KEOWEE COURIER.

"TO THINE OWN SELF BE TRUE, AND IT MUST FOLLOW, AS THE NIGHT THE DAY, THOU CANS'T NOT THEN BE FALSE TO ANY MAN."

BY KEITH, HOYT & CO. WALHALLA, SOUTH CAROLINA, FRIDAY, AUGUST 25, 1871. VOLUME VI.——NO. 44.

Professional Cards.

S. P. DENDY,
Attorney and Counsellor
AT LAW,
AND
Solicitor in Equity,

Will practice in the Courts of Law and Equity, in the Eighth Judicial Circuit.

OFFICE IN THE COURT HOUSE,

Walhalla,————————South Carolina.
Nov. 1, 1870 3 1y

THOS. M. WILKES,
ATTORNEY AT LAW
—AND—
Solicitor in Equity.
—ALSO,—
United States Commissioner,
For the Circuit and District Courts of the United States for South Carolina.

OFFICE ON THE COURT HOUSE SQUARE.

WALHALLA, S. C.
July 22, 1870 40 1y

J. P. REED, Anderson C. H. } { W. C. KEITH, Walhalla.

REED & KEITH,
ATTORNEYS AT LAW
AND
Solicitors in Equity,

Have renewed their Co-partnership in the practice of Law, and extended it to all Civil and Criminal business in the Counties of Oconee and Pickens.

ALSO,

ALL BUSINESS IN THE UNITED STATES COURTS.

Office on Public Square, Walhalla, S. C.
July 18, 1870 41 tf

S. McGOWAN, Abbeville, S. C. R. A. THOMPSON, Walhalla, S. C.

M'GOWAN & THOMPSON,
ATTORNEYS AT LAW,
WALHALLA, S. C.,

Will give prompt attention to all business confided to them in the State, County, and United States Courts.

OFFICE IN THE COURT HOUSE.

The junior partner, Mr THOMPSON, will also practice in the Courts of Pickens, Greenville and Anderson.
January, 1870 tf

JOSEPH J. NORTON,
Attorney at Law,
WALHALLA, S. C.

All business for Pickens County left with J. E. HAGOOD, ESQ., PICKENS C. H., WILL BE PROMPTLY ATTENDED TO
October 26, 1868 4 tf

J. H. WHITNER. WHITNER SYMMES

WHITNER & SYMMES,
Attorneys at Law,
WALHALLA, S. C.

Office on the Public Square.
February 1, 1870 16 tf

S. D. GOODLETT,
Attorney at Law
AND
SOLICITOR IN EQUITY,
HAS LOCATED
AT THE
NEW TOWN OF PICKENS, S. C.
Nov. 10, 1868 7 tf

ALEX. S. ERWIN, Athens Ga. } { O. C. BENTLY Clayton, Ga.

ERWIN & BENTLY,
Attorneys at Law,
WILL PRACTICE IN PARTNERSHIP IN THE COUNTY OF RABUN, STATE OF GEORGIA.
Oct 5, 1869 52 tf

DR. E. E. WHITNER.

HAVING located in Walhalla, offers his Professional Services to the citizens of the place and surrounding country,

OFFICE—BIEMANN'S HOTEL,
Feb. 1, 1871 15 1y

The Narrow Guage.

A REPORT OF THE CHIEF ENGINEER OF THE BLUE RIDGE RAILROAD.

[CONCLUDED.]

To the President and Board of Directors of the Blue Ridge Railroad:

First, let us estimate, as nearly as possible, the relation which will obtain between the dead and non paying load, in actual practice, on the 3 feet gauge. We have taken the statistics, which give us this information for the 5 feet gauge, from official reports, and we have the relations between full loads; but the new cars are not going to run full, although they will come much nearer to it than on the old lines.

We have seen that the freight cars of all existing roads carry an average of 5 tons, and that, therefore, they run with an average of ⅝ of a full load, calling 8 tons a fair full load. To keep within safe limits, I estimate, then, that the peculiar adaptability of the narrow car to the average load of five tons, has no greater effect than to raise the average load one-eighth, (⅝+⅛=¾,) and say that the usual load of the narrow gauge car will be ¾ of five tons, or 3¾ tons. It is more difficult to estimate the probable number of passengers per car. Still, deducing our results from such statistics as are at hand, it appears that 2,748 pounds dead load of passenger cars, exclusive of baggage, was moved for each passenger over the New York roads. This indicates about thirteen passengers per car, which seems a small number for Northern trains, but answers well to experience here. The passenger cars, then, run about one-fourth full. I think we shall not over-estimate, if we assume that the narrow car will run one-third full.

On this basis, the table of dead weights and paying loads is re arranged thus:

Kind of Traffic.	Gauge in feet.	No. of Passengers or tons Freight to car.	To each Passenger or Ton Freight. Dead Load. Pounds.	Paying Load. Pounds.	Gross Load. Pounds.
Freight.	5	13	5,748	150	2,898
	3	10	1,200	150	1,350
Passenger.	5	5	2,091	2,240	5,331
	3	3¾	1,446	2,240	3,705

Showing the actual relation between dead and paying load, in practice, on the common gauge, and the probable results to be expected on the narrow gauge.

The average charge for transporting one ton or one passenger, per mile, is about 2½ cents, and, to earn this amount, there must be transported:

On the wide gauge, 2,240+3,091=5,331 lbs. of freight and cars one mile; or, 150+2,758=2,878 lbs. of passengers and cars one mile.

On the narrow gauge, 2,240+1,466=3,206 lbs. of freight and cars one mile; or, 150+1,200=1,350 lbs. passengers and cars one mile.

This is a comparison, not at all exaggerated, between the two systems The expenditure of power stands in the relation of 37 to 53 in freight, and 13 to 28 in passenger traffic. When the freight traffic stands to the passenger traffic in the proportion of 4 to 1, the difference on the whole power expended is 33 per cent. in favor of the narrow gauge. Does it, then, actually cost 33 per cent. less to conduct traffic when done on the narrow gauge? The mechanical forces expended certainly stand in this proportion.—But that may not be a true measure of the money cost, because all parts of the expense account may not be equally affected.

Here I classify, in a general way, the ordinary railroad expenses, and inquire how the difference in gauge will affect each class:

For maintaining roadway	37 per cent.	
For repairs of machinery and cars	20 " "	
For operating	43 " "	
	100	

These headings may be sub-divided, as follows:

Maintenance of roadway:		
Repairs road bed	.166	
Cost of iron for renewals	.129	
Repairs buildings, fences, &c.	.037	
Taxes	.038	.37
Repairs of machinery and cars		.20
Operating:		
Office expenses, agencies and employees on trains and at stations	.228	
Fuel, oil and waste	.125	
Loss and damage to goods and persons general superintendence, &c.	.080	
Contingencies	.052	.43
Total		100

I estimate the probable saving in operating the road on the narrow gauge system as follows:

The repairs of road-bed, whether considered by their relation to first cost or by the diminished wear and tear from the reduction of weights upon each wheel, and the smaller dead load hauled, cannot be reduced less than one third. The exposed surfaces of earth-works on a line, over so rough a country as the Blue Ridge Road traverses, must be reduced more than a third; and the waste of these works is proportioned to their surface The weight and amount of materials in bridges, masonry, and all timber structures, would also be greatly less, probably one-third, and they would be correspondingly less costly to keep in repair.

The labor of track repairing would be, also, lighter, as the rails and cross ties to be handled are nearly one-half less in weight: the track itself, under the diminished weight of trains, being much more easily and cheaply kept up.

I diminish the cost of iron for renewals one-half, the rails being, in weight, in the ratio of 30 to 56. Besides this, the lighter rails will always be found of better quality, and will have a much longer life. Considering weight and quality, the iron will show, proportionally, much greater durability, under the narrow gauge locomotives, than the 56 pound rail, under the wide gauge engines.

Charges for repairs of buildings and for taxes I leave untouched; the latter, of course, will be reduced, so far as they are laid upon our property, in proportion to its diminished cost. If we should say that the repairs of rolling stock were in direct ratio to the cost of the stock, the reduction for the small gauge would be 50 per cent., as we remember that to be the difference in the cost of the equipment by our former estimate.

But the repairs of machinery and cars I reduce only one-third in equal ratio with the motive power expended This expenditure of power, and the ordinary repairs, must be held to be strictly correlative. And yet, I believe that all the parts of the narrow gauge rolling stock, being relatively stronger, and the shocks to which they are exposed being so much less, both the cars and engines will run with less repairs even than have been estimated

Here let me ask a moment's attention to a matter that bears directly upon the wear of iron and cross-ties, the labor of keeping up the track, and wear and tear of machinery: introducing a table showing the weight on each wheel of ordinary trains on the two gauges, and the momentum with which the wheels will strike any irregularity in the track:

Passenger Trains—Speed Twenty-five Miles Per Hour.	Five Feet Gauge. Weight on Single Wheel. Pounds.	Five Feet Gauge. Momentum Wheel. Pounds.	Three Feet Gauge. Weight on Single Wheel. Pounds.	Three Feet Gauge. Momentum. Pounds
Engine driver	8,000	288,000	6,250	225,000
Engine truck	5,000	180,000	2,500	90,000
Tender	7,650	171,000	3,500	126,000
Baggage car	4,000	144,000	3,000	108,000
Passenger car	4,760	171,360	1,780	64,080

The ends of the rails are beaten to peices and the surface abraded, the ties splintered, and the fibre of the wood cut under the iron, weak joints quickly made worse, so that each succeeding wheel falls with an increasing force upon the ends of the yielding rails, by the tremendous forces developed by the passage of these enormous weight at high velocities. It does not pay to preserve the wood of cross ties from decay by any of the simple methods which are now known, only because the tie seldom has time to rot, but is shattered before decay commences under the hard usage to which it is exposed.

And the action upon the rolling stock is the same as upon the track. The wheel receives a blow of precisely the same weight as that which it administers to the rail at a low joint, and the stock is transmitted to the axle, save what is taken up by the springs, and the yielding of the parts of the whole structure of the engine or car Now the saving of dead weight transported is so much saved from the grand total of this destructive agency; and, by the reduced weight upon each wheel, it comes to pass that no single blow of such enormous force can be given on the narrow road. I leave this point with a single illustration, showing the total of the forces expended upon a defective joint on one side of the track, by the passage of a train of 50 passengers, on either gauge. The joint is supposed to have yielded, so that the wheels fall into it with a perceptible shock. In an example, selected, for calculation it results that the wide gauge train will have inflicted a series of blows, amounting, in the aggregate, to 6,891,840 pounds, while the narrow train will have expended a force amounting to but 3,248,640 pounds.

Fuel, oil and waste are also reduced in cost, in proportion to the power developed—say one third.

The list of employees, cost of general superintendence, office expenses, losses and damages to persons and goods, are left untouched.

We state, then, the per centage of saving in the different departments of expenditure, as follows:

Classification of Expenses	Per centage of whole operating Expenses.	Per centage of Saved by Narrow Gauge.
Maintenance of Railway:		
Repairs road-bed	.166	.055
Cost of iron for renewals	.129	.065
Repairs buildings, fences, &c.	.037	
Taxes	.038	
Repairs of machinery and cars	.20	.070
Operating:		
Office expenses agencies and employees on trains and at stations	.228	
Fuel oil, and waste	.125	.017
Loss and damages to goods and persons, General Superintendence, &c.	.080	
Contingencies	.052	
Total	.80 per cent	.047

The result is, that the narrow gauge line may be operated for 25 per cent. less than the wide; and, as the usual proportion of expenses to gross receipts is 70 per cent., the ratio of small gauge expenses to receipt as would be 52½ per cent., so that we were not so far out of the way in the assumption upon which we calculated our traffic in a former paragraph.

With one additional remark, I leave this branch of the subject. In my calculation of the comparative cost of working the two gauges, I have been solicitous in no particular to exaggerate the advantages of the narrow system. I have given the narrow gauge a proportion of dead load greater, and, to the wide, a less amount than you will find stated in any of the numerous reports, and other publications, on the subject.

In round numbers, I have made the wide gauge to carry, in freight traffic, one and a half pounds dead, to one pound paying weight, and, in passenger traffic, eighteen [illegible] CARTER & half pounds paying load of freight trains, and eight pounds dead, to one pound paying load, passenger traffic.

Now, Mr. Fairlie, speaking of the English roads, remarks: "It is known, and everywere admitted, that the proportion of non paying to paying weight in passenger trains, is as much as 29 to 1, and, in goods trains, exclusive of minerals, as much as 7 to 1. This terrible disproportion is partly due to the system of management pursued, but, in a far greater degree, to the gauge;" and, in speaking of the London and North Western railway, he demonstrates, in a calculation, which has been so frequently republished here, that I will not quote it in detail: "that, if its gauge were 4 feet, instead of 4 feet 8½ inches, its goods traffic could be hauled at half the present cost, and in such a way as to reduce the present tonage on the road by one-half."

FINANCIAL PROSPECTS.

I now apply the conclusions which have been reached to the commercial or financial prospects of the road.

To complete the road, and furnish it with rolling stock, will require, for the 5 feet gauge, in cash:

For grading, track, depots, and engineering,	$6,800,000
For rolling stock,	640,000
For repair shops,	100,000
	$7,540,000
Brought forward,	$7,540,000
To which must be added, for retiring the old debt, and paying the floating debt,	800,000
	$8,340,000
Toward this, will be realized, from the four millions endorsed bonds, at, say 80 cents.	$3,200,000
Leaving a cash capital, to be raised, of,	$5,140,000

To complete the road, and furnish it with rolling stock, will require, for the 3 feet gauge, in cash:

For grading, track, depots, and engineering,	$4,000,000
For rolling stock,	320,000
For repair shops,	80,000
	$4,400,000
For old and floating debt, as above,	800,000
	$5,200,000
Proceeds of the four millions of bonds, above,	3,200,000
Leaving to be raised, in cash,	$2,000,000

For the purposes of comparison, we will assume that the additional capital required to complete the road, on either system, can be raised by cash subscription to preferred stock.

The capital then represented by the road, completed on the 5 feet gauge, would be,	$9,140,000
If completed on the 3 feet gauge, the capital would be,	$6,000,000

This calculation of capital pre-supposes that the present capital stock is virtually destroyed by the preference of the new, and that the old first mortgage bonds are retired, as provided in the estimate.

Now, to pay interest at 7 per cent. on the capital necessary for a 3 feet gauge, ($6,000,000,) requires a net income of $420,000; and, at 52½ per cent. expenses, the gross receipt must reach $880,000. Such a traffic (as before stated in this report, 80 per cent. of that of the South Carolina Railroad for the year 1870) yields perfectly satisfactory results, paying 7 per cent. interest on the capital invested. If, however, we suppose the road to be built on the common gauge, requiring a capital of $9,140,000, this gross traffic of $880,000 would pay less than 2 per cent. interest on the capital invested; for, in such a case, there must be deducted from the gross earnings 70 per cent. for expenses, leaving but $264,000 for the net earnings

Is there any doubt which of these two projects would receive the preference in any money market? For it must not be forgotten that the capital necessary to complete this road has to be procured outside our own resources; and when I look at these figures, and contemplate the chances of obtaining, upon such a showing of traffic as we can make, $5,000,000 for the one plan, or $2,000,000 for the other, I confess to a feeling that our choice is between the narrow gauge railroad and no road at all.

BREAK OF CONNECTIONS.

As we look back upon the information which we have collected, and gather up the results of our inquiry, the question before us seems to take a new shape, and we are tempted to ask, "if all this be true, why should we think of building a wide gauge; what possible reason can be given in its favor?" And but one answer can be found, which is this: "There is, in fact, no reason for building roads wider than three feet, for such speed as is required for the traffic of the South, except, that all the other existing lines are of another and wider gauge, and at every break of gauge freight and passengers must change cars."

This is a real and weighty objection to the introduction into our system of a new gauge, and it must not be pushed out of the way without examination. Certainly, I am not disposed to do so, for it has long hindered my own mind in advancing to a conclusion as to, not the merits of the system, but the policy of its introduction. When I was prepared to recommend it for branches, I could not feel satisfied to approve it for main lines, connected at both termini with a general railroad system of a different gauge. That the objection may lose none of its proper force to your minds, I quote the most forcible statement of it that I remember to have seen. The writer speaks of English roads:

"The evils resulting from the break of gauge, are by no means unimportant. The inconvenience to passengers is great, but the difficulties, as respects the goods traffic, are still greater. The removal involves loss, pilferage, detension, besides a money tax, estimated at from 1s. 6d. to 2s. 6d. per ton. It is found at Gloucester that it occupies about one hour to remove the contents of a wagon, full of miscellaneous merchandize, from one gauge to another, with all the force of porters that can be brought to act upon it. An ordinary train, laden with promiscuous goods, may contain loose commodities, such as bricks, slate, lime, or limestone and chalk, flags, clay, manure, salt, coal or coke, timber and deals, dye woods, iron, iron ore, lead and metals, cast iron pots, grates and ovens, grindstones, brimstone, bones and hoofs, bark, hides and seal skins, oil cake, potatoes, onions and other vegetables, cheese, chairs and furniture, hardware, earthenware, dry salteries, groceries, provisions, cotton, wool, oils, wines, spirits and other liquors, manufactured goods, fish and eggs, ripe fruits, &c., &c. In the hurry the bricks are miscounted, the slates chipped at the edges, the cheeses cracked, the ripe fruit and vegetables crushed and spoiled, the chairs, furniture and oil-cakes, cast iron pots, grates and ovens, all more or less broken, the coals turned into slack, the salt short of weight, sundry bottles of wine deficient, and the fish too late for market; whereas, if there had not been any interruption of gauge, the whole train would, in all probability, have been at its destiny long before the transfer of the last article without damage or delay. Though this description is somewhat over drawn, there is still much truth in it. It will readily be imagined that the live stock frequently manifest decided objections to the change of train, and we are informed that pigs exhibit their usual peculiarities of disposition on these occasions, that cattle sometimes resist with great energy, and that two hours have been spent in effecting the removal of one of them."

We agree with the writer that his description is a little, or a good deal, over-drawn, but let it stand, without further remark, save on one point, that of the money cost of changing freights. This is excessively over-stated, even for the time when the passage was written, twenty years ago. Experience has demonstrated the cost of transferring freight in Great Britain to be about 2 pence per ton. That the cost of handling at the break of lines on the Canada frontier has been found to be, from many years' experience, 5 cents per ton. Considering this, then, as only a question of additional cost, it will evidently bear hardest upon the through freight, which has to be changed at each end of our line, at a cost of 5 cents per ton, or a charge of 10 cents per ton total. The average cost of transportation of freight may be taken at 1½ cents per ton per mile on the existing roads; but on the narrow road, we have found that we can transport 25 per cent. cheaper in actual expenses. One ton transported 180 miles, at 1½ cents, would cost $2.70, and a saving of 25 per cent. on this would be 67½ cents, so that an expense may be incurred of 10 cents per ton in transferring freight, and still leave a balance in favor of the narrow gauge of 57½ cents.

I might leave this topic here, but, in equal justice to the advocates of the narrow gauge, must add, that it is claimed by them all that it is well worth paying the cost of transferring freight to keep the cars of each road on its own line. The system of interchange of cars is prolific in losses and damages to the different companies. One does not gain what another loses, but all suffer alike; and from a common cause, namely, that when off its own line, no car receives that timely repair which, at home, would be given the "stitch in time." However bad be its condition, if it can be got off the hands of the parties at present responsible, and, like Ginx's baby, put off on the next parish, employees rejoice in a sense of duty performed. Around the great terminal stations are bone yards, filled with the remains of these victims of neglect, whose owners are too far away to care for them.

It is also probable that the cost of transferring freight may be materially diminished by special appliances for the purpose. For instance, all articles in bulk, as grain or coal, may be spouted from one car to another by an arrangement of tracks on a different level; and it is possible, by the use of cranes, to raise and transfer the smaller box car bodies to flats of a wider gauge. It will be sufficient for this argument to let the question rest on the comparative money cost of the two systems.

CONCLUSION.

This discussion, then, leads me to these conclusions:

First—That the three feet-gauge will answer all the requirements of our prospective traffic.

Second—That the saving in first cost will be immense, enough, in fact, to place the completion of the road within our reach, by raising $2,000,000 of additional capital, while it seems impossible to obtain the large sum necessary for a 5 feet line.

Third—That, being built, the narrow gauge will be much more economical in working, the expense being only 52½, instead of 70 per cent. of the gross receipts.

Fourth—That the main, if not the only objection to be urged against the change of gauge, is that drawn from the necessity for transferring freight at the termini; but that, without seeking to diminish the force of this argument, it is greatly overborne by the weight of advantages, which must be counted in favor of the narrow gauge.

OPINIONS OF EXPERTS.

However satisfactory to ourselves are the processes of our reasoning, and whatever confidence we may have in the soundness of our conclusions, yet, should we lead the managers of this enterprise to such an important a step as the change of gauge, the public will be likely to inquire, and with propriety, whether the system adopted has the sanction of experience, and the approval of those professional men whose reputation and attainments command public confidence.

In addition, therefore, to the experimental details which have hereinbefore been given, I think it well to conclude this paper with a few brief memoranda of the results attained by such European narrow lines as have published statistics of business; and, also, to give the testimony of some professional authorities and experts.

During eight years, the Festiniog Railway, of 23 inch gauge, has been worked by locomotives. The tonage of this line, for 1869, reached 136,000 net, and 97,000 passengers. The gross tons hauled, exclusive of engines, 242,000. The total receipts for the year

1869 were	£23,676
Expenditures	13,053
Net income	10,623
Capital	36,185

Mr. George A. Parker, in a report to the Massachusetts Legislature, presented, March 11th, 1870, says of this road:

"Under its reform *regime*, it is a wonder of mechanical science—a lamp of hope to the railway forsaken everywhere. In one year its tonage amounted to 136,132 tons, averaging 9,388 tons per mile of road, which is more than double the traffic of the Connecticut River Railroad, a fair example of the thrifty roads of Massachusetts; and its passenger business, though not strictly a passenger road, amounted, in the same year, to 6,807 passengers per mile, which exceeds that of the prosperous Worcester and Nashua Railroad for the year 1870."

To make the capacity of this two foot line, for business, appear more vividly, contrast these figures:

Festiniog Railway, down tonage, 1870	118,182 pounds.
South Carolina R. R., down tonage, 1870	105,771 "
South Carolina R. R., up tonage, 1870	133,143 "

In Norway, railways of the 4 feet 8½ inch and of the 3 feet 6 inch gauges have been constructed by the same Engineer, and worked by the same Manager for the Government, and the following statistics are taken from the Government returns, showing the average from six years' experience;

	Gauge 4 8½	Gauge 3 6
Cost of construction per mile	26,843	17,148
Receipts, per mile (alike,)	27,600	27,325
Maintenance, per mile	7,173	6,565
Locomotive expenses, per mile	9,426	5,760

Traffic on these narrow lines exhibits a most encouraging aspect, and the impulse given to the development of the country already re-acts to the great increase of the business and profits of the railways.

Mr. C. E. Spooner, under date of December, 1870, gives the following:

"In the paper I read before the Inventors' Institute, in 1865, on narrow gauge railways, I advocated a 2 feet 6 inch or 2 feet 3 inch gauge for future lines. Since then I have gone fully into the matter, and taking into consideration that it would be advisable to be able to construct locomotives with inside cyl-