

NEW DUTY ON TOBACCO

IT ROBS THE WORKMAN, FARMER AND CONSUMER.

The \$2 Duty, Though but Two Years Old, Has Decreased Wages, Closed Factories and Increased Prices or Deteriorated the Goods.

The McKinley Tariff Tree.

If the 53d Congress does not reduce or remove the \$2 per pound duty which McKinley placed on Sumatra tobacco, it will not be because it has not done great injury to legitimate business and has not worked havoc to all except a few monopolists. A McKinley tree, though only two years old, is easily known by its fruit—reduced wages, closed factories, increased power to monopolists, benefits to speculators, increased prices or deteriorated goods, deception and perjury. The \$2 duty has already borne all these varieties of fruit.

"There are more cigar makers tramping the streets to-day," said a manufacturer of Havana cigars in New York the other day, "than I have ever known before." When asked the cause he explained it by stating his own case. "We have not," said he, "done as most manufacturers did—increased the price of our goods because wrappers cost more. Here is one of our 'Conchas Especiales' cigars, which we have sold for \$51 per thousand for five years. We tried to get square with McKinley in the first place by reducing wages. We now pay but \$9 for making that \$51 cigar, instead of \$10 as formerly. Many other houses stopped paying union wages for the same reason. They were compelled to do it. In the next place we required our workmen to cut closer. They used to use two and three-quarters pounds to wrap 1,000 cigars, now two and one-quarter is a liberal allowance. This, of course, makes it harder for men to earn high wages. Then we pay less for seed leaf tobacco than ever before. The tobacco growers thought they were getting protection. The fact is that the extraordinarily high duty compels us to pay more for wrappers—which our farmers can't raise—and forces us to pay less for fillers—which they can raise.

"In spite of all these facts, we have been unable to keep our workmen busy, and have had to let some go. If it were not for the McKinley duty, we could now be employing twice as many men and paying them union wages, too."

This same man who, by the way, did not wish his name mentioned in print, in connection with reduced wages, said that the \$2 duty had not hurt him as much as it did small manufacturers, nor benefited him like it had benefited large ones who had sufficient capital, in 1890, with which to purchase a two years' supply of Sumatra tobacco, before the McKinley tax doubled the price. Many small manufacturers have gone to the wall because of the duty, and many workmen are prevented from going into business because it requires so much more capital than formerly, to purchase wrapper tobacco. "The duty," he said, "protects only the monopolists and speculators at the expense of small manufacturers, workmen, farmers and consumers." He mentioned three New York speculators who had made at least \$1,000,000 by buying Sumatra tobacco before the duty took effect, and selling it a year or two later.

That this high duty has, as usual, led to undervaluation and perjury and favored the dishonest importer, is evident from the statement of this manufacturer, accompanied by a wink, that a neighbor manufacturer had actually imported 600 bales of Havana fillers; and that although these bales contained, in their centers, enough wrapping tobacco to wrap the fillers outside, yet wrapper duty was paid only on one bale. This, said my informant, has become the usual method of procedure.

Politicians Take Warning. Those who hope and those who fear that the demand of the people for a radical reform of the tariff will somehow be juggled with and evaded by the politicians overlook the most impressive and most decisive element in that demand. It is that great public wrong be righted. The economic argument against protection is conclusive, but it was no mere argument of any kind which led to the peaceful revolution of this year's Presidential election. The tariff was wound down not simply or mainly because it was perceived to be economically unsound, but because it was perceived to be politically unjust.

Politicians will do well to give early and serious heed to the just demand of the people for relief from oppressive tariff taxation. Delay is not even expedient. If there is any force in the plea that the law-made profits of certain men should not be touched this winter or next spring, there will be still greater force in it a year from now, and greater yet from then on. Those notorious "adjustments" which we are adjured not to touch will become more sacred and inviolable with every month. If they are to be broken up at all, as the country declared its wish they should be, the work cannot be begun too soon. Furthermore, it will be extremely dangerous for any politician to trifle with a public demand which has so strong a moral element in it as that now found in the tariff-reform movement. When an avalanche of that sort is loosened it never moves backward. In 1861 Senator Sherman was writing his brother that the Republican party would pass no laws disturbing slavery either in the States or the District of Columbia. The clearer-sighted General told him that a war was coming which would "run all politicians." It did run all who did not make haste to ally themselves with the moral sentiment back of the war. A similar sentiment is now stirring in the breasts of the people, calling for the speedy removal of the abuses and injustices which selfish men have enacted into law under the name of protection, and it will be the ruin of all politicians who do not give heed to it.—New York Evening Post, Dec. 5.

Democrats—True and False. "Protection is a fraud," said the Democratic platform. "It is robbery of the poor by the rich," said the Democratic stump-speaker. To all of

which the people call "union" in a voice as loud as that of nearly scared Republicans out of their boots.

"Well, what are you going to do about it," now says the protected manufacturer. "Surely you aren't going to stop all the fraud and robbery at once! You will ruin us and the country will go to the dogs if you do."

"Lord, save us from our friends," says the half-fledged, weak-kneed Democratic Representative, as he begins to think about voting to put the duty back on sugar and to leave a little, just a little, "incidental protection" on manufactured goods.

"If protection is robbery, as the people have declared, then incidental protection is incidental robbery," says the stout-backed Democratic Representative, as he prepares to vote to abolish the whole rotten system of favoritism and corruption and to lift the heavy load of taxation from the backs of the workingmen.

The Steel Rail Trust. The policy of the powerful combination of the manufacturers of steel rails has at last caused a considerable quantity of rails to be imported, in place of the heavy tariff duty. The Iron Age of the 23d ult. reports the sale of 10,000 tons of foreign rails to be delivered at Seattle for use on the Pacific coast. The price of such rails at Liverpool, free on board, is now \$10.44 per ton. The duty is \$13.44, and the ocean freight charges must make the total cost at Seattle about \$40.

The conditions which permit these rails to be imported profitably are exceptional. There are no rail factories west of the Rocky Mountains, and there is only one small one west of Chicago. Consequently, the cost of domestic rails to consumers on the Pacific Slope is largely increased by the overland freight charges. It would not pay to import rails for use on lines this side of the Rocky Mountains, for foreign rails cannot be sold down at this port, duty paid, for less than \$36 per ton; but the high cost of transportation, added to the high price exacted by the combination, makes it possible now for railroad companies whose lines are near the Pacific coast to save something by bringing rails from Europe by water.

If prices were determined here by competition, even the high cost of overland transportation would not prevent the purchase of domestic rails for use on the Pacific coast. But for more than two years the domestic manufacturers, under the shelter of a duty which is 69 per cent. of the selling price of foreign rails in Liverpool, have suppressed competition and have exacted a uniform price of \$30 per ton at the Eastern mills and \$32.50 at the Illinois mills. In the meantime the cost of their raw material has been reduced by \$3 to \$4 per ton, but the effect of the combination agreement has been to deprive consumers of any benefit on this account.

This is one of the most familiar examples of the manner in which a trust or a similar combination uses a high-tariff duty as an "instrument of extortion," in the words applied to this process by the New York Tribune in an unguarded utterance. The duty is three and one-half times the difference between the labor cost here and the labor cost abroad, as shown clearly by Mr. Harrison's Commissioner of Labor, and the manufacturers seized upon it as an instrument that would enable them to exact huge profits from the people, for it is upon the people that the cost of railroad equipment finally falls. The price was so fixed by the combination that importations for any part of the country except the Pacific coast were unprofitable, and not until now has it been possible to import for roads there, the quantity of rails imported is shown by the Treasury reports to have been only 433 tons in the last two years for the whole country. A reduction of the combination price is now predicted.

The South Looking Up. One of the pleasant reflections of this Christmas is the fact that we are on the verge of better times. Everything indicates that the coming year will bring prosperity to all parts of the country. The Manufacturers' Record, of Baltimore, has been making inquiries in all sections, and it reports the outlook as very encouraging, especially in the South.

All business interests in the South, the Record finds, have suffered in common with those of other sections from the financial disturbances of 1891. Cotton growers, and along with them a large proportion of the mercantile and banking interests, suffered from the low price of cotton. To the financial difficulties created by the Baring failure was added the economic drag of the McKinley tariff, increasing the price of articles used by Southern agriculturists.

The November election has had very material results on a business point of view. There is a revivifying hope of lower prices and cheapened production when the protective tariff is reduced. The fear of inimical Congressional legislation has vanished. "Confidence," says the Record, "has been established, and the South will become within the next year the scene of unprecedented industrial and commercial activity, not a boom, but natural, unrestrained growth and progress." The gratifying statement is made by a well-informed business man in Alabama that the farmers of his region are out of debt—and a rare thing—"have enough to run them through another crop." It is the general testimony that the elections have made the people "feel good." They are "cheerful and confident," which means renewed effort, increased enterprise, business activity and progress.—Atlanta Journal.

Not Going to Washington. Congressman Walker, of Massachusetts, in his speech the other day, referring to coming tariff changes, said: "Now, let no manufacturer show his face in Washington under any circumstances." Mr. Walker's diagnosis of the times is that the manufacturer's employees will go to Washington and do the work usually done by the employers, if the latter will leave it severely alone. We trust that all manufacturers will heed Mr. Walker's advice and that the pearl-button men, the tin-plate heroes, the worsted sufferers, not to mention the sugar-refining martyrs and the trusts in general,

will resolutely stay away and leave the whole thing to their workmen. Then we shall perhaps see the unwelcome spectacle of a lot of mill operatives going to Washington to beg Congress not to do the things that they voted in favor of when they went to the polls in November. For did not President Harrison say in a recent letter that the election was lost because the operative would not walk under the same umbrella with his employer?—New York Evening Post.

Tariff on Raw Material. The claim that the tariff encourages industry is nowhere more conclusively exploded than in the numerous and flagrant instances in which we impose tariffs upon the raw materials of our manufactures. The tariff on raw materials—coal, iron, copper, tin, lead, lumber, wool—is not merely (1) a tax on the laboring man, making his fuel and clothing, as well as his tools and every article of furniture, cost him more than it otherwise would, but (2) directly reduces the profitable opportunity and demand for labor, and therefore helps to paralyze industry.

As to (1) it is so well understood that it needs but a word. The tariff enables the owners of raw materials to charge more than they otherwise could. If it did not, there would be no use for a tariff. The manufacturer having to pay more for his materials, his manufactured goods cost him more than they otherwise would, and he has to sell them for more to make a profit. Every suit of clothes costs the buyer more, because of the duty on wool. Every tin pan costs the economical housekeeper more, because of the duty on tin. Every can of tomatoes or oysters costs more because of the tax on tin plates. Every yard of calico costs the woman that wears it more because of the tax on dye-stuffs; every pound of paint costs more because of the tax on lead; every house costs more because of the tax that is levied on the materials of which it is composed. The result of this is, that the wages of the workman are diminished—that is, he gets less goods for a day's work.

But the second effect of the tariff on raw materials is a still more serious one. Even if our people alone were to be considered, it is plain that the higher the price of any article the fewer will be sold—fewer people can afford to buy it. And since the demand for labor depends upon how many goods are to be made (and not on how much profit the manufacturer makes on each piece), it is easy to see that taxed raw materials reduce the demand for labor and the number of men employed. But this is not the worst. The high price of raw materials caused by the tariff (25 per cent. on coal, 40 per cent. on iron ore, 75 per cent. on tin plates, 40 per cent. on copper, 20 per cent. on lumber, 50 to 100 per cent. on wool) makes them cost more to our manufacturers, who, therefore, cannot make goods as cheaply as they otherwise could; and hence, cannot afford to sell them as cheaply as do the English and Germans, who get their raw materials free. It therefore is the English and Germans, and not ourselves, who supply the rest of the world with manufactured goods.—Hon. John DeWitt Warner.

Some Sugar Statistics. Willett & Gray's Statistical Sugar Trade Journal of Dec. 29 contains weekly quotations of raw and refined sugar since 1882. Those who still think that the tariff is not a tax should glance over these tables. The price of granulated sugar varies from 6 to 9 cents per pound, for eight years, and then it suddenly drops from 6.13, on March 24, 1891, to 4.50 cents on March 31. A foot note says: "About 2 cents per pound duty taken off April 1, 1891." Since then the price has varied from 4 to 4.92 cents. The price of raw sugar (96 degrees centrifugal) dropped in the same dates from 5.65 to 3.53 cents per pound. If the trust had not been in control at the time, the price of refined sugar would have dropped about exactly 2 cents. But McKinley graciously left a duty of 4 cents per pound on refined sugar to enable the trust to retain control of the market.

The tables also show the benefits of the "economies of production" from trusts. Before the trust was formed, in November, 1887, the difference in the prices of raw and refined sugars had for twelve years averaged less than 7-10 cents per pound. In 1888 and 1889 it averaged 14 cents. It then decreased, while the trust was waging war upon outside refiners until, on Jan. 14, 1892, it was only 9-20 of a cent. The trust having completed arrangements to purchase all of the competing refineries, the difference began to increase in February, 1892. On March 25 it crossed 1 cent; on May 19, it was 1-6 cents; on September 8, 1-4 cents; on December 29, it was again 1-6 cents. It costs about 1 cent to refine sugar. Every difference, then, of 1-6 cent above this cost means \$2,000,000 of extra profit to the sugar trust. The duty of 1 cent produces no revenue to the United States, but is worth about \$20,000,000 a year to the trust.

Price of Lead Advanced. The Iron Age comments as follows upon a significant change of prices: "While the deal between the National Lead Company and the lined oil producers has been shrouded in mystery, as usual of late where concentration of interests is involved, a most suggestive move has been made in the shape of an advance of 2 cents per gallon in the price of oil. Not a particle of evidence comes from any quarter that would point to a change in the relation of supply to demand as dictating this advance, nor is the condition of the market for crude material such as to necessitate higher figures for oil."

The advance is probably due to the great "economies of production" which are attained, the professors of trustism say, only by means of a combination that suppresses competition.—New York Times.

Whisky Tax. The proposal to increase the whisky tax is the one, however, which seems to meet with greatest favor. It would please the temperance people and it would not hurt the liquor manufacturers in the least. On the contrary, it would enrich them.

BANGS ARE BECOMING.

BUT THE HORRID FRIZZLE IS "ON THE LIST."

The Present Bangs Are Each and All Examples of the Survival of the Fittest—Don't Let Talk About New Hair Adjustments Bother You.

Captivating Coiffures.

New York correspondence.

FTER all the talk about fillets, coronets and Greek parts, and so on is over it will still remain a fact that the girl to whom the bang is distinctly becoming is and always will be, as she always has been, a very pretty kind of girl. Incidentally she is apt to look badly in a Greek part. She is bright enough to know it, and smart enough to bang-style of girl is all bang, and let those who can do it, or who have not the sense to see that they can't, wear their Grecian effects. She stays pretty in her own particular way, retaining her own dear, So, here is a word about bangs.

The horrid frizzle is, let us hope, gone forever. You may have as much or as little hair in the bang as you please, and as you can, but there must be only little curls, and no frizzles, bang at all. That was so ugly style, too. We who wear bangs may congratulate ourselves that the present bangs are each and all examples of the survival of the fittest. If your hair is very thick at the forehead, you may make just a little fringe. Curve it down in the center, for now no bang is ever out of conceit. Let it be a genuine fringe that shows the clear color of the skin where it lies over the forehead. This fringe is not curled at all, but is straight, and is not straight, if it is not, it don't risk more than one-half turn of the iron. The hair at the sides and top of the head is not to be waved, and for two reasons. For one, it is more dressy, and besides, if you have put back part of a previous bang in favor of the present fringe, you will find the hair very rebellious unless it is waved. Then, too, may be your hair is not very thick at the forehead, in which case the waving makes it seem so.

This fringe is as becoming to-day to young girls, or to older faces that have in boxes, for the McAllisterian "exclusive" make it a point to sit and beam on the assemblage at the Charity ball, without mixing much with the affair. Tickets are sold, too, to whomsoever will pay ten dollars apiece for a chance to attend the annual ball for sweet charity's sake, but really cannot, you know, condoned to be anything further than patrons and patronesses.

We are to wear night-gowns again. Not content with attacking our husbands and the world at large with them, and wearing robes of long ago, we are going to carry it further and wear night-caps. The recent, mark my words, will be a lot of fuss. Out into the night will rush little, screaming figures, with mob caps on their heads, and their tresses streaming down their backs. That is the modern modification of the old and somewhat ugly nightcap. The modern girl has discovered that the cap is merely to keep the hair smooth at the roots, and that it is very unhealthy to have the hair smoothed down. One should let the long ends down the back just as usual, and have the cap tied under the chin, set back of the bang, and with a ruffle all around the face, and a bow under the chin. No dreamer will have the presence of mind to carrying a cap so gotten up down a ladder, or I don't know anything of human nature. As a matter of fact, it is of importance to keep the hair smooth at the roots. That is, since glossy locks are to be the rule

the girlish look, as it ever was, and if you're a face to which the style is becoming don't let the talk about new hair adjustments bother you. The girl with the bang has been much talked down. She is ready to hang at all either a school girl of the "what-d'yer-soy" type, or a most frivolous and artificial creature. But that need not worry you. Your bang is not that kind. A thoughtful, girlish face of delicate oval wears the fringe charmingly. Such a head dress as I have just described goes with downcast lids and wistful mouth very sweetly. Even the very prim girl suits her style of bang and looks the more quaintly prim and sweet. She may not wish to adopt the Greek head-dress and a Greek part. Perhaps her hair will not part, some girls don't, you know, and maybe she looks like the mischief with her hair parted. Besides, being just a quaint, girlish girl, she does not want to wear her hair straight back and look like an uncompromising bluestocking. The bang is a happy compromise, so she cuts a tiny bit of fringe, then another above it and just covering the part of the first, and perhaps another still above. Each row gets its own half turn on the iron. There is just the needed "relief" to the line of the brow, the contour of profile is softened, and the

bang in no way takes from the charm of the precisely poised head and the demure coil at the back. This sort of bang is always a lady's bang. She has a bright, clear complexion, a good figure, well rounded neck and shoulders which she is most prudent about displaying, and she wears pretty gowns, and all with an air, from the top of her moderate bang to the soles of her moderate shoes, of not bothering or caring desperately about her dresses or getting up, anyhow. Now, how would that type of girl be improved by a change in her head-dress?

There, too, is the pretty girl who is a bit frivolous. She is naturally and unconsciously frivolous as a butterfly is light-hearted. Would you spoil her pretty face by putting elastic touches to her hair and putting her hair, or would you abolish her bang and leave her with a straight back hair? Such a girl will cut a bang away back to the crown of her head, thereby getting rid of a lot of hair and making the coil at the back smaller and less calculated to interfere with the graceful outline of her head. The first two or three rows of the bang are very short lengths, and those further back are longer, so that they will not stand up and spoil the outline. The first fringe is slightly turned by the iron, and those nearer the top of the head are almost straight that they may lie more closely to the head. She is so sweet and so delicately pretty as she can be, and a Greek coiffure would not suit her half so well.

I might go on and quote any number of types that should stick to the bang. Some women may dignify their faces by parting the hair at the forehead, but for most of you, do not do it. Fashions are not made to adapt yourself to, they are made to be adapted to you. They are not made to rule, but to serve, and if it suits your beauty you may consider them. If not, make up a fashion for yourself, or take one from some other period, or stick to the old one, like the bang, and continue looking well in your own way.

The women with long, heavy hair had better cut the lengths off. Shoulder length is the most convenient. It knots on the top easily, and is easy to keep curled and clean. Then, too, you are much more apt to have nice heavy hair when you get old, and need a few charms to help you to look above all, you will be in the present mode. Very heavy and long hair is more of a nuisance than anything else. There is no way of doing it up, and you can't always be pretending Ophelia or Judith and let it hang.

What has been written concerning the coiffures of the fashionable women is illustrated in the accompanying pictures. It may be added that these sketches were made at the great annual Charity ball in this city, and that they are portraits of five belles of the Four Hundred, drawn from life, in the Madison Square Garden, exactly as the original girls appeared as they posed unconsciously for the pencil of the artist. Not only are the faces of the five little of small girls shown with truthfulness, wearing the transient expression of the moment, but feminine readers will find in the corsages a clear notion of the new styles in low-necked gowns, as seen at this notable yearly exhibition. The subjects of portraiture sat regally

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as soon as we can get them. We shall get them by putting glycerine with whatever we use to wash the hair, by washing it frequently and by brushing it and wearing a night-cap. When it comes down to fact, between you and me, the whole thing is got up as an excuse for the night-cap.

Important Letter. In the diary of George M. Dallas, formerly United States Minister to Russia, occurs a story which, as the writer remarks, illustrates the extent to which the most important matters are subject to imperial whims. The incident, it should be said, occurred more than fifty years ago.

The Empress, having written a letter to her father, gave it to a servant to put into the hands of a courier, then waiting to start. The servant, misunderstanding the order, deposited the letter in the postoffice, and the mistake was not discovered until five or six hours had elapsed. In the meantime the regular mail for Russia, and, indeed, all western Europe, was made up and dispatched.

As soon as the Empress was told what had become of the letter she expressed to command the whole mail, bag and baggage, back to St. Petersburg. About fifteen hours were lost. Everything was reopened, the Imperial missive recovered and placed in the courier's care, and then, but not till then, the mail was allowed to resume its journey.

A Most Remarkable Case. A San Francisco paper tells a curious story of Mr. Watson, of that city, who has been in the city for some time, having learned it. His father was a missionary in Asia Minor, and died there some time before the birth of his child. Not many months after his birth his mother returned with him to this country, and he was reared as an infant. He received a fair education, but never devoted himself particularly to linguistic studies. Not long ago he happened to be in the office of the Turkish Consul in San Francisco, when he heard some conversation going on between the Consul and some Turkish sailors. He was surprised to notice that the sounds seemed familiar to him, and, listening carefully, he found that he could understand almost all that was said. He said that it seemed as though a veil was removed from his comprehension or a new faculty added to his mind.

ENGINEERING FACTS.

The Greatest Works of the World and When Constructed.

The Romans built the first dikes in Holland.

In 1880 there were 2,814 lighthouses in the world.

The first coast light in the United States was in 1873.

The first Eddystone lighthouse was erected in 1758.

Asphalt pavements were first laid in Paris in 1854.

The diamond drill is pointed with black diamonds.

The total cost of the Suez Canal exceeded £20,000,000.

A tunnel between Dover and Calais was proposed in 1892.

The coast survey of the United States was begun in 1817.

Roebing's railway bridge at Niagara has a span of 821 feet, with 59 feet deflection.

The Cherbourg "digue" is 4,120 yards long, having two arms inclosing the entrance.

Pontoon bridges, with copper pontoons, were invented by the French about 1673.

At the beginning of the eighteenth century all European armies had pontoon trains.

The weight required to crush a square inch of brick varies from 1,300 to 4,500 pounds.

Gunter's chain, used in measuring land, was invented by Edmund Gunter in 1606.

The great aqueduct which supplied Carthage with water was seventy miles long.

There was a medieval association of engineers called the "Brethren of the Bridge."

The St. Gothard tunnel is nine and one-fourth miles long; began, 1870; opened, 1881.

The Minot Ledge lighthouse is of granite; height, 88 feet, the lower 40 feet being solid.

A pneumatic dispatch tube, thirty inches in diameter, was laid down in London in 1861.

A light suspension bridge was built at Niagara Falls in 1848, and removed in 1854.

In A. D. 105 Trajan built a magnificent stone bridge across the Danube, 4,770 feet long.

The Brooklyn suspension bridge is 5,882 feet long, 1,595 feet central span and 135 feet high.

In blowing up Blossom Rock, San Francisco Bay, 43,000 pounds of explosives were used.

The caissons of the St. Louis bridge were sunk, in one case, 120 feet through the sand.

There are eighty miles of tunnels in Great Britain, their total cost exceeding £6,900,000.

A tunnel under the Thames was proposed in 1799; the present tunnel was finished in 1843.

The most noted lighthouse in the United States is at Minot's Ledge, in Massachusetts Bay.

The cost of the Union Pacific was reported as \$112,259,260, an average of \$109,778 a mile.

The excavation of Hell Gate reef was attended by 21,000 soundings and 8,000 borings.

The Croton aqueduct in New York surpasses all modern engineering efforts of this kind.

The first lighthouse in the United States was built on Little Brewster Island, Boston, 1715.

Ventilating machines are a necessity in coal mines to overcome the effects of noxious gases.

The Eads jetties are regarded by engineers as a greater triumph than the St. Louis bridge.

The theodolite was first constructed in the seventeenth century, by an unknown inventor.

The giant statues of Ramesses were placed in position by rolling them along greased planks.

The receiving reservoirs of the Croton aqueduct have a joint capacity of 1,180,400 gallons.

Including commissions and interest, the total cost of the Croton aqueduct was \$12,500,000.

A railway tunnel under the English Channel was projected in 1869; charter refused by Parliament.

The "digue," or breakwater, of Cherbourg is one of the boldest engineering feats ever performed.

Preliminary surveys for the Pacific Railroad required four seasons, and cost over \$1,000,000.

Civil engineering became important about 1650, when Smeaton began the Eddystone lighthouse.

The Great Levels in East England, 2,000 square miles, have been recovered from the sea by dikes.

Cornelius Vermuyden, the Dutch engineer, was invited to England in 1621 to reclaim the Fens district.

Every pontoon used in the French army weighs 1,658 pounds and has a buoyancy of 18,675 pounds.

The walls of Babylon are said by Herodotus to have been 350 feet high and 100 feet thick at the base.

The Mont Cenis tunnel is seven and one-half miles long; begun, 1857; opened, 1871, total cost, £2,600,000.

The surveys of the Hoosac tunnel were so accurate that the drifts differed by only five-sixths of an inch.

Jerusalem is still supplied with water from Solomon's Pools, through an aqueduct built by the Crusaders.

The engineers of San Francisco propose to supply that city with water from Lake Tahoe, 150 miles distant.

Westminster Bridge, built in 1750, was the first in which the foundations were laid by the aid of caissons.

The Pharos light house, Alexandria, was built B. C. 295; height 550 feet, light visible forty-two miles.

The Caledonian Canal, Scotland, is sixty miles long, twenty feet deep, 120 wide at the top and 50 at the bottom.

The day before the battle of Wagram Napoleon had a complete pontoon bridge built and floated into place.

The Union Pacific has fifteen long and a great number of short tunnels, the aggregate length being 6,600 feet.

In 1793 Van Estin invented a hollow sphere and tube several hundred feet in length, the motor power being air.

Some of the Comstock mines are so deep that no means have yet been devised to overcome the excessive heat.

The Union Pacific road crosses nine mountain ranges, the highest being the Black Hills, 8,242 feet above sea level.

In the construction of the Suez Canal 80,000,000 cubic yards of material were excavated by 30,000 laborers.