

once, put a stop to improvement in this manner. We all know that it would be vain to attempt to grow wheat crops in the salt sands of the sea shore. I have observed in my travels through Ireland, and indeed through a great part of England, that there is too much water in the ground. To remedy this difficulty, we must drain the land. The lecturer proceeded to point out the advantages of thorough-draining to the cultivation of land, and also how in undrained land the under soil became overpowered with the refuse of the over soil which sunk below, and thus put a stop to vegetation. He also pointed out how draining would prevent this evil, and then proceeded to discuss the manner in which the land was exhausted by means of crops. On this subject he said, You will see by the table that a crop of wheat draws a certain proportion of phosphoric acid, lime, soda, &c. from the ground. It is the same with the other crops. Now what is the remedy for this exhaustion? Why, we must assist the soil by manure—we must endeavour to add to it as much of that inorganic matter as has been taken away by the growth of the crop. By so doing we shall put it in the same position as it was before; and in this place it is necessary for us to consider what is the particular component part of the soil which becomes exhausted, and in what degree, for there are different effects in this respect produced by different crops, and sometimes there is even a difference in different parts of the same plant, for if I take a ton of potato tops from the ground I exhaust the soil more than from a crop of tubers. Thus you see, that if a succession of the same crops be made, the result will be the exhaustion of the soil in the substance which that crop abstracts most of, and this is called a special exhaustion, in distinction to a general exhaustion. If I crop my land successively with oats, I deprive it of phosphoric acid especially, and for this a special manure is required; and it is the same, gentlemen, if I turn my land into pasture, and put dairy cows upon it.

## COMPOSITION OF COWS' MILK.

Casein (curd) . . . . .	1.19
Butter . . . . .	3.13
Milk Sugar . . . . .	4.77
Saline matter . . . . .	0.60
Water . . . . .	87.02

100

On reference to the table you will find that they will abstract from the soil phosphoric acid. Now, if I put young stock to grow upon it, you will find on reference to the following table, that phosphoric acid and lime compose nearly 60 per cent. of that substance, and in that proportion, will the land be exhausted of those substances.

## COMPOSITION OF OX BONES.

Cartilage . . . . .	33.3
Phosphate of Lime . . . . .	57.4
Phosphate of Magnesia . . . . .	2.0
Carbonate of Lime . . . . .	3.9
Soda, with a little common salt . . . . .	3.4

—100

The lecturer then referred to the composition of muscle, which he stated contained only one pound of saline matter in the hundred.

## ONE HUNDRED POUNDS OF FRESH MUSCLE CONSIST OF

Water . . . . .	77
Fibrin, with a little fat . . . . .	22
Phosphate of Lime . . . . .	3
Other Saline Matters . . . . .	3
	100

A knowledge of these facts, he continued, will enable us to determine what kind of stock we should put on any soil. This is a fact which is now beginning to be understood in the hill pastures, and I may state that in Cheshire, and other counties, where pasturage has been followed to a great extent, the country has become exhausted in the way I am now describing. If you exhaust the soil of one or more substances, then the application of those substances by manure restores it to its original state. And here I must advert to the liquid manure, of which a large quantity is generally allowed to be lost, but which contains a great deal of valuable inorganic matter, chiefly composed of alkalies. The professor here described, at some length, the benefits to be derived from the judicious application of liquid manure, &c., and then proceeded to speak of springs.—There are, he said, mixed with the waters of springs, certain saline substances—which restore to the soil the inorganic substances, of which it has been deprived by the negligence or indolence of man, and in this respect nature acts a beneficial part, in thus giving, as it were, a special manure, as well as in cleansing the lower soil, which, through neglect, has become deleterious to the plant, sweeping away all the noxious substances, and thus becoming a natural improver of agriculture. And with respect to this island, surrounded as it is by the sea, it is every year washed over, as I might say, by the spray, which is conveyed to every part of it, carrying with it a portion of inorganic matter. This is a beautiful design of nature, it is a design to atone for the indolence or negligence of man. But this is not all that is required for the proper cultivation of the soil. It is here, when by chance of negligence, that the soil has become barren, that chemistry can be made available for the purpose of restoring it to a proper state of cultivation. And it is to the proper application of chemistry to agriculture that we must look for the great benefits it is capable of affording, and the great results that will ensue from that proper application. By its means we are enabled to assist the soil with whatever substance it may have been deprived by the growing of crops or feeding of cattle. If it wants phosphoric acid, we can apply a manure containing a large proportion of that substance, and the same is the case with lime, or soda, or any other substance. A knowledge of the principles of chemistry throws a light on all these things, and

by acquiring that knowledge you will be able to carry into effect all the improvements which have been made in agriculture.

From the Farmers' Gazette.

## WANTS IN CERTAIN SOILS, FOR CERTAIN CROPS.

Aware of the necessity there exists, in certain soils, called "rich" in this country, to alter their condition to produce certain crops, we beg the attention of our readers, whose complaints so frequently reach us on the deficiency of their produce, to the following letters, relative to the farms of Mr. Davis, the champion of "thin sowing" in Kent. We had intended—nor is our intention yet altered—to give from ourselves a notice of Mr. Davis's farms, as we saw them in the autumn of 1844, when we had the pleasure of seeing his grain crops, abundant in appearance, securely harvested, and his green crops of such a character, as reflected the highest credit on the cultivator, whilst the crops of his neighbours, even more favourably circumstanced as to soil and situation, would be a disgrace even to any part of Ireland.

We saw in October, 1844, barley, on a farm adjoining those of Mr. Davis, in a green state, which was really disgraceful, after such a summer and harvest as we had that year. The cause of this backwardness was the absence of draining and subsoiling, both of which had been well and cheaply executed by Mr. Davis. His thin sowing succeeded, in consequence of his operations already alluded to, together with knowing the species of manuring his land needed—a fact that every farmer should endeavour to make himself acquainted with, before he need expect to reap the vast benefits derived from either draining or subsoiling, or both; and we hope the day is not far distant, when we shall see the land agents of this country imitating Mr. Davis, and thereby setting an example worthy of the landlord as well as the tenant farmer.—Ed.

## MR. H. DAVIS' FARMS, AT CROYDON.

To the Editor of the English Farmers' Journal.

SIR—In your last number, beside the elaborate report of the great agricultural meeting (worth ten times the cost of the paper), is an account of a visit to Mr. Hewitt Davis' farms in April: and having myself visited them so recently as the end of June, a summary of my notes may not be unacceptable to your readers as reciting the progress in the meanwhile.

The general aspect of the farms was of garden-like neatness, contrasting with the loose gravelly appearance of the soil, as suited rather for rye and buckwheat (of which latter, indeed, I noticed a larger proportion than anywhere else in this country); but in some places the deep-four-horse plough was turning up heavy clods.

His wheat, of course the first object, did not exhibit the irregularity which has