

A HEAD: However important may be the proper selection of a site for the proposed experimental stations, fully equal in importance is the selection of a *Master Head*, whose arduous duties must extend even to the under-stations, *after*, we suppose, the main station shall have been put properly under way. For it would appear to us, most unwise—we respectfully submit here—to attempt the creation of the under-stations before the difficulties to be expected in the proper starting of the main station have been thoroughly mastered. Who this *Master Head* should be, and where it is to be found, are questions which we frankly admit ourselves incapable of solving. But this much must we say: *Success*, or *want of success*, hinges on such selection. Competent subordinates are needed at each station. And, to be successful, such heads must work together and unite, in a high degree, under the soundest judgment, PRACTICE WITH SCIENCE; nay, a great deal of science, controlled by the very best practical ability.

THE AIM: A thoroughly competent *Head* having been secured, and this *Head* exercised in the proper selection of a site, with the needed grounds, for the main Experimental station,—of sub-heads, and all proper appliances,—the aim should be to arrive, as soon as possible, at such *practical* results as must prove beneficial to the farming community in general.

PROBLEMS: In our humble opinion, the first problem to solve is how to increase surely the net returns from Canadian farms, without incurring too much expenditure, and without impoverishing the soil. We frankly admit the problem to be most complex, in fact it might better be termed: a whole nest of problems. And yet, we submit, its more or less complete solution, in a given time, and without extravagant means, will be the gauge by which the Head Experimental Station Master will be judged in the future, both by the Legislature and by the people.

It cannot be gainsaid that the net revenue from Canadian agriculture is far below what it should be. High authorities admit that, even with the scanty capital at the command of the ordinary farmer, our agricultural returns, on an average, could certainly be doubled all over Canada, and, in some provinces, even tripled. It is also admitted that, nearly everywhere, very great waste prevails: waste of manure, of all descriptions; waste of land; waste of time; waste, from bad agricultural practices; waste from poor, dirty seed; waste, from want of drainage; waste by weeds; waste, from slovenly and hurried cultivation; waste, in the proper adaptation of cattle foods; waste, and very great waste, from the under-feeding of stock, both winter and summer; waste, in fact, from innumerable sources!

Who shall gainsay that, in ordinary Canadian farming, and in a very large proportion indeed, wasteful practices in agriculture are the general rule, and thoroughly efficient, paying practice, the exception? Few farmers are aware of their deficiencies in agriculture? Should not those deficiencies be tested and gauged at the Experimental Station?

Here are problems indeed: How best to feed our crops? How to feed our stock? How to husband our manure? What seeds to select? What implements to prefer? What varieties of stock give the largest net returns? How to treat various soils, under varying climates? And how many more!

But should our Experimental Stations become model farms? We say, no. Model farming depends on circumstances of soil, locality, means, markets, climate, &c. Model farms cannot be improvised. They can only, at best, be *models* for a circumscribed locality, and it takes many years to make a really model farm. On the other hand, Experimental stations have a given mission—one entirely distinct from model farming: Their object is to solve unknown, or, more generally,

disputed problems. Some of these problems,—many of them,—can be solved in less than a year: the selection of pure, healthy, powerful seeds, &c., &c. The comparative value of various fertilisers, of various cattle foods, can also be demonstrated in a comparatively short time. Other experiments of great importance, must take many years to solve, and yet should *show progress* from year to year. In fact the task is a tremendous one, especially, on the scale proposed by the *Act* lately passed.

Let us hope that wise counsels will prevail. That too much be not attempted at once; that too much be not expected, at first; that every person concerned in this vast enterprise be thoroughly competent and *willing* to perform this most useful, but most onerous task.

E. A. BARNARD.

Home-made Superphosphates.

The following correspondence explains itself. Our readers will no doubt avail themselves with pleasure of Mr. Skaife's, kind offer. We shall; certainly.

Dear Mr Skaife,—I am afraid our experiments with *char* are to be nipped in the bud! The cost of sulph. ac. in Brookville—66° B, is 2½c. a lb. wholesale; *freight* about ¼c. In England the same, or better, (70° B.) is advertised at \$8.50 a gross ton; here it would cost \$47.60.

Of course at such prices sulph. ac. is out of the question. Could not the amm. waters from gas works make the *char* soluble enough to give a sufficient return? If you are right in valuing the *char* at 75% of phosphate, and if we could dissolve just ½ of this for immediate use, it would be far better to buy *char* than the Canadian superphosphate.

What would be the effects of fermenting manure, on the *char*? I have a manure cellar receiving every atom of liquid as well as of solid manure. The *char* could also be dropped in the manure troughs behind the cattle. Could it not also be fed to the stock, in small quantities, mixed with prepared food, and thus get the gastric juices to help in its future solution? *Voula bien des questions pour notre savant chimiste!*

I do not intend to give this matter up. I want cheap phosph. ac. I can get bones at about ¾c. per lb., but how to dissolve the large ones without a crushing mill is the question.

Please help one out of these problems, and oblige

Yours very truly,

ED. A. BARNARD

Dear Mr. Barnard,—In reply to yours of May 25th I can tell you that the ammoniacal waters from the gas works would be of no use whatever as regards making the phosphates in *char* soluble. Muriatic acid is sometimes used, but owing to the formation of calcium chloride, the resulting mixture always remains moist, and this is objectionable. Sulphuric acid is cheaper than muriatic and the superphosphate formed when it is used is very dry.

As to mixing the *char* with manure I think the experiment is well worth the trial. There are certain weak organic acids generated during the fermentation which might act on the insoluble phosphate. The *char* should however be in the form of dust and the mass should be stirred up frequently.

I may say that it is a disputed point among agricultural chemists whether *char* dust or very finely ground apatite, (*coprolite*?) are not after all very effective manures when put in the ground in fall, without any treatment with acids. It is held by some that the organic acids present in the soil act upon the phosphates slowly but effectively. It is well known that bone-meal can be used directly with excellent results. It