IS THE FORTH BRIDGE SAFE?

Comparison With Quebec Bridge--Interview With Superintendent Turnbull.

(Edinburgh News.)

Is the Forth Bridge safe? The question is one which has been frequently asked since last week's lamentable disaster in Quebec, which resulted in the loss of so many lives, and the total destruction of what was hoped would be an engineering triumph. The great steel structure which was designed to echipse the Forth Bridge and to take its place as one of the wonders of the world now hes at the bottom of the mighty river which it was proposed to span.

It is not unnatural, therefore, owing to the fate of its rival, that public attention should be directed to the stability of the Forth Bridge, which has been viewed by thousands of people from the far corners of the earth. "Is it safe?" asked our Edinburgh representative of Mr. Turnbull, the superintendent of the Bridge. *

Bridge. "he ejaculated, in a tone of surprise, and as he gazed at the great steel girders and mammoth tubes a faint smile crept over his face.
"That Bridge," said he, in a voice that would have convinced even the most ner-

would have convinced even the most nervous, "is incomparably the strongest, therefore the salest, in the world, and with a continuation of that care which is at present bestowed upon it, it will live as long as the Pyramids of Egypt. The running load—and I am taking the average aggregate weight of a train at 200 tons, although there are many of them very considerably less—has as much effect upon this structure as a mouse would have upon an oak table by crawling across it.
"As far as I can see, there is no comparison between the Quebec and the Forth Bridge, for, whereas it was proposed to embody in the structure which has collapsed only something like 38,000 tons of steel, between 53,000 and 54,000 tons were required in the completion of

tons were required in the completion of the Forth Bridge. You will see, there-fore, that there is

A Wide Margin of Difference

A Wide Margin of Difference although it was proposed that the widest span of the Quebec bridge should be 1,800 feet compared with the 1,710 feet span of the Forth. The height from the surface of the water to the top of the bridge is just about the same; in fact, the crown or dome of the Quebec bridge was all that added to its immensity compared with the Forth bridge.

was all that added to its immensity compared with the Forth bridge.

"Doubtless there will be a searching investigation into the cause of the disaster, but my own opinion is that the margin of strength was not sufficient, and as soon as the train had gone on to the bridge it had caused the anchorage or struts to snap, with the result that it toppled right over."

"What are the weak points of the Forth Bridge?" queried our representative.

"It has no weak points," replied Mr. Turnbull, promptly. "Its strength is such that it will long outlive the present greenation; in fact, if it is well loo' at after, which I have no reason to doubt, that it will be, its life is positively unlimited. It has no allotted span. The oftener I examine it the greater grows my wenderment at its extraordinary strength, and the more I marvel at the ingenity of the mind that conceived the plans for its construction. In very truth it is a national achievement of engineering skill. Just look at this," continued Mr. Terrebull, and he pointed to an expension gauge of the southern extremity of the Queensferry cantilever. "Watch the sfeet which is produced by the crossing of a train. Here's one coming.".

It was an express, and as it thundered a roas 'as bridge we eagerly scrutnized the gauge, which, even when the train roas quarter of a mile distant, gave in Jea Yons of the wave motion caused by its travelling over the cantilever. It laved about three-sixteenths of an inch, and as soon as the train had transferred its burden from one centilever. "It has no weak points," replied Mr

and as soon as the train had transferred its burden from one cantilever to another the bridge resumed its normal

other the bridge resumed its normal equipoise.

"The wave motion is really part of the g.eat strength of the bridge," recarked Mr. Turnbull. "If it were rigid the structure would not be nearly so ex.e, and there would be an infinitely. The Slightest Movement is Perceptible of the same."

The Slightest Movement is Perceptible
1 the gauge."
The had scarcely given utterance to the
words when a waft of warm wind blew
across the bridge, and a sound which resembled the click of a clock emanated
from somewhere in the vicinity.

"What's that?" I inquired.

Mr. Turnbull laughed. "But another
proof," he explained, "of the extraordinary scientific skill with which the
bridge has been constructed. That click
is indicative of a sudden change of atmorphere, and in this connection I might
just remark that provision is made for
the expansion of the bridge three times
greater than will ever be required in our greater than will ever be required in our greater than will ever be required in our climate. No jar or strain can possibly affect it. Look at the rails. You will observe that provision is also made for their movement backwards and forwards in its construction at any one time was their movement backwards and forwards

observe that provision is also made for their movement backwards and forwards according as the bridge contracts or expands by the influence of the cold and the heat. They might be designated split rails, and the wave motion of the bridge is also reflected by their movement, which, although infinitesimal, is still apparent. And then as to vibration. Well, here's another train coming, and you can judge for yourself. I think you will admit that you have felt as much vibration as the result of a cart of coals passing your house."

On came the iron horse and its heavy load. It was one of the "fliers" which traverse the journey from Edinburgh to Abtrdeen in three hours. Its excited strotting, even afar off, was all too indicative of the weight of its burden as well as the speed at which it was travelling. A quarter of a mile distant, and still there was not a tremor. On, on it rumbled, and still no effect of its coming could be felt. It passed with a swish, and the current of air caused by its excursion invited one into the vortex, but the movement sensation of its passing was practically nil.

"The average individual," continued Mr. Turnbull, "is not aware of the fact that the interior of the struts or mammont tubes of the bridge are fitted with ladders, which enable the men to examine them thoroughly and facilitate

The Detection of Any Flaw.

The Detection of Any Flaw. or indication of corrosion, which, of course, is the greatest enemy we have to fight against. I am very pleased to say, however, that, as far as the interior of the bridge, so to speak, is concerned, the work can be overtaken in a very few weeks in the winter time, for there is rectified, no corrosion whatever You. few weeks in the winter time, for there is practically no corrosion whatever. You see, therefore, that every nook and cranny of the gigantic structure is submitted to the closest scrutiny in the course of painting operations, which go on perpetually. We have 28 men constantly engaged, and their united efforts are

bridge in three years, the annual cost of its upkeep being about £5,000.

"Every plate, rail and rivet is examined at least once a year, and the keen eyes of scrutiny are directed very especially into the little crevices at all junctions where the workmen might not exercise the same care as they would in places where the surface is greater, and therefore much more easily covered.

"Altogether there is a regular staff of sixty men engaged on the bridge, but at present that number is augmented considerably on account of the relaying of the metals, an undertaking which will take three yers to accomplish, at a cost of something like £35,000. No fewer than 1,200 logs of American oak, each 23 feet long, will be required before the work is finished. These logs act as a sort of bed to the rails, of which something like 600 lengths will be required, each of which weight 120 pounds to the yard."

"You will require a ton or two of

"You will require a ton or two or paint annually?"

"About seventy tons, and it is because of the care which is exercised in the painting of the bridge that we are able to discover the slightest flaw. It is not possible for even a slack rivet to escape our eye. At all junctions where expansions take place, expert workmen are employed four times a year to make a searching examination; in face, no toil, however unnecessary it may be, is considered superfluous in the preser-

toil, however unnecessary it may be, is considered superfluous in the preservation of the structure.

"There are six wind gauges," contiaued Mr. Turnbull, "distributed all over the bridge from the highest to the lowest level, which enable us to obtain a fair estimate of

The Velocity of the Wind.

"But," queried our representative, "does that information serve any prac-tical purpose?"
"Well, it gives us an idea of the strain

"Well, it gives us an idea of the strain that is brought to bear upon the bridge. About two years ago, it will be remembered, the kient, one of the biggest cruisers in the British navy, was blown ashore at Nortic Queensberry. On that particular occasion the wind was blowing at about eighty-five miles an hour, and it had absolutely no effect upon the bridge, which, taking into consideration the fact that it has a surface of something like 300 acres, will give you some idea of its stability. I had a conversation with an eminent enginer recently, and he imparted the information to me that no scientific instrument had as yet been invented which could detect the oscillation of the Forth Bridge. I have heard people say that lightning would affect the bridge to such an extent some day that its collapse would be inevitable. The same engineer to whom I have re-The same engineer to whom I have re-ferred was of the opinion that the bridge is the finest lightning conductor in the world, inasmuch as it is a continuin the world, maximum as it is a continu-ous chain of steel, and if at any time lightning did strike it, it would simply exhaust itself and do absolutely no dam-

Mr. Turnbull held out the invitation to was slowing in nurricane force, and one could from personal experience form a slight estimate of the exposure to which the men employed on the bridge are subjected, especially if a gale, accompanied by drenching showers of rain, should be blowing up the Firth.

and an iron nerve on the part of all engaged in the preservation of the bridge, which is still without its compeer in the world. The following details of the size of the different parts of the bridge should be interesting:

Total length, upwards of 1½ miles.

Douth over piers, 342 feet.

16,000 tons.

Average time taken in building verticles to full height, about seven months.

Thickets steel plates in permanent structure, 1½ inches.

Upwards of forty miles of steel plates are used in the construction of the tubes

in its construction at any one time was between 4,000 and 5,000. The bridge was opened on the 4th of March, 1890, by King Edward, then Prince of Wales.

Mr. Turnbull, who is directly responsible for the care of the gigantic structure, is a native of Edinburgh. He had charge of the Tay Bridge for seventeen years after it was opened, and about three years ago was promoted to the charge of the mighty "Forth."



Daughter of the U. S. Secretary of Agriculture, who may appear in grand



COUNTESS OF ROSSLYN, She returns to the stage after se years' retirement.

GIVE WAY TO CONCRETE.

Reduces Work for Bricklayers and Stone masons, But Has Helped Carpenters,

(Philadelphia Record.) (Philadelphia Record.)
Th remarkable rapidity with which reinforced cement construction is being applied in the erection of manufacturing plants, warehouses and other business structures in this city is looked upon with considerable alarm by the big brick manufacturing concerns as well as by bricklayers and stonemasons. There are so many advantages claimed in favor of this mode of construction from the this mode of construction from the standpoint of durability and economy that in all sections of the city the wooden framework used has become so com-

en framework used has become so common a sight as to be no longer an object of any interest. It has been calculated that nearly \$10,000,000 is now being expended in Philadelphia for concrete buildings.

How greatly this method of construction is affecting brick manufacturers and bricklayers is well illustrated in the erection of a certain factory uptown, which was originally planned to be erected of brick, of which 3,000,000 would have been required. The owners subsequently decided to use the reinforced system of construction, with the result that but 300,000 bricks were required, and these only for the exterior work. and these only for the exterior work.

When the number of such buildings in course of construction is considered and the further fact that the statistics for this year show so far a falling-off of more than 1,000 dwellings, it is easily calculated that the output of bricks in this city for construction will show a falling-off of nearly 100,000,000 this year. Nearly all the brickyards ars carrying big stocks at the present time, while a few years ago at this season the demand was far greater than the supply. This reduction in demand is expected to produce a gradually lower price in this commodity. When the number of such buildings in

Comes a result of the part of the company of the co

By the use of cheap spectacles or those fitted for some one else. If your eyes tire easily, if the letters look blurred or misty, or if you suffer from headache or nervousness, it is almost certain you need glasses. You may rely on being accurately fitted at a moderate price by J. W. Gerrie, druggist and Doctor of Optics, 32 James north.

NOTES OF A TRIP AROUND THE WORLD.

Visit to San Francisco Theological Seminary -Corea and Its People.

(By ROBERT J. BUCHANAN)

season.

The religions of Corea may be briefly

estimated as follows: Buddhists, one and half millions; Confucianists and Ancestor Workinpers, six millions; Animists, four hundred and thirty thousand, and Christians, ninety thousand, of

and Christians, ninety thousand, whom thirty-five thousand are commu

Corean Characteristics.

Corean Characteristics.

The origin of this unique people is shrouded in obscurity. In general appearance the Coreans resemble closely the people of Laos, but assert most positively that their ancestors came from China about three thousand years ago, under the leadership of one called Keija, whose tomb is still in existence, but this is tradition rather than authentic his.

is tradition rather than authentic his

tory. The race is manifestly Tartar or Mongoloid. The natives resemble the Japanese facially, but are of a larger

and thereafter, so far as may be possi-ble, eliminate them from our calcula-

San Francisco, Sept. 20.—Out here, on lic interest is due largely to the burning San Francisco, Sept. 20.—Out here, on the Pacific coast, near San Francisco, only about sixteen miles distant, across the bay, upon its north shore, lies the beautiful Marin county. In one of its most secluded and peaceful valleys, in the rear of the graceful Mount Tamalpais, and not far from its base, are situated the ivy-clad, massive, modern stone buildings of the San Francisco Theological Seminary. The situation is superb in the grandeur of its environment, and being separated by a tunneled hill from the hydrolynty of the outer world. from the hurly-burly of the outer world, its seclusion is most restful. The Seminary is located at the little village of San Anselmo, which is not far from the better known, fashionable suburb of San

Prancisco—San Rafael.

Accepting the invitation of the Rev.
Edward A. Wicher, Professor of New Testament Interpretation, formerly of Toronto, Ontario, it gave the writer great pleasure to visit San Anselmo today.

Under the guidance of Professor Wicher, he visited the Saminary and was in

day.

Under the guidance of Professor Wicher, he visited the Seminary, and was informed of the aims of this institution, which, while controlled by the Presbyterian Church in the United States of America, welcomes students from all denominations.

It is an obvious fact that men are urgently required for Christian work upon the Pacific coast. The supply must, for years, come from the Christian homes of the East. Men are needed who hate iniquity, soldiers of the Cross who will endure hardships and rejoice in strenuous campaigns. To such heroic souls are promised the grime of toil, the victor's exultation, and the crown of rejoicing. The West offers such men every inducement to work, but for the weaking it has no use. If Eastern young men accept these conditions of service, they will, in this land of promise and at

ling it has no use. If Eastern young men accept these conditions of, service, they will, in this land of promise and at this Seminary, receive full confidence and affection.

While being directed steadfastly to the north star of our heavenly calling—Jesus of Nazareth, the day star from on high—they may in this community learn sociology by actual contact with humanity.

manity.

To the faithful and true workers is To the faithful and true workers is assured a life-work wherein they may spend and be spent in a sacrificial ser-vice in behalf of society's outcasts. This Theological Seminary seeks for men who can fight evil and never know what it is

men who can fight evil and never know what it is to yield, and coming in con-tact with actual slum life in city work, what it is to yield, and coming in contact with actual slum life in city work, the consecrated students learn to sympathize with their fellow mortals, and receive a revivitying foretaste of the vitalizing power of a personal Redeemer. They learn, from actual experience, the futility of mere ethical culture in the great crises of life that try the souls of menordeals which require the human touch of the personal saviour to bring calm to troubled souls. Shams no longer pass current in the world, and it does not pay to pretend that we possess what we cannot produce. Speak then the truth with full assurance, as man to man, and your message will be heard, if delivered in love and with humility. Thus alone will the great multitude be reached, whether intellectual or ignorant.



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cants.

The peculiarities of the people—their others, and The peculiarities of the people—their helpless dependance upon others, and their lack of ability to direct their own development, has to a certain extent given Japan some cause for stepping in as the guardian of the country. C. B. LINTON, District Manager

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WHEN S

Mongoloid. The natives resemble the Japanese facially, but are of a larger frame, and thus are physically more like the Chinese, both in figure and strength. In forming an estimate of Oriental nations we very naturally are led into the error of grouping Japan, China and Corea, and thus of judging them as a unit, which is obviously misleading, because any three nations of distinctly different origins, or, if similar in race of different environment for centuries, must present, even to the casual observer, radical, even if not racial divergence in all the fundamental principles of national life and character.

If we desire to have a true conception of the Coreans, we must understand some of the salient peculiarities of those nations which are contiguous, and with which we have been accustomed to associate them. Our analysis will lead us to epitomize the more obvious characteristics of the Chinese and Japanese, and thereafter, so far as may be possible eliminate them from our calcular calcular. ment, but it is surmised that Japan is playing a deeply laid game of national politics for the benefit of the "galleries" of the world, in which she is trying to demonstrate the utter incompetence of the Coreans to evolve a government of themselves..

Those who know the people say that there are competent men among the Coreans to even the people say that there are competent men among the Coreans to even the people say that

and thereafter, so far as may be possible, eliminate them from our calculations of the Corean character.

Let us examine Corean characteristics, without those faise lights which are cast upon them by our preconceived ideas of the Chinese and Japanese too often educed from our observations of very inferior representatives of these two great nations, who have come to live in our country, and who have thus to an appreciable degree been modified by contact with their new environment. The Coreans are of a mild and gentle disposition—they are quiet, peace-toving and long-suffering as a rule; but in common with all down-trodden people, there comes a time when endurance ceases to be a virtue—in other words, the breaking point is reached when the strain becomes too great, and abused human nature refuses to longer submit supinely to "the slings and arrows of outrageous fortune," and our mild Corean becomes a wild animal in his ferocity.

Taken as a whole, we would say that there are competent men among the Coreans who know the people say that there are competent men among the Core ears competent men among the Coreans who have they can be reason, and it is not hard to surmise. Corea is sparsely settled, while Japan is over populated, and of necessity must find new territory for its natural expansion. Corea is so very Japan.

Corean Peculiarities.

Those who know the people say that there are competent men among the Coreans who are quite able to cope with the local exigencies, but whose services have not been sought by Japan.

There must be a reason, and it is not hard to surmise. Corea is sparsely settled, while Japan is over populated, and of necessity must find new territory for its natural expansion. Corea is so very Japan.

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There must be a reason, and it is not hard to surmise. Corea is sparsely set, the local exigencies, but whose services have not been sought by Japan.

Corea finds itself with a government too incompetent to cope with existing conditions or to withstand the virility of the Japanese, and is slowly but apparently surely, passing over into the hands of Japanese rulers. The Government had become so corrupt and inane that, to the world at large, it seemed almost imperative that some stronger power should step in and indicate its policy if not supplant it entirely. Japan has taken the first step towards complete control by its present occupancy of Corea.

To outsiders this seems the logical sequence of history, and an advance upon that invertebrate national government, which had existed so long; but there are other phases of the question unknown or ignored by the superficial observer from across the seas, which are very important factors in the solution of the problem.

The people, as a rule are manifestly superior to their rulers and are striving to race above their past sordid history, and there are bright hopes of future improvement.

The government is admittedly the weakest and most decadent part of the national life, and upon this basis alone foreigners can judge a nation.

Japan has upset this flimsy govern.

YNOPSIS OF CANADIAN NORTH-WEST

HOMESTEAD REGULATIONS.

ANY even numbered section of Dominton

A Lands in alanuoba or the North-Westtrovinces excepting, sind 25, not reserved,
more than the section of the solohead of the family, or male over 18 years of
a the section of one-quarter section, of
a deres, more or less.

Application for homatead entry must be
made in person by the applicant at the oftice of the local Agent or Sub-agent. Entry
by proxy may, however, be made on certain
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An application for entry or inspection made.

conditions by the father, mother, son, daughter, brother, or sister of an intending home-steader.

The control of the control

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A least six months residence upon extract the term of the land in each year durity the term of the land in each year durity the term of the land in each year durity the term of the land in each year durity the term of the following th

survey made, and upon compying with other requirements, purchase the land at \$1 per acre. The patent provides for the payment of a royalty of 2½ per cent. on the sales. Placer mining claims generally are 100 feet square; entry fee \$5. renewable yearly. An applicant may obtain two leases to dredge for gold of five miles each for a term of twenty years, renewable at the discretion of the Minister of the Interior. The lessee shall have a dredge to operation within one season from the date of the reason from the date of the reason of the first provided the sale of the reason of the first provided the control of the sale of the reason of the sale of the reason of the sale of the reason of the sale of the sale

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