, flour, 100 barrels; combination car, 200 barrels. The following comparison shows the average quantity of cars low in general use hauled by an ordinary locomotive, with the difference of dead weight hauled as compared with dead weight hauled with a train of cars constructed on this combination pattern, and also the quantity of paying freight or cargo on the old principle and the new:—

PRESENT SYSTEM

Engine load—120 tons... Total dead weight in 20 cars of level—44,000 lbs.

—The K & P Railroad is said to be getting an... —Return of traffic on the Midland Railway for the week ending January 7th 1880.

—Norwood, Ont., January 12.—The party of... —Great Western Railway of Canada—Traffic for week ending January 14th, 1880.

CANADA SOUTHERN.

The Canada Southern has within the past few days come rapidly to the front both at the Stock Exchange...

THE EFFICIENCY OF RAILROADS

The efficiency of railroads as highways of commerce has increased much more than their mileage...

AMERICAN RAILWAY LEGISLATION IN 1880.

In California and Iowa there has been legislation in favor of companies chartered in other States...

For presenting cables and to help people on the platform steps...

SCIENTIFIC AND PRACTICAL.

NEW CURE FOR SMOKE

Dr. C. W. Siemens describes in Nature a new method of the ordinary fire grate, by which all smoke is done away with...

MINERAL WOOL PACKING

In many cases steam-pipes that were wrapped with mineral wool (slag wool) have become deeply rusted...

STEEL BOILERS

In an article on steel boilers the London Engineer says: While we admit that excellent boilers have been made of steel...

TRANSMISSION BY BELTING

Experiments made by M. Leboutre on the transmission of power by belting disclose a curious fact...

SPONTANEOUS COMBUSTION OF SOFT COAL

The Boston Manufacturers' Fire Insurance Company states that at present rates of prices semi-bituminous and soft coals are coming into more general use...

—An English engineer recently returned from a visit to American steel works, where enormous output is secured per converter...

IMPROVEMENT IN THE MANUFACTURE OF PAPER.

A Canadian patent has just been granted jointly to Mr. John Manning, of Windsor, N.S., and Mr. C. W. Knowlton, stationer, of the same place...

—A company has been formed for lighting the city of Jerusalem with gas.

—The situation of the German iron market is so far unchanged that prices are quoted at the same figure as the previous week.

—The contract for the iron superstructure of a bridge over the Meuse near Gronau, Holland, has been let to MM. Skidde & B. Jansz for the sum of 182,500 florins.

—Owing to the severe competition of Swiss and German factories the manufacturers of St. Etienne, France, are arranging to substitute gas for coal as a source of power for looms and the like.

—A two-foot rule was given to a laborer in a Clyde boat yard to measure an iron plate. The laborer not being well up to the use of the rule...

—Notwithstanding England's enormous indebtedness to her mechanics, but one mechanical workman has ever been honored with a burial in Westminster Abbey...

—Very often the dyers of woollen clothes are blamed for the rubbing off of the pieces dyed in the indigo vat without reason, while in many cases this is caused by the ignorance of some fullers who perform the fulling on pieces which have not been perfectly washed...

HOW LONG MAY A MAN LIVE?

It was Prof. Hufeland's opinion that the limit of possible human life may be set at 200 years. This is on the general principle that the life of a creature is eight times the years of its period of growth...

—Edison has at last ordered the Southwork Foundry in Philadelphia to ship the engine for driving his new dynamo-electric machine, and it will be running in about a fortnight.

MONTREAL PRICES CURRENT.

GROCERIES

Table listing various grocery items such as flour, sugar, and oil with their respective prices in Montreal.

Table listing various drug and chemical products including acids, salts, and oils with their prices.

Table listing various industrial and hardware items such as iron, steel, and machinery with their prices.

Weekly Review. Financial - The loan market in New York has remained about the same during the past week as since the first of January...

Latest Grain and Provisions. Wheat is a little stronger in Chicago to-day, closed at 94 1/2 for February...

RAW FURS. Bear, cub 2 00 @ 4 00. Bear, large-prime 4 00 @ 8 00.

WEEKLY REVIEW.

MONTEAL, January 26th, 1901. FINANCIAL - The loan market in New York has remained about the same during the past week as since the first of January...

Local Flour Market - There is but little doing and that at steadily declining prices. The dropping prices is like squeezing drops of blood out of the holder...

Latest Stocks. The market in New York, after settling down from the opening range of prices, regained all or the loss on most stocks...



THE LUMBER TRADE.

UNITED STATES MARKETS.

(North-Western Lumberman.)

The lumber trade in the United States is showing a marked improvement in the past week. Business has moved along quite as it always does at this season, though it has averaged better, probably, than is usually the case during the opening weeks of the year. This is about the best result to be expected, and while it is not yet a sign of a general recovery, it is a sign of a more active trade. It would indeed be remarkable if a general commercial depression in the lumber business should develop at this season, as a result of the general depression of the country. The lumber trade is a very important one, and its depression would have a serious effect on the country. The lumber trade is a very important one, and its depression would have a serious effect on the country. The lumber trade is a very important one, and its depression would have a serious effect on the country.

TIMBER CULTURE.

(North-Western Lumberman.) Aside from all considerations relating to the rapid depletion of the pine forests of the North-West, the propriety, utility and necessity of systematic timber culture throughout the land, can but be acknowledged by all whose intelligence enables them to form an opinion. Granting that the claims of the religionist are backed, as they are by the results of scientific research in discovering the adaptability of all things to a given end—point correctly to the theory that the Creator induced every spot of earth with those elements which are best calculated to forward its development, and that the pine tree was planted in the greatest profusion in those localities where it would prove the most beneficial in man's endeavors to convert the desert and waste places into a garden of beauty, it yet remains an unquestionable fact that man's co-operation is essential to the preservation and reproduction of all those elements, which in their nature are capable of exhaustion, or the providing and adapting of such substitutes as will best accord with the economy of nature, to the furtherance of the end in view. That the pine tree is fast passing away is not to be doubted. It is conceded that the fear which places the exhaustion of the pine supply as a prime factor in commerce, at so early a date as eight to ten years from this time, is a mistaken one, we can only fall back upon the claims of the more sanguine, and hope for the evil day to be delayed not more than fifty years at the farthest. Due regard for posterity, then, demands that the present generation shall not unwisely destroy, and make no provision to replace. But the pine does not reproduce itself, and if it did, not only the wants of man in the occupancy of the soil, but as well the absence of those conditions of quiet and practical concealment, under which alone the pine tree thrives, forbids the increase in the future to anything like an adequate supply for the teeming millions whose destiny it is to inhabit this continent. But if the present supply of pine should last for fifty years in quantities adequate to the wants of the people, what of the future? It millions of acres of pine should at once be planted under the most favorable conditions for growth and development, it would not be possible, at the end of the present supply, to draw upon the cultivated forest for a perpetuation of it, and at least another fifty years would be requisite to bring it to anything like that stage of development which would enable it effectively to take the place of that which has been growing upon this continent for hundreds of years, and which forms the basis of our present supply. If

we view the matter rightly, future generations in the United States will be no one of the pine as a building timber, and will look upon such solitary and exceptional trees as they appear to the eye, and not as the present generation looks upon them. The pine, which can never be replaced by any other tree in the economy of nature. That man will be left without a building timber, we have no idea, for we do not believe in a substitute which will be equally available and economical, and so long as we are equally content to reproduce the pine as a commodity, we can obtain it for lumber, and for other uses, while the pine produces from, we need not have a lack of timber, into which straw has already been converted, or for the other materials which are requisite in the construction of our buildings, or in the manufacture of our machinery. It is when this has been said, the truth still remains that a treeless country will not long remain a prolific one, either in population or in crops, or crops to sustain population, and although it might be, from a commercial point of view, profitable to burn the timber land into little farms, yet the actual improvement would be destructive to the best interests of mankind. If, then, it is a necessity that a tree growth should be cultivated, and pine cannot be excessively raised, it becomes an imperative obligation to each other timber-grower, to give promise of a kindly response to our efforts, and devote a zealous measure of it to those varieties which will thrive under our efforts, and themselves prove of commercial value when they shall attain their growth. Of these the most hopeful is the black walnut, which has no doubt a quality that prevents its flourishing under the kindly influences of fertilization, but which thrives in large areas of soil, both north and south, east and west, and supplies us with our most valuable forest wood for ornamentation and utility, while combining a rapid growth with a most genial influence over the climate. We may mention the poplar or whitewood tree in the same category, and as a wood supplying more nearly the conditions of pine for finishing lumber than any other.

HEMLOCK TREE AND BARK.

In view of the fact that the pine is being rapidly stripped from the districts of Muskoka and Parry Sound, a Bracebridge correspondent thoroughly familiar with the subject calls the attention of the Canada Lumberman to the great destruction of hemlock, which is taking place in those districts to supply tan bark. He estimates that there are about 10,000 cords of hemlock bark peeling annually in that region, and assuming that 7 trees of an average diameter of 13 in. and 35 feet in length will furnish a cord of bark—would equal 3 saw logs of 13 inch diameter, which by Scribner's rule gives 219 feet of lumber—or 10,000 trees would make 1,320,000 feet. This has been going on for the past four years, so there must have been 61,320,000 feet of lumber felled during that time, but not more than one million feet of this large amount has been manufactured into lumber. The balance has been left to rot in the woods, or, which is far worse, to make kindling wood for the first bush fire which may happen to break out near by, and which might destroy the greater part of the valuable pine or hemlock left standing. As long as pine stumps are piled up, and as long as pine can be obtained, no one cares to get into manufacturing hemlock lumber, and as tan bark must have bark, the waste will go on, and the wood be left useless. A portion of this bark is peeled on patented lands, but the greater portion, the correspondent says, is cut on crown lands without lease or license, and it is about time the government took some steps to stop this waste, as the day is not far distant when hemlock will be of more value than the pine now is. In some places the bark is so slashed down that the refuse seriously interferes with getting out the pine.

—Large quantities of lumber are being shipped from Ottawa district to the States via the St. Lawrence & Ottawa Railway. —There are 45 saw-mills in Manitoba, the North-West Territories and Keewatin, 22 of which were started during the past year. —The Muskoka Mill & Lumber Company last season cut 15,000,000 feet, and have on hand 4,500,000 in lumber and 6,000,000 in logs. —Stanton Clipper. The lumbermen in this vicinity are extremely well pleased with this winter's work so far, and we venture to say that such another amount of logs was never before put into the streams and lakes of Michigan prior to the first of January. —The Detroit, Mackinac and Marquette Railroad Company is building branches into hardwood tracts adjacent to its line north of St. Martin's Bay and in the Monticque Lake country, to facilitate the fringing out of charcoal for the iron furnaces at St. Ignace. —Alpena Lyman Sylvester, with three teams, put 1,000,000 feet of logs in the river up to New Years A. N. Spratt, at Phelps Camp, put in 2,000,000 by New Years. Fletcher, Pack & Co have got in 6,000,000 of their stock of logs, and are now putting in very fast. —Wetzell Bros., Grand Rapids, shipped by rail during 1880 11,184,745 feet of pine lumber, 52,292 feet of hardwood, 29,725,000 shingles and 398,000 lath. They had on hand, January 1st, 1880, pine lumber, 3,500,000 feet, hardwood, 60,000 feet, shingles, 1,000,000; lath, 210,000. —J. B. & W. A. Atwood, of Flint, are cutting 5,000,000 feet of pine on the Huron Lake, or Harrison division of the F. & P. M. Railway, and are hauling the logs by rail thence to Saginaw. In the spring they will either sell the logs or cut them into lumber, as seems most profitable. —According to Surveyor General Brackett's report, the lumber cut of the second Michigan district, which includes the upper Mississippi and St. Croix rivers, was, for 1880, 279,377,230 feet, lath, 48,674,700, shingles, 85,405,750, pickets, 127,075. The total amount of logs on hand is 55,103,000 feet. —Ludington: Mill owners have commenced the work of overhauling their mills. The probability is that next season the lumbering business will be one of great activity, particularly in this locality. All the mills will be well stocked, their capacity increased, and they will be pushed to the utmost capacity. —The Michigan salt association has sent out cards of notice that no further advances will be paid on salt, including the December product. The reason probably is that the market is glutted, and this measure is necessary to check the production, which is getting so enormous that the association cannot find market for it. —Alpena Pioneer: D. D. Oliver has been measuring the stumps on the land of his that has been cut over since the firm of Cunningham, Robinson, Haines & Co. took it, and finds the amount to be according to

this measurement about 50,000 cords. The reports given by the different parties who cut it amount to only about 100,000. —The New Brunswick Lumber and Coal Company, organized with the object of developing and colonizing the lands purchased from the new owners of the N. P. Railway Co., was organized 1st day by the election of the following officers:—1st Genl. Hon. Lord Elphinstone, President, Hon. Stephen Mackenzie, M. P. (Montreal), Hon. J. A. Smith, Hon. Isaac Duggan, J. Kinzie, J. Todd (New York), Samuel Thomas (New York), O. H. Northcote (New York), T. W. Ratcliff (Toronto), J. B. Duggan, Directors, Robt. Tennant, Secy.

TONNAGE OF LAKE MARINE.

Table showing tonnage of lake marine by district. Columns include District, Number of Vessels, and Tonnage. Total: 3,071 vessels, 414,588 tons.

The above includes only steamers, sail vessels, and such other craft as are enrolled. If small craft and canal boats, barges, etc., were counted, the total would be much greater. It is estimated that the value of our American lake marine is \$100,000,000. The total number of Canadian vessels on the lakes is 1,537, measuring 212,138 tons.

—The managers of the world's fair lumber in New York are a little out of sorts with Mr. Vanderbilt. When they settled on Inwood as the site of the fair, should it ever be held, they counted on him for a subscription of at least \$500,000. The fair would be worth more than that, they said, to Mr. Vanderbilt's railroad, and he would surely give \$500,000 anyway. They counted on the same amount from the railroad companies of which he is the head and front, or just \$1,000,000 from the Vanderbilt interest alone. And now they are out of sorts, for Mr. Vanderbilt did not subscribe at all, while the subscriptions of the railroad companies is only \$250,000.

Advertisement for R. H. Smith & Co. Sole Manufacturers in the Dominion of Canada of THE "SIMONDS" SAWS. Includes images of saws and text describing their products and services.

COMMERCIAL NOTES.

The Montreal Rolling Mills Company hold their annual meeting to-day. The Royal Canadian Insurance Company has declared a dividend of five per cent, payable February 15th. The annual meeting will take place on the 23rd ult, at the company's Montreal office. —Ludington Report: During the last severe weather the north branch of the Pere Marquette river was frozen over. Banking logs had to be suspended until Feb. 1st was broken up a dozen miles or so. The north branch rarely freezes over. The Adams Tobacco Company has declared a dividend of 2 1/2 per cent, payable 24th January. The annual meeting of the directors and stockholders will take place on the 23rd at the company's office in this city. The annual meeting of the directors of the Victor Hudson Cotton Mills Company will take place February 3rd, when the question of proposed improvements, by enlarging the facilities, will be the chief matter of discussion. The sale of the stock and fixtures, horses, sleighs, wagons, etc., constituting the assets of J. R. Urquhart, grocer, Montreal, who failed just previous to the holidays, is now taking place. The sale is in lots to suit purchasers—retail or wholesale. Ship builders in two of the largest yards on the Clyde struck for a 7 1/2 per cent increase of wages on Saturday last. The strike was declared settled in favor of the strikers on Tuesday. The large contracts in hand give the owners no choice but to yield, or suffer more loss by non-fulfillment. —Three hundred and forty-four failures were reported in New York city during the year 1880, the aggregate liabilities being \$19,391,682, and the assets \$8,146,301. While the gross liabilities exceeded those of the preceding year by \$2,000,000 in round numbers, the number of failures is 25 per cent less, and is the smallest since the panic of 1873. In 1879 there were 400 failures, with liabilities of \$16,384,000, and assets of \$5,160,000; in 1878 517 failures, with liabilities of \$61,000,000 and assets of \$18,000,000. The increase in the failures for this year has been caused by speculations in coffee, cigars, iron and grocery trades.

THE METAL TRADE.

THE ENGLISH MARKETS.

Writing from Westbury, England, on the 1st...

Mr. Thomas Thorneycroft's annual report on the...

In France, the foreign masters are receiving a...

The highest price of the year was 73s 3d, which was...

Activity is noticeable at most of the iron and steel...

The following were the closing prices in the London...

Table with columns for metal types (Iron, Steel, Copper, Lead, Tin) and prices in London.

UNITED STATES MARKETS.

Pittsburgh.

Pig Iron—In common iron there appears to be a...

(American Manufacturer)

Writing from Westbury, England, on the 1st...

Nothing new has transpired in the nail market...

Wrought Pipe—The weather continues unfavorable...

Railway Supplies—Spikes, 2 1/2c per pound, spike...

Old Rails—We could learn of no transactions in...

Lead—It has advanced to 5 20c per pound pipe in...

Philadelphia.

The Kensington manufacturers met on Monday...

Pig Iron—Pig iron holds its own, but there are no...

Muck Iron—Inquiries are received for muck, and...

Sheet Iron—The demand for light sheets noted be...

Railway Material—The pressure for all sorts of ma...

Structural Shapes—Orders are not quite so abund...

Plate and Tank Iron—Only a moderate showing of...

New York.

Pig Iron—American: Transactions have come to...

has been mainly effected directly between consumers...

Scott's—A prominent banking firm closed out a...

English—Early last week about 25,000 tons Besse...

Old Rails—Since the extensive speculative purcha...

Scrap Iron—There is a large amount of undrable...

Manufactured Iron—Among dealers generally there...

The movement of foreign iron at the port of New...

Table with columns for metal types (Pig, Scrap, Old rails, Steel rails, Hoop, band, etc) and quantities.

Tin—Some speculative lots have been closed out...

Copper—Transactions in ingot have been confined...

Lead—The recent advance in price of pig metal is...

Splinter—There is still a fair trade in common...

Antimony—Sales are confined to small parcels...

In Hungary it is a practice of long standing to...

One of the growing industries of Australia is the...

A Montreal despatch says a new cotton mill will...

LEHIGH VIEW OF THE COAL OUTLOOK.

The Lehigh Coal & Navigation Co. has the following...

There is not much doubt that the period of the...

NEW ENTERPRISES.

On Jan. 22—The Accident Insurance Company will...

St. Hugh Allan, Messrs. Henry Atwater, Alexander...

The British America Iron & Coal Company gives...

The object of the acquiring, mining and working of...

THE POST OFFICE IN GERMANY.

Of all German official publications the annual pro...

A Montreal despatch says a new cotton mill will...

MINING NEWS.

DEVELOPMENT OF GOLD MINING BY THE JAPANESE GOVERNMENT.

A large quantity of valuable machinery has recently been made in San Francisco and consigned to the Japanese Government, which is about to develop the gold mines on the Island of Sulu...

BRITISH COLUMBIA

From a passenger who came down on the Gold Line, we glean the following items: Much activity is felt at Sitka concerning the mines and prior and their parties...

GOLD MINING IN CARIBOO DISTRICT

Brilliant Prospects for the Future.

With the exception of deep sinking and tunnelling, which can be carried on at all times, and some occasional prospecting, gold mining in Cariboo has been suspended for the season...

and that a great yield of the precious metal will be obtained by means of hydraulic mining...

OUR MINERAL RESOURCES

Some time since we mentioned that a certain degree of excitement had been aroused in the neighboring towns of Oregon by rumors that comparatively large sums of money had been paid by American speculators for the valuable minerals found on certain lots in that locality...

AMERICAN ANTHRACITE COAL OUTPUT—1880.

Table showing coal output for Philadelphia & Reading R.R., Lehigh Valley R.R., Central R.R. of New Jersey, Delaware, Lehigh and Susquehanna, and Western R.R. for the years 1879, 1880, and the decrease.

The question of the renewal of the dynamite patent came before the annual meeting of the Cornwall Mining Institute recently at Penance. Letters were read from several mine managers in England and Wales sympathizing with the Institute in their efforts to prevent a renewal of the patent...

POSTAL TIME-TABLES.



Post Office, Ottawa.

ARRIVAL AND DEPARTURE OF MAILED MAIL.

Table with columns for MAIL, ARRIVAL, and DEPARTURE, listing various routes and times for Ottawa.

Registered matter must be posted half an hour previously. Office hours from 8 a.m. to 8 p.m. For Savings Bank and Money Order business, 9 a.m. to 4 p.m.

Post Office, Montreal.

MONDAY, July 5, 1880

Large table with columns for DELIVERY, MAILED, and CLOSING, listing various routes and times for Montreal.

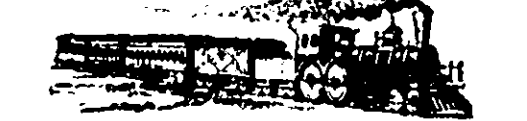
RAILWAY TIME TABLES.



Canada Central Railway

CHANGE OF TIES

On and after MONDAY, 29th JUNE, 1880, the following changes will be made in the running of the Canada Central Railway...



ST. LAWRENCE AND OTTAWA RAILWAY.

On and after THURSDAY, 10th JUNE, 1880, trains will run as follows:

For the East, West, South and South-East 11:15 a.m. For the East 2:00 p.m. For both East and West 10:30 p.m.

Q. M. O. & O. RAILWAY.

CHANGE OF TIME

COMMENCING on Wednesday, June 3rd, 1880, trains will run as follows:

Table with columns for Mixed, Mail, and Express, listing departure and arrival times for the Q.M.O. & O. Railway.

(Local trains between Hull and Aylmer.) Train leaves Hull Station seven minutes later. Magnificent Palace cars on all passenger trains and elegant sleeping cars on night trains.

INTERCOLONIAL RAILWAY.

SUMMER ARRANGEMENTS, commencing 10th June, 1880.

Through Express Passenger Trains run daily (except Sunday) as follows: Leave Pointe Léprieux 7:30 a.m. River du Loup 1:00 p.m. Arrive Trois Pistoles 2:00 p.m.

PICTON.

TO BREWERS AND MALTSTERS.

The undersigned, having enlarged his storage capacity, and put in an elevator, which is the latest and best in the County, is prepared to purchase on Commission, barley and other grains for Maltsters and dealers.

TO CAPITALISTS.

A SPLENDID SITE FOR A LARGE MALTING ESTABLISHMENT in the heart of the celebrated Bay of Quinte barley district. A never-failing supply, by gravity, of pure spring water at a temperature of 45° the year round. Also, a splendid site for a WHITE PAPER MANUFACTORY.

PETROLEUM.

THE BRITISH MARKETS.

A. T. BROWN & CO'S PETROLEUM REPORT.

LONDON, Jan. 10th 1884.

Refined Petroleum Oil—The quotations for refined oil from the States have declined 1/2 cent. But as we are told the business is nominal, or dull and nominal, the market prices will not fall so far. It matters much what quotation is called. A fair business has been done on the spot to the trade, but with only limited transactions on speculative account, which is confined to months and February delivery. Standard White, Penna. Crude, sold on the spot at 8 1/2 to 9 1/2 c. and to be held but more especially as to what month at 8 1/2 to 9 1/2. February at 8 1/2 to 9 1/2 per cask.

Today's market closed at 9 1/2. Naphtha—Steady. Coal Oil—Has a good price, selling readily at 4 1/2 to 5 1/2 according to quality.

Turpentine—The market has been quiet, and shows a decline of about 1/4 per cent. on the week. Spot is 5 to 5 1/2. February, April 5 1/2.

The stock at wharves today is 13,722 barrels, and the deliveries for the past week amount to 641 barrels.

PETROLEUM OIL.

Table with columns for Refined and Crude oil prices in New York and London. Includes 'Stock this day', 'Landed last week', and 'Delivered last week'.

COAL OIL.

Table with columns for Refined and Crude coal oil prices in New York and London. Includes 'Stock this day', 'Landed last week', and 'Delivered last week'.

Above represents stocks and movements at London and Thames Haven Public Wharves only.

THE EXTRAORDINARY YIELD OF PETROLEUM.

It is now 21 years since the first artificial well for petroleum was sunk. The following year mineral oils were first reported, and in 1864 exports of them began to be reported complete. Comparing 1870 with 1880 (64 years), the increase in quantities of illuminating petroleum is enormous—367,325,000 gallons for 1880, against 97,902,000 in 1870. It rose to 132,608,000 in 1871, declined 10,000,000 in 1872, rose to 158,000,000 and 217,000,000 in 1873 and 1874, declined to 191,570,000 in 1875, and has since been largely and uninterruptedly increasing, having increased in 1880 30,000,000. Between 1870 and 1880 the increase in quantity exported is 275 per cent., but the increase in value is trivial, being less than \$2,000,000, 64 per cent. only—\$31,783,000, against \$29,864,000. The quantity exported in 1877, about 105,000,000 less than in 1880, brought more than \$23,000,000 more. The average export price of refined petroleum .264 cents per gallon in 1862, was .523 in 1864, and .743 in 1865; it declined, with fluctuations, to .235 in 1873, and has but once been as high as .20 since—211 in 1877, the export of that year having brought the largest aggregate return ever realized; then it sank to .144 cents in 1878, .103 in 1879, and .087 (the lowest ever known) in 1880. In quantity, numerically speaking, and not by bulk, petroleum is an export of vast importance, its 367,000,000 gallons being outranked only by cotton, lard, and bacon and hams; in value it ranks fourth. Its discovery, subsequent commercial importance, and extraordinary cheapness form a striking illustration not only of the bountiful dealing out of natural resources to this country, but of the great moral and economic lesson that when a new source of supply is enough needed it is found a quarter century ago there might have been doleful inquiries what the world would do for light ere long, for the whales were becoming alarmed at their own census returns, and if people did not worry about it the reason must have been the lack of the peculiarly demonstrative class of statisticians who now hurl at us such information as the number of trains, each made up of a certain number of freight cars, drawn up such a grade by an engine of such a power, and having an engineer weighing so many pounds, which could haul at such a speed enough standard dollars (if they were only coined) to pay the national debt (if anybody would take them). Posterity has done nothing for us, and we can lay on the table this problem of what will be done when the coal is all gone—by that time the world may find out how to tow icebergs down and utilize their latent heat. Before the petroleum is exhausted we shall make the day 24 hours long by electricity. Petroleum being then out of demand for burning—even for starting the morning fire at which the servant girl makes herself a martyr to stupidity—we shall get beyond the use we now have for it (under new commercial names) in mollifying the rage of sore throats and lubricating stiff joints, and shall probably discover that its nature has been mistaken and that it is really the cure-all mineral water of the age.—Chicago Journal of Commerce.

PARAFFINE AS A WOOD PRESERVER.

A German chemist, Dr. Schaal, has established the useful fact that wood impregnated with paraffine is preserved from rot, especially when employed in aliarine manufactures, where it is exposed to the do-ying action of damp, acid and alkaline lyes. Wooden vessels which become totally rotten in two months the last for two years when impregnated with paraffine. The preparation of the wood is effected by drying it in warm air for three weeks, then steeped in melted paraffine to which has been added some petroleum, ether or sulphuret of carbon. In preparing this bath great care must, however, be exercised, owing to the inflammability of its ingredients. To prevent the paraffine from escaping from the pores, the wood should be coated with oil varnish or soluble glass, washed after drying with diluted hydrochloric acid. The silicic acid thus formed clogs up the pores from the outside, and protects the paraffine from the action of water. Paraffine, melted with equal parts of linseed or rapeseed oil, is also, according to Dr. Schaal, useful for coating iron vessels, which in chemical manufactures are otherwise very liable to rust.

THE MONEY MARKET.

TORONTO STOCK REPORT.

Table of Toronto Stock Report with columns for Banks, Loan and Savings Companies, Insurance, etc., and Debentures. Includes sub-sections for Interest Payable and Wharf Payable.

MONTREAL STOCK REPORT.

Table of Montreal Stock Report with columns for Name, Capital, Paid-up, Rest, Dividend, and Closing Prices.

EMPLOYERS LIABILITY ACT.

According to an English exchange the Employers' Liability Act, which came into operation on the 1st inst., seems likely to prove an extremely valuable and effective measure. It gives the workmen, in effect, that for which they have always contended—a right for compensation if they are injured through the negligence, not of a common laborer, but of some one in a position of authority and responsibility. More than this, it especially gives relief against the negligence of any person in the service of the employer who has the charge or control of any signal, points, locomotive engine, or train upon a railway. It is for this that railway operatives have worked for years, and the act, as it stands, substantially affords them the fullest rights that they have ever formulated. A limit, of course, is fixed to the liability employers have to meet. In no case is the workman to recover more than the amount of his average earnings for three years. This is reasonable enough. But the strangest thing of all is that the workmen themselves seem to be agreed that now the act is passed and the vexed question of common employment decided in their favor, it will be the most prudent course to contract themselves out of its provisions. The miners of Lord Dudley, and the hands of one of the largest shipbuilding firms on the Clyde, have resolved that, in the interests of both masters and men, it is better to waive the act by mutual consent, and to organize a joint insurance fund. Thus, then, the act is not likely to prove a source of litigation. It has defined the legal responsibility of the master, and has, so far, done good service. For the rest its objects and provisions seem likely to be worked out amicably.

—Although among the many fires occurring in the U.S. and Canada last year, there were only nine or ten where the loss exceeded \$500,000, and only three where it reached \$1,000,000, there were no less than 250 fires of \$50,000 and up ward. The property destroyed by fire last year in the U.S. and Canada amounted in value to \$78,813,900 against \$81,862,000 in 1879, \$70,266,000 in 1878, and \$97,325,000 in 1877.

—The Link Belt Machinery Company, of Chicago, manufacturers of improved elevating, conveying and general machinery, are placing in their establishment about \$10,000 worth of the very best improved machinery for their business, and will soon be in active operation. One hundred men will find employment in these works at once.

—American Manufacturers: Orders for 60,000 tons of steel rails have recently been placed, through agents in Philadelphia, with domestic and foreign works, and the heavy demand continues. Quotations are \$38 per ton at mill. Several quite large orders for bar iron have also been placed at 2-4 cents per pound, some of the orders amounting to as much as 1,000 tons.

—Among other new industries starting in New Orleans is a new cotton mill to cost about \$150,000, with 8,000 spindles, 62 carders, and 320 looms, to give employment to 320 hands; a new ice factory to cost something like \$150,000, and to give employment to about 75 hands, turning out 25,000 tons of ice annually; and a new bagging factory with \$100,000 of capital, to give employment to about 200 hands.

—A girl of 15, convicted of unlawful logging within the city precincts, was cast into prison in Lugos, Hungary. During the very first night of her incarceration, however, she not only contrived to escape from her cell, but to abstract the key of the great prison gates from its place of nocturnal deposit in the chief warden's lodge. She noiselessly let herself out of jail, and, closing the gates from outside, double-locked them securely, vanishing into darkness, with the key safe in her pocket. Next morning early, when the officials of the Stadthaus arose from their slumbers, they found themselves prisoners to their late captive. Strenuous efforts to break open the prison gates from within having proved ineffectual, they were compelled to invoke the intervention of a baker's boy, whom the chief warden hailed from the roof of the jail, and entreated to fetch the Royal Free Municipal locksmith with all convenient speed. That functionary presently made his appearance on the scene, dexterously picked the lock of the Stadthaus door, and delivered the correctional authorities of Lugos from confinement in their own jail.

DOMINION TRADE REGISTER

INDUSTRIAL DIRECTORY.

COTTON MILLS

DUNDAS COTTON MILLS CO., Dundas, Ont. They domesticate, double, triple, and various other grades of cotton yarns.

HAMILTON COTTON MILLS CO., Hamilton, Ont. Double, triple, and various other grades of cotton yarns.

ENGINES AND BOILERS

G. MORRISON, Hamilton—Manufactures steam engines, etc.

FILES

T. HOS. GRAHAM, Toronto—Manufactures cutlery and files and rasps.

GLOVE MANUFACTURERS

W. H. STORRY & SON, Aston, Ont.—Manufactures fine gloves and mitts in every variety of leather.

IRON WORKS.

CANADA SCREW CO., Dundas—Manufactures iron and brass screws, bolts and rivets.

HAMILTON BRIDGE & TOOL CO., Hamilton, Ont. Iron railway and highway bridges and iron working machinery.

McKECHNIE & BERTRAM, Dundas—Manufactures iron and wood working machinery.

OSHAWA MALLEABLE IRON CO., Oshawa, Ont.—Manufactures malleable iron; also Cast-iron patent screw wrenches.

COWAN & CO., Galt—Manufactures every description of wood working machinery.

KNITTING MILLS.

S. LENNARD & SONS, Dundas—Manufactures plain and fancy hosiery.

LEATHER BELTING.

DOMINION BELT AND ROPE CO., Toronto—Oak tanned belting, lace leather, etc.

ORGAN BUILDERS.

BOLTON & SMITH, 167 Mountain St., Montreal—Tuning and repairing attended to.

S. R. WARREN & SON, Toronto—Manufactures church organs.

PAPER MANUFACTURERS.

CANADA PAPER CO. (Limited), 374, 376 & 378 Paul street, Montreal—Manufactures and exports of all kinds of papers. Mills at Windsor, Sherbrooke and Portneuf.

JOHN FISHER & SONS, Dundas—Manufactures printing and wrapping papers.

W.M. BARBER & BROS., Georgetown—Manufactures of book and fine papers.

SAW MANUFACTURERS.

R. H. SMITH & CO., St. Catharines—Manufactures of all kinds of saws, plastering trowels, claw knives, etc. Sole manufacturers for the Dominion of Canada of the celebrated "Simonds Saw."

SPICES, ETC.

R. D. VAN DE CAIRE & SON, Toronto—Manufactures and imports of coffee, spices, cream tartar, mustard, etc.

STEREOTYPERS, ENGRAVERS, ETC.

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LEATHER BELTING

Mill Owners, Manufacturers, Iron Founders, and the Hardware Trade will please notice that

BARRY, SMITH & CO., LEATHER BELTING MANUFACTURERS, 504, 506 & 508 ST. JOSEPH ST., MONTREAL. Were awarded at—

Dominion Exhibition First Prizes for Leather Belting, Belting Leather and Harness Leather.

THE DRY GOODS TRADE.

NEW YORK ADVICE.

New York, Dec.

The market for dry goods shows a considerable improvement. A large number of out-of-town buyers are on the market, and while they seem disposed to pay a somewhat of a hand-to-mouth policy, yet they are taking a sufficient quantity of goods to give the market an appearance of activity. Jobbers also report the condition of affairs somewhat satisfactory. The rates of prices are very firmly maintained. Some advances have been made and others are under consideration.

There has been a good steady movement in all the staple cotton goods, though it has consisted principally of small parcels. The limited stocks tend to restrict the movement somewhat, nearly all the best and most favorable known mills are not only sold close up to production, but in a number of cases hold large orders for future delivery. Exporters are in the land and are taking a fair average amount of stock. Prices are in all cases very firmly held and on some makes have been advanced.

Print cloths have been in very active demand, and prices show an advance. Sales at Fall River and Providence for the week ending January 15 are reported 100,000 pieces at the following prices—15,000 pieces 41x36, 4 1/2; 114,000 do, 1 2/4; 1 per cent. 14,000 do, 4 3/16; 1 per cent. 15,000 do, 4 3/16; 20,000 pieces irregular counts and 2,000 pieces 65x36, 3 11-16.

The stock of cloths on hand on January 15 was about as follows—

Table with columns: Stock on hand in Fall River, Providence, Stock held by speculators in Providence (estimated), Total stock (outside of printers), Stock week ending Jan. 8, Dec. 31, Dec. 21, Dec. 15, Dec. 11, Nov. 27.

The demand for printed calicoes has been quite active, and the orders are close up to production. Holders are very firm in their views, and advances will in all probability be made shortly.

The tone of the market for woollen goods shows some improvement, though as yet there has been no appreciable increase in the demand except for desirable grades of men's wear woollens which have sold with a fair degree of freedom at a firmly maintained range of quotations.

No changes of importance have transpired in foreign dry goods since our last. The demand has been, as a rule, slow, but prices are quite steadily held.

The imports of dry goods at this port for the past week, and since January 1, compare as follows with same periods of the past two years.

Table with columns: For the week, Entered at the port, Shown upon the market, Since Jan. 1, Entered at the port, Shown upon the market.

CO-OPERATION IN DRESS.

(New York Tribune.)

The organization of a Ladies' Co-operative Dress Association in this city, which has thus far not met with success, is now to have the aid of Mr. Fulbrook, of London, who was instrumental in founding the Ladies' Dress Association of that city two years ago. Mr. Fulbrook arrived in New York from England last Wednesday, and will undertake the entire labor of organizing the association here at the request of Miss Kate Field, as it was thought that this preliminary work could not be accomplished without the aid of an experienced hand. A reporter of the Tribune called upon Mr. Fulbrook yesterday morning at the Fifth Avenue Hotel. "We have two distinct systems in England," he said, "one which originated in the north among the operatives in the large manufacturing towns, and the other upon which the societies in London are founded. In the former case the capital is subscribed by the shareholders, who get their regular profit, but the stores are open to the public, and the goods sold at the ordinary price. At the end of the year the profits are divided among the customers in proportion to their purchases. The method pursued in London differs only in this, that the goods are sold at a reduced price, at a profit which only just covers expenses, and only the shareholders, or those who hold life-tickets, are permitted to enjoy the advantages of the association. "What societies are there in London?" "There are two principal ones—the Army and Navy Co-operative Society, and the Civil Service Supply Association. They have been in existence about ten years, and last year the sales of each amounted to nearly \$10,000,000. One, of which the capital was only \$10,000, has by the accumulation of an average net profit of only 3 per cent., raised a working capital of over \$3,000,000, and its shares bring \$375 each. The shares in another, now obtain 300 and 400 per cent. premium for the privilege of dealing with the store. "What has been the success of the Ladies' Dress Association?" "It has been wonderful. Although the association was founded only two years ago, we have been obliged already to restrict our business for lack of room. "Is the business restricted to materials of dress?" "Not entirely. Our supply consists of dress materials and the designs for making them up, mantles, hosiery, fancy goods, millinery, lace, underwear, boots and shoes, household linen, and in fact everything kept at a first-class dry-goods store, at prices considerably below those demanded by any of the retail stores. Over twenty visits are made each year by our buyers and dealers to Paris, where the best models are selected from all the principal Parisian dressmakers and milliners, and the silks and other goods selected are always of the best quality. "Do you think the prospect of success in New York is good?" "From what I have seen of the stores in New York, I think there is a legitimate opening for the intended co-operative store. If a woman can get comfort in shopping and materials of the very best quality and artistic taste, with the economy of purchasing four dresses for the price of three, she cannot be otherwise than pleased. If the system satisfies five hundred ladies of title in England, I believe it will satisfy ladies on this side of the water. "When do you think the scheme will be completed?" "I shall probably remain here about two months, and hope to complete the organization of the society."

A WONDERFUL NEW LACE MAKING MACHINE.

The French journals contain an account of an automatic machine for the making of hand-made lace that has been invented. From 1,000 to 2,000 revolutions per minute, it produces lace of all kinds. All kinds of lace hitherto made by hand can be rapidly turned out. Valenciennes, guipure, tulle, and square mesh, Malines, thimble, Chantilly, etc. Even the old styles can be reproduced. It would be impossible to find workers, can be repaired in a few hours, can make any desired change, and the work of several hundred girls is readily performed at once. It is said that as much as \$150,000 have been offered for the American patent, and an equal amount for the English. The French Journal Le Figaro speaks in the highest terms of the machine and the production which it is capable of. A loom, which costs 4,000 francs, will give an annual profit of 14,000 francs. As 200,000 women are engaged in the making of lace in France alone, and 500,000 throughout Europe, the invention, if practical, may cause some temporary distress. Imitation lace will also be suppressed.

U. S. COTTON MANUFACTURES.

The following very interesting table is furnished by the Census Bureau, at Washington, and is the summary of the work of special agent Edward Atkinson, of Boston.

Table with columns: States, Looms, Spindles, Bales of Cotton, Persons Employed. Lists states from United States to Wisconsin.

The above does not include the hosiery mills, or any of the mills known as woollen mills where cotton may be a component material used in the manufacture. The large majority of cotton manufacturing is still carried on in the New England States, but the showing in the South is very satisfactory and gratifying to those who have the true interests of that section of our country at heart. The manufacture of cotton is an industry of comparatively recent date in the South, and yet of the entire 230,223 looms in the United States, 10,386 are in the South, and they consume 240,682 of the 1,580,481 bales of cotton consumed. In speaking of this subject the New York Manufacturer says, in a recent issue: The tendency of the cotton industry to move southward has arrested the serious attention of New England capitalists interested in that industry. Edward Atkinson, with Bayley Potter and several Fall River manufacturers, have been in Atlanta in consultation with Southern capitalists, looking to the future of cotton producing and manufacturing interests. There are several large factories there, among them one with 10,300 spindles and 300 looms, making 180,000 yards of cloth per week, two others with 24,000 spindles each, and one with 14,000. The advantages of proximity to cheap fuel, cheap living and the source of cotton supply are so apparent and the returns to capital so much more satisfactory, that close attention is being given to this section with a view to transferring a portion at least of the production there.—Grocer.

CONTINENTAL TRADE NOTES.

PARIS, January 11th. The production of wine in this country amounted to 29,677,472 hectolitres in 1890, or 4,000,000 more than in the previous year. It was still, however, 22,000,000 hectolitres below the average of the past ten years. Notwithstanding a rigorous winter, the yield was above the average last mentioned in the departments of the Aude, Haute-Garonne, Pyrénées-Orientales, Haute-Savoie, Tarn, and Tarn-et-Garonne. The phylloxera is still prevalent in the two Charentes, in the Lierault, the Lot-et-Garonne, the Ardèche, Dordogne, Sabon-et-Loire, Rhône, and Var, its ravages having destroyed 37,000 hectares of vineyards. The imports of wine, principally Spain and Italy, increased from 1,900,000 hectolitres in 1878 to 4,460,000 in the first eleven months of 1890, while the manufacture of the beverage from dry raisins has undergone a considerable extension, the imports of that fruit having augmented from 29,258 tons in 1878 to 62,000 in the first eleven months of last year. Manufactured wine of this description has neither the flavor nor the tonic elements of vintage, and many complaints have been made that it should be sold without any statement as to its origin.

The cotton branches are without notable change, and yarns for the present are in quiet demand at Havre.

Prices in the coal trade of France and Belgium are firmer than for some weeks past. The imports of the mineral to the latter country amounted in the first eleven months of 1890 to 825,814 tons, as against 656,734 in the same period of 1879, the chief increase being from Prussia (from 185,236 to 297,931 tons) and England (from 222,286 to 262,283). The exports rose from 3,994,363 to 4,108,506 tons. Those of coke in the direction of France advanced from 430,667 to 624,723 tons; Luxembourg, from 114,538 to 141,061, and Holland, 2,369 to 4,428. In the same period the imports of raw steel indicated an increase from 195 tons in 1879 to 1,378 in 1890, steel bars, sheets, and wire, from 3,063 to 6,788; and wrought steel, from 633 to 1,189. The exports under these heads improved respectively as follows—from 105 to 714, 32,490 to 35,989, while wrought steel declined from 2,438 to 2,134. The exports of old iron reached a total in the first eleven months of 1890 of 29,366 tons, rails, 24,854; etc. etc. 26,988; and ore and slings, 209,620, the imports under the latter head being set down at 80,434 tons.

Many of the collieries in the Rhine districts have been flooded, work being suspended in consequence, while, on the other hand, coke and coal have been in less demand. The iron market in France is firm. At the last meeting of the forge-masters of the Nord it was agreed

to raise the basic price of the production now being 17 1/2 at the works. The orders included in that department amount to 17,000 tons, or sufficient for the next 18 months. It is stated that a new contract has been entered into with the proprietors of the Credit Lyonnais to finance the Grand and Châtillon Works with those of MM. Wondelberg for the working of the Thomas alkaline phosphoric patent, at the example already set by the eastern departments. The steel trade is busy, no more than 100,000 tons required to complete the extension of the E. R. S. and 50,000 for 1892.

Recent contracts in Belgium show the lowest prices for fish plates at 1.00 per ton, rails, and bolts, 18 of 50, and Vande rails, 10.12, per cent. which are the best to be had. The latter are ordered for 2,000 tons. Another offer is to supply rails on the same terms and for at least 10,000 tons, in which case the price is 1.00 per ton.

There is some prospect of a real steadiness in continental markets this year than last, there being considerably less margin for the operations of speculators. Manufacturers will be content to quietly await the rather extensive orders expected from the United States, Canada, and Italy—the two former in regard to the rail trade, and the latter with reference to armor plates, in view of projected additions to the fleet. Less confidence, however, prevails in German centres as to the immediate future, the bar iron and boiler plate branches being unusually quiet for the season. On the other hand, blooms and spiegel Eisen are in fair demand for abroad and the steel trade is brisk. It is rumored, in fact, that the Ruhrort Steel Works have received an order from the Mexican Government for 20,000 tons of rails, while the Phoenix and the Rhine Steel Works have entered into contracts with the Russian Railway, and Krupp with Finland, for the supply of 8,000 tons, all at tolerably remunerative prices. Six hundred tons of sheet iron are being supplied to the Cologne-Minden Railway 21 1/2 per cent. The general condition of the Austro-Hungarian market has improved, the smelters having orders in hand for the first six months of the year. The rail mills are nevertheless quiet, and the demand for wrought iron is slow.

Quite a revolution is expected to take place ere long in the lace trade of France. The 200,000 women engaged in this branch of industry, notwithstanding the painfully minute care which they are compelled to bring to bear upon their work, receive no more than 1 1/2 an hour for their services. Fourpartiers have just commenced for the introduction of the English and American patents for the mechanical manufacture of lace, at a cost in each case of £200,000 for the inventor's rights. Each machine, capable of producing lace, not only identical with, but in many respects superior to that made by hand, costs £2,400, and its net profits at the end of the year would, according to competent specialists, amount to £1,750. As it would replace several hundred hands, the saving would be not less than 75 per cent.

WINDSOR HOTEL, NEWCASTLE, L. D. DATMAK, Proprietor. New house and new furniture throughout.

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ROUND and flat hoisting ropes of best brands of Bessemer iron and cast steel. Charcoal iron transmitting power ropes and pulleys. MANUFACTURED BY B. GREENING & Co. Hamilton, Canada. 11-12

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MANUFACTURE all descriptions of Card Clothing; and, using the very best leather, rubber, felting and wire, and employing skilled workmen, can supply an article equal to, if not better than, any imported. (Sheets, Diamond Point, Space Killet for cotton manufacturers, and Boiler Rings made to order.) W. R. GRAY, Proprietor. DUNDAS, ONTARIO. (11-13)

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The productions of these mills continue to have a deserved high reputation in the trade. The proprietors are determined to maintain the quality of unstrained excellence they have heretofore held.

GENERAL INTELLIGENCE.

EXPERIMENTS ON THE EXPLOSION OF STEAM BOILERS.

In the year 1865 the Polytechnic Institute of Paris... The experiments were conducted in a boiler... The results showed that the explosion was caused by the sudden liberation of steam...

The first vessel of full of water in these experiments... The committee, commenting on the experiment, say: "It is interesting to note that the explosion was caused by the sudden liberation of steam..."

The fact which is pointed in italics above, is recommended for study to those who have a superficial notion that a rise of pressure follows the act of opening the safety valve... The danger, it seems, comes solely from the sudden formation of a heavy foam...

The steam in the boiler not being higher than two atmospheres, the following experiment was made... The level of the water was reduced until it stood just below the lowest gauge cock...

After some trials of a prismatic glass water-gauge, which proved too frail, the committee's report describes the glass water-tube gauge used, which will be recognized as substantially what is in use to-day for indicating the water level... The gauge used was 9 1/2 inches in length, the upper part being so near the top of the boiler as only to be affected by the foaming in extreme cases...

The committee experimented in this connection with some apparatus devised by Mr. Thomas Ewbank... The experiment was made in a boiler, and the results were as follows: "When an opening is made in a boiler, of which the sides are heated, will the effect be to diminish the elasticity of the steam within, by permitting its escape or will the water thrown upon the

be heated, the paper processes a good natural sizing, which is a great advantage in paper intended for... It is only by making use of a cold maceration that this quality can be obtained without expense...

Mr. Aron, in his essay on the explosions of steam boilers, states that MM. Fabron and Reyat, at Lyons, found, on opening a boiler, that the safety valve, showing an increase of pressure within...

Thus it seems that there is no foundation for the belief that there is a rise of pressure in consequence of making an opening in a steam boiler, even though there may be hot plates upon which the water is thrown by reason of the sudden liberation from pressure upon its surface...

THE MANUFACTURE OF STRAW PAPER IN FRANCE. (The Paper Makers' Circular.) The two kinds of straw paper that are manufactured in the Dauphiné have no resemblance with those of southern France, or of the Limousin...

The various agricultural shows held last autumn in different parts of the country cannot fail to impress all who visited them with the extraordinary developments made in recent years in mechanical appliances for agriculture...

WHAT MACHINERY HAS DONE FOR AGRICULTURE. The various agricultural shows held last autumn in different parts of the country cannot fail to impress all who visited them with the extraordinary developments made in recent years in mechanical appliances for agriculture... It is well, therefore, to notice the benefits which this industry has derived from the genius and the labors of the mechanician...

It is not to be considered what they owe to the power of influence of machinery... The Board of Trade emigration officers at Liverpool have just completed their returns of emigration from the Mersey for the month and the year ending December 31, from which it appears that there is a striking increase in the number of departures over the figures of 1879...

INDIAN TEA IN AMERICA

The news comes from the other side that a syndicate has been formed in Calcutta, for the introduction of Indian tea into this country and Canada... The quality or flavor of the tea is developed by its treatment; for instance, English breakfast is fermented; Oolong is not...

NEW BRUNSWICK RAILWAY COMPANY

Letters patent have been issued incorporating Stephen, Montreal, Hon Isaac Burpee, St John, J. R. Burpee, Fredericton, J. Thorne, New York, J. Kennedy, Tod, Rankin, H. O. Northey, Lockport, New York, under the name of the "New Brunswick Land and Lumber Company," with a capital of \$1,000,000...

OLD FOGYISM IN THE HARDWARE TRADE

We find in the hardware trade two kinds of dealers—one is a leaguer behind the times, the other is up with the times... The former thinks it is better to sell an old style article, if he can make a little more profit on it, than to introduce the latest styles...

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Made from the best Sheffield cast steel, and specially adapt-  
ed to the Canadian trade.  
Mill and Paper Saws put up in boxes (our own invention),  
which is handy and neat. We were awarded the only medal  
ever given for Files in Canada, at Quebec, in 1871; also  
obtained the only medal for Files alone at Paris, 1878.

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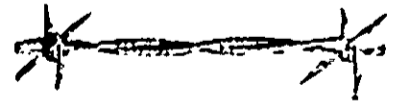
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