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JANUARY, 1832.

Embellished with Views of Trinity Church, Little Queen Street, Holborn; And the old West Bridge and Gate, at Gloucester.

By SYLVANUS URBAN, Gent.

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ORIGINAL COMMUNICATIONS.

ON THE SUBSTITUTION OF STEAM-POWER FOR HORSE-LABOUR.

Mr. URBAN,

CONSIDERING the extensive circulation of your Journal among the intelligent classes of the provincial population, I have been induced to submit for insertion in your valuable columns, a few remarks on the promised advantages held out to the public, by substituting steam-power for horse-labour in the conveyance of passengers and merchandise on common roads. Having no other interest in the question than must be felt by every person desirous of promoting our national prosperity and rendering our internal resources available to the utmost possible extent, I shall enter into a few of the leading points connected with the transit of goods and passengers by horse-labour, previously to examining the comparative value of elementary power applied to the same objects.

The superiority of travelling in Great Britain, in comparison with most other parts of Europe, is not less owing to the great improvements which have been made within the last twenty years in the construction of roads, than to the great attention which has been paid in this country to the breed of horses. Indeed the extent to which capital and enterprize have carried the system of running coaches between the metropolis and the great provincial towns, may be said to have almost exceeded its proper limits, whether we take into account the question of humanity, or the risk of life; for the severity of treatment to which the noblest animals of the brute creation are subjected by the cruel practice of driving a set of horses eleven or twelve miles an hour with a heavy load, can scarcely be justified by any pretence of competition among the members of any civilized community. The vast improvements in roads have unquestionably reduced the actual labour of horses in a very great ratio; yet the enormous loads which are attached to four horses, both in the heavy six-bodied coaches, and the four-horse vans for carrying goods, shows that no other limit regulates the amount of labour demanded from these valuable animals, except their total incapacity to sustain such violent labour with profit to their heartless employers.

Yet the amount of horse-labour in this country, great as it is, bears a very small proportion to the aggregate amount of labour performed by steam engines. Without the introduction of locomotive carriages for the transport of raw produce on rail-roads, a very large proportion of our internal mineral riches would be unattainable, except at such cost as to limit their use within a very narrow field. Indeed, we obtain a very inadequate idea of the vast amount of labour now performed by the aid of locomotive engines, from the quantity formerly executed by horse-power in our large iron and coal works, and slate and stone quarries. A new era has in fact been created by combining the mechanical force of steam as a propelling agent, with the use of iron railways for diminishing the amount of friction. The extent to which this combination of scientific principles with mercantile enterprize in the transit of raw produce, has enriched every class of the community in the great coal and iron districts, naturally led to the introduction of steam-power for the conveyance of passengers as well as merchandise, between the great towns of Manchester and Liverpool; while the advantages resulting from that undertaking having exceeded even the most sanguine expectations of its projectors, there is little reason to doubt that in a few years more, we shall have steam

carriages very generally substituted for vehicles in transporting both goods and passengers on common turnpike roads.

It is not necessary, Mr. Urban, that I should trespass on your readers' patience by giving a detailed account of the progressive experiments made by parties who have devoted their whole attention to the construction of steam carriages, adapted for working on common roads; since the House of Commons, during the last Session of Parliament—being duly impressed with the national importance of the subject—directed a Select Committee to be appointed, with full powers to examine evidence, and "report on the probable utility which the public may derive from the use of Steam Carriages."—And it is only doing justice to the sound judgment of the House, and to the honourable Members who composed the Committee, to admit that the Report, together with the Evidence on which it is founded, contains a mass of more valuable information to the public at large, than any Report I remember to have seen within the same compass. Instead, therefore, of offering any individual opinion as to the advantages and disadvantages that might result from the substitution of Steam for Horse-power, it will be more satisfactory to your readers to take the collective opinion of a Parliamentary Committee, founded upon the evidence of five or six gentlemen who have been several years engaged, and are still occupied, in bringing steam-carriages to perfection;—of five or six eminent engineers and surveyors who have devoted great attention to the construction of roads and wheel-carriages;—and to the evidence of two honourable Members of the House, distinguished for their scientific attainments and knowledge of political economy.

The first witness examined by the Committee was Mr. Gurney, who made the first successful experiment with a steam-carriage on common roads, about six years back, near the Regent's Park; and about two years since made a journey from London to Bath and back, at a rate of travelling varying from eight to twelve miles per hour. Under favourable circumstances as to the state of the road, and the full power of the engines, Mr. Gurney found it neither difficult nor dangerous to drive the carriage at the rate of sixteen, eighteen, or even twenty miles per hour on level roads.

Messrs. Summers and Ogle, who have run a steam-carriage many months at Southampton, gave similar evidence as to the perfect practicability of propelling those carriages even at twenty-four miles an hour. Mr. Hawkins, another patentee, who has been running a steam-carriage from London to Stratford, Essex, gives similar evidence as to the perfect practicability of running such carriages for any number of hours on common roads, at ten or twelve miles per hour, including all stoppages.

With regard to any apprehension of danger from the explosion of steam-generators, all the before-mentioned witnesses agree—that with proper management the liability to such accidents is exceedingly remote; but even in case of such pipes or chambers bursting, the only inconvenience that has resulted has been that of extinguishing part of the fire, and making a temporary delay in the journey till the apparatus can be repaired.

Steam-carriages are also, from the concurrent testimony of all the witnesses, far less liable to be overturned than coaches drawn by horses travelling at a rapid pace, both from the centre of gravity being lower than in coaches or other vehicles now in use, and from the great facility with which such carriages can be directed, in comparison with that of guiding or reining-in four high-bred horses.

In descending hills, also, the engineer or conductor has the power of effectually retarding the velocity of a steam-carriage, both by regulating the supply of steam to the working cylinders, and by the still more effectual method of reversing the action of the cranks, in the manner adopted in steam-boats. By this means an incalculable advantage is obtained over the management of vehicles drawn by horses—accidents being in almost every instance the result of horses running away, more especially in descending a hill, or turning sharply round corners in the road.

Steam-carriages can also be turned round, or entirely stopped, within a shorter distance than any coach with four horses, thereby enabling the conductor not only to guard against accident from his own vehicle, but to

turn out of the road at an instant to avoid accident from carriages drawn by unruly horses, or driven by negligent coachmen.

In addition to the greater safety and economy of steam-carriages for carrying passengers and goods, the testimony of the inventors (which is fully corroborated by that of the most eminent engineers) proves that the injury done to turnpike roads is much less than in drawing the same weight with horse-labour. It was proved to the Committee that the injury done to roads by stage-coaches is far greater through breaking up the surface by the horses' feet, than from the action of the wheels: while it appears that in drawing a given weight (say three tons), a steam-carriage will admit of the tire of the wheels being made at least double the breadth of the wheels of ordinary four-horse coaches, thereby reducing the injury done to the road to less than one half, independent of the horses. This fact is of the utmost importance in the introduction of steam power in lieu of horses, and renders the subject one peculiarly entitled to parliamentary notice, and to the attention of road trusts in every part of the kingdom; for the wear and tear of roads (and more especially indifferent roads) requiring an enormous outlay of capital to maintain them in repair, any measure which has a tendency to lessen such expenditure must be deemed a public or national benefit. One of the first measures therefore that ought to be adopted by the Legislature, should be to place steam-carriages upon at least an equal footing with other carriages drawn by horses, instead of allowing the several road trusts to charge any amount of tolls they may think proper.

It having been apprehended that serious inconveniences might arise from the use of steam-carriages on common roads, through the liability of horses to be frightened, the Committee peculiarly directed their attention to this point, and the uniform testimony of all the witnesses who have examined the effect of steam-carriages, shows that in very few instances have horses evinced the least notice of such vehicles on the road—by no means exceeding that shyness high-bred horses manifest on other occasions.

For additional evidence as to the view taken of this important subject by the Parliamentary Committee, we must refer to the following extracts from the Report itself.

The Committee state, that

"These inquiries have led the Committee to believe that the substitution of inanimate for animal power in draught on common roads, is one of the most important improvements in the means of internal communication ever introduced. Its practicability they consider to have been fully established.....Many circumstances, however, must retard the general introduction of them as a substitute for horse-power on roads. One very formidable obstacle will arise from the prejudices which always beset a new invention:—especially one which will, at first, appear detrimental to the interests of so many individuals."

Mr. Farey, one of the witnesses examined before the Committee, states:

"That steam-coaches will, very soon after their first establishment, be run for one third of the cost of the present stage coaches."

But the evidence of Colonel Torrens (one of the Committee) bears so particularly on the immediate question of Rural Economy, that I shall be excused for giving it a little more in detail.

"'Have you considered the effect which will be produced upon British agriculture by substituting, on common roads, steam carriages for carriages drawn by horses?'—'I have.' 'What do you conceive that effect would be?'—'I think it would produce very beneficial effects upon agriculture. I conceive that agriculture is prosperous in proportion as the quantity of produce brought to market exceeds the quantity expended in bringing it there. If steam-carriages be employed instead of carriages drawn by horses, it will be because that mode of conveyance is found the cheapest. Cheapening the carriage of the produce of the soil must necessarily diminish the quantity of produce expended in bringing a given quantity to market, and will therefore increase the net surplus,—which net surplus constitutes the encouragement to agriculture. For example, if it requires the expenditure of two hundred quarters of corn to raise four hundred, and the expenditure of one hundred more on carriage to bring the four hundred to market, then the net surplus will be one hundred. If by the substitution of steam carriages you can bring the same quantity to market with the expenditure of fifty quarters, then your net surplus is increased from one hundred to one hundred and fifty quarters: and consequently either the farmer's profit, or the landlord's rent, increased in a corresponding proportion. There are many tracts of land which cannot now be cultivated, be-

cause the quantity of produce expended in cultivation and carriage, exceeds the quantity which that expenditure could bring to market. But if you diminish the quantity expended in bringing a given quantity to market, then you may obtain a net surplus produce from such inferior soils, and consequently allow cultivation to be extended over tracts which could not otherwise be tilled. On the same principle, lowering the expense of carriage would enable you to apply additional labour and capital to all the soils already under cultivation. But it is not necessary to go into any illustrative examples to explain this, it being a well-known principle that every improvement which allows us to cultivate land of a quality which could not previously be cultivated, also enables us to cultivate in a higher degree lands already under tillage.'"

Now we apprehend nothing can be more demonstrable in political and rural economy, than the truth of this reasoning; yet it will require more resolution than prevails among the occupying farmers of Great Britain, to believe that any measure which could reduce the present price of corn, can be advantageous to their interests, ultimately. It is a very common, though a very mistaken maxim in rural economy, that high prices are advantageous to the operative farmer. With an average crop and moderate prices, the farmer in *all cases* derives greater profits, ultimately, than by high prices with a diminished crop, and the consequent diminution of consumption. It would not be difficult to demonstrate this by incontrovertible evidence from the best writers, if it were at all necessary for the support of our argument. But with the view of looking fairly at both sides the question, we shall give another extract from the valuable evidence of Colonel Torrens.

The witness being asked by the Committee—

"'If horses were displaced from common roads by using steam-carriages, would not the demand for oats, beans, and for pasture, be diminished, and land thereby be thrown out of cultivation, and labour out of employment?'—'If steam-carriages were very suddenly brought into use, and horses thereby displaced, I think the effect stated in the question would be produced for a time; but practically, steam-carriages can be introduced only very gradually, and the beneficial effect upon the profits of trade by bringing agricultural produce to market more cheaply, will tend to increase profits, to encourage industry, and to enlarge the demand for labour; so that by this gradual process there will probably be no period during which any land can actually be thrown out of cultivation, the increasing population requiring all the food that horses would cease to consume. With respect to the demand for labour, that demand consists of the quantity of food and raw materials which can be cheaply obtained, and as by the supposition the displacing of horses will leave at liberty more food and more material, the demand for labour will ultimately be greatly increased instead of being diminished. It has been supposed (I know not how accurately) that there are employed on the common roads in Great Britain one million of horses, and it is calculated that one horse consumes the food of eight men. If steam carriages, therefore, could be brought to such perfection as entirely to supersede draught horses on common roads, there would be food and demand for eight millions of persons additional. But when we take into consideration, that lowering the expense of carriage would enable us to extend cultivation over soils which cannot now be profitably tilled, and would have the further effect of enabling us to apply with a profit, additional portions of labour and capital to the soils already under tillage, I think it not unfair to conclude that, were elementary power on the common roads to completely supersede draught horses, the population, wealth, and power of Great Britain would at least be doubled."

If these estimates, given by Colonel Torrens with regard to the number of horses employed in draught, be even near the truth, and we take the amount of food they consume (or in other terms, the amount of land necessary to produce that food,) at one-fourth less than his estimate,—or as equivalent to the sustenance of six millions of persons,—the subject still is one of vast moment at a period like the present, when thousands of our hardy peasantry are annually compelled to expatriate themselves from their native land, in order to procure subsistence. It is no longer a question of merely local policy, in which parochial overseers and district magistrates have very difficult and painful duties to perform; the subject is daily assuming a far more serious aspect from the overwhelming numbers of unemployed poor among the rural population. The subject, in short, has already engaged, and *must* continue to engage in a very increasing ratio the serious attention of the Legislature, with a view to devise some adequate remedy, or at least some palliative for so formidable an evil. Provided the substitution of

steam-power for horse-power offered no advantages as to saving expense in the transit of goods, it would be well worthy of parliamentary support, as a means of economising our national resources, and providing for the first object in the whole circle of political economy—the subsistence of the people. The double evil of the present state of things is,—that while the middling classes in the provincial districts are borne down by the weight of parochial rates, the individuals who receive such rates contribute little or no available labour in return. If, therefore, both the dictates of humanity and the law of the land oblige us to furnish subsistence to the poor, it is not only sound policy but our duty to devise means of providing employment for the poor. If any additional arguments were necessary to show the misery and degradation to which a very large proportion of the peasantry of a country may be reduced from want of employment, we need only direct our view to the present wretched condition of Ireland; and it requires no great gift of prophecy to foresee that the English peasant is rapidly approaching the same vortex of misery, in spite of the legal claims he possesses on the parochial funds, and the gratuitous aid of benevolent individuals. Indeed, no single axiom in political economy is more demonstrable, than the pernicious effects entailed on society through the system of giving subsistence to the able-bodied poor without procuring an equivalent in the form of labour.

To a question put by the Committee to Col. Torrens—"whether the reduction of draught horses on common roads would not throw out of cultivation certain poor soils supposed to be only capable of raising oats?" The Hon. Member expressed "a doubt if there be *any* land which is worth cultivating with profit, that would not raise some other agricultural produce than oats, in order to supply the increasing population with food." In this view of the question I entirely concur; for it is well known that a fair remunerating crop of potatoes, with alternate crops of artificial grasses, may be in most cases procured from the poorer soils appropriated to the growth of oats. In numerous cases, pulse and esculent roots, both for human food and cattle, might be grown on light soils now appropriated to the subsistence of horses. If we take into account the enormous extent of land still under pasture in Great Britain, the greater portion of which would afford a profit as tillage land, and consider how much of such pasture is rejected by horses, we shall have a better idea of the waste of land when devoted to horse-keep in this country. Whether in the form of pasture, meadow, or horse-corn land, an enormous sacrifice of the agricultural resources of the nation are swallowed up in the maintenance of horses, that might immediately be appropriated to feeding stock or raising grain for human subsistence.

Inasmuch, therefore, as machinery can be substituted for horses in draught for the conveyance of passengers and goods, so far shall we be enabled to transfer the food of each horse to the maintenance of eight persons; with the additional advantage of saving at least one-half or two-thirds in the transfer of goods from place to place. While, on the other hand, the labour employed in the construction of such steam-carriages will furnish employment for a considerable number of artisans, and promote the consumption of a large quantity of copper, iron, and coal:—commodities which may be truly called the mineral treasures of Great Britain, and which have no value whatever until brought into use by the employment of labour and capital.

In whatever form we view this question, it cannot be considered but in the light of ultimate advantage to the community. Every political economist, from the time of Adam Smith to the present hour, concurs in opinion that *labour is the fundamental source of national wealth*, and we have only to look at the produce of our coal mines to be convinced of the vast accumulation of national wealth among the whole community, where that staple commodity exists. By means of cheap transit we virtually give the metropolis and all the other parts of the kingdom remote from our coal mines, a portion of that wealth which is at present limited to certain districts merely in consequence of the expense of carriage. But we have the additional consolation, that by the dissemination of such mineral riches over all parts of the kingdom, we give increased ac-

tivity to commerce and enterprise in all such distant parts, without detracting from those advantages already enjoyed by districts contiguous to our coaleries.

It would extend the limits of this paper beyond due bounds to enter into all the benefits that this country would derive if the whole kingdom possessed such advantages as those in the immediate vicinity of our great coal basins. Even in the article of manure alone, the benefits would be almost incalculable, if coal could be obtained in abundance in the southern counties for lime-burning. I shall therefore close my present remarks by a few observations on the advantages that would necessarily accrue to Agriculture, if Steam Carriages could be applied on a large scale for the conveyance of raw produce and manure.

It is well known that in many clay districts enterprising farmers consider chalk so valuable for amending the staple of the soil, as to employ a team for the conveyance of chalk from a distance of many miles, at an expense of one day's work, of four horses and a man, or at a cost of 20 to 25 shillings per waggon load. Now if steam-power were substituted for such purpose in lieu of horses, can there be a doubt that it would be attended with the most decided advantages? Or, instead of the dreadful wear and tear of horses and harness in drawing chalk, stone, bricks, &c. from the quarry, would it not save an incredible deal of labour, if the proprietor of a chalk-pit were to keep a steam carriage in constant work for a given period in carting chalk from the quarry to the road-side, or to the lands adjacent, as may be found desirable, by the parties interested? Again, what an immense saving in outlay and keep for horses might be effected by substituting steam tug-carriages for conveying agricultural produce to market, on every great line of road leading to market towns; more especially in districts where fuel is abundant? By the use of iron rail-roads, and diminished friction, an enormous increase of power is attained in locomotive engines, yet by the distribution of the load from one carriage to several carriages, so as to prevent the wheels cutting the road, together with the use of broad tire wheels (as recommended by the Committee) for the steam tug-carriage, incalculable advantages would result from the employment of steam in lieu of horses, both in the various operations connected with rural economy, as well as in the transit of goods for hire and for the conveyance of passengers on every great road in the kingdom.

Yours, &c. A. A.

Mr. Urban, *Louth, Sept.* 1.

IN 1817 I sent you a short account of the parish of Fotherby, co. Lincoln, which is inserted in your vol. LXXXVII. ii. p. 207. I now communicate a few additional notes.

The church is situated nearly in the centre of the parish, and is dedicated to St. Mary. It consists of a tower, nave, and chancel; but the upper part of the tower was taken down many years ago, and covered with a penthouse roof, like the nave. It still contains three bells: the first, or least bell, is two feet three inches in diameter; the second, two feet five inches; and the third, or largest, two feet eight inches, with this inscription:

"All men that hear my doleful sound,
Repent before you are in the ground. 1608."

In the chancel, on the south side of the altar, is a piscina.*

On a tablet against the north wall of the nave is this inscription:

"Sacred to the memory of Mrs. Charlotte Mitchell, relict of Mr. John Mitchell, of Boston, merchant, and daughter of the Rev. Robert Uvedale, D.D. Rector of Langton, near Spilsby, and Vicar of Swineshead, by Diana his wife, daughter of Bennet Langton, of Langton, esquire. She died at Louth, August 29, 1826, aged 51, and is buried here. This tablet was erected by her affectionate brothers, the Rev. Robert Uvedale, M.A. Vicar of this parish and of Hogsthorpe, and the Rev. Washbourne Uvedale, B.A. Vicar of Kirmond and of Markby, in this county."

Arms: Sable, a fess between three masles Or; impaling, Argent, a cross moline Gules.

On a slab in the chancel is a short inscription in memory of Mr. Daniel Allenby, who died in 1790; and of his wife, who died in 1791. In the churchyard are three altar-tombs, in memory of Mr. George Richmond, who died in

* The original use of piscinæ in churches is satisfactorily explained in Gent. Mag. vol. LXVII. ii. 649.

gaged for more than three years in preparing a history of the town; and has made such progress that the work is now nearly ready to be brought forward.

Steam Carriages.

The Select Committee appointed last session, on the motion of Colonel Torrens, conclude their report with the following summary of the result of their inquiries:—1. That carriages can be propelled by steam on common roads at an average rate of ten miles per hour. 2. That at this rate they have conveyed upwards of fourteen passengers. 3. That their weight, including engine, fuel, water, and attendants, may be under three tons. 4. That they can ascend and descend hills of considerable inclination with facility and ease. 5. That they are perfectly safe for passengers. 6. That they are not (or need not be if properly constructed) nuisances to the public. 7. That they will become a speedier and cheaper mode of conveyance than carriages drawn by horses. 8. That as they admit of greater breadth of tire than other carriages, and as the roads are not acted on so injuriously as by the feet of horses in common draught, such carriages will cause less wear of roads than coaches drawn by horses. 9. That rates of toll have been imposed on steam-carriages which would prohibit their being used on several lines of road were such charges permitted to remain unaltered.

Adversaria.

Shah Abbas, Sophi of Persia, having conquered Armenia, transported a number of the inhabitants to *Giulfa*. Many of them escaped into Poland, and there became graziers. At this day they are still a distinct race, and preserve their language and physiognomy, with their olive tint and black hair, although they have existed for more than two centuries in a country that produces fair complexions. They are principally found in Austrian Gallicia, but they rent lands in the neighbouring principality of Moldavia, for the purpose of rearing their oxen and horses. The tyrannical nature of the Moldavian government has proved injurious to their commerce; but the Austrian agent has secured to them some important privileges, and since his intercession, their condition is more easy, and their business less disturbed.—*Voyage en Valachie et en Moldavie, Paris*, 1822.

The *Zigans*, or Gypsies of Moldavia and Wallachia, are the most expert persons at catching bears and teaching them to dance.—*Ibid.*

Mr. Hazlitt supposes, that the publication of the Bible in England called forth the literary fervour of the Elizabethan age, by opening new sources of the sublime. May not the beautiful idea in Shakspeare—

> She never told her love,
> But let concealment, like a worm i' th' bud,
> Feed on her damask cheek,—

have been taken from the words of Psalm xxxii. 3, which stand thus in the Liturgy. *While I held my tongue, my bones consumed away through my daily complaining.*

There are few epigrams more severe than that addressed by Jean Baptiste Rousseau to the Journalistes de Trevoux: of which the following is a translation:

Ye dwarfling authors of a vile Review,
Who think yourselves Apollo's priests and sages,
Try to improve your style a little, do,
Or cease to criticise another's pages.
To trace a fault you sift our books for ever,
But cannot find a passage to decry;
We traverse yours with kindlier endeavour
To praise, and nothing laudable can spy.

The equestrian statue of Peter the Great at St Petersburgh, by Falconnet, is a model of ingenuity; the hind feet only of the horse are fixed on a rock, from which the animal seems to be springing.*

M. de Bourrienne, in his Memoirs of Napoleon, vol. ii. c. 15. remarks, that at the siege of Acre, the women excited the inhabitants to the defence, by running about, and throwing dust into the air, according to the custom of the country. This illustrates Acts xxii. 23.

Among the original laws of Portugal, passed at the accession of Alfonso I. is a remarkable clause, that such nobles as were convicted of disguising the truth from the king, should be degraded from their rank. In theory this approaches very near to the perfection of government; in practice it is impossible to be realised.

There are two passages in our translation of the Bible, in which *man* ought to be printed in italics, Acts xiii. 38, and Heb. x. 12. neither ἀνὴρ nor ἀνθρωπος occurs in the text, and the sense would more properly be expressed by *person*.

It is said, in Daniel vi. 1. that Darius appointed a hundred and twenty governors, and in Esther i. 1. that Ahasuerus reigned in a hundred and twenty-seven provinces. Does not this afford a clue toward ascertaining who this Ahasuerus was? The period seems to have been, when Egypt and the Indian provinces (perhaps also the Thracian acquisitions), were under the power of Persia, to which the reign of Darius Hystaspes or of Xerxes answers best.

Civilization will be found to depend mainly on climate. The inhabitants of middle latitudes do not lose their time in retreating from heat or cold, but are able to pursue their occupations without any physical hindrances. Hence the superiority of the Greeks over other nations. The Orientals, whatever progress they have made in luxury, retain the ferocity of barbarians.

An inveterate Nicotian, who could not begin the day without a mouthful of weed,

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* Engraved in our Vol. LIII. p. 128.