SMOKE PREVENTION IN CITIES AND TOWNS.

It is to be borne in mind that the railways have their share in producing the smoke nuisance in towns and cities, and that their works and locomotives in many cases need to be reformed in this regard. A discussion is going on in United States journals on the subject of the abatement of smoke, and in the course of it we find the Railway and Engineering Review calling for larger grate area in locomotives, and saying : Outside of the consideration that in recent years there has developed a preference for boilers more ample in all their proportion, lies the general rule that the bituminous coal used at present contains much more slack than it was deemed advisable to use in the Past. That this slack can be burned very profitably by means of an increased grate area has been conclusively shown, but in the general use of this character of fuel, it is also evident that the more limited grate area and boiler capacity of the older locomotives prevent them from burning this fuel in an economical or smokeless manner. So that railway officials are confronted with the alternative of confining these locomotives to service outside of the larger cities, or of furnishing them with the character of fuel they were designed to burn.

Bituminous coal is largely used by factories, as it is by locomotives, because cheaper and more handy in many cases. But it is easier in the case of stationary engines to get rid of an objectionable proportion of smoke and soot from soft cool than it is to adapt similar appliances to a locomotive engine, which, especially if a yard engine, or if approaching or leaving a railway station, is alternately subjected to great stress and allowed to be quiescent for minutes or hours. Careful firing will, however, do much to abate smoke even here. As the Review says: "Suburban and switch engines, however, are the ones that do most of their work within the city limits, and through the alternating character of this work, are the ones which offer the greatest difficulties in securing reasonably perfect combustion and consequent avoidance of smoke. Where anthracite coal or coke is obtainable at any reasonable price, this is probably the easiest way out of the difficulty, but in most instances the cost of these forms of fuel'is prohibitive."

With engines already in service in the United States, different roads have adopted different forms of apparatus for the abolishment of smoke, but there seems not to have been trial made of a complete, well thought out combination of the various appliances. For instance, one road uses a brick arch with air conduits incorporated therein, another uses a brick arch with steam jets below it, still another uses a fire-door baffle plate with a damper on the door, others use hollow staybolts or a few 2-inch boiler tubes through the leg of the boiler, and still others depend upon accurate ash-pan damper regulation. It would appear, we again quote our contemporary, that "some of these various devices offer ideas for a combination of their different functions, which would give a greater range and thus tend to the more perfect control of conditions in the firebox, to the circumstances under which the locomotive may happen to be operating at any time. Combinations of fuel also offer a field for trial, for instance, coke and coal might be mixed in proportions which would render the resultant fuel cheaper than the costlier article, and at the same time give sufficient heat results with a lessening of smoke production."

If an aggrieved manufacturer, when desired to abate his factory smoke, asks what is to be done with the gas generated in blast furnaces or boiler furnaces, he may be n ormed that the gases of blast furnaces are being used

as sources of heat, and directly [as motors] in gas engines. Science is making such strides, and the pressure of competition is so compelling steam users to employ every economy in fuel, that the up-to-date manufacturer can generally find means for the more effective and thrifty use of the components of coal if he will keep his eyes and ears open for recent inventions and discoveries in this direction.

THE METALS MARKET.

In a year which has been marked by a general rise in the prices of commodities metals have shared the advance to an almost unexampled extent. Broadly speaking, the year 1899 has proved a rising one for every kind of metal goods, all over the world. Iron and steel have been in great demand, especially structural kinds, and this is the less remarkable when we remember the extraordinary development that has been going on in distant parts of the world. The Siberian railway, the opening up of China the shipments of machinery to South Africa, before the interruption of traffic caused by the present war-all these caused great activity in factories of every description in Great Britain, in Continental Europe and in the United States. There was never such a year's output of American railway locomotives as in 1899, and even to-day the Americans are unable to get all the iron ore they want for railway and manufacturing use, and talk of navigating the Great Lakes in winter is rife, so as to keep up the supply of iron and copper ore from Lake Superior to iron and copper works on Lake Erie and in Pennsylvania. Iron is scarce in both the East and West of England, and stocks had diminished by 100,000 tons between 1st January and 80th November. In ten months of 1899 the quantity of iron ore imported by the United Kingdom had increased by 1,858,000 tons over the same period of 1898.

It was about midsummer or before it last year, that excitement began in tin and copper, and these metals advanced enormously. Prices of iron and steel went up also, zinc followed suit, and then lead also advanced, though in lessened ratio. The following comparison will show the course of the New York market :

Average.	Copper.	Tin.	Lead.
January, 1899	\$14.65	\$22.57	\$4.20
March. "	17.55	23.85	4.40
Mav. "	18.90	25.67	4.45
Inly. "…	18.42	29.55	4.57
September. "	18 50	32.47	4.61
December. "	16.80	25.75	4.72

The zinc market showed a nearly corresponding course. Beginning at \$5.40 in January, by March it had reached \$6.35, and by May \$6.87; receding to \$6.20 in July and to \$5.52 in September, closing at \$4.65 in December, a difference of over two dollars and a quarter between the highest and lowest points of the year.

It is to be remarked that the "slump" in New York stock market in December last lowered tin and copper quite seriously, while the South African war was a factor in the same direction. But this week has witnessed a marked recovery. Iron and steel, however, showed remarkable strength throughout, and to day there is no indication of weakness anywhere, but very encouraging prospects. The demand continues strong, and the fear seems to be that the supply will not be equal to it. American iron establishments appear to be excessively busy, whether in Chicago, Pittsburg or Philadelphia. Indeed there are many kinds of iron and steel heavy goods of which the supply is bare.

Canadian iron-making establishments are almost without exception busy, whether it be of pig, bar, plate or nails and spikes. Hardware manufacturers, too, are full