into holes faster than timber under the biggest of augers, as the case may be. Down the centre of the shop stand three steam hammers and one at one side. They are not of the phenomenal varieties that work up to large numbers of tons, the centre one is the most powerful and does not go much over one ton. But the wonder of the performances of these giants, for giants they are nevertheless, is a source of perennial astonishment. They can give slow steady blows as befits their ponderosity, or they can go with a "rat tat" worthy of lightest hammer ever used for the striking of hot iron. The hammerer just works at them with a turn of the wrist and they do all the work from the one big slog to the multitudinous rat tatting. Springs, draw-bars, brakes, every detail of the same that is forged, bolts, fittings of all sorts, iron gears of all conditions, all things forgeable are piled up here making a big output from the big furnaces under the control of the big men. For moving the heavier stuff about there is a crane. To complete the fittings there is a spring furnace for making and tempering. It is noteworthy that all the work from here goes straight to the car shed, being finished in every way.

Patterns.

Back among the buildings we are in the pattern shop. A small corner it is of the carpenters' shop hard by the carriage department. A small place it looks, for the work of the magnitude done here. But go into the pattern store hard by and you will see the output of that small place. The store is full to overflowing and the shelves positively groan with abundance and variety. Here are patterns for big cranes, steam hammers, wheels of every kind great and small, locomotive smoke-box fronts, locomotive cylinders, and all things big in the casting way. On the other hand there are all the small things down to hat racks and the little blocks that act as catches for the windows of the railway carriages. These last are made thirty in the time where it was once the custom to fashion one with much labour and infinite patience. In this store things are of the needle to anchor order. They make you realise the industry of the pattern makers working so methodically at their machines. They also help you to understand the expense of iron work and the skill of the workers as well as the cunning of the machines. Hard by is the drying furnace for the cores. We are invited to go in to sample the atmosphere, but the behaviour of the first straw hat to get inside the door is a warning and we are satisfied to take the heat for granted without going further in. The heat convinces without the spontaneous combustion of a not too cheap Panama.

Moulders, Polishers, and Brass Finishers

In the iron foundry is a new vibrating table moulding machine, operated by compressed air; this machine is used principally for brake blocks and other repetition work.

The pneumatic sand shakers are a great saving in labour for sifting and preparing the sand used in moulding.

There is also in this foundry a small machine for making cylindrical cores up to 2¾in. diameter and a circular saw for cutting off gates of brass castings.

The moulders turn out some fifty tons of castings a month. Here one sees all the iron castings, ventilators, firebars, cylinders, axle boxes, brake blocks, everything that is cast in requirement of railway work. Of the brake blocks, it appears presently that forty a day is the output here. An economic fact is worth noting. The ventilators of the carriages used to be cast in several pieces and put together after the moulding. Now they are, thanks to a mechanical invention of one of the staff, cast in one piece. The saving is five shillings per ventilator, and as there are sixteen to the car, the saving per car is four pounds sterling. The furnace stands near, notable for the coloured glass peep holes for the men to see unhurt the progress of the melting, and a few paces off is the Fettling shop where the fettling machines clean the castings, and further on is the burnishing shop where the last touches are put on the brass and other fittings, which are then ready for their appointed places in the cars.

Last Scene of All.

The car finds its way polished, painted, ready for the road to the shed, where the Westinghouse brake and the gas plants are waiting to be fitted. The cylinders, blocks, and pipes of the Westinghouse system are lying about, and the cylinders of the Pintesh gas with the lamps and the piping. We note the couplings of the former and have a talk with the inventor about the merits of the "Pearson coupling" which supplements the Westinghouse brake and a sample of the coupling is produced to illustrate the descriptions. As the subject is dealt with fully elsewhere in the present issue nothing more need be said here, except to wish the inventor the success which his ingenious invention deserves.

In this shed there are many stacks of timber drying, and fittings of various sorts are kept against the time of need.

The System of Work.

It is the rule here at Petone that all the parts of cars or wagons or locomotives to be built must be finished by the various shops and delivered before the erecting shop can begin to put them together. Thus is the pace set for the whole establishment. In addition there is close supervision. The lowest grade of supervisor is the leading hand, over him comes the shop foreman, and over him there is the workshops manager; and lastly there is the locomotive engineer. The lower grades are always with the men and the others come at odd moments without beat of drum or regular understanding of the hour of their visit. The results, especially when you have the right quality of men, ought to be good. The quality is beyond doubt as every one can testify cheerfully who has been through these shops. There need therefore be no fear as to the results.

Some interesting links with the middle century, when the South of England was a prosperous iron-smelting district, may be found to-day in Sussex. Although iron ore is found abundantly in this area, there is an entire absence of fuel for smelting purposes, and it was the close proximity of the two minerals to one another in the North of England that brought about the removal of the indsutry to that more convenient area; so that the Sussex iron trade fell into desuetude. Throughout the country now may be found scattered large expanses of water called "hammer-ponds," from the simple fact that in the iron-smelting days, the water constituted the motive power for driving the ponderous hammers by means of which the ore was pounded or the iron smelted. They are still known under their original name.

MINING

Deep Sinking and Deeply Seated Wealth

In the North the great question of the Thames goldfield is of getting the flood mine water out so that the lower deeps may repeat the fairy stories contributed by the upper levels to the history of quartz mining in the Dominion. Scheme after scheme of pumping, all based on Government subsidies, has been published and tried and for some reason has not prospered as it was expected to prosper. The fight goes on against nature, circumstances, and the speculator, who is often the greatest hindrance to true mining. In the midst of the controversy it is interesting to cast our eyes across to the Victorian goldfields, the Bendigo district of which is remarkable for the deepest mines in the world. We talk with breath almost bated of 1000 feet. There they reckon a mile as the limit possible, but not to be astonished at and likely to be one day left behind.

The history of the sinking which has reached that astounding depth in the Victorian mining centre is full of enterprise and resource beyond the common, to say nothing of faith and courage beyond the power of belief. In the beginning the gold of Bendigo was alluvial, and men got rich by scratching the surface. Gradually the gold receded into the lower regions and was followed by increasing pertinacity and by increasing rewards. The famous "Saddle" reefs were discovered, and fortunes were made. These run continuously for long distances and for the whole of these distances not a duffer has ever been encountered. Three such lines stand out prominently as profitable, but there is no reason, the experts say, for believing that many more may not be discovered in the same formation, which is very extensive.

The fear is that the policy of "Sink, sink, sink," which has done so much in the past, is approaching the end. In other words, after a history of golden yields improving directly as the depths, the time has arrived when it will not pay to take gold out of mines at these great depths. "Poor country," not "Worked out" is the cry beginning to be heard. It has driven private enterprise, which has held up its head so high in these regions, and done so much for the development of the quartz industry, to ask for Government help.

The two best mines along the runs above described are, according to the director of the Bendigo School of Mines, the New Chum Railway, and the Victoria Quartz. Of these two the Victoria is the deeper—it is now being tested at a depth of 4,525 feet, a depth at which the illustration we publish in connection with the subject was taken—and the hopes of the deep sinkers are concentrated upon its fortunes. At 150 feet this mine paid £218,000 in dividends. At depths descending to 1,000 feet nothing was got worth speaking of. At 1100, 1700, 1800, 1900 feet the yields were enormous even for Bendigo. From the last to over 2600 the miners struck nothing. At 2700 the mine paid £90,000 in dividends before it gave out. In consequence of this alternation of success and failure, the former paying off the cost of the latter and