

to be obtained, at certain seasons, at a very low rate; but then we must remember that in fish we have to deal with an article which is of an exceedingly watery nature; even the muscle of animals has been shown by Berzelius to contain more than 77 per cent. of water; it would not therefore, probably be far from the truth if we estimate that to produce a ton of guano (as by Mr. Petit's plan), about nine or ten tons of fish would be required. The Essex farmers, who use fish as a manure pretty extensively, deem a dressing of 50 or 60 bushels of sprats to be a fair dressing for oats, and that these produce a powerful effect, especially in moist seasons, equal to a dressing of 3 or 4 cwt. per acre of guano; allowing a bushel of fish to weigh 56 lbs., this would be equal to a dressing of  $1\frac{1}{2}$  tons per acre; and allowing nine-tenths of this to be water, we have an application of about 3 cwt. of solid animal matter per acre.

It remains, then, to be seen, if refuse fish can be obtained in sufficient quantities to enable our chemical friends to produce a supply of the British guano.

#### ECONOMY OF MANURES.

##### *From the Mark Lane Express.*

Last Christmas we showed how large an area might be covered in, and the internal arrangements made portable and moveable, so as to be easily adapted to the changing fashions of farming practice, whether the loose box, the shed, or the stall-feeding system were adopted; and that almost any change might be made, if a four-sided piece of sloping ground were fenced in. With all our knowledge, the liquid manure is the real difficulty of the farmer; he knows not yet what to do with it. To save it, and cart it away, is manifestly a costly mode of disposing of it; to make compost heaps near it is very costly, and terribly expensive of horse and human labour. Few can irrigate with it; nor will those, who can, be at the expense of making the pipes and hose necessary to spread the water-refuse. Box-feeding will preserve a little; but the open yards, the manure cleansed out of the pigsties, the stables, and the various out-offices of the farm, will be found exposed in most places for a very long period to the effects of the atmosphere.

We must not, however, forget locality. In some places hardly too much rain falls; in others almost all the soluble parts of the manure are regularly washed out. Still water is far easier let out upon the manure if it run any risk of being too dry, than to stop an overflow of liquid if it exists in excess.

#### AGRICULTURAL NOTES.

##### *Lincolnshire Farming.*

The meeting of the Royal Agricultural Society of Lincoln led to a challenge, by some men of Norfolk, to show, half a dozen of farms in that county against the same num-

ber on the Heath and wolds of Lincoln. It is to be hoped that the challenge will not end in mere talk; because, although wagers could do little towards deciding on the respective merits of the two counties, the report of the judges—which would, or should, be a detailed report—would show the modes of farming in the two first counties of England. In an agricultural point of view, Lincoln and Norfolk are in a totally different position. Norfolk was one of the earliest counties in England in which the important agricultural improvements, which we owe to the Dutch and Flemings were introduced. From Flanders the turnip—on the cultivation of which all good farming rests—first found its way into Norfolk. Norfolk differs from Lincolnshire, too, in being more amply supplied with labourers; and in having had, before the era of railroads, a manufacturing market close at hand.

The name best known in connection with the agriculture of Norfolk is that of Coke, of Holkham, afterwards Earl of Leicester, who, during a long life, devoted himself with energy and success to the improvement of a naturally poor soil by good farming and good stock, and long leases. He was one of the great landed proprietors who, following in the footsteps of Lord Somerville, and availing themselves of the experience and example of Francis Duke of Bedford, set the fashion of agricultural-minded landlords—a fashion which has been of such enormous advantage to the country, by spreading through its length and breadth the stock brought to so high a degree of perfection, by Bakewell in Sheep, and by the Collingeses in Short-horns. The sheep-shearing of Woburn, and afterwards of Holkham, became famous wherever agricultural improvement was appreciated. At the present time Norfolk has several improving landowners, and some farmers of the first class, whose names have an European celebrity.

Coke, of Holkham—for that is his agricultural name—left his mark on Norfolk more in the shape of improved live stock than in improved processes of tillage. He introduced the Devon, superseding an inferior local breed; and he did good service by assisting to render fashionable the new Leicester sheep, by which all the improvements in our Long-wools have been effected. But, although Norfolk may, perhaps, boast one of the first, and certainly the largest cultivated farm in the world, the county has had to struggle against the disadvantage of traditions which the improvements of the age have put out of date. For instance, the turnip sown broadcast was a wonderful step in advance, as a root crop, a hundred years ago, when grown by Lord Somerville; but the turnip sowed broadcast, as it may still be seen in Norfolk and at the famous farm of Tiptree, is terribly bad farming.

Lincolnshire has not had to contend against old customs and a prejudiced tenantry. The districts which attract most atten-

tion have been colonised and reclaimed within the last eighty years. The labouring population of the Heath and wolds has always been in number rather under than over the demand, and the supply of tenant-farmers has depended to a considerable extent on migration from the other counties. Now it is a well-ascertained fact that in agriculture, as in manufactures, improvements are carried on more vigorously by emigrants unshackled by ancient prejudices.

In 1770 Arthur Young made his first agricultural tour through Lincolnshire; and at that period, with the exception of a few favoured spots in the vicinity of ancient Church domains, the sea-bordered lowlands were a succession of lakes, where, in winter, the ague-smitten inhabitants carried on their decoys, and, in summer, with the help of stilts and boats, gathered crops of rich rank hay; while on the high ground, the heaths, and wolds—gorse covered—gave sustenance to a few miserable sheep. The lowlands first benefited from the great drainage works, which were vigorously pushed early in the present century. Since that period, the introduction of the steam-engine has dried hundreds of thousand of acres, and substituted heavy crops of cole or rape and corn for uncertain catches of pike, eels, and wild duck. The hissing of the steam-engine has driven away

The bittern booming in the marsh, and substituted the partridge and corn-crake.

On the wolds—a back-bone of sloping hills of light land that run through the country from north to south—a transformation into thriving farms has been effected by "turnips grown with bones, fed off with sheep;" the farmers finding courage to spend the money needful for reclamation, under the shelter of a tenant-right custom, established by the great landlords of the country, with the Yarborough family at their head.

In 1790, when, as Secretary to the Board of Agriculture, Arthur Young made his second tour of inspection, he found that more than 150,000 acres had been reclaimed by embankments and levelled cuts. The first drainage improvements were effected by taking advantage of the natural fall of the ground to get rid of superfluous water. Windmills, for pumping from a low to a high level, were introduced by, and copied from, the Dutch; but, useful as they were, it not unfrequently happened that the rain fell in summer, and that the wind failed in autumn, just when most needed, and the corn, fit for cutting, required reapers in boats, or, if cut, floated away here and there with the floods. The steam-engine has done much toward protecting the fen farmer from these uncertainties. Near Boston, Algar-kirk, Kirtan, Billingborough, and Hackenby, there are wide tracts of grazing land, formerly covered with water, which carry a bullock or three sheep to an acre. To drain the lowlands of Lincolnshire, artificial out-