

FINE AMERICAN BRIDGES

Lead the World in Size and Method of Construction

PART TAKEN BY ROADS

New Inventions to Suit Conditions—Longest Bridge at Cairo, Ill.—Brooklyn Most Expensive Structure in World—Changes Most Noticeable in Smaller Construction.

To the railroad must be given the credit for furnishing the impetus that has resulted in the marked advances of the past half century. Especially is this true in the United States, whose unprecedented growth would have been impossible without the aid of its transportation lines.

The railroads, in their constant endeavor to improve, their unceasing effort to give the American people a service unexcelled in the whole world for comfort, speed and cheapness, have so increased the weight of their rolling stock and train loads that the light structures which did service when the first transcontinental road penetrated to the Pacific coast have become obsolete and utterly incapable of meeting the demands of standard modern carriers. Thus stronger and better bridges had to be built.

Co-extensive with the development of railroading has been that of the iron and steel industry. The two have co-operated in a transformation that is one of the marvels of the nineteenth and twentieth centuries.

America, the land of big things, possesses more striking examples of advanced bridge construction probably than any other country. It has the longest metallic structure across any river in the world—that over the Ohio River at Cairo, Ill., exceeding in length the renowned Tay Bridge in Scotland by 33 feet.

The Cairo bridge was finished in 1869. It is 10,540 feet—precisely 19 miles—in length, though originally, with the timber trestle approaches, which have since been filled in and replaced by solid embankments, there was almost four miles of continuous bridge work.

A bridge with the longest single span ever built is one by an American firm across the St. Lawrence River five miles above Quebec. It is designed for both railway and wagon traffic and contains a central span 800 feet in length and 150 feet above the water, permitting the unobstructed passage of the largest vessels afloat.

In drawbridges, too, America leads the world. There was opened at Omaha recently a center pier double drawbridge each swing span of which is 525 feet long.

This excessive length was necessary on account of the shifting channel of the Missouri River, which is constantly undergoing changes in its course, and the new bridge was designed to provide as much as possible for the future vagaries of the stream.

In the common types of steel bridges—the truss, the cantilever, the suspension, etc.—it cannot be said that there have been any extraordinary changes since these types were first introduced. Beyond being successively strengthened and improved in minor details so as to take care of the greater loads they are called upon to bear, these structures remain practically unaltered in their general outlines.

Bridge engineers to-day confine themselves chiefly to the study of stresses and strains, the provision of maximum strength with the minimum use of material, and consequent minimum cost. Every pin or bolt that can be dispensed with is saved.

It is in the smaller bridges that the recent changes have occurred in recent years. In movable structures over navigable waterways the development has been revolutionary in its nature.

The old style swing or draw bridge is being rapidly superseded; at least where the channels are not excessively wide, by the roller lift bridge, an improvement on the pivot axle type which had its origin in the feudal days when the spans over castle moats were raised up on end to shut off communication with the outside world.

The original design of the roller lift consisted of two movable leaves that met in the center of the stream and were rolled up and down from piers on either shore. Single-leaf draws, however, are now being built in many instances where this form of construction is best adapted to local conditions.

Its advantages over the center-roller bridge are overwhelming, in that it leaves unobstructed the full width of the river or canal. Vehicles or cars cannot fall into the water when the lift is open to vessels. It is more rapid and economical of operation, saving delay and expense.

Concrete, reinforced by steel, is becoming more and more a popular material for the construction of permanent bridges over small streams and ravines. Their advantage over iron structures lies in their greater permanency, and in their economy both as to first cost and maintenance.

The ordinary form of modern bridge construction is known as the truss, and various modifications of the truss element (the rigid triangle) are in more general use than any other type of span up to, say 350 feet in height. The common highway and railroad bridge is almost invariably a truss.

PHILIPPINE RAT CATCHERS.

Bounty for the Capture of the Animals in Manila.

The Manila rat is much more in demand than is the Buffalo rat. Since the American occupation of the Philippines rat catching has become a big industry. It has thrived so much under a paternal form of government that 150,000 of the animals were caught in Manila during the last year. Incidentally, that meant 150,000 deaths in the rat colony, for the only good rats in Manila are dead rats. This wholesale slaughter of rats is carried out under the direction of the Philippine Board of Health. It is one of the means used to prevent the much dreaded Asiatic plague.

"Although it is an established fact that rats are carriers of the infection of the dreaded Asiatic plague, yet comparatively few Americans in Manila are alive to the importance which the Board of Health authorities attach to the trapping of rodents, or are aware that the city has an organized corps of seventy-five rat catchers, and that they trap about a hundred and fifty thousand rats a year," said the doctor. "Such is the case, nevertheless, and were it not for this rat brigade, it would be difficult to say where the pest would stop.

"The corps of rat catchers is divided into seven sections, one being assigned to each of the health stations. Each man, who in turn hires small boys to do the actual work, receives a monthly salary of 10 pesos, which is \$5, and, in addition, three centavos (1 1/2 cents) for every rat he catches. This bounty amounts to about six pesos a month—an average Manila clerk's salary. A rat catcher must be industrious. He is hired by the district medical inspector, and if he fails to corral a certain number of animals he is promptly succeeded by a new aspirant.

"This Oriental professional resorts to many ingenious ways in attempting to fool the officials and incidentally, increase his revenue. When the trapping was started the officials were none too strict, and it was soon noticed that some of the trappers were making quite an amount of money. Investigation revealed the fact that oftentimes one rat was made to do duty several times, being kept on the grounds earning bounty for its captor until decomposition set in. To remedy this the inspectors now make each trapper bring his rats to the station every morning, and there the right front foot is chopped off and the rat is labelled with the street and the number of the house from which it came. All rats are then taken to the crematory.

"But the clever native found a new means of evading the law. He conceived the idea of starting a rat farm, and before the authorities were aware of it the business of breeding rodents, in order to collect the bounty, assumed goodly proportions.

"Once a month an auditing is made, at which time all the traps which are furnished by the authorities must be accounted for by the catchers.

"One of the principal acts in this rat drama is enacted at the waterfront, where every precaution is taken to prevent rats from coming ashore from ships arriving from plague infected ports of Asia. Cargoes are closely watched, and while they are being discharged tin funnels are placed on the lawns to prevent the rodents from reaching the wharf."—Buffalo Express.

Strange Origin of Fashions.

The custom of powdering the hair dates back as far as the sixteenth century, and was first introduced by the nuns in French convents. Those who had occasion to leave the cloisters for any reason were wont to powder their hair, so as to make it appear gray and give them a venerable look. The fashionable dames were so struck with the novel effect of white powder on dark hair that they soon appropriated the device as one of the arts of the worldly toilet. Out of this grew the use of tints in the hair. The Roman women often used blue powder, and later, in 1860, Empress Eugenie set the fashion of using gold powder.

Rome under the empire of Greece during the time of Pericles were seized with a mania for golden hair. The bellies and fops of the day devised several methods whereby black locks might be changed to golden yellow, but bleaching did not always succeed. Consequently, quite a trade was established with the fair-haired tribes beyond the Alps, who sold their locks to Latin merchants, to be worn on the heads of Roman dandies.

Many a dame dampened her raven tresses in the strongest of muriatic acid and sat in the sun to bleach her hair to the coveted yellow, says the Cincinnati Commercial Tribune.

There were some cunning devices in vogue among the bellies of the old world for giving expression to the eye. The most reckless of them were wont to place a single drop of that deadly poison, prussic acid, in the bottom of a wineglass and hold it against the eye for two or three seconds. Or, more rashly still, they would take a small quantity—a piece not larger than a grain of rice—or an ointment containing that mortal drug, atropia, and rub it on the brow. Each of these was supposed to give clearness and brilliancy, expand the pupil and impart a fascinating fulness and mellowness to the eye.

Property Destroyed by Fire.

Nearly two hundred millions of dollars' property is destroyed by fire annually in the United States.

Armand Gautier, a French physician contends that a strict vegetarian diet is impossible for white races.

HANDICRAFT OF THE BLIND.

Invading Many Fields of Industry and Turning Out Good Work.

"Don't pity the blind man—employ him. The blind do not want charity. They simply ask justice." This is the keynote of the gospel which Charles F. F. Campbell, superintendent of the experiment station for the training of the blind at Cambridge, Mass., is everywhere preaching. Mr. Campbell is the son of the blind Dr. Campbell, of London, whose achievements in striking out new lines of occupation for the blind are well known. He spoke in New York, urging the imperative need not only of finding occupations for the sightless, but of employing them when they are trained.

"Employment bureaus for the blind," he said, "are a prime necessity. At present, even when a person wishes to employ a blind man and woman or to buy their handicraft, he seldom knows how to go about it. We need greater co-operation between the blind and the rest of the world. It is one thing to know how to cane a chair, quite another to get chairs to cane. What is urgently needed is an employment bureau and handicraft shop that shall be run co-operatively by New York, Boston and Philadelphia.

"The definite purposes for which the experiment station was established were threefold—to determine what industrial occupations other than those already named the blind could profitably engage in; to establish such industries on a business basis, and to enable blind persons, when possible, to become wage earners in shops or factories or selling agents.

"We began in a very small way, testing different trades with blind people of average or less than average mentality. Our purpose, you see, was not to pick out specially gifted people and exploit them, but to discover remunerative occupations which even defectives could follow successfully.

"One day I saw a Swedish woman working at a little loom. Next day I set a blind girl to work at a loom. Rug carpets without pattern or color scheme have been made by the blind for many years, but this was the first attempt to produce artistic results. Now we have an expert designer, a woman, to supervise the work, which is taught by an ingenious employment of a piano keyboard. We are turning out rugs, portieres, table covers, draperies, centerpieces, etc., which no woman of taste would be ashamed to use in her house.

"Another industry that promises well for the blind, and it is the direct fruit of the Cambridge experiment station, is mop making. Mr. Campbell expects to 'wipe up the floor,' literally as well as metaphorically, with the mop which a blind man has invented."



Miss Phoebe T. Cousins, formerly the most famous advocate of woman suffrage, is heartily in favor of the open saloons on the Sabbath. She claims such a measure would tend to reduce crime.

CZAR'S BODYGUARD OF SPIES.

Amid a Complicated System He Has Cause for Uneasiness.

Some of the most valuable and least suspected spies that guard the Czar are women of high rank, who frequent the aristocratic saloons of St. Petersburg and Moscow, and even go as far afield as the Siberian cities of Tomsk, Tobolsk, and Irkutsk, says L. S. Farlow in Harper's Weekly. There are also spies among the Imperial Guards; and for these men the entire army and reserves of Imperial Russia are ransacked. Among them one finds men from the Don and Dnieper Cossacks, the Mohammedan forces from Kazan, the Caucasian provinces, and even from far Kashgar in Central Asia, as well as from the Imperial Preobrazhensky and Pavlovski Guards. The unquestioning and doglike fidelity of these men is wonderful. They are absolutely fearless, of great physical strength, and mentally of unusual acumen and foresight. There are nearly one thousand of these military guards constantly employed in and about the park and palace of Tsarko-Sele. One might suppose that the Emperor Nicholas would sleep peacefully, surrounded by this amazing human network of protection. Yet revolutionists penetrate the royal apartments, and leave letters of sinister menace and warning, which must often suggest to the unhappy monarch that it might be as well for him to do away with this far-reaching system of espionage and mingle freely with his people.

CONSECRATING A HOUSE.

What Orthodox Hebrews Fasten to the Doorpost.

A dozen families of Orthodox Jews were busy moving into a new brick tenement house on Sheriff street, in the heart of the East Side, when a Tribune reporter was passing. His attention was attracted by a ceremony, which seemed to center about the doorpost of one of the ground floor flats.

An aged gray headed patriarch was tacking a little case to the upper right hand doorpost, a hairbreadth from the edge. It was of tin, about three inches long and half an inch wide, and while fastening it securely in place the old man seemed to be muttering a Hebrew prayer.

After the ceremony was ended the reporter began to ask questions. "Yes, it is a religious rite," the old Hebrew answered. "One of the most sacred of our religion—the fastening of the mezuzah. No home is blessed without it, and one might better die at once than attempt to live in a flat that did not have a mezuzah on the doorpost."

Some of the mezuzahs one finds in the East side are of glass. Others, more elaborate and expensive, are of carved wood. Still others are nicely turned, with knobs at either end. Great care is taken that unclean hands shall never touch them. They are not allowed to fall into the hands of non-Jews, if that can be prevented, for fear they will be mistreated.

According to a rabbi with whom the Tribune reporter talked, the obligation is derived from the Biblical passage: "And thou shalt write them on the doorposts of thy house and within thy gates." The custom has been known since the time of Josephus, and at one time the mezuzah was supposed to be a powerful factor in warding off evil spirits. In the Middle Ages the practice of writing the names of certain favored angels, in addition to the passages, crept in. Maimonides, the great Jewish teacher, put a stop to the innovation after a vigorous campaign, in which he preached that those who lived in houses so branded would have no share in the future world.

Policy, Chinese Fashion.

It is a curious thing, says the Hawaiian Star, that here in a community where the Chinese gambling game of che-fa has flourished for many years comparatively few outside of those who are devotees at the shrine of the goddess of chance have even the faintest idea of how the game is played.

Che-fa is a very simple game, indeed, and in its very simplicity lies the difficulty which the authorities here, as elsewhere, find in suppression. It needs no apparatus or "lay out" as do roulette, faro and other games of chance. It does not even need a pack of cards or a supply of chips.

Simply judge as a gambling game and conceding for the moment that it is played on the square, che-fa has its allurements, for it is, on that basis, a game in which every player has an equal chance and the bank simply collects a percentage of the money staked. Unfortunately for the players, however, there is not the slightest reason for doubting that the game as ordinarily conducted is as crooked as the traditional dog's hind leg.

There are 36 characters in a che-fa ticket, each representing some familiar object. The lion, tiger, moon, centiped, dog, rat are among these, but many of the characters represent things which are not generally discussed in polite society. A person who wishes to play the game seeks an agent and gives him what such he wishes, from five cents up, at the same time indicating what character he chooses. The character is marked off on the agent's ticket and the fortune seeker receives a slip acknowledging his bet or stake. Should the particular character prove at the drawing to be the winning number the lucky player wins 30 times the amount of his stake. Thus if he stakes five cents he wins \$1.50, or if he plunges heavily with, say a dollar, he wins \$30. But he does not get all that, he wins. There is the agent to be considered and he collects 10 per cent of the amount of the winning, so that the man who won \$30 would receive only \$27 from the hands of the agent.

It is one of the odd traits in the Chinese character that make che-fa so popular with them. They are devoted believers in dreams. If a Chinaman dreams of a rat, for instance, he will lose no time in seeking a che-fa agent, and backing the rat to win, and no number of recurrent losses seems to upset the Chinese faith in this heaven-sent sign for success. Of course, it is apparent that if a man played on every one of the 36 characters he would in all probability win, but his win would be a loss, for he would only receive 20 times the amount of the single bet on the winning character less the agent's commission of 10 per cent.

Such is the game of che-fa. Bearing only the dream portion of it, it does not seem to possess any particular allurements, and to some persons even the chance of betting that their dreams will come true does not seem attractive. Possibly the average American does not have the same kind of dreams as does the mid-eyed Chin. That can easily be imagined from the casual glance at a Chinese meal and a reflection on the possibilities of what even a simple Welsh rabbit can accomplish.

Inventors in Connecticut.

Connecticut, not necessarily, seems to be the mother of inventions, as most of the useful inventions are made there.

A rich man died the other day. He died in the very misadventure of life, and he left his family \$1,000,000. The doctor's certificate showed that death resulted from typhoid fever. The doctor himself said to a friend: "That man was a suicide. He had a splendid constitution. I could have pulled him through if his stomach had been sound. But he ruined his stomach by hasty meals, snatched by business and by neglect of symptoms which have been warning him a year past, that his stomach was falling in its duties."



The symptoms of a disordered stomach are, among others, variable appetite, sour risings, heartburn, undue fullness after eating, dull headache, dingy complexion, discolored eye, fluctuations in physical strength, nervousness, sleeplessness, drowsiness. No person will have all these symptoms at once.

The restoration of the stomach to sound health, begins with the first dose of Dr. Pierce's Golden Medical Discovery. The cure progresses until the functions of the stomach are in healthy operation. Then the nerves are quiet and strong, the appetite healthful, the sleep restful, the eye bright, the complexion clear.

"Please accept my thanks for the benefit which my child received from your medicine," writes Mrs. W. A. Morgan, of Silica, Mo. "He had been troubled for nearly a year with liver complaint, indigestion and constipation. I gave him your 'Golden Medical Discovery' and 'Pleasant Pellets,' and they did him great good. He gave him the 'Discovery' about eight months, and several vials of the 'Pellets.' He seems to be perfectly well now."

If you want a cure accept no substitute for "Golden Medical Discovery." These ORIGINAL Little Liver Pills, first put up by Dr. J. C. R. V. Pierce over 40 years ago, have been much imitated but never equalled. They're made of purely vegetable, concentrated and refined medicinal principles, extracted from native American roots and plants. They speedily relieve and cure food, torpid and deranged Stomachs, Livers and Bowels and their attendant distressful ailments. One or two a laxative, three or four a cathartic.

Vast Value of Farm Products.

The farm products of this country for the present year aggregate \$6,450,000,000 in value, according to statistics issued from the Department of Agriculture the other day. Of the immense total wheat counted for \$525,000,000, oats for \$282,000,000, potatoes for \$138,000,000, barley \$58,000,000, tobacco \$52,000,000, sugar cane and beets \$50,000,000, dairy products \$625,000,000, beef cattle \$662,000,000, sheep and swine \$283,000,000, corn \$1,216,000,000, hay \$605,000,000, and the balance represents the value of horses and mules and other products of the farm. The products of the dairy and poultry amounted to as much as the iron industry.

In the history of the world no country has ever before produced from soil such value in that time. It is small wonder, in view of the facts, that the farmers want banks and other conveniences and utilities. They produce the wealth and have just claim to the right to control it in part. But the exhibit does not reveal the vast wealth of the farmers. They have paid off their mortgages, improved their standard of living and hold at present lands of the value of more than \$20,000,000,000, horses and mules of the value of \$1,450,000,000 and agricultural machinery and implements to a figure beyond the dream of avarice.

In the face of the exhibit how absurd appears the pretense that the prosperity of this country depends upon tariff taxation? As a matter of fact the tariff policy of the dominant party retards, rather than promotes the prosperity of the country. Upon the items of clothing, machinery, implements and other tariff burdened articles which the farmers consume it is safe to estimate a tariff taxation within the year of the aggregate of a billion dollars. We don't say that that amount of their earnings went into the treasury in the form of revenue. But it went into the pockets of the tariff pampered manufacturing barons in the shape of enhanced profits and unearned bounties and the farmers are foolish for permitting such robbery.—Ev.

Boy Wanted.

A boy sixteen years old with fair common school education is wanted at this office to learn the printing trade. Full particulars as to work and pay will be given on application. tf

HUMPHREYS'

Specifies cure by acting directly on the sick parts without disturbing the rest of the system.

- No. 1 for Fevers.
- No. 2 " Worms.
- No. 3 " Teething.
- No. 4 " Diarrhea.
- No. 7 " Coughs.
- No. 8 " Neuralgia.
- No. 9 " Headaches.
- No. 10 " Dyspepsia.
- No. 11 " Suppressed Periods.
- No. 12 " Whites.
- No. 13 " Croup.
- No. 14 " The Skin.
- No. 15 " Rheumatism.
- No. 16 " Malaria.
- No. 19 " Catarrh.
- No. 20 " Whooping Cough.
- No. 27 " The Kidneys.
- No. 30 " The Bladder.
- No. 77 " La Grippe.

In small bottles of pellets that fit the vast pocket. At Druggists or mailed 25c. each. Humphreys' Med. Co., Cor. William & John Streets, New York.

THE PUBLIC SCHOOL IN AMERICA

A Most Remarkable Evidence of Progression.

Within the last decade there have been so many additions of departments of education that training in the chosen lines of one's vocation is an absolute necessity. The time has gone by when "ignorant, self-made men" are possible. There can never be any more successful uneducated men or women in this country. Money getting will always be a ruling passion with Americans, says Mrs. John A. Logan in the New York American, but the standard of requisite knowledge has been raised and hence decreased the opportunities for success of untutored minds.

State and national governments and philanthropy have provided for the free education of the public, while experience, native intelligence and travel have inspired persons of means with the highest ambitions for the education and training of their sons, daughters and wards. In every community the educational idea prevails and seems to inspire old and young with an insatiable desire for knowledge.

Statisticians have estimated that there are in the United States 18,000,000 students engaged in the various schools in the business of acquiring an education, some for the love of learning, a majority for the purpose of fitting themselves for useful careers.

Including all educators, from the university and college presidents down to the "district schoolmarm," there are more than 500,000 men and women engaged annually in teaching the students in our various educational institutions. The facts seem to justify the statement that the teachers in American schools are second to none in the world.

Discovering the North Pole.

There is a popular belief in the extreme Northwest that the north pole will be discovered by a musher, and not by any scientific polar expedition. This belief is based on the conviction that a gold stampede will eventually be started toward north latitude 90 degrees, and that mushers will rush in where Arctic explorers have feared to tread. So completely unknown to fame is this newcomer in the race for the pole that to the majority of people, the name suggests nothing but cereal breakfast food.

Gilbert Parker, the novelist, who finds his most congenial theme in French-Canadian life, has made his readers familiar with "Marche-en!" the cry with which drivers of dog teams urge forward their panting animals.

French-Canadian trappers were among the earliest white men in the far northwest, and American prospectors on the Yukon soon learned to goad their dogs on with the same cry, without, however, understanding the French which, in their mouths, "as rapidly corrupted to "Mush-on!" to say an Alaska dog driver's equivalent for "Gee up!" Dog drivers generally run with the team, and therefore from "Mush-on" has come the noun musher, used all over Alaska and the Yukon territory to designate a trailman.

The musher is generally prospector, stamper and trailman all rolled into one, and Alaska trails are such uncertain quantities that he has frequently to make his own precedents over newly frozen sea and trackless snow. The musher achieves most of his stampeding to new gold fields during the arctic winter, for then the rigid sea becomes a highway and mighty rivers need no bridging.—Sunset Magazine.

Ice For Heating.

The use of ice for heating purposes is one of the oddities of our modern civilization. Often it happens that a train carrying fruit from the South to the Northern market encounters a cold spell while en route. If the temperature goes below a certain point the perishable merchandise will be ruined. But it has been ascertained that such a misfortune may be prevented by covering the fruit car with a coat of ice—a thing easily accomplished by turning a hose upon it and allowing the water to freeze until the whole is enveloped in a glassy and glittering blanket.

It may, indeed, be appropriately called a blanket, inasmuch as it prevents the radiation of heat from the interior of the car. The ice being a good non-conductor, the warmth is retained and the fruit, or possibly it may be vegetables, goes on its way unspoilied even by zero weather.

Cars used for transporting oranges and other fruit from California to the East are often provided nowadays with large cylindrical "ice stoves," as they might be called, at each end, which, while useful in summer time for refrigeration, are filled with ice during a cold spell in winter. When the temperature outside is at zero or below, the ice, at thirty-two degrees Fahrenheit is relatively warm and thus the "stoves" described act as heaters.

The Salt in the Ocean.

If the ocean did not have salt it would freeze somewhat more rapidly than it does now, but there would be no very marked difference. The ocean is prevented from freezing not so much by its salt as by its size and by its commotion. On account of its size, large portions of it extend into warm climates at all seasons, and by reason of its great depth it is a vast storehouse of heat. Its currents distribute much warm water among the cold.—St. Nicholas.

A Novel Institution.

France has a unique institution called "The Drop of Milk," for the maintenance of infants for the first six months.