NARROW GUAGE RAILWAYS.

In the last number of ENGINEERING we find a detailed description of the Broelthal Valley Railway, which has a guage of only 2 feet 7 inches. It appears that the tonnage carried on this small road in 1864 amounted to 32,700 tons, and that the undertaking was successful commercially, although not employed to one-tenth of its capacity. The line appears to be run and managed on an extremely economical basis, while the rate of freight is only one shilling and eight pence sterling per ton for the distance of 12¼ miles. In this country where large manufacturing towns and villages are situated a short distance from trunk railways, such cheap, small railways as the Broelthal should receive attention.

We would especially recommend them to the consideration of the promoters of the many wooden railway schemes now agitated. The rails weigh from 22 to 26 lbs.—The engines are tank locomotives, and weigh in working order 12¼ tons. The freight cars cost L56 to L92. The Engineering says:—

The railway connectiug the valley of Brol with that of Sieg, near Cologne, of which we propose to give some particulars, is of interest to engineers not only on account of the narrowness of its guage, which is 2 ft. 7 in., but also on account of the success with which its working has been attended. The line leaves the Cologne and Giesen railway at Hannef, and with the exception of a short length near that station, it is constructed along the line of the ordinary road, the administrative authorities have permitted a width of about 4 ft. 8 in. to be taken from the latter for the purposes of the railway.

The Broelthal valley line was originally designed exclusively for the accommodation of the mineral traffic, to the works of Friedrich-Wilhelm-hutte, but the inhabitants of the surrounding districts found it to be their interest to employ the line for the conveyance of their goods, as the cost of transportation was found to be about 60 per cent. cheaper than by the ordinary roads, and as a result the line has at the present time a considerable general goods traffic.

After having explained in detail the dimensions of the engines, cars, and other details of construction, it is remarked as follows:—

We must now say something concerning the manner in which the line is worked and its comparative results. The usual load drawn by the engines consists of 28 wagons loaded with 5 tons each, giving 140 tons of paying load. The total weight of the train is thus as follows:—

	tons.
Locomotive,	12½
Wagons	70
Load in wagons	140
	222½

It is found that the engines can easily draw 36 loaded wagons, but the above is the usual load. The speed on the level portions of the line is a little over 9 miles per hour, and in traversing those portions of the road at which there are habitations, this speed is decreased to about 5½ miles per hour.

The Festining Railway in Wales carries about 147,000 tons of freight, and passengers to the number of 135,000 annually, at a speed of 12 to 15 miles an hour on a guage of only two feet. From these data it will be seen thal there is a wide field in the choice of guage, in accordance with the cost and ends to be obtained.

GALVANIZED IRON WATER PIPES.

In the opinion of some the use of galvanized iron for water pipes, conveying water for drinking and culinary purposes, is injurious. Others take opposite ground in regard to this matter, and express themselves strongly in favor of such pipes. Our opinion upon the question has been asked by parties interested.

The use of zinc as a coating for the surface of iron pipes is not merely mechanical. Being more readily oxidizable than iron it produces an electric state in the latter metal which protects parts not covered perfectly as well as other portions of the pipe. The oxide which forms upon zinc is insoluble in pure water. Acids dissolve it readily and when hydrated, as is the case in water pipes, solutions of the caustic fixed alkalies and solutions of ammonia will dissolve it.

Whether the oxide which forms upon the surface of galvanized iron pipes will be dissolved, depends therefore entirely upon the character of the water flowing through them. Rain water contains more or less ammonia when first precipitated. The oxide upon a galvanized iron roof would of course be dissolved to a certain extent during a rain storm, a fact that has been noticed not only in connection with this material but with a roof of sheet zinc.

It is probably rare that water does not contain traces of free ammonia or salts, the acid of which has a greater affinity for the oxide of zinc than the base with which it is combined. In such cases we should expect to detect traces of the zinc in water which has remained for any length of time in the pipes.

There are waters, doubtless, which could be passed through such pipes without the slightest danger of being charged with the poisonous oxide, and before their adoption an examination and analysis of the water should be made.

But while we have no doubt that in many cases it would not be proper to employ galvanized iron pipes, we do not think that in a large majority of cases the possible evils which attend their use would be likely to prove serious. A great deal of exaggeration is to be expected upon the part of those who deal in pipes or other materials, and whose interest it is to excite the fears of the publie in regard to any wares that damage their particular trade. People are too apt to become excited by newspaper statements upon such subjects as these, and alarm themselves needlessly. If the fact exists that water flowing through galvanized iron pipes is impregnated with zinc, a simple chemical test by a competent person will readily determine it.

All metallic pipes in use are open to some objections. Much has been said upon the danger of using lead pipes, but the injury that has resulted from their use has undoubtedly been over estimated. Lead poisoning is by far more subtle than zinc poisoning, and as its effects may follow without premonitory symptoms of sufficient extent to excite suspicion, we think them fully as dangerous as galvanized iron pipes under most circumstances.

A material for water pipes, cheap, durable, and capable of resisting the chemical action of all waters fit for household use is a long sought for desideratum. Until it is found we must do the best we can with such materials as we possess. Glass has been proposed and used to a considerable extent, but there are practical difficulties which will probably prevent its ever being generally adopted.

The matter may be summed up by saying that the circumstances of any particular case can only determine whether galvanized iron pipes are safe or otherwise. For most cases we think their use admissable.—Scientific American.