

taken from each quarter. This portion is again quartered and a portion taken from each, and so on until a sufficiently small quantity has been obtained, and this last is considered a sample. I think no one will deny that a sample thus obtained will undoubtedly fairly represent the whole.

The method outlined is that which is in use in the large copper ore and matte sampling works in New York; but, of course, it cannot be carried out in the case of quantities of ore which have to be sampled at the mine or any point except the sampling works. Nevertheless, all sampling should aim to approach as closely as circumstances will permit to this ideal method.

To see how closely this method may be approached, let us suppose the case of a quantity of phosphate in bins, and it is required to draw a sample for analysis, the sampler acting for both buyer and seller.

If not fairly level, it is advantageous to first level the pile, and then to place stakes at points, say 10 feet apart. Next, workmen, at these marked points, dig down through the ore until the bottom of the pile is reached, and in digging the contents of say each fifth shovel is thrown into a box and carried off to a level floor. When the bottom of the pile has been reached at every staked point, the portion that has been carried off is broken into fragments not larger than an egg, thoroughly mixed, then spread out and quartered, and the selected portion is again crushed, so that now it will contain no lumps larger than an almond. This portion is then mixed and quartered, and so on until a sufficiently small sample is obtained; this may be a quantity that will fill an ordinary pickle bottle.

If ground ore in bags is to be sampled, it will suffice to take a portion from the middle and bottom of every fifth bag; the whole lot thus drawn should be mixed and quartered as already explained.

Closely related to ore sampling is ore grading, which prevails to a certain extent in all mining regions. There is, however, one distinctively Canadian ore which nominally is graded, but in which the grading is of but little importance, for the reason that there is no uniformity in grading; and since it is an ore whose value cannot be determined by analysis, grading is all the more necessary. I refer to asbestos. It is well known that No. 1 grade of some producers is no better than the No. 2 of others, and a purchaser buying No. 1 ore is by no means certain of the character of the ore he will receive. Such a state of affairs is a blot on the