Narrow Gauge Vindicated.

[Concluded.]

In last week's issue we gave some facts collated from the late report of the Denver and Rio Grande railway, upon which was based a plea for the narrow-gauge. Taking up the thread, we notice that the power of the narrow-gauge locomotive is not affected by the narrowness of the track. This power depends upon the amount of weight placed upon the driving wheels of the locomotive, which may be increased as desired,—in other words, as the size of the train requires it. Practically throughout the United States it has not been found desirable, except on unusual grades where special power is used, to increase the freight train above what a 30-ton locomotive will draw. While the narrow-gauge road with the same weight of rail can of course carry any weight of locomotive that the wide-gauge can, yet even with a very much lighter rail than that usually adopted on railroads in the United States a 30-ton engine can be used without difficulty on the narrower road, by increasing the number of driving wheels which carry the 30 tons over the track. In consequence of the reduction in dead-car weight, such an engine will draw, as has been shown, 35 per cent. more freight than it can, taken with the present style of rolling stock, on wide-gauge roads; or, a locomotive weighing 23 tons on the narrow-gauge will carry as much as one of 30 tons on the other. It is true the number of driving wheels could be increased on the wide-guage engine, enabling lighter iron to be used without diminishing the train below its best practical size; but the heavy passenger and freight cars of the wide roads (each of which weighs more than the heaviest present locomotive on the Denver and Rio Grande Railway), and the fact that thousands of these machines pass over the line, since a railroad will have say 20 times as many cars in motion as of locomotives, will practically prevent this advantage from being realized to any considerable extent.

On the Denver and Rio Grande Railway the present passenger locomotive weighs 12¼ tons, and the freight locomotive 17½ tons. They are more powerful than are needed ordinarily for the present size of the daily through freight train and passenger train, and for the local mixed train. On occasions where there is a temporary excess of freight an extra engine is run. When the daily through freight business increases, so as regularly to exceed the capacity of the present locomotives, heavier ones will be put on up to 30 tons. Practically, on any road (except in the case of special inclines), the loss from broken links, smashed drawbars, injured freight, etc., by switching with a train that a 30-ton locomotive cannot handle, is greater than the expense of running an extra engine; or, if the grades are light, so that the number of cars would be too large, an extra train. Freight trains, where there is a large business, are consequently run in fleets, the train unit having reached its practical maximum limit.

Alternatives.

Why not alter the rolling stock on the broad-gauge-road? Because there are so many hundred thousand cars that it is impracticable. The principal cost of changing the gauge of a road is the alteration of its rolling stock. The process of reforming the cars could not be gradual, because the new, light and lower cars would either be knocked to pieces by the other heavier and higher ones, or require to be run in separate trains, which is impracticable. These roads are at the mercy of the heaviest cars, or the most vicious model that any other and perhaps distant road may have introduced, otherwise they could not be run through. All new cars had to be heavy enough to resist the momentum of these, and thus the evil has gone on increasing.

Why not adopt the reformed cars on a new road adhering to the wide gauge? Because the great advantage claimed for adhering to the gauge is simply the avoidance of transhipment, and this could not be gained practically, because the cars of other companies could not be carried unless in separate trains, which is out the question, and the new, light cars could not be run off their own line with any advantage.

The Cauge Adopted.

Well, admitting all this to be true, and that a narrower gauge than 4 feet 8½ inches is advisable, why adopt specially that of 3 feet? The Denver and Rio Grande Railway was the pioneer of the new movement in the United States, and, so far as known, constructed the first road of 3 feet gauge in the world.

From the experience already had on the Festiniog Railroad of Wales, it was known that the heaviest class of freights—coal, iron, lumber, ores, stone, etc.—could be advantageously carried on a gauge of 2 feet, and even passengers for short distances. But as the Denver and Rio Grande Railway was to exceed 800 miles in length, to traverse a variety of climates, to have a large passenger business of tourist and health travel, as well as of emigrants and soldiers, and was required to carry many of the lighter and more bulky commodities, and cattle, it was admitted that the gauge should be just as much wider than the gauge of that existing narrow-gauge railroad, whose success, mechanically and financially, was indisputable, as would permit these new conditions to be complied with.

For the government roads in India, a year's careful and thorough examination of the whole question by a board of experienced commissioners had resulted in a majority of the board voting for a gauge of two feet nine inches, and the remainder for three feet six inches, which the government settled by adopting as a compromise the French metre, about three feet three inches, for a system of 10,000 miles decided upon for that country. But the roads of India were not to pass through or near a mountain country generally, and a large amount of cotton was to be carried, so that it might be considered advisable to have a larger car-floor surface than under ordinary circumstances in the United States. Mr. Spooner's experience had suggested two feet nine inches for average conditions in England, while admitting that this might be too narrow for different characters of climates, customs, and prevailing load. Mr. Fairlie recommended three feet. Norway and the Canada roads had adopted three feet six inches.

The hope, which has since been fully realized, of inducing throughout the United States an uniform adoption by all narrow-gauge enterprises of the gauge selected by this company, so that there might be no war of narrow-gauges, also entered into the question. It was not thought advisable to abandon the American style of passenger car, and upon this plan a three-feet gauge would permit three passengers to sit comfortably across the width of the car, leaving sufficient space for the passage-way. Less than this gauge would compel a reduction to two passengers, or the adoption of the English compartment system. A wider gauge would not admit of four, without making it too wide for economy, and besides it was every-day experience that by reducing the proportion of those passengers who could have seats by the windows, or by themselves, it was made more difficult to fill all the seats. On the average, as we have seen, even three seats are not occupied on wide-gauge roads.

As a resultant of all these various elements, the gauge of 3 feet was considered to best satisfy the largest number of the most important requirements and was adopted. The strong desire of setting an example which all the narrow-gauge railroads to be built in the United States would find it to their interest to follow, whether in the East or West, sacrificing as little as possible in the extreme cases of location on the smoothest plains and in the most difficult mountains, and meeting best the average conditions of the topography and transportation business of the country, had a very considerable weight in influencing the decision, and it is with great satisfaction that we are able to announce the thorough success of the new tentative gauge in this respect. It has commended itself to the judgment of all narrow-gauge engineers, and without exception, so far as known, every narrow-gauge project in the United States has adopted the same width. There will be no war of narrow-gauges. The Union Pacific Railroad Company has, during the year, constructed the Colorado Central Railroad west from Denver of the same gauge, —3 feet—on which the cars of the Denver and Rio Grande Railway will pass without transshipment.

That the gauge of 4 feet 8½ inches, which George Stephenson found prevailing in the case of the roads and wagons in the north of England to which he first applied locomotives, should necessarily be the best all over the world, for a new class of railways, and carriages of a highly improved character, would be indeed singular. While it might have been suitable for horse-power, and for an imperfect surface, it would surely have been extraordinary had this same width been the most advantageous for an entirely new machine—the steam railroad; and even had it been best for a small, densely, and uniformly populated island of smooth topography, it would not have followed that it was the proper gauge for a vast continent of great variety in the character of its surface, population, and development.

In fact it *was* contested from the beginning, —not, however, on the ground of being too wide, but too narrow. An able engineer, Brunel, claimed that 7 feet was a better gauge for England, and in the support of that claim urged, it is safe to say, with one exception, (that of its being a change from the existing order of things,) every argument that has been adduced in latter days to support this in behalf of the 4 feet 8½ inches gauge as against one still narrower.

Thus it happened that for 30 or more years, during which the war of the wide gauges has been going on, attention has been drawn away from the true direction for inquiry, to wit, whether the narrower of the two broad gauges was not too wide for true economy, and therefore for the greatest efficiency. Two competitive wide systems grew up alongside of each other in England, and to a less extent, thanks to our comparative poverty, in the United States. The results of that long struggle are well known. Now, the narrower of the broad gauges is being seriously challenged in every country; while in the United States, where three feet has been adopted by the uniform judgment of narrow-gauge engineers, a large number of roads have organized, many of which are under construction and in operation, for sections varying from 12 to 156 miles each. Thus it will be seen that the one admitted deficiency of narrow-guage roads—that they are different from the existing ones, and prevent interchange of cars for through business—is about to be removed; that a narrow-gauge system is rapidly growing up, with the latest improvements in rolling stock, which will afford all the benefits of this interchange without many of the disadvantages which accompany it on the old roads. We have explained the reasons which induce the company to adopt the guage of three feet, and show how it has operated on the road thus far, but have refrained from polemical discussion, holding in wholesome veneration the thirty years' war between Stephenson and Brunel, with their followers, and will here leave the subject until still further actual experience has enabled us to state something new.

The Yellowstone Expedition.

Gen. Rosser, in charge of the Railroad Survey of the Stanley Yellowstone Expedition has submitted to the authorities of the Northern Pacific Railroad Company his official report of the results thus far accomplished by the expedition. He finds the new and final route across Western Dakota from Missouri to the Yellowstone River entirely practicable and satisfactory, it being greatly superior to those of former days. The distance, 295 miles, is twenty-one miles shorter than the survey of 1871. The gradients are moderate, the average of work per mile is considerably less, the number of important bridges is reduced nearly two-thirds, and the Little Missouri River, which former surveys crossed seven and eleven times, is crossed once on the line so located. The route runs immediately through only one mile of the "bad" or clay lands, just east of the Little Missouri. With few exceptions, the country is a rolling prairie, sometimes rising into low hills, the grass being excellent and soil good. Good water was found the entire distance. Coal outcrops at various points in veins several feet in thickness and timber is more abundant than on former routes.

The report states that the main body of Gen. Stanley's expedition accompanied the scientific corps, and most of the press correspondents did not accompany the engineers who were escorted by Gen. Custer's department, but followed the old abandoned route south of Heart river, hence descriptions of the region traversed by the main command do not apply to the country traversed by the new route for the railroad. The directors of the company have accepted the new line recommended by Gen. Rosser from Bismarck, the present end of the track, to the Yellowstone crossing, and have called for proposals to grade and bridge this section of 205 miles.

The expedition is now prosecuting the survey westward up the left bank of the Yellowstone to Pompey's Pillar, where it will join the survey made last year from the west, and thus complete the surveyed line across the continent. The entire command is expected to return to Fort Rice about October 1st.

A Novel Transportation Scheme.—It is reported that Mr. Nehemiah Gibson, of Boston, is preparing a plan to shorten the water transportation between the coal markets and Boston. He proposes to construct iron barges for the transportation of coal from New York, Philadelphia, or Baltimore, by way of Narragansett Bay and the Taunton River, in Massachusetts. These vessels are to be very strong, each to hold four hundred tons of coal, and to be propelled by tug-boats. From some point on the Taunton River he thinks a railway can be constructed upon which these barges can be taken from the water and carried overland about twenty miles to the cars at Weymouth. In this way 150 miles of sea transportation will be saved without breaking bulk. The construction of the road and barges, however, will be very expensive. The rails, even the author of the scheme acknowledges, will have to be very large, made of steel, and laid on a road-bed much wider than the ordinary railway. The plan has some interest as one of the new points in the transportation question.

To Clean Silver Plate, rub it lightly over with kerosene, then polish with fine whiting and chamois skin.

The Ministry of Trees.

As the proper season for transplanting trees is now fast drawing near, it may be important that public attention should be directed to the subject.

Every one knows there is nothing more refreshing than shade on a hot day; but all are not so well acquainted with the philosophy of vegetable life and growth, and thereby with the sanative power of green foliage. Carbon is the basis of the vegetable body. This substance, which exists in our atmosphere in the gaseous form, is absorbed by the leaves, and, after certain changes is converted into material for the nutriment and growth of the plant.

In cities and large towns, carbonic acid gas is given off abundantly, from the various decomposing vegetable and animal substances, with which all such places abound; and especially from the millions of breaths, which still more infect the air. This gas, as is well known, is most deadly in its nature, and in its concentrated form destroys life instantly. But green and growing leaves, under the action of light, absorb large quantities of this gas, and, at the same time, evolve oxygen, which is an invigorating and life-giving principle; and as trees contain a very large amount of foliage, they must contribute in an equally high degree to purify the corrupt air of cities. Boards of health should take this fact into consideration; and as a matter of economy—of absolute physical interest and comfort—should enjoin their cultivation; for healthful is their presence, not merely to the senses, but the soul.

But there are other points of view, in which the philosopher looks at trees, conceiving ideas far more important, as they relate to the higher nature of man. In every beautiful object there is found, lying beneath its merely external qualities, a principle by which it connects itself with the soul. Thus, in a flower, the irised hues of the petals, the delicate structure and tender green of the leaves, the beauty of form and coloring, the more spiritual perfume, all address themselves to the senses; yet there is a something more than these, even for the common mind—a shadowing forth of the Divine Power—the mysterious Life—connecting it, as by fraternal ties, with all other life; and this is the great end and use of Beauty. It is a revelation of the Unseen, the Spiritual, the Infinite.

Every humble flower, that lifts its modest head along the beaten wayside, is invested with a mission to the soul, is planted and reared there, to speak of purity, of beauty and sweetness, of which itself is but a type and an emblem. Clouds are ministers of love; waters are tuneful prophets, unfolding sweet philosophies of life—calling us ever to return, to restore the harmony we have violated—the purity we may have left far behind. The sea-shell is not merely the habitation of a stupid fish; but its roseate lips are bright with the smile of angels—angels that are forever whispering to us the divine mysteries of Nature—"unwritten poetry," which is but another name for the fulness of indwelling life.

In rocks, and caverns and mountain peaks, we find sculpture and architecture in their grandest forms; and glowing in sunset skies, or the divinest cheek of Beauty, is the original type of the Painter's eye. The great ocean, itself, is a poem, written in language that is intelligible only to the soul. It embodies episodes of awful power, tragedies of terrible effect and interest; yet all giving utterance to the one great thought of a present Deity, that speaks in every voice of Nature, whether it be in the whispering zephyr, that kisses the drooping cheek of the love-sick floweret, or the deep-heaving thunder of the surges, that make holiday in the destruction of life.

In all these are the primitive ideas of beauty and sublimity pre-existing in the mind of God; and when their true spirit and relationship is perceived, they may be appropriated and developed by the kindred human mind, which is genius. But of all sensible objects, the most powerful representative of this thought is a Living Tree. There it stands, in its fulness of leaves, in its beauty of outline, in its majestic proportions; and if we would behold it, we must look up! So is the thought drawn upward. We are transiently lifted out of our senses, and all the wants which they impose. We forget that we are machines, created with express relations to the fact of being fed and clothed, or of ministering to the food and clothing of others—a philosophy which our daily life but too truly teaches. Even the selfishness which is fostered by almost every process of human experience—by every onward step in life—which is made the bottom line of our religion and the sum-total of our morality, until the heart becomes the most wonderful of petrifactions—even this is softened, and like the rock of old, acknowledges the presence of the Divine Power.

In the country, where the works of God are bountifully spread abroad, in all the fulness of their variety, their beauty and sublimity, the presence of these voiceful ministers of good is not so deeply felt, nor so sorely needed. There, too, the very occupations have a tendency to preserve inviolate the original bond between sense and soul. But in cities, where the main business of life is to drive a bargain, to over-reach, to plot, to advance the deified Self to the highest possible niche in the temple of wealth and honor, much need is there of something to lift the heart out of its unnatural littleness, to pluck the soul from beneath its indurating egotism, that it may be relieved from the cramp of its growing deformity, and expand itself, though but for a moment.

And what can do this like trees? He who comes within the magic circle of their inviting shadow, whether he bear with him the small heart and the narrow mind of a penny dealer in tapes and shoe-ties, or the harder heart and narrower mind of the good-for-millions usurer, cannot get away without being made something better for having been there. He may struggle against the influence, if he will. But the soul is true to its birthright; and how deep soever it may lie embedded, it will struggle upward, it will dilate and expand itself, until it attains to something more nearly approaching the true proportions of the Human; and he goes away a larger hearted and better man than he came.

How much of the world's history might be told by a single tree. There it stands, an untiring witness of the ages, with its roots driven deep into the soil of the past, and its towering head looking over the dim horizon to the distant future. Physically we are but ephemera in comparison. Races of men successively come forward on the stage of being; they play their parts in the great life drama and retire, to be seen no more, yet there stand the trees, sentinels of eternity on the outposts of time; watching the flight of centuries, as they come and go, and their life is measured by cycles, and not by years; yet from studying this life our thought gathers stronger wings; we sweep through the immensity of uncounted ages; we penetrate the depths of being, where neither time nor space is known; where the past and the future are lost in the fulness of one immeasurable present, which we call eternity, and we find it all within the soul, the true life of man, before which all other periods of duration vanish as the fleetest shadows.

There are nations who worship trees; and not wholly heathen, not wholly void of a true spiritual life can he be, whose God is so enshrined. We will not, then, sneer at the simple African, who bows down and worships, beneath the bending arch of his beautiful Mazamba tree, which is both temple and divinity. If it be then but to teach us to look upward, to give to the human brow its erect position, which is the true external God Image, there *should* be trees. It has been said by one of old, as an incitement to hospitality, that he who gives a cordial reception to strangers, may unaware entertain angels. Let us, then, bring hither, to grace our burning side-walks, these beautiful strangers of the neighboring forests—doubting not but we shall find, and our children after us, to remotest generations, that we have won to ourselves the ministry of angels.—*Pacific Rural Press.*

"Farming by Book."

As in every other department of practical science, farming is considered by those who are styled "old school" farmers to be something purely experimental in nature, and to be learned only by experience, either self-acquired or that of others. On these assumptions is based the sweeping condemnation dealt out to agricultural books and periodicals at large by those whose ignorance of their character and aim is thus evidenced. Now *our* platform, too, rests on these same facts, but our inferences differ. An agricultural paper merely professes to collate the results of successful experiment, to disseminate new theories for further and more thorough trial, giving in turn the issues of such trial, and to put before the farmer, who otherwise would be limited in information to the knowledge possessed by his own clique, his immediate neighbors, the practice of his brother farmers in remote parts of the country or of the world, and to enable him to keep pace with the continuous progress made in his own department of labor.

The agricultural paper meets much the same feeling that the Signal Service reports and warnings had to combat, and is in many respects analogous. We all remember how the "practical" old sea dogs laughed at the flags sent up by those scientific "sharps," and how carefully they disregarded their prophecies. But now how changed is their slighting opinion. The conclusion was gradually forced upon their minds that there was something in scientific meteorology, after all, and they at present regard the signals with a more than superstitious reverence.

So with the reports of the Department of Agriculture among farmers, at the outset. So with the agricultural schools and colleges. So with the application of organic chemistry to systematic tillage. So with the principle of rotation of crops, which, though old as the hills in some lands, is among us a comparatively new feature, that has had to fight its way into esteem before being so generally adopted, and so it has been with the agricultural press. That sentiments are changed is sufficiently proved by the many farming papers which exist and the numbers of new ones that are everywhere springing up.

Let us try to state briefly, condensing words as much as possible, our own ideas of our proper sphere. We look upon our position as that of a medium of thought between farmer and farmer. In addition, we conceive it to be our duty to express opinions on rival modes, and to criticise new methods. We are enabled, by superior advantages, to gather from all sources the intelligence which especially bears upon the well-being of the farmers of our own locality, which evidently it would be impracticable for the farmer himself to obtain. Whether in topics of the field, the kitchen and flower-garden, the apiary, the poultry-yard, or the stock-farm, it is ours to keep posted on the advance of the day; it is the farmer's opportunity and duty to examine and compare, and to follow, if found wise, our advice. Still further, it devolves upon us to guard his pecuniary and political interests, without professing to be a trade journal, and still less a partisan organ. Such should be, and are, for the most part, the objects of agricultural papers, and such, we hope, is the character o the Rural Press.

The Narragansett Turkey.

This is one of the largest and hardiest of all the breeds of turkeys. It is raised in the greatest perfection in Southeastern Connecticut and Rhode Island, a region famous for its fine poultry. Turkeys do remarkably well along the sea-board and almost every farmer remote from the villages has his flock. It is not uncommon to find flocks of from one to two hundred birds, the product of about a dozen hens, under the skillful management of a poultry woman or boy. Of course they do some damage to grain; but this evil is counterbalanced by the enormous destruction of insects. From June o September they subsist mainly upon grasshoppers, crickets, and other insects, ranging for the most parts in the pastures and woodlands.

They are fattened in October and November, and it is not uncommon for a lot of early chicks to reach the average weight of fourteen pounds, dressed, at Thanksgiving or Christmas. The common run of turkeys sent to New York market do not average more than eight or nine pounds.

The Narragansett is a very large, healthy bird, and has been bred for size many generations. Most of the birds sold in Boston and Providence markets under the name of Rhode Island, or extra No. 1, are of this breed. The farmers are careful in the selection of their breeding stock, taking young gobblers that will weigh from twenty-two to twenty-eight pounds, and hens that will weigh from twelve to sixteen.

When the birds are kept over, gobblers will sometimes dress 32 to 34 pounds. For making poultry for market, the Narragansetts have no superior. The prevailing colors are white and black, with a large patch of white upon the wing bow, giving the general impression of a gray bird. They are not uniform in the shading, but, with sufficient pains-taking, could be bred to a feather.—*W. Cäft, in Poultry World.*

Some experiments have lately been made in the arsenal at Vienna with a new explosive mixture, the "Volkman powder," which are stated to have produced very satisfactory results, and to have shown that the new mixture is cheaper and more powerful than ordinary gunpowder.