

are at all times discomforting and often (especially when fluor-apatites are being worked) positively injurious to those exposed to their influence, are carried off and completely absorbed. When phosphates containing iodine are employed, the iodine disengaged during their conversion into superphosphate and carried away in the state of vapour or as hydriodic acid, is completely absorbed and by allowing the same liquid to retrace the coke, the solution may contain as much as eight grammes of iodine to the litre. It will be thus seen that it is quite possible to collect all the iodine which is disengaged in the gaseous condition; the amount thus disengaged however is very far from representing the total amount originally contained in the apatite, the greater part unfortunately remaining in the superphosphate; and, so far as I am aware, a method has yet to be discovered whereby that portion of the iodine may be profitably extracted.

Collection of the iodine.

If, however, the method devised by M. P. Thibault does not so far permit of the recovery of all the iodine it nevertheless possesses other important advantages, such as a continuous process of manufacture, considerable saving of manual labour, and complete absence of noxious vapours.

Advantages of P. Thibault's method.

From its usually high content of phosphate of lime Canadian apatite may be regarded as a most eligible material for the manufacture of a concentrated superphosphate. Generally speaking it contains (as will be seen on reference to Table I.) only small quantities of oxide of iron, and not unfrequently the amount is altogether quite insignificant: it is to be remembered that No. 7 is a very exceptionally occurring variety, has only been met with at this mine, and there only, as stated, in small quantity.

Canadian apatite as a material for the manufacture of superphosphate.

All the Canadian apatite hitherto met with belongs to the variety fluor-apatite, and is very similar in composition to that derived from many European localities, as will be seen on comparing Table I. with II. A great deal of the phosphatic material at present extensively employed in the manufacture of superphosphate, contains more or less fluoride of calcium, this may be said of Spanish phosphorite, German or Nassau phosphato and most coprolites: when such material are treated with sulphuric acid in the process of superphosphating, hydrofluoric acid is evolved, which not only causes discomfort, but is injurious to the workmen. For this reason, at works where no special precautions are taken to effect the removal of the noxious gases evolved in the mixing process, any phosphatic material containing much fluorine is apt to be looked upon with some disfavour: its presence, however, can be a matter of very little moment when the very simple and effective device, for drawing off and absorbing these gases, as ear-

On the presence of fluoride of calcium in phosphatic material employed in the manufacture of superphosphate.