possible; then, by using them well and choosing them wisely, they will be found most advantageous; the outlet for our animal produce will never fail us; and by means of copious manurings we shall obtain the highest returns, which alone can give large profits.

15.—*Cheese-making in Small Dairies.* By JOSEPH HARDING, Marksbury.

AN opinion prevails among small dairy farmers that they have not equal advantages with those who have larger dairies, and who make thick cheese, because they cannot so profitably convert their milk into marketable produce. Hence various methods of dairy practice are resorted to; calves are fattened throughout the year, or butter and skim cheese are made; and sometimes butter is made and the skimmed milk given to the pigs.

The former of these methods is quite as objectionable as the practice of selling milk, since nothing is left for the pig, and consequently there is little or no manure for the land.

The latter practice involves a positive waste, as the milk could be turned to a more profitable account, and the pig be otherwise fattened at a smaller cost.

Milk is the dairy farmer's source of income; it is, therefore, to his interest to be conversant with and to employ that method which will yield him the most profitable return. It may be useful if I give my own experience in determining this point. Some years ago I experimented with equal quantities of milk upon the three usual methods employed in dairy practice; viz. (1), making skimmed cheese and butter; (2) half-skimmed cheese and butter; and (3) whole milk cheese. The following are the particulars and the results:—

1st.—*Skimmed.*

		£.	s.	d.	£.	s.	d.	Price per Gallon for Milk.
50 gallons of milk produced	Butter, 12 lbs., at 1*s.* ..	0	12	0				
	Cheese, 35 „ at 4*d.* ..	0	11	8				
					1	3	8	.. 5¾*d.*

2nd.—*Night's Milk Skimmed.*

		£.	s.	d.	£.	s.	d.	
50 gallons of milk produced	Butter, 5½ lbs., at 1*s.* ..	0	5	6				
	Cheese, 41 „ at 6½*d.* ..	1	2	2½				
	Whey butter, 4 ozs., at 10*d.*	0	0	2½				
					1	7	11	.. 6½*d.*

3rd.—*Whole Milk.*

		£.	s.	d.	£.	s.	d.	
50 gallons of milk produced	Cheese, 46½ lbs., at 7½*d.*	1	9	0¾				
	Whey butter, 12 ozs., at 10*d.*	0	0	7½				
					1	9	8¼	.. 7*d.*

The results of these experiments shew that the highest price per gallon for the milk was realised by converting it into full milk cheese; the next by partly skimming the milk and making both butter and cheese; and the lowest by skimming all the milk and then making cheese from it. Were these experiments repeated at the present time there is little doubt but that, owing to the increasing demand for fine cheese and the limited consumption of that made from skimmed milk, the balance would be still greater in favour of making full milk cheese.

The most profitable method of converting milk into marketable produce having thus been determined to be by making full milk cheese, the next point to be considered is, what size and shape of cheese are best suited to the public taste? It is a mistake to make full milk curd into a flat, thin cheese. However good it may be, it is only in exceptional cases that a first-class price can be obtained, simply because the shape is not commendable. In a dairy of 20 cows and upwards a thick, handsome cheese can be made, and, if good, will realise the highest price; but, as this cannot be done in small dairies, the best shape to be adopted is the truckle or loaf. Thousands of cheese of this form are made in the rich marsh lands of Somerset and some parts of Wilts; but though the form of these cheese commends itself to our notice for imitation, the character and quality must be avoided, or the object of the cheesemaker will be defeated. If a better class cheese be not made than is usually exposed for sale at the Highbridge and Chippenham markets, it would be more profitable to adopt the plan No. 2 in the above Table, as involving less loss; but there is no reason why the *finest* cheese may not be made in small dairies. The inferior character of the loaf cheese above referred to is due partly to the manner of making, but chiefly to the want of a proper understanding of the nature and state of the milk and curd during the process. As to the method employed, perhaps there is none better than that of the improved Chedder, as being systematic, simple, and successful. The making the loaf cheese may involve an additional amount of labour and some waste; but if *well* made, so as to be rich, mellow, and fine in flavour, such cheese are always in request, and will realise 5*s.* per cwt. beyond the cheese made in larger dairies, as small families will readily pay more for convenience of size and presentability of appearance. The best kind of vat is the expanding staved vat, either with or without a bottom, as the cheese can be much more easily liberated from them than from those of ordinary construction, whilst at the same time the edges of the cheese are less liable to damage. All the vats should be of equal size, and furnished with inside followers made to fit nicely. The

cheese may be pressed in tiers of threes or fours, as required; if turned twice a day, two days' pressing will be sufficient. The edges should be well bandaged whilst in the press, to secure them against damage. There may not be sufficient curd to fill each vat every day, but if salted, and pressed by the hand into a vessel, and the vessel covered, the curd will keep till the morrow, when the cheese may be made up with new curd. No anatto should be used or the colour of the curd of the two days may not correspond. It frequently happens that these small cheeses are not quite as solid as those of a larger size. Cavities will occasionally appear, unlike a naturally heaving cheese, but as though a portion of air had been suddenly arrested and confined. This, I believe, arises from too sudden pressure upon so small a surface, and should be remedied by a gradual addition of power to the press. With ordinary treatment in the cheese room, these small cheeses will be equal in quality, flavour, and appearance, to Cheddar cheese of any size, and will give the small dairy farmer corresponding advantages to those of the larger dairy farmer. The approved size of the Cheddar truckle is about 10 in. deep by 7 in. wide, and the weight from 10 lbs. to 13 lbs. each.

16.—*Arterial Drainage and Outfalls.* By RICHARD B. GRANTHAM.

As far as I am aware the subject of arterial drainage and outfalls has not yet obtained that notice which a question of such very great national importance and professional interest to the engineer is entitled to. I therefore beg permission to offer a few remarks upon the subject, as I have taken special interest in it, and am in a position to promote the adoption of a system hereafter described, which must prove beneficial to those who will avail themselves of it.

This matter refers simply to the improvement by deepening, widening, and straightening of rivers and the prevention of floods in districts under their influence, especially where underground pipe drainage and open ditches have been so extensively carried out as to inundate valley lands by overcharging the rivers, this evil being considerably on the increase as these improvements are made.

For many years past the difficulties in the way of improving rivers, so as to increase their discharge, have been so numerous as to totally put a stop to any attempt at producing a better state