a liberal ration of corn meal and bran, with hay and silage, and slept in doors during the pasturage period. They gained in both quantity *and quality* of milk, and *made more butter* when at pasture The average gain was nearly 3 lbs. of milk and nearly a quarter of a pound of butter *per diem p r annum*, while the fat was increased over a third per cent. The quality of milk was increased ½, and on account of its increase in both quantity *and quality*, the butter yield was increased nearly ¼! So, here is another experiment the results of which tend to prove that *you can feed fat into* milk, as every practical farmer *chez nous* knew long ago.

Free nitrogen assimilation.—Herr Frank, a well known German agricultural chemist, seems to agree with us in the opinion that the amount of nitrogen that accumulates in the root tubercules of leguminous plants is *not sufficient* to supply the amount which they, when mature, possess in their seeds and other parts. The value of nitrates applied to the soil is, he says, best shown when the plants are young and the power of assimilation weak. As to this point, see our article on *nitrogen*, page 000 of this number.

The London Dairy-show.—A very satisfactory exhibition, for there were, this year, 126 entries against 87 last year, and 86 in 1893. The challenge-cup, given by Mr. Titus Barham, was won by a cross-bred Shorthorn Ayrshire cow, the total marks she received being 139.8 Next in order came a cross-bred Shorthorn, with 137.8 points. The points awarded to the best of the cows of different breeds were as follows:

SHORTHORNS.

136 64	123 6	118 7	113.0
1st	2nd	3rd	Reserve.

JERSEYS.

110.8	110.72	89.0	88.4
1st	2nd	3rd	Reserve.

GUERNSEYS.		RED POLLS.		
94 46	91 8	113.0	97.16	89 22
1st	Reserve.	1st	2nd	Reserve.

AYR-SHIRES.	CROSSED BREEDS.			
103 22	139 8	137 82	123 86	117.5
1st	1st	2nd	3rd	Reserve.

Here again, for we are in luck this month in meeting with confirmation of our views from influential sources, the writer, Professor Wrightson, of the Agricultural College, near Salisbury, England, is speaking of wheat after clover—see article on nitrogen, p 238 of this number:

The crop is happily placed. It follows clover, when it finds the ground (promising that the clover root is abundant and strong) full of nitrogen in combination, ready to be liberated. It is the aim of the farmer to grow good crops with the least outlay, and he sees his opportunity in taking wheat after clover. Let the matter be explained by Professor Warington or anyone else, but it cannot be altered, and it has been known to farmers for a number of years. It was appreciated by Scotch and English farmers 80 years ago. Not only was wheat likely to succeed after clover, but, strange to say, better wheat could be grown after clover mown than after clover fed. Further, it was known at that benighted period that even better wheat could be grown *after clover seeded than after clover grazed*, and all *because of the superior development of clover root* under such circumstances. That one good crop begets another is a very old agricultural *dictum*, and it is *explained* to us now. It is "crop residues" which exert the greatest influence—the fall of the leaf, the stores of freshly formed roots, and the immediate dressings of animals—which readily yield organic matter in an active condition. To explain is not to create, and this is a lesson which some scientists should take more to heart than they do. British agriculture is very complicated and truly scientific, as every-one knows who tries to practise it, for only long training in the best methods can give the necessary skill.

Ploughing in Vetches.—V. S. J.—I have a field in which I wish to grow a crop of winter vetches, with a view to ploughing them in as manure next summer. Will any of your readers kindly tell me the best way to plough these vetches under, as it appears to me a difficult matter to bury a heavy and probably tangled crop of vetches with the plough? I should be glad also to know to what height the crop may be allowed to grow. [There are conceivable circumstances in which the proposed course might be the best, but a crop of vetches in these days is far too valuable to plough in. If you have no sheep, other people have, and, in any case, you might almost as well plough in any other valuable crop instead of securing it. If your crop of vetches turns out well, you will find it impossible to plough it in. Make hay of it, sell it on the ground, soil it in folds, or let it ripen for seed, but do not destroy it] (Bravo! Ed.)

Ag. Gazette.

The Scotch experiments on fertilisers for hay.—The hay-crop experimented on was rye-grass. It will be observed that in the two instances of the use of potash alone, whether in the form of muriate or in that of kainit, the effect was to create a dead loss. As the yield of the undressed plot was 3690 lbs., it may fairly be supposed that the land had been well done by for some years and, consequently that the regular doses of farmyard dung it had received had given such abundant supplies of potash to the land that no more was needed. Another instance in support of our favourite theory that, when strong land has been well farmed and manured in its regular turn, the addition of kainit or potash in any form is unnecessary.

Seeds.—Lord Leicester, of Holkham, Norfolk, England, of whose estate we have spoken before, finding that in his light sandy soil the 4-course rotation of crops left no profit to the farmer, has laid down ⅔ of his farm of 850 acres to temporary pasture. Although a "Belted Earl", Lord Leicester is about as practical a farmer as any of his tenants. The new plan seems to answer well. Why it has not been more extensively imitated by other Norfolk farmers is because some who tried it persisted in leaving their ordinary leys—red clover and common rye grass—to stand, and, on the hot sand of that district, soon found out that they would not stand more than two years. Lord Leicester's mixture of seeds are given here:

SEEDS FOR TEMPORARY PASTURE ON LIGHT LANDS.

Lb.		s.	d.
4	Cocksfoot, Dactylis glomerata, at 11d	3	8
2	Pacey's Perennial ryegrass, Lolium perenne, at 2½d	0	5
2	Italian ryegrass, Lolium italicum, at 3½d	0	7
1	Timothy, Phleum pratense, at 6d	0	6
1	Fall oat grass, Avena elatior, at 10d	0	10
¼	Golden oat grass. Avena flavescens. at 3s	0	9
2	Meadow fescue, Festuca pratensis, at 8½d	1	5
1	Hard fescue, Festuca duriuscula, at 7d	0	7
1	Tall fescue, Festuca elatior, at 1s. 3d	1	3
1½	Alsike clover, Trifolium hybridum, at 9d	1	1½
1	White clover, Trifolium repens, at 1s. 2d	1	2
¼	Yarrow, Achillea millefolium, at 3s. 4d	0	10
17		13	1½

The Italian ryegrass will not stand our climate, and the yarrow we have no experience of, as it is only, as a rule, grown in Scotland; but the rest of the seeds are pretty sure to take here. For the Italian ryegrass and the yarrow we should substitute two pounds of the true cow-grass, *trifolium pratense perenne.*

Harrowing wheat land.—If wheat is to be broadcasted, the importance of good ploughing is most evident; but if the drill is employed, some, of the faults of bad ploughing may be corrected by repeated harrowings. In any case ploughing ought to be well done, and harrowing ought to be thorough. It is almost impossible to over-harrow wheat land. In the case of broadcasting on a pressed furrow, six strokes of the harrow is the minimum, and eight or nine are not too many. In drilling upon a rolled furrow eight or nine harrowings may well be given before drilling, and one after drilling. The effects of the harrowing are—first, to break and pulverise the furrow; secondly, to obliterate the slices and produce a uniform seed-bed; thirdly, to complete the continuation between the ploughed surface and the subsoil, so that the roots may descend without encountering hollow spaces.

Manures per acre.	Cost of Manures	Average Yield of Hay per acre.		Increase		Value of Increase			Profit or Loss per acre.		
		cwt	qrs	cwt	qrs	£	s.	d.	£	s.	d.
2 cwt. muriate of potash	18/6	39	0	5	1	0	15	9	− 0	2	9
1 cwt. nitrate of soda	10/3	43	1	9	2	1	8	6	+ 0	18	8
2 cwt. superphosphate	7/-	39	1	5	2	0	16	6	+ 0	9	6
2 cwt. muriate of potash, 1 cwt. nitrate of soda	28/9	47	2	13	9	2	1	8	+ 0	12	6
2 cwt. muriate of potash, 2 cwt. superphosphate	25/6	45	3	12	0	1	16	0	+ 0	10	6
2 cwt. muriate of potash, 2 cwt. superphosphate, 1 cwt. nitrate of soda	35/9	52	0	18	1	2	14	9	- 0	19	0
806 lb. kainit	19/9	39	2	5	3	0	17	3	− 0	2	6
806 lb. salt	18/-	34	2	0	3	0	2	3	− 0	15	9
20 tons farmyard manure	100/-	54	3	19	0	2	17	0	− 2	3	0
10 tons farmyard manure	50/-	45	1	11	2	1	14	6	− 0	15	6
10 tons farmyard manure, 1 cwt. nitrate of soda	60/3	57	1	21	2	3	4	6	+ 0	4	3
Nothing	....	33	3	.....		.....			.....		

The managers of those Agricultural papers that do us the honour to exchange with us, would do us a great favour if they would address their publications to our private residence 4 Lincoln Avenue, Montreal, Q.

Nitrogen is decidedly cheap in England at the present time, the price of nitrate of soda at Liverpool being only £7. 10s per 2240 lbs., which is equal to $32.70 per 2,000 lbs, our ton, or $1 63 per 100 lbs. Now, though 100 lbs of nitrate of soda *should* contain 16½ % of nitrogen, let us taken only 15.50 %, and we shall find that this excellent constituent of fertilisers is worth at Liverpool only, approximately, 10 cents a pound! And yet we see the calculations of the U. S. experiment-stations are based on a valuation of nitrogen at 15 cents a pound!

Perhaps this may not strike some of our readers as a very monstrous difference, but apply it to an acre of land and then see. A fair allowance for a dressing for wheat is 40 lbs. of nitrogen; this, at 10 cts. a pound would cost $4 00, but at 15 cts, the expense would be $6.00, and supposing the wheat crop to occupy 10 acres, the extra cost would be $20.00, equivalent, at present prices of wheat, to all but 24 bushels. And yet, we hear of Canadian dealers asking three dollars for 100 lbs. of nitrate of soda, making the price of nitrogen about 19 cts. a pound, a perfectly prohibitive price, for we really, with all our advantages, cannot grow stuff for England if we are to pay nearly 100 % more for our most useful fertiliser than the English farmer pays. We are nearer the nitrate beds of Chili than England is, and the only reason why we should pay higher prices for their product is that the sales here are so small that the dealer is, so to speak, obliged to import on such a small scale, that he cannot live without making an enormous charge on the goods he sell. So, it is just the old argument over again, as in the case of insurance of farm-stock here: there are so few insurers that the companies have to make high charges, and the charges being so high, there are many farmers who prefer running the risk of loss to paying such premiums.

Price of mangels in the U. S.—Mangels are quoted in our exchanges as being worth $15.00 a short ton in many markets of the New-England States. In England, they are selling in the S. E counties at less than $4.00 a gross ton = $3.50 for a short ton! As it is by no means difficult or costly to grow 30 to 40 tons of mangels on an acre, provided a fair allowance of nitrogen be added to the usual dressing of dung, would it not pay to export mangels to the States, if we could get nitrate of soda or sulphate of ammonia at a fair price? Thirty tons, at $15.00, comes to $450.00: there is a great deal of margin for expenses in