

of the roots to the centrifugal apparatus. The task of handling the pulp of beet roots for the presses requires, comparatively speaking, a large supply of hands to do the business connected with that process, but Robert's diffusion method dispenses with a large number of the hands formerly required in the press room—nearly one half."

**Beet Sugar Supplement.**

**COST AND EXPENSES OF LABOUR, AND GENERAL ESTIMATES OF ONE OF THE GREAT BEET SUGAR FACTORIES OF EUROPE.**—This is copied from Crocky's work on Beet Sugar, which is the best and most reliable work yet published in English. The reader will see that the allowances for Wages and Salaries are most liberal.

The Factories work day and night, and the wages are reckoned at four shillings sterling per shift of 12 hours, which for the old country is very high. The amount of Beet roots worked up in this Factory is twenty thousand tons in a season. The following is Mr Crocky's language and figures:—"With perhaps the exception of two or three men, no skilled labourers are required in New Beet sugar works, as most of the operations are of a simple Mechanical nature, easily taught to inexperienced country hands, by a competent superintendant and his overseers.

The only skilled hands really needed are, an Engineer, an hydraulic pump man, a defecator, a sugar boiler, and a bone black burner. Of these the defecator and sugar boiler should have already had some experience in a Beet Root Sugar Factory."

We have added as a separate item, the necessary additions to be made for the extra salaries to be paid to specialists in the various departments.

The calculation is based on a campaign of 100 working days.

**WASHING AND PULPING,**  
Transportation and washing of the Beets, 14 men 2 shifts per 24 hours, sterling 2800 days labour at 4s.....£560 0 0

**PRESS DEPARTMENT,**  
28 men 2 shifts per 24 hours=5600 days at 4s.....£1120 0 0  
Sack washing and darning, 8 women 2 shifts, 1600 days at 4s..... 320 0 0

**DEFECATION.**  
8 men per 24 hours—equal to 800 days labour at 4s..... 160 0 0

**SCUMS.**  
6 Men for 24 hours, 600 days at 4s..£140 0 0

**CARBONATATION.**  
250 days at 4s..... 50 0 0  
Monte jus, (that is steam pump men) 40 0 0  
Preparation of Carbonic Acid, (i. e. from the Charcoal),..... 40 0 0

**FILTRATION.**  
3 Men every 24 hours, at 4s..... 60 0 0

**CONCENTRATION.**  
2 Men every 24 hours, at 4s..... 80 0 0

<b>BOILING.</b>	
2 Men every 24 hours.....	80 0 0
<b>CRYSTALLIZATION AND CENTRIFUGALS.</b>	
1500 days' labour.....	300 0 0
<b>GENERATION OF STEAM.</b>	
2 shifts of 3 men, 600 days, at 4s...	120 0 0
<b>BREAKING AND PACKING.</b>	
5 men at 4s.....	100 0 0
<b>MEN IN THE YARDS, ETC.</b>	
5 Men at 4s.....	100 0 0
<b>MANAGEMENT.</b>	
1 General Superintendent and two overseers.....	300 0 0
Book-keeper and Clerk.....	320 0 0
<b>EXTRAS.</b>	
Carpenter, Plumber, Smith, 3 men..	300 0 0
Extra pay to skilled labourers.....	500 0 0
<b>General total cost of labour for one year's Campaign.....£5190 0 0</b>	
The quantity of coal consumed in such an establishment as we have described, would average 600 tons, which, at 15s. per ton, would cost.....	450 0 0
The bone black, 30,000 lbs., would cost for the first outlay 2½d. per lb., £312 0s. 0d., but in succeeding years would only amount to replacing the waste.	
The lime used would amount to 4,500 bushels, and cost £280 0s. 0d.	
The cost of 15,000,000 lbs. of Beet root to be worked up into Sugar would at 12s. per ton be.....	£1,500 0 0
<b>ANNUAL EXPENSES.</b>	
Summing up the above we calculate that the yearly expenses will amount to:	
Labour.....	£5,190 0 0
Coal.....	450 0 0
Boneblack Waste.....	100 0 0
Lime.....	280 0 0
Purchase of beet roots.....	1,500 0 0
Add 20 per cent. for incidentals.....	2,100 0 0
We have a total of.....	£12,620 0 0
To which has to be added Taxes and Insurance, which we have computed at.....	400 0 0
Interest on capital invested.....	960 0 0
Making a Grand Total of.....	£13,980 0 0
The total cost of erecting the works for the above factory, is given at.....	£13,157 0 0
This factory is fitted for the manufacture of Sugar from Beet roots, for the produce grown on 500 acres of ground, which ought to produce at least 1,200,000. One million two hundred thousand pounds of raw Sugar.	
<b>REALIZATION.</b>	
The products to be realized in our example of a Sugar Manufactory would be as follows : Sugar from 15,000,000 lbs. of Beets at 8 per cent of Sugar,—the Sugar being sold at 24s. per cwt. (of 112 lbs.).....	£14,400 0 0
2,700,000 lbs. pulp calculated at ¾d. per lb.....	5,620 0 0

5,000 gallons of molasses at 40°	
Baamo at 1s. per gallon.....	250 0 0
Residue as fertilizers.....	200 0 0
	£20,470 0 0

Deducting annual expenses and interest as above.....13,980 0 0  
Leaves a net annual profit of.....£6,490 0 0  
There is every reason to believe that with careful management the quantity of sugar will range as high as 10 per cent, instead of 8 per cent, which we have taken as our basis.

In such a case the net income would be £24,470.00; and the net annual profit £10,090.00.

Other authors make their calculations on an entirely different basis,—and arrive at results equally favourable, though differing somewhat in detail.

That the above is not too sanguine a view to take of the probable yield is shown by the fact that during the season of 1868, 1869 in the Zollverein, 2,500,000 tons of beet root produced 207,500 tons of sugar, a return of 8.40 per cent.

The foregoing quotations speak no doubt of land in the highest state of fertility, and which has been manured for years in the most scientific manner, and also, there is no doubt, of land which has been specially selected for the purpose, and which by repeated crops of Beet root very well manured with the refuse, and the results of the cattle fattened; has been brought into the most favourable state possible for the crop.

One of the most remarkable features of the growth of the sugar beet industry is, the constantly increasing crop and yield per acre which the proper culture of that crop produces, not only in the amount of roots grown per acre, and their richness in sugar, but also in the constant increase of other crops particularly wheat throughout the district.

**Exhausted Land.**

Horace Greely says in one of his recent agricultural articles.—"That a healthy animal cannot be raised on land exhausted of its phosphorus,"—and he explains what he means by this,—"land that had been used to produce animals, and therefore bones, for many years, without having any bone returned to the soil." This is certainly the gist of his remarks. He also says—"Whenever a steer or heifer can occasionally be caught gnawing or muzzling an old bone, then phosphates are indispensable, no matter at what cost. Better pay \$100 per ton for a dressing of 100 lbs. of bone, than try to do without." Does he imply by this, that the steer or heifer cannot find bones for itself, out of the natural grasses on which it feeds, but must eat the bones themselves, and get it wholesale, exactly on the principle seen practiced of a hen, eating old mortar to make egg shells. There can be no doubt whatever this is his meaning, and if this is "what he knows of farming," and all he knows on this particular point, it certainly is hardly worth recording; and liable to mislead thousands of us, unlearned people, who may be tempt-