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PRELIMINARY HEARING OF THE PRESIDENT'S CANAL COMMISSION.

The Senate has shown a proper appreciation of the gravity of the Isthmian Canal question by refusing to take up the bill for the immediate construction of the Nicaragua, which was passed in such unseemly haste by the House. Its refusal to enter upon a premature debate was no doubt largely due to facts brought out at a preliminary hearing of the engineers of the canal commission by the Senate Committee on Interoceanic Canals, of which Mr. Morgan is chairman.

Although the members of the commission very properly refused to commit themselves, at the present stage of their incomplete investigations, to any exact statement of the relative cost or feasibility of the Nicaragua and Panama routes, enough information of a general nature was presented to prove that the question of the best route is yet an open one, and that the passage of the Hepburn bill by the House was precipitate, and contrary to the dictates of prudence and forethought by which the discussion of this great national project should be governed.

It is impossible to review the interesting report of this hearing at any length, and it must suffice to quote a few of the salient features of the testimony. In the first place, then, it is the opinion of every member of the commission that both canals are feasible; and while no exact estimate of cost was given, Col. Ernest stated that in his opinion "it would cost less money to finish the Panama Canal than to build the Nicaragua Canal." There was a consensus of opinion that the present plans of the French engineers had solved the three great problems of the Culebra cut, the summit water supply, and the control of the Chagres River, and the impression produced upon the committee was voiced by Senator Sewell (of the committee), who said: "We have been educated for the last ten years with the idea that the Panama Canal was an impracticable thing, and it has only been within the last month or two that we have heard from your commission, not officially, but from individual members, that it is an open question whether the Panama Canal could not be finished just as cheaply as the Nicaragua Canal could be built."

On the question of harbors, Admiral Walker stated that it would be easier to make a harbor at Colon (Panama) than at Greytown (Nicaragua), while at the Bay of Panama, on the Pacific, there would be "really no necessity for a harbor." Speaking on the same subject, Mr. Morison testified that the construction of Greytown Harbor (Nicaragua) would be a "work of unusual difficulty and magnitude," and in common with the great dam across the San Juan, "must be considered a very great obstruction in an engineering sense." At the same time he considers that these engineering difficulties can be surmounted, since "everything is feasible in construction to an engineer, provided he has sufficient time and money."

The imperative necessity of waiting for the report of the commission is shown by the fact that, as regards Nicaragua, the Walker survey, according to Colonel Hains (a member of the Walker commission), was a "paper location," whereas the present commission are "locating the canal on the ground itself." Hence it is not surprising that the new estimate of cost will be greater than that of the Walker commission. The more rigid examination has revealed among other things the fact that the dam on the San Juan will be a far more costly affair than was supposed. According to Mr. Morison, it will be necessary to go down 100 feet below the low water level of the river to secure rock foundation, and work at this depth will involve the use of the pneumatic process. This is deeper than the foundations of the Mississippi bridge at Memphis, which measured 60 by 100 feet. As the foundation of the dam will be 120 feet wide by 1,500 feet long, we can appreciate Mr. Morison's statement that "it is going to cost an enormous amount of money."

We could quote at further length from this report; but we think enough has been said to show that the question as to which is the best canal for the United States Government to construct and own is still very much "in the air;" especially when we bear in mind that other possible routes, such as that at Atrato, are also under consideration and may yet prove to have superior advantages over the two great rival routes above considered.

MUTUALLY PROFITABLE.

We have on more than one occasion referred to the frankness, unusual in transportation companies of this character, which characterizes the annual statements of the operation of the Metropolitan Street Railway Company of this city; and the figures disclosed by President Vreeland at a recent meeting of the shareholders are, as usual, full of valuable and instructive facts which have a general public interest. The operations of this, the largest street railway company in the world, are shown by these statistics to have been as profitable to the general public as they have been to the shareholders themselves, and this result is an endorsement of the liberal policy which, with few exceptions, has governed the attitude of the company toward the public.

The following is a digest of the comparative figures given by the president for the years 1894 and 1899:

	1894	1899
Miles operated track	131	224
Car mileage	17,383,590	41,760,856
Gross earnings	$5,398,465	$13,525,485
Per cent operating expenses	59·7	48·7
Divided profits	$328,000	$2,471,675

It will be noticed that although the length of the track operated increased in this period but sixty per cent, the mileage increased in the same period about two hundred and fifty per cent, while the gross earnings increased at the same rate, and the profits at the rate of eight hundred per cent. Looking at these enormous profits one would naturally be prepared to find that they were the outcome of a policy in which the general public was made to suffer for the benefit of the corporation. So far is this from being the case, however, that by virtue of a generous system of transfers, a passenger can ride continuously for a distance of about fifty miles on the different lines of the system for one five cent fare; and the public has shown its appreciation of this convenience by taking transfers during the year 1899 to the astonishing total of 128,365,161.

The company point with commendable pride to the fact that under the old system of separately owned and operated systems, the same amount of transportation would have cost the traveling public an additional sum of $6,418,258.

As a matter of fact it will be apparent at once to all students of the economics of transportation that this sum would never have been expended by the public under the old system. It is the consolidation of roads under one management, and the high state of efficiency to which the roadbed, rolling stock, and motive power have been brought, that enable the street railways of New York not only to carry passengers at a much lower rate per mile, but to do so with vastly increased profits to the shareholders; while the cheapening of transportation has served, in its turn, to increase the amount of travel by 250 per cent. The recent acquisition of the vast system of the Third Avenue Railway Company places the whole of the railroads of New York under one management, and as this consolidated system will be advantageously placed with regard to the city's underground system, there is no doubt that a further extension of the system of transfers will be made by which the efficiency of both the above and underground lines will be greatly improved.

CONGRESS AND THE PNEUMATIC DISPATCH SYSTEM IN THIS CITY.

Chiefly because of certain irregularities which were stated to have occurred in connection with the granting of former appropriations for the Pneumatic Postal Tube System in this city, Congress was disposed at first peremptorily to refuse the requested appropriation for this year; and has only now given a reluctant consent, coupled with the stipulation that no further extensions of the system are to be sanctioned.

Opposition to the granting of the appropriation was based upon some very explicit statements, to the effect that persons financially interested in the Dispatch System had held positions in a previous year which gave them a hand in the unloosing of the government purse-strings when the question of appropriations was passed upon.

The SCIENTIFIC AMERICAN is not concerned in this aspect of the question further than to say that if the facts are as stated, this journal is heartily in sympathy with the motive which suggested the withholding of further appropriations; for every blow at the iniquities of the "spoils system" brings us nearer to that day when the word Congress shall be suggestive of an integrity that is spotless and unassailable. At the same time we think that if the appropriations had been refused, Congress would have shown more zeal than discretion; for in its desire to punish a few individuals, it would have seriously crippled the New York Post Office by depriving it of its most efficient system of delivery.

The pneumatic postal service of this city, a description of which appears in the SCIENTIFIC AMERICAN of December 11, 1897, was installed after the practicability of the system had been demonstrated by the postal authorities in London, Paris and Berlin, and by the successful operation of a plant erected by an American company in Philadelphia. The American plant embodied all the improvements suggested by past experience, and surpassed all previous installations in the fact that its capacity was trebled, and a larger class of mail matter was eligible for transmission. The New York system, which includes a line of tubes from the general Post Office downtown to the banking district, uptown to Forty-second Street and across the Brooklyn Bridge to Brooklyn, may well stand upon its record as gathered from the report of the postmaster at New York to the postmaster-general. From this report we learn that on the first named of the above routes the tube has saved over 10,000 miles of wagon service annually, on the second-named, 48,312 miles; while the branch across the Brooklyn Bridge has reduced the wagon mileage by 18,000 miles. The time occupied by the mails in transit has been surprisingly reduced; in the case of the Brooklyn delivery, according to the report, mails which took twenty-five minutes by wagon are now carried in three minutes through the tubes, while "mails are now delivered with ease, on the first round of carriers all over the city, that heretofore were delivered only by a constant struggle with delayed trains, broken-down wagons, and careless drivers."

Quotations from this report might be multiplied, showing that, whatever doubtful influences may or may not have been at work in connection with the matter of appropriations, the new system of postal delivery is thoroughly efficient and a boon to the general public. Congress, in its determination to administer a stinging rebuke, has apparently lost sight of this fact; with the result that the punitive measures proposed would have fallen heavily upon that very public whose interests it is desired to protect. Evidence of this is found in the agitation which was immediately started among the merchants and business associations of this city to loosen the deadlock, and preserve an institution which has proved its right to become a permanent feature of our system of postal delivery.

DEVELOPMENT OF COLOR-PHOTOGRAPHY.

In a communication made to the Académie des Sciences, M. Graby gives an account of a method of color-photography, by which he has succeeded in obtaining an approximation to the natural colors. After having made a series of prints upon a paper containing subchloride of silver and bichromate of potassium, he found that in some cases prints were obtained which gave an appearance of the natural colors. He came to the conclusion that since this effect is obtained by the violet-blue of the subchloride and the orange of the bichromate, the next step would be to make a separate print of the blues and violets upon a blue paper and one of the oranges and reds upon an orange paper, and that these prints, when superposed, would give more or less the desired effect. His method of working is to make the first exposure upon a plate sensitive to orange, behind a red screen; the second exposure is made with a screen of bluish-green, upon a plate sensitive to the blues and greens; by using a stereoscopic camera, the two exposures may be made at the same time, besides obtaining relief.

The first plate is printed upon the ordinary ferroprussiate, or blue print paper, the second upon a chloride of silver paper, which is not toned, but merely fixed in the hypo. bath and washed, giving thus an orange-brown color. The two prints are pasted upon a stereoscope card and viewed through a stereoscope, a red screen being placed before the blue print and a blue screen before the orange. In this case the colors of the object are seen with a greater or less approximation, and if a stereoscopic camera has been used at first, relief is also given. A remarkable point observed is the brilliancy with which the metals are reproduced; thus in the case of gilding, the color is not merely yellow, but a fine metallic luster is given. This process is one of great simplicity, as it requires but two exposures and two prints, which are made without toning. By making one of the prints transparent the colors may be obtained by superposing one on the other. This process is now in an experimental stage, and is capable of further improvement to obtain a close approximation to the natural colors; it has the disadvantage of not reproducing the reds or violets to any great extent, but as there are many subjects which do not contain these colors, the process may be used to advantage in certain cases. M. Graby states that he is also at work upon a process by which he uses but one exposure and one photographic print.

THE AMERICAN TROTTER ABROAD.

The superiority of the American trotting horse abroad has become so well established in the last few years that European breeders have sent agents to this country to study our methods of breeding, and in Germany and France the local horse-breeders have induced their governments to place an embargo on fur-

ther importations. Two years ago the American trotter went abroad to enter the races in various parts of Europe, and after winning in dozens of important contests their virtues become fully recognized. The Russian government imported several thousand for breeding purposes and established an American trainer and breeder in the Imperial stud. In Austria wealthy lovers of horse flesh paid from five to ten thousand dollars apiece for American trotters, and in London similar high prices were offered for exceptionally fine American trotters.

In the international races held at Nice the American horses won nearly all the medals and money. Someof them were classed as American-bred horses, but owned by Europeans. This condition of affairs was painfully similar in other races held on the Continent, and while admiration was felt for the American trotters in some quarters, their unfailing success caused envy. The local trainers felt they had no chance of winning in the race. In Russia, the American-bred trotter is now handicapped in all races, the American breeder has been dismissed from the Imperial stud, and the importations of further American horses stopped. In nearly all of the Continental races the American trotters have to enter under such odds that there is no possibility of their winning.

But while local breeders can manage the racing associations so that the American trotters cannot win when pitted against their horses, they cannot besmirch the enviable records and reputation that our trotters have established. Their virtues are so well known that the demand for these animals by prominent European racing men is extensive, and to-day this country is supplying more trotting horses for the European market than any other. Our export trade in horses reached its minimum in 1894, when the bicycle and trolley threatened the doom of the horse, but five years later, in 1899, the pendulum had swung to the other extreme, and our export trade reached its maximum. Last year we exported nearly 100,000 head of horses, and a fair precentage of these were trotters to be used either for racing, coaching, or for the parks. A large number of cavalry horses were also shipped, and these are still going abroad in a continuous stream.

The American trotter, as bred to-day, is the most useful and serviceable horse in the world, and he has outclassed all others at the shows at home and abroad. He is the ideal type of horse, with just sufficient mobility about him to permit the breeders to rear him for a variety of uses. He is bred from fifteen to seventeen hands in height, and from 900 to 1,400 pounds in weight, suitable alike for racing, trotting on the speedway, or for road handling. He is bred to trot from 2:20 to 2:03, and he sells for $600 to $10,000 on the average, not taking into account the extraordinary prices paid for a Maud S. or Sunol. There is a demand to-day in Europe for American trotters that can meet the market requirements at prices ranging from $600 to $10,000. Trotting-bred road horses of extra speed and beauty sell to-day in the London market for $10,000 a pair, and in nearly all instances of such sales the horses are either bred in America or are from American-bred sires.

This condition of our trotting stock abroad has given a new impetus to horse breeding in this country, and there is a revival in the business that promises well for the future. The present scarcity of good salable horses is forcibly contrasted with the condition of the market five years ago. Then the horses in the far Northwest were so plentiful and in such little demand that they were left by the farmers to starve on the range. On the great ranges of Texas, California, Oregon, and Dakota the stallions were shot to stop the increase, and premiums were even offered for removing the herds. Only recently the Union Pacific Railroad closed a contract to carry from the Oregon ranges some 9,000 head of wild horses to the grain-growing States. The organizers of this movement anticipate making money out of these wild horses when they have been fed and prepared for the market. Instead of the wild horses being a nuisance on the plains to-day, they are in great demand both for export and for home use. This change of condition is partly due to our war in the Philippines. The Pacific coast has been shipping horses to the far East for our soldiers and army transports at the rate of nearly a thousand a month. These half wild horses when broken to the saddle make the best sort of army and cavalry horses. So well is this recognized that both Germany and Russia are now buying American horses for this wing of their armies. The South African war has demonstrated the value of a large cavalry army, and nearly all the European nations are increasing their mounted troopers, with the result that the American horses are in greater demand than ever. Not only are the American trotters and range horses of the West great winners, but we practically have a corner in the horse markets the world. We have the breeding stock, and above all the cheapest ranges and feed in the world. The American breeder can put the products of his stock farms on the European markets at less cost than the local breeders, and his animals will be superior in speed, power, and endurance.

THE JAPANESE GRASSES.

Japan continues to supply us with wonderful products of their gardens, which, through centuries of culture, they have brought to the present high state of perfection. Japanese plums, morning glories, and lawn grasses are now quite common in every orchard or garden, and they are not excelled by anything that the Western nations have been able to produce. The Japanese grasses, or Eulalias, have only been introduced in this country a few years, but wherever planted they receive more than common notice. For ornamental grouping on the lawn there is no palm or plant that quite equals them, not even excepting the celebrated pampas plumes. When once planted these grasses flourish so abundantly that it is a question whether they may not have a commercial value as well as an ornamental one. In Japan they are dried and woven into mats, and if one cares to imitate the Orientals in this respect, durable home mats can easily be manufactured. After the cold weather has killed the graceful stems or the variety of Eulalia known as gracillima, the stems should be cut down close to the ground. This will give stems from five to seven feet in length. After cutting, dry a few days in a cool, shady place, and then weave the mats cross-wise, fastening the ends by tying them under or sewing with a bagging needle and twine. A mat at least six by five feet can be made in this way, and it will be found durable enough to last for a long time. The mats can be made in a short time, and the stalks can be had in abundance.

The Japanese make many ornamental wicker-work articles with the stems of the Eulalias, and if they are properly dried in season, they will prove very stiff and strong. For this work they should be cut in the late fall and dried in the shade where moisture cannot reach them. Ornamental baskets, paper racks and scrap-baskets can be made with the dried stems.

The best Eulalia for this purpose is the variety mentioned above. This variety sends up beautiful stems to the height of six or seven feet in the fall, with stems not much larger around than thick straw. The leaves branch out from these solid stems and widen to about a quarter of an inch. These long graceful blades are of a light green with a light midrib running from top to bottom. In late autumn they produce a light pink plume, which is the flower of the plant; and as the frosts come, the stems and leaves turn to a pretty brown, which they maintain until spring. If the stems are cut off in the late fall, new ones shoot up early the next spring, and another crop as large as the first will follow.

The most commonly known Eulalia is the zebrina. This is a short grass compared to the first, but raised in beds and masses, it gives a pretty effect to the lawn or garden. The pure zebrina has yellow bars across a green blade, but most of the specimens seen in gardens are nearly green. This is due to the fact that the variety has a tendency to revert back to its original type. In order to preserve the variegated nature of the plant the roots that show a plain green foliage must be taken up, and the roots divided which emphasize the yellow bars. In this way the plants can be prevented from degenerating.

The Eulalia japonica variegata is a variety that greatly resembles the old-fashioned ribbon grass, but it is prettier and taller. The green leaves are brightly variegated with white and yellow, which colors do not disappear as the season advances, but remain on the foliage until frost kills the plants. Although fragile in appearance this grass is quite hardy, and does not suffer from our severe winters. A pretty method of planting them is to surround a group of the taller-growing gracillima with a border of the variegata. The former lends support and contrast to the latter, and the two together always make an effective ornament. The variegata is a foot or two shorter in its full growth than the gracillima. The two varieties grow with the greatest freedom, and require next to no care after being planted. They can be made to flourish in clumps or in a scattering row, where each individual stem stands out tall and straight as a reed arrow.

There are infinite uses to which these tall slender grasses may be put. They are not as tough as the Japanese bamboo, but for light work they answer almost the same purpose. We cannot raise the bamboo in this country, but the Eulalias will flourish, and we might endeavor to employ them about the house in useful and ornamental ways.

DEATH OF JONAS GILMAN CLARK.

Jonas Gilman Clark, the founder of Clark University, died at his home at Worcester, Mass., at the age of eighty-five. He was born in 1815. After obtaining a public school education he apprenticed himself to the carriage-makers' business in Boston, and in 1853 he went to California during the gold fever and laid the foundation of his fortune. When he returned East he located in New York, where he amassed a large fortune in the banking business. In 1889 he founded Clark University, in Worcester, Mass., giving it an endowment of $2,000,000. By his death the institution receives his magnificent library of rare and costly books. Clark University is perhaps unique among the educational institutions of the United States. It is devoted entirely to post-graduate studies, and the university has recently celebrated its tenth anniversary.

PARIS EXPOSITION NOTES.

The number of passengers to the Paris Exposition on the opening day was 118,630. In 1889 111,295 were admitted.

The Post Office in the American pavilion will be a valuable object lesson to Europeans as regards the prompt handling of postal matters. It is located on the main floor together with the Bureau of Information, reading and writing rooms. The second floor will be devoted to various State headquarters. The commissions reception room will occupy the third floor, and the fourth floor is given up to the headquarters of juries, delegates, etc.

A large number of fine jewelry exhibits have been placed at the Exposition, and from now on special arrangements have been made to prevent losses by robbery or fire, and a special service has been organized, which is in charge of M. de Balnégre, a former Commissioner of Police. A service of day and night watchmen has been arranged for, and should any of the cases be broken into, or jewelry be stolen from any of the vistors, measures have been taken to have a bell rung as soon as the theft is detected, and the gates of the different buildings are closed at once.

The Exposition authorities are making a special effort to finish the work of installing the exhibits, and the Minister of Commerce has issued a decree limiting the time allowed for this work. According to the decree, no installation work is permitted after May 12, and exhibits which are too late to be put in place will be refused admission to the grounds after that date, and the Administration will take possession of the empty spaces. No exception will be made to this rule except for special reasons admitted by the Commission. The same limit is made for the erection and installing of exhibits, and all building material, etc., must be removed from the grounds before May 13. The exhibits which are not finished on that date will be stopped by the authorities, who will take measures for removing the unfinished work.

A partial illumination of the grounds took place on Sunday evening, the 6th of May. The various buildings of the Champ de Mars had a line of incandescent lamps along the top, and the Eiffel Tower had a series of lamps from the base to the summit, outlining the general form. Some of the attractions were also brilliantly lighted up, but the Electrical Palace and Fountain could not be illuminated for the occasion, to the disappointment of the large crowd that had gathered in anticipation of this event. In the Champs Elysées section the grounds were brilliantly lighted up with a pleasing effect by a series of translucent orange colored globes containing incandescent lamps, these being hung in the trees all over the grounds, especially along the Seine, including a portion of the space occupied by the national pavilions. Some of these were also lighted up by rows of lamps outlining the main architectural features. The space between the Grand and Petit Palais was well lighted by arc lamps upon poles, and the Alexander III. Bridge by the bronze candelabra which are placed along the balustrade. These candelbra are very handsome, being in massive bronze of artistic design; each supports four large globes containing several incandescent lamps. On either end of the bridge is a large bronze group upholding a candelabrum of an elegant design; this is finished in antique bronze.

The Spanish pavilion was one of the first to be inaugurated, and the ceremony took place on the 8th of May. The pavilion is situated on the bank of the Seine, in the group of national buildings, between those of Germany and Monaco. Among those present at the ceremony were M. Picard, Commissioner General of the Exposition, Prince Roland Bonaparte and many other celebrities. One of the interesting features of the occasion was the presence of Mr. F. W. Peck, the United States Commissioner, with a number of the Exposition staff, thus showing the friendly relations which now prevail between the two countries. The American representatives were cordially welcomed by the Duke de Sesto, the Spanish Commissioner General and his staff. The building takes the form of a palace built in the style of the Spanish Renaissance. Its details are taken from different historic buildings. The façade is designed after that of the University of Alcala, constructed in 1553; another part of the building is copied from the Alcazar of Toledo, erected during the reign of Charles V. The University of Salamanca and various other palaces are represented. In the interior of the building is a large hall surrounded by arcades; a wide staircase leads up to the second floor, where the reception took place. The building is almost entirely occupied by a retrospective exhibition of the national art, and the Queen Regent has sent a number of interesting and valuable collections of ancient tapestry taken from the Royal Palace at Madrid.