

the whey was sour. In Germany and Switzerland, and particularly in Holland, the acetic and muriatic acids were used to curdle milk for cheese. Mr. Way exhibited a diagram of the composition of cheese, which would show that, although we believed cheese to be dry, it still retained a large quantity of water,

COMPOSITION OF CHEESE (JOHNSTON).

	Skin Milk Cheese	Double Gloucester.	Cheddar.	North Wilts.	North Wilts, 24 specimens	Dunlop.
Water,	43.82	35.81	36.94	35.38	44.80	33.46
Caselin,	55.04	37.96	28.98	25.00	28.16	25.87
Butter,	5.58	21.97	30.40	30.11	23.04	31.86
Saline matter, . .	5.18	4.23	4.58	6.29	3.99	8.81
	100.02	99.99	100.00	99.99	99.98	100.00

The relative richness of cheeses was due to the quantity of butter in them. The rich cheeses were those which it was most difficult to keep. The thorough salting and perfect washing of the curd also rendered cheese liable to change, although, as in the case of butter, every precaution in this direction was unfortunately opposed to the production of cheese of good flavour; those cheeses that keep best, as the Dutch and Suffolk cheeses, being far less agreeable to eat.

Before he sat down, Mr. Way wished to make one or two observations upon the effect of dairy cultivation on the land. Obviously by exporting butter and cheese from a farm, we export the same elements as in ordinary wheat, beef, and mutton farming. In addition, however, to the carbonaceous and nitrogenous elements so exported, a quantity of mineral matter, chiefly phosphate of lime, is removed by the cheese and in the bones of the calves. In old pastures this was never replaced, until the practice of manuring with bones came into use.

DRAINING.

The following suggestions on this important subject, are taken from one of the Foreign Journals lately received:—

As regards the practical execution of drainage, there are three essential points to be regarded—*efficiency, durability and cost*; and where works are systematically conducted, there are at least two subordinate objects to be attended to, viz: the providing for the application of the draining-water to the irrigation of the lower land, and the conservation of it for purposes of power at the several homesteads of an estate, both of which have hitherto been, in too many instances, overlooked. Perfect completeness of effect can only be secured by a practical knowledge of the object to be obtained, and fitting application of means to an end; in other words, the man who undertakes drainage operations must not only be thoroughly conversant with the most suitable state of dryness for land to be in, that its cultivation may be brought to the highest state, but he must possess corresponding skill to produce this at the least cost. The Sangrado doctrine of one remedy for all complaints, is as certain to lead to many adverse results in the bleeding of land, as in the human frame. Each case must be treated according to the different circumstance of locality, stratification, contour, &c. In the drainage of arable land, every district and every formation will afford, in the *naturally* dry soils of the locality, the best example for that completeness which is sought to be obtained by artificial means; and the more nearly we approach this standard, the more com-

plete will the work be. Where land is intended to remain permanently in grass, some difference in the system may be properly made; for, if the excess of moisture be removed so as thoroughly to eradicate all aquatic plants, experience shows that in our climate, subject to occasional droughts, grass land is retained in better condition by having some reserve of moisture for these seasons, derivable from below by capillary attraction. It is very different, however, in arable land, where a uniformity of dryness is so necessary to the growth of plants, most of which are of one year's duration only, and for the production of which the constant preparation of the land is required; and to effect this economically, depends on the mechanical condition of the soil.

Under ordinary circumstances, and to illustrate in point of time, the efficiency of drainage on arable land, it is desirable that it should admit of the usual operations being proceeded in upon it, in not exceeding twenty-four hours after a saturating rain, and that the entire surface of the land should present a *uniform* dryness. I know that many, if not most occupiers, as well as owners, will not allow that it is practicable to render clay lands thus dry by artificial drains, at a compensating cost; but my own observations have convinced me to the contrary, over many varieties of strong soils. It may be readily conceived that opinions may differ as to what is strong land; and no doubt, both as to the active soil and the subsoil of what are ordinarily designated clay lands, much misconception does really exist; but nevertheless, assuming Mr. Arbutnot's description to be sufficiently accurate as to the mechanical texture of the land, it is ample evidence of that altered condition which drainage is certain to realize in such soils, if effectually performed. It is within the recollection of most of us, that these were at one time the description of farms most sought after, as possessing more stamina for cereal crops, than the lighter lands; experience, and better farming however, showed that grain crops could be produced at less cost on the naturally dry soils, and they in their turn were regarded as the most desirable. But let the strong lands of the country be once perfectly drained, and there is not a doubt but that they possess naturally far greater capabilities for cultivation. They are much less susceptible of excessive changes, less liable to weeds, retain and impart the fertilizing effects of the manures applied to them, much longer than the thinner soils, and for the most part produce a heavier quality of grain. In fact, they need only that mechanical condition which effective drainage gives.

One great hindrance to vegetation on these soils, which can only be removed by good drainage, is that excess of evaporation consequent upon a constant excess of moisture, which keeps the land always at a low temperature, when, in fact, an ordinary observer would suppose from the sun's heat it was the warmest, and when vegetation should be progressing. The contrary, however, of this is really the case; for, except during frost, all wet land is absolutely the warmest when there is the least heat from the sun; and, *vice versa*, when the sun is most powerful, and exercising his beneficent influence on other more favoured lands, this clay soil becomes so torpid as to stop the progress of the crop until the sun's rays have converted into the atmosphere a portion of that excess of moisture which leaves the soil, after a time, dried to a certain depth from the surface. The depth and distance at which drainage should be executed to secure a perfect result, must depend entirely on the character of the subsoil. No general rule can be laid down, except that in every case the depth should not be less than three feet to ensure permanency.