RAILROAD GAZETTE

ESTABLISHED IN APRIL, 1856.
Published Every Friday,
At 73 Broadway, New York.

EDITORIAL ANNOUNCEMENTS

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The contest of the Demurrage Bureaus with consignees who think that a demurrage charge is a wicked imposition upon them, continues to be heard of here and there. A week or two ago we noted a case in Cleveland where the magistrate of a local court allowed the whole question of the reasonableness of a demurrage bill to be settled by the jury. His charge to them evidently was a very mild one, as they decided that the consignee need not pay anything, though in every other recent case that we have heard of it has been held that a reasonable demurrage charge is legal. The latest disturbance reported is at Holyoke, Mass., where a number of consignees, mostly paper-makers, who receive large quantities of rags, and who have heretofore saved storage room by storing in cars, have appealed to the legislature. They begin, of course, with the claim that the railroad ought to pay demurrage to them when goods are delayed on the road. This is a plausible argument and has been familiar ever since demurrage was first thought of. It is to be hoped that the Holyoke men will be made to see that it would, if it prevailed, do them more harm than good. Any scheme to make adjustments on the complicated basis of delays, avoidable and unavoidable, would break down of its own weight, howsoever just the principles which it might be attempted to carry out, and the result would be only a lot of unnecessary vexation for all concerned. Such a scheme would involve constant comparison of good and bad, of debit and credit items, all intangible and of a nature to be judged by each party by guesswork; while the present demurrage plan has the advantage of being very simple. It only attempts to mitigate what every one admits to be an evil—the use of cars as storehouses. Rather than try to allow for delays and do it equitably—and of course there are numerous delays which inflict pecuniary damage on consignees and which the carrier must allow for in some way—the railroads would better reduce demurrage charges one-half. And, in fact, this is just what they are doing. One dollar a day, or even two dollars, is very small pay for the use of a freight car and the ground it stands on. Four days free time in which to unload, which is the rule in Holyoke, is too liberal. In four days a car could travel a thousand miles and its owner could thereby earn a hundred dollars which could not be earned without the car. Railroads often get $10 for four days' use of a car lent to another road.

The Holyoke people also want credit for cars unloaded in less than the free time allowed. This is a reasonable claim if the free-time limit is rightly adjusted, but four days is too long. At Cleveland, the plan of charging only for detentions over 24 hours, provided the consignees will sign an agreement to take reasonable measures to prevent delays, has worked with great satisfaction for a year and a half, and over a third of the cars handled by the Cleveland Association are now charged for on that plan (8,740 cars in February) The basis of the plan is explained by an example, thus: A party receiving 1,000 cars in a month finds, at the end of that term, his demurrage bill is $100, the charges having been entered against him according to the ordinary rules. The detention on all his cars, including those which have been unloaded promptly, is then computed and found to be 25,000 hours. Of this, 24,000, equal to one day each, for the 1,000 cars, is deducted, leaving 1,000 hours to be paid for. This is divided by 24, making 41⅔ days, which, at $1 a day, equals $41.66; and this is the amount to be paid, instead of $100, as would be the case under the ordinary rules. The consignee gets this direct advantage, and the railroad gets the indirect advantage of a definite agreement by which all the usual friction is obviated.

The third grievence of the Holyoke men is not so easily disposed of. They complain because demurrage matters are in the hands of the association manager, 35 miles away, instead of being under the control of the local freight agents of the several roads. Every railroad manager knows why he makes this arrangement; it is because the man who must be constantly engaged in pleasing customers cannot be allowed discretion in a transaction which is sure to displease them; but it is hard to present a suitable explanation or apology to the customers. If every station agent were a $10,000 diplomat, perhaps he could adjust demurrage bills so as to get the cars unloaded and still retain the friendship of the consignees, but no ordinary fellow can do it. Probably no man can do it with reasonable success under present conditions unless he can have *at least* 35 miles between his office and the people he has to deal with. Such very fragile things have to be well cushioned. Probably the best the Holyoke roads can do will be to promise a very good telegraph line to the demurrage manager's office. It should not be a telephone, unless the manager has some vigorous assistants to relieve him some of the time.

The Movement to use Green for an "All-Clear" Night Signal.

It is reported that the London & Northwestern has decided to change all its lamps in fixed signals, so that the indication for all-clear shall be a green light instead of a white one. Green lights have been used for all-clear at some places on that road for several years, so that the present action must have been taken only after ample deliberation. The Great Northern of England has used green for all-clear for many years, and the Midland some time ago decided to adopt the same practice. In this country the Chicago & Northwestern has long been a consistent advocate of the use of green for all-clear, and it has a large number of signals arranged in this way. The growing favor in which this idea is held, as shown by these instances, has not been without its effect on railroad men who read, and it now seems likely that the signal committee of the American Railway Association may, at the April meeting, report in favor of the adoption of this principle as the standard of the Association. The *Railroad Gazette* has kept this question before its readers, presenting the arguments in favor of the change whenever occasion offered, and the principal arguments on both sides were set forth in an editorial on Jan. 2, 1891; but as these are somewhat complicated and as some of those on either side are offset by others nearly as strong on the opposite side, it may be well to recount them briefly here.

The use of green for all-clear in fixed signals implies the use of red for danger; and then for caution we must use either a white signal, or a light of some third color (blue, purple or violet), or a form signal. (It is to be remembered that the English use red in distant signals and that therefore the question now before us does not trouble them.) The arguments for leaving things as they are—"letting well enough alone"—are:

(1.) White is not very dangerous. Although there are numerous white lights which tend to confuse an engineman, all enginemen become perfectly familiar with the minutest details of the location of lights on their runs, so that they rarely have difficulty in picking out the proper signal light. (2.) White is consistent with the all-clear signal used in the daytime and thus conforms to long usage, which it is undesirable to disturb. (3.) There is no satisfactory third color. Green and red are the only colors (excluding white as not being a color) which are readily distinguishable from one another and which can be made visible at a long distance. Even green is objected to as being hard to make visible with ordinary lamps at long distances. Blue-green has been used so much for signal lenses that pure blue would, if used, be confounded by some men with green; and some are slow to distinguish blue from green, even under favorable circumstances. If green were used for all clear and blue for caution, this possibility would be a considerable element of danger. To all these arguments the advocates of the illuminated semaphore add the plea that that device has been or will be perfected so as to obviate the necessity of further improving our color signals.

The first argument in favor of discarding white for the all-clear signal is that the breakage of a colored glass, whether it be a danger or a caution signal, changes that signal to an all-clear signal. This accident has occurred at many places, though it has rarely done much harm. Every one admits, however, that the possibility of a serious collision from this cause is always present. The next argument is that an engineman may run into danger from the false indication of a street light or a lamp in a dwelling-house. This is a positive danger, but any inconvenience or danger of this kind is not very likely to come to the notice of the Superintendent, and therefore its true gravity cannot be accurately estimated. The fact that most signal lights are on high posts reduces this danger, but it is desirable to use shorter posts; and, moreover, the increasing use of street lights on high masts and the additional complication due to the constant erection of new houses in thickly settled parts of the country increases the liability that one light may be mistaken for another. Not long ago the writer noticed a white signal light on a high switch stand which was exactly in line (from an approaching locomotive) with an electric street light a mile or more beyond, and in certain conditions of the atmosphere the difference in intensity or color of these lights would not be noticeable.

These are the two main arguments for a change. Another point on the conservative side is met by the assertion that white need not be used in the daytime for all clear. Flags and switch targets could be changed as readily as lamp lenses. On a semaphore arm neither white, green nor red is suitable, because a change of the position of the arm changes the indication of the signal, while the color remains unchanged. Again, the claim that every engineman is perfectly familiar with his route is controverted by the fact that accidents occasionally occur in which the cause is attributed, in part at least, to the unfamiliarity of the runner with the signals at some place which he has not visited for several months.

Of the two main arguments, therefore, one is based on an actual danger which has not yet proved very great, and the other is based on a danger which is generally admitted to exist, theoretically, but which is not susceptible of proof in precise terms. Notwithstanding this, they have found a good deal of favor, and the white probably would be replaced by the green without much opposition if a satisfactory distant signal could be devised. On this question there will doubtless be much difference of opinion, and it is to be hoped that the meeting of the Association will bring out some intelligent discussion.

It should be noted in passing, however, that the use of green for an indication exactly opposite to that given by red necessitates the careful exclusion of all color-blind persons from the train service, for nothing is better settled than that such persons confuse red and green. The worst color-blinds judge of each of these colors by the intensity of the light, which, whether red or green, appears to them exactly like a plain glass smoked to the proper degree of blackness. A test of eyesight should be a regular thing on all railroads, whatever signals are used, but it will be especially necessary if this change is made; and if violet is used a test of acuteness of vision as well as of color sense will be important, because that color is harder to make visible at a long distance.

In discarding "white" lights from the important position they now hold, and in searching for a satisfactory third color, two or three things should be assumed as settled, to start with. First, every green glass should be pure green, and not bluish. By green we mean a green image as it appears to the eye when an ordinary flame lights the glass. Second, all signal lamps should be made with large lenses and large burners, and be firmly supported on the post; and they should be well cared for. Nine-tenths of the objections presented by railroad officers to the use of colored lenses would be swept aside if we could get rid of all the small, poorly constructed lamps, with lenses placed too high or too low or at a wrong angle. Third, distant signals need not be visible a great way off. Every one should settle in his own mind how far he wants his signals to be seen. A violet signal can be readily

arranged to show well at, say, 500 ft. Every one knows that to run trains safely at high speed in times of fog the signals must be so located that the engineman need never slacken his speed more than 500 ft. before reaching the signal. This being so, why try to provide a caution signal to be visible farther than that distance? Fourth, a violet light should be reddish rather than bluish, so as to be more like a danger signal than like a safety signal.

The Chicago & Northwestern arrangement of red and green for caution has worked to the satisfaction of the officers of the road.* If an engineman discerns the light long before he gets to it he may call it red (the red being larger than the green) and prepare to stop on reaching it, but this problematical objection proves to be of no moment in practice, for before the train gets near enough to necessitate material reduction of speed the green is discernible and the actual indication of the signal is understood. With green used for all-clear, white will be available for a caution signal. White might be substituted for the green in the Chicago & Northwestern signal.

The Boston & Albany has used successfully, for years, a semaphore signal which gives its night indication by form entirely. It would introduce practically no complication (except additional expense) to place three white lights on every distant signal post, two to be shown in a horizontal line to indicate caution, and two in a vertical line to indicate all-clear.

Any one of these three schemes (violet, red-and-green, or colorless) could doubtless be introduced with perfect safety. The introduction of green for all-clear on fixed signals ought to be followed by the abolition of green as a tail signal on trains, but this necessity should not hinder the movement. If the three principal points are kept in mind—that violet, though inferior to red and green, is good enough for a caution signal; that the feasibility of the various schemes proposed is attested by actual experience in the hands of expert signal engineers and superintendents; and that the alleged difficulties affect only one class of signals—the distant signals—there should be no great delay in agreeing upon this simple plan to get rid of both of the two serious objections to the use of white lights for go-ahead signals. With large, well made lamps, standard colors, strictly adhered to, and abandonment of the attempt to make signals visible any farther than is necessary, the chief difficulties of the problem vanish.

* This signal was illustrated in the *Railroad Gazette*, May 8, 1891.

Cheap Railroad Working in India.

We have heretofore called attention to the remarkably low cost of working the more important Indian railroads, and to their extraordinarily low passenger fares. We have now the "Administration Report on the Railways of India" for the fiscal year ending with March, 1893; and this shows, reducing the India currency to its value in our own, even more remarkable results than any heretofore chronicled in India or elsewhere. We give warning, however, that the appearances are to some extent deceitful, made so by the recent great depreciation of the Indian currency, based on the silver standard, and the peculiar social and economic condition of the population, where prices and wages are established by *custom* to an extent unknown in Europe or America, so that a large part of them have remained unaffected by the great depreciation in the currency. Those of us who can remember the depreciation of our currency during the war and afterwards will remember that while the price of gold was going up (or the value of the greenback currency going down), prices of all commodities followed the price of gold with great agility, and wages, though they could not be changed from day to day, still kept step with all considerable fluctuations in the currency. Salaries, fixed for the year, were sometimes changed in spite of contracts, because they were too evidently unjust when the value of the money in which they were paid had fallen one-third or one-half; but salaried men and all receiving payments on time contracts often suffered seriously. The common soldier, for instance, had been paid $13 per month in gold. When gold had risen to about 140 this was advanced to $16, but there it remained throughout the war, though gold averaged about 146 in 1863, 205 in 1864, and 157 in 1865, so that in the second of these years the soldier's pay was equal only to about $7.80 of the currency in which he was paid when the war began.

In India the depreciation of the currency is felt to its full extent in all importations of foreign goods, and probably in the price of breadstuffs—at least in those a surplus of which is exported in competition with other producing countries; but the average native consumes very little of any imported commodities, and it has so happens that wheat (the food of probably not one-fourth part of the population) has fallen in price about as much as silver of late years. At least there appears to have been no change in the wages of the great mass of Indian railroad employees, and no advances in fares and freights on account of the depreciation of currency. The railroads have had to pay in gold for all their imported supplies, and for substantially the whole interest on their capital; but for their native supplies they have paid in silver probably at just about the old rates, and for wages also. Thus the rates, cost, etc., which we have reduced to our currency at the average rate of exchange of the year, which was just about 37½ per cent. less than the value of the currency when the silver in a dollar is worth a gold dollar, may seem too small. But it is absolutely true that for sums in gold equal to those we give, so much transportation was to be had, and the cost of it paid for by the railroads during the last fiscal year. It was not intended that it should be so—that is, the fares and freights and wages were fixed when they were worth more in gold than they are now—but it actually *is* so.

The Indian railroad system at the close of the year covered by the report included 18,042 miles of railroad, of which 14,211½ miles were owned by the Indian government or by native states (1,380 miles by the latter). The larger part of the government railroads are worked under contract by companies, generally the companies which originally built and owned them. The government guaranteed interest on their whole cost under contracts which authorized it to buy the roads when they made profits exceeding a given amount. When it has exercised this authority, the old company of course had all the staff and supplies required for working the road, and in most cases it has contracted to work it for a share of the profits. Yet the Indian government works directly 4,992½ miles of its railroads, and the native states 787½ miles, which together make nearly one-third of the Indian railroad system, nearly 79 per cent. of which they own. No less than 7,451 miles of the system are of the meter gage, and 245 miles are of 2 ft. and 2 ft. 6 in. gage, the latter now classed with tramways and their operations not covered by the report. Within the last two fiscal years, of 1,167½ miles of new railroad opened in India, 891 miles were of meter gage. The standard gage of India is 5 ft. 6 in., as that of Canada was once; they adopted it at about the same time.

The length of railroad in India is just about equal to that in Russia in Europe. India has 18 per cent. less territory than Russia, but three times as many inhabitants. The latter in India number about 15,000 per mile of railroad, against about 2,700 for all Europe, 2,200 in Europe exclusive of Russia, and 385 in this country. With so few railroads in so large a country, of course no railroad is accessible to a large part of the Indian population, and it is not so true of the lines there that they have 15,000 people to support each mile, as it is of those here that they have 385 to support them. Nevertheless, the number of those who directly contribute to the traffic of the Indian railroads is enormously greater than here, in proportion to mileage.

The average length of railroad worked in the last fiscal year was 17,677 miles. The average cost per mile, reckoning the currency as equivalent to gold, as it was when nearly all the lines were built, had been $74,931 per mile for the 5 ft. 6 in. lines, $32,715 for the meter lines, and $54,926 for the average of all. The earlier lines were made unnecessarily costly, and were built at a time of high ocean freights, and these are all of 5 ft. 6 in. gage.

The average gross and net earnings and working expenses *per mile* of road in the year reported compare as follows with those of the railroads of this country in the year to June 30, 1892, as reported by the Interstate Commerce Commission:

	India.	U. S.
Gross earnings	$4,245	$7,213
Working expenses	1,992	4,809
Net earnings	$2,253	$3,404

Thus our railroads earned per mile $2,968 more gross, but only $151 more net than the Indian railroads, the cost of working being 141 per cent. greater here. The Indian gross earnings per mile were 6.85 per cent. less (in rupees) than the year before, but the greater depreciation of the currency made the loss actually greater. The decrease was substantially wholly in freight earnings.

The working expenses were 47 per cent. of the gross earnings in India and 66⅔ per cent. here.

With so dense a population, naturally passengers form a larger proportion of the traffic in India than here. In fact, the passenger mileage was very nearly one-fourth greater than the ton-mileage there; here it was about 15 per cent. of the ton-mileage; but freight rates being higher than here, and passenger rates very much lower, the passenger earnings were not much more than half as great as the freight earnings in India, and but 33½ per cent. of the total earnings, while they were 29⅔ per cent. of the total earnings here. The average traffic was equivalent to a movement each way daily of 408 passengers and 361 tons of freight over the whole system in India, against 118 passengers and 744 tons of freight in this country. Their passenger traffic is 3½ times as heavy as ours; their freight traffic less than half as heavy.

Now all this traffic was carried with a train movement equivalent to only 4.3 trains each way daily. So very large a proportion of these were mixed trains that we cannot well divide them between passenger and freight trains, but the report assumes to do it by assigning a certain proportion of the mixed trains to each class, making thus 46 per cent. of the whole, passenger trains. The average train-load was 209 passengers and 140 tons of freight on the principal broad-gage roads; 231 passengers and 78 tons on the meter-gage roads; against an average of 42 passengers and 182 tons of freight in this country. Such passenger train-loads as in India are unknown elsewhere in the world. They are *five times* as great as ours.

Taking all trains together the Indian standard-gage roads earned $1.37 gross and 74 cents net per train-mile; the meter roads 98 cents gross and 49 net; the working expenses being 62 cents and 49 cents respectively. Reckoned in silver the cost per train-mile is only 85 cents on the broad and 67 on the narrow-gage roads, and that with the train-loads we have described. Here passenger trains are reported to have cost 58 cents and our freight trains $1.06 per mile, our passenger trains earning 90 cents gross, against $1.03 on the broad and 98 cents on the narrow-gage in India; our freight trains, $1.65, against $1.55 and 81 cents on the two gages in India. We made a profit of 58 cents per passenger and 32 cents per freight-train mile; the Indian railroads, a profit of 74 cents per train-mile (of all kinds) on the broad and 49 cents on the narrow gage lines.

The average passenger fare in India was 0.469 cent gold per mile on both gages,—in the silver currency of the country 0.645 cent—not to be matched elsewhere in the world; ours was 2.126 cents. The average freight rate was 1.023 cents per ton-mile, against 0.898 cent here, or 14 per cent. higher. If our railroads had carried at the Indian rates their freight earnings in 1891–92 would indeed have been $110,000,000 greater, but their passenger earnings would have been $221,000,000 less.

The net earnings of the Indian railroads were nominally 5.43 per cent. on the total capital outlay on them in 1892-93, and 5.76 per cent. the year before. As these net earnings were in depreciated silver, and nearly all the capital was equivalent to gold when expended, and interest on it now has to be paid in gold, this is misleading, as were the accounts of our railroads during the war. In spite of the apparently satisfactory return last year, the Indian government suffered a net loss in connection with the whole Indian railroad system amounting to about 98 lakhs of rupees, worth $3,165,400 in gold at the average rate of exchange, against a profit of 18½ lakhs of rupees the year before, when the rupee was worth more. The average profit (silver) on the state lines was 5.22 per cent. on the capital; two-fifths of this profit was from the East Indian Railway, worked by a company, whose net earnings were 9.62 per cent. on its capital, the other state lines averaging 3.03 per cent.

The most striking results are seen on individual lines. The Madras Railway has the lowest average fares, amounting to 0.301 cent. per passenger mile, which is at the rate of $2.90 from New York to Chicago, 70 cents from New York to Boston or Washington, and a little more than $10 from New York to San Francisco. Adding three-eighths to get the rates in silver, this is still cheap traveling. This railroad had a passenger traffic equivalent to 567 each way daily, which is two-fifths more than the average Indian railroad, but far below that of some of the lines. Its freight traffic is light, even for an Indian road, and 71 per cent. less than the average here. Its average train-load is no less than 274 passengers, and it has only 4.1 trains each way daily to handle both kinds of traffic, an average of 2.07 passenger trains. Its expenses per passenger-mile are 0.175 cent, which is greater than on some other lines. Its trainmen cost it 1.2 cents per train mile. Ninety-seven per cent. of its travel was of fourth-class passengers; but the other 1 per cent. paid 11½ per cent. of the passenger earnings.

More notable is the East Indian Railway, which has 1,610 miles of railroad in the Ganges Valley, where there is a population of 500 per square mile—twice as dense as that of the United Kingdom, and three times as great as that of Massachusetts, the