

A simple method of depriving water of its earthy carbonates was successfully adopted in a small high pressure boiler. This was done by admitting a very small jet of cold water into the exhaust pipe of the engine, where, mingling with the waste steam, it condensed a portion of it. The steam, by raising the water to boiling heat, drove off the free carbonic acid, and the natural carbonates were thrown down on the sides of the pipe, which was made large enough to allow it to accumulate. The water then ran down into a tank, whence it was pumped into the boiler at a temperature of about 200 deg. In addition to this, the partial condensation of the waste steam reduced the back pressure on the piston, and the result was a saving of half the fuel, the boiler remaining quite free from scale. But better than all these is the plan of using boilers properly constructed in the first instance, by which incrustation is reduced to a minimum, if not entirely prevented. By a properly constructed boiler is meant one so arranged that a proper circulation of the water is affected. In boilers thus designed such a thing as scaling is of very rare occurrence. Some eight-and-twenty years ago a small circular boiler with water tubes was made by Mr. Hugh Greaves—we believe, the first of its kind in this country. Between the fire box and the outer case was placed a piece of sheet iron around the fire box and the tubes, by which means the circulation was completely established. After being in use twelve years the boiler was taken to pieces, the fire box was scarcely coated, and the slight incrustation was clearly of very recent formation. In the Benson boiler, when worked with salt water at high pressures, no incrustation takes place, owing to the rapid circulation of the water. The Field boiler, described in our number for February 17th, is another in which the principle of rapid circulation is fully developed and incrustation consequently prevented. In the Harrison or multispherical boiler this latter condition is secured by twofold means, a double action being at work to hinder the formation of scale; first, the perfect circulation, and if that be insufficient, second, the alternate action of expansion and contraction. Scale being deposited whilst the spheres were heated, would, on their cooling and consequent contraction, be broken up and thrown down. In marine boilers incrustation was at one time a perplexing matter to deal with, as it was supposed to be impossible to prevent the boilers of a steamer from becoming salted up in some seas. But it has been ascertained that the saltiness of different seas varies but little, and, however salt the water may be, the boiler can be preserved from any injurious amount of incrustation by blowing out as already noticed. This operation, to be effectual, should be performed very frequently, or a portion of the super-salted water may occasionally be allowed to escape. But, by proper blowing out, a very slight scale, at the most, will ever be found. There is no excuse for the engineer who allows his boiler to become damaged from incrustation.

They have on exhibition at a Working Man's Association in London, an alarm clock, which, on striking the hour appointed, lights a lamp and boils a pot of coffee or tea while the workman is dressing.

## CANADA AS A FIELD FOR CHEMICAL MANUFACTURES.

(From the *Montreal Gazette*.)

The fifth of the Somerville course of lectures in connection with the Natural History Society was delivered by Professor Bell, of Queen's University, on the evening of Thursday the 23d inst.—Principal Dawson in the chair. The subject was, "Certain chemical manufactures which may be advantageously established in Canada. The lecturer stated in the first place that he purposed to confine his remarks to those substances which might be derived from the natural productions of the country, although it could be shown that certain materials imported from abroad might be advantageously worked up in this Province. From their very profitable nature it was surprising that chemical works were not already established in Canada. The reason of their absence in this country might be attributed to various causes, the most probable of which would be the higher price of labor here as compared with other countries, where such manufactures are carried on, or perhaps the want of a sufficient market. In regard to the price of labor the difficulty was shown to be much less than is generally supposed. The want of a sufficient market could scarcely form a good reason for the non-existence of such manufactures in our own country, for the Trade Returns show that already the home demand for certain chemical products is sufficient to sustain works of this kind in our midst, while it could be proved that it would be found profitable to produce in Canada various chemical substances for exportation." The lecturer thought that the want of skill and knowledge had something to do with retarding enterprises of this kind.

Before proceeding to speak of what are commonly known as chemical manufactures, certain processes involving chemical treatment would be briefly noticed. The first of these had reference to

*Copper*.—Copper ores are generally reduced by the agency of heat, but of late years certain processes had been perfected for the profitable extraction of copper in the wet way from ores, which were too poor to pay to work on the old plan. Such processes are carried on with success in various parts of England and Wales and on the continent of Europe. An instance was mentioned of a clear profit of 50 per cent. being realized in this way. Several of these processes were described, and the lecturer thought that one of them would probably be found suited to the extraction of copper from a certain class of ores which are abundant in the Eastern Townships. In regard to

*Iron*, it was contended that circumstances were now more favourable than at any former time for working the rich and unlimited stores of iron ore in our own province. The difficulties of iron mining abroad, the small quantity of ore obtained in proportion to the labor expended, and the low percentage on that ore, were strongly contrasted with the facilities for mining and the richness of the ores in Canada. Considering the improvements which have lately been made in the modes of reducing iron ores and other circumstances, the lecturer said he could not help thinking that the time had come when we should try to work our