

RAIL ROADS AND STEAM CARRIAGES

The interest excited in this and some of the neighbouring counties by the renewal of the attempt to obtain the sanction of the Legislature to the promotion of a Railroad between London and Birmingham, induces us to lay before our readers two somewhat lengthy extracts from a very able article on "Inland Transport" in the number of the Edinburgh Review recently published. The first of these extracts contains a striking summary of the very important advantages likely to result from the increased facility of communication which steam carriages and railroads seem about to effect between remote parts of the country. The second gives a very distinct description of Mr. Stevenson's Locomotive Engine which has affected such wonders upon the Liverpool & Manchester Rail road.

The important commercial and political effects attending increased facility and speed in the transport of persons and goods, are too obvious to require any very extended notice here. A part of the price and in many cases a considerable part of every article of necessity or luxury, consists of the cost of transporting it from the producer to the consumer, and consequently every abatement or saving in this cost must produce a corresponding reduction in the price of every article transported that is to say, of every thing which is necessary for the subsistence of the poor, or for the enjoyment of rich, of every comfort, and of every luxury of life. The benefit of this will extend, not to the consumer only, but to the producer by lowering the expense of transport of the produce, whether of the soil or of the loom, a less quantity of that produce will be spent in bringing the remainder to market and consequently a greater surplus will reward the labour of the producer. The benefit of this will be felt even more by the agriculturist than by the manufacturer, because the proportional cost of transport of the produce of the soil is greater than that of manufactures. If 200 quarters of corn be necessary to raise 400 and 100 more be

required to bring the 400 to market then the net surplus will be 100. But if by the use of steam carriage the same quantity can be brought to market with an expenditure of 50 quarters, then the net surplus will be increased from 100 to 150 quarters; and either the profit of the farmer or the rent of the landlord, must be increased by the same amount.

But the agriculturist would not merely be benefited by an increased return from the soil already under cultivation. Any reduction in the cost of transporting the produce to market would call into cultivation tracts of inferior fertility the returns from which would not at present repay the cost of cultivation and transport. Thus land would become productive which is now waste, and an effect would be produced equivalent to adding so much fertile soil to the present extent of the country. It is well known that land of a given degree of fertility will yield increased produce by the increased application of capital and labour. By a reduction in the cost of transport a saving will be made which may enable the agriculturist to apply to tracts already under cultivation the capital thus saved, and thereby increase their actual production. Not only therefore, would such an effect be attended with an increased extent of cultivated land but also with an increased degree of cultivation in that which is already productive.

It has been said that in Great Britain there are above a million of horses engaged in various ways in the transport of passengers and goods, and that to support each horse requires as much land as would upon an average support eight men. If this quantity of animal power were displaced by steam engines, and the means of transport drawn from the bowels of the earth, instead of being raised upon its surface, then, supposing the above calculation correct as much land would become available for the support of human beings as would suffice for an additional population of 3ight million or what amounts to the same would increase the means of support of the present population by about one third of the present available means. The land which now supports horses for transport would then support men or produce corn for food.

The objection that a quantity of land exists in the country capable of supporting horses alone, and that

such land would be thrown out of cultivation scarcely deserves notice here. The existence of any considerable quantity of such land is extremely doubtful. What is the soil which will feed a horse, and not feed oxen or sheep or produce food for man? But even if it be admitted that there exists in the country a small portion of such land, that portion cannot exceed nor indeed equal what would be sufficient for the number of horses which must after all continue to be employed for the purposes of pleasure, and in a variety of cases where steam must necessarily be inapplicable. It is to be remembered also, that the displacing of horses in one extensive occupation by diminishing their price must necessarily increase the demand for them in others.

The reduction in the cost of transport of manufactured articles by lowering their price in the market will stimulate their consumption. This observation applies of course not only to home but to foreign markets. In the latter we already in many branches of manufacture command a monopoly. The reduced port, will still further extend and increase our advantages. The necessary consequence will be an increased demand for manufacturing population and this increased population again reacting on the agricultural interest, will form an increased market for that species of produce. So interwoven and complicated are the fibres which form the texture of the highly civilized and artificial community in which we live, that an effort produced on any one point is instantly transmitted to the most remote and apparently unconnected parts of the system, the grower or feeder. The truth of this observation is manifested by the effects which have followed the intercourse by steam on the Irish channel. The eastern towns of England have become markets for a prodigious quantity of Irish produce, which it had been previously impossible to export. If animal food be transported alive from the grower to the consumer the distance of the market is limited by the power of the animal to travel and the cost of its support on the road. It is only particular species of cattle which bear to be carried to market on common roads and by horse carriages. But the peculiar nature of a railway the magnitude and weight of the loads which may be transported on it, and prodigious speed which may be

attained, render the transport of cattle of every species to almost any distance both easy and cheap. In process of time, when the railway system becomes extended the Metropolis and populous towns will therefore become markets not as at present to districts within limited distances of them but to the whole country.

The moral and political consequences of so great a change in the powers of transition of persons and intelligence from place to place are not easily calculated. The concentration of mind and exercise which a great metropolis always exhibits will be extended to a considerable degree to the rest of the realm. The same effect will be produced as if all distances were lessened in the proportion in which the speed and cheapness of transit are increased. Towns, at present removed some stages from the Metropolis will become its suburbia others now at a day's journey, will be removed to its immediate vicinity business will be carried on with as much ease between them and the Metropolis as sit is now between distant points of the Metropolis itself. The ordinary habitations of various classes of citizens engaged in active business in the towns, will be at that now are regarded considerable distances from the places of their occupation. The salubrity of cities will thus be increased by superseding the necessity of heaping the inhabitants together, story upon story, within a confined space; and by enabling the town population to spread itself over a larger extent of surface, without incurring the inconvenience of distance. Let those who discard speculations like these as wild and improbable recur to the state of public opinion at every remote period, on the subject of steam navigation. Within the memory of persons who have not yet passed the meridian of life the possibility of traversing by the steam engine the channels and seas that surround and intersect these islands, was regarded as the dream of enthusiasts. Nautical men and men of science rejected such speculations with equal incredulity and with little less than scorn for the understanding of those who could for a moment entertain them. Yet we have witnessed steam engines traversing not these channels and seas alone, but sweeping the face of the waters round every coast in Europe, and even ploughing the great oceans of the world. If steam be not used as the only means of

connection the most distant habitable points of our planet, it is not because it is inadequate to the accomplishment of that end, but because local and accidental causes, limit the supply of that material from which at the present moment it derives its powers.

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The Locomotive engines used on the Liverpool and Manchester railroad consist of a cylindrical boiler placed upon its side, the furnace being at one end, and the chimney at the other. The boiler has flat circular ends, and its length (seven feet) from end to end, is traversed by about 100 copper tubes, each an inch and a half in diameter. These tubes form the only communication between the furnace and the chimney and therefore through them the draft from the furnace towards the chimney must pass. The furnace is a square chamber of considerable size, the back of which is connected with the end of the boiler. The sides and top as well as part of the front are formed of a double plating just mentioned is filled with water, which communicates with the water in the boiler and every part of this intermediate space being below the level of the water in the boiler, must necessarily be always filled.

Under these circumstances it will be apparent that the surface of fire on the grate bars is upon every side surrounded by a sheet of water upon which its radiant heat acts. The blast of air which rises through the grate bars and passes through the burning fuel, is carried by the draft through the 100 tubes which traverse the boiler longitudinally. This highly heated air is passed through the tubes, imparts its heat to the water in the boiler by which they are surrounded and when it reaches the chimney it is reduced to nearly the same temperature as the water itself. By these means the greatest portion of the heat whether radiated by the fire or absorbed by the air which passes through it is imparted to the water the shell of water surrounding the tubes and the boiler receives as large a portion of the heat absorbed by the air as can be communicated to it. The shell of water surrounding the furnace upon which the heat acts being below the level of the water in the boiler and being generally heated somewhat more highly than that water has a tendency to ascend, a current is accordingly established running from the intermediate

space surrounding the furnace to the cylindrical boiler, and a corresponding returning current must of course take place. Thus there is a constant circulation of water between the spaces surrounding the furnace and the cylindrical boiler.

A Close chamber of such magnitude is constructed at the opposite end of the boiler under the chimney and in this chamber are placed the working cylinders. In the earlier engines used on the railroad these cylinders were placed =outside the boiler and were consequently exposed to the atmosphere. A considerable portion of heat was thus lost, the saving of which was completely accomplished by transferring the cylinders into the chamber under the chimney just mentioned. This chamber receiving in the first instance the hot air which rushes from the tubes and the exterior surfaces of the cylinders.