analyses must be regarded as representative of the best qualities of lump plumbago in both cases. I reproduce here the table of analyses:—

Analyses of Canadian and Ceylon Graphites.

Locality.	Specific gravity.	Volatile matter.	Carbon.	Ash.
		per cent.	per cent.	per cent.
Canada, Buckingham; vein graphite; variety, foliated ...	2·2689	0·178	99·675	0·147
Canada, Buckingham; vein graphite; variety columnar ...	2·2679	0·594	97·626	1·780
Canada, Grenville; vein graphite; variety foliated	2·2714	0·109	99·815	0·070
Canada, Grenville; vein graphite; variety columnar	2·2659	0·108	99·757	0·135
Ceylon; vein graphite; variety columnar	2·2671	0·158	99·792	0·050
Ceylon; vein graphite; variety foliated	2·2664	0·108	99·679	0·213
Ceylon; vein graphite; variety columnar	2·2546	·900	98·817	·283
Ceylon; vein graphite; variety foliated	2·2484	·301	99·284	·415

I reproduce from the same source an interesting analysis of the uses to which the mineral plumbago is put.

Proportionate amounts of Graphite used for different purposes.

Purpose for which used.	Source of Supply.	per cent.
Crucibles and refractory articles as stoppers and nozzles ...	Ceylon, American	35·
Stove polish... ...	Ceylon, American, German ...	32·
Lubricating graphite	American, Ceylon	10·
Foundry facings &c. ...	Ceylon, American, German ...	8·
Graphite greases ...	American ...	6·
Pencil leads... ...	American and German ...	3·
Graphite packing ...	Ceylon, American	3·
Polishing shot and powder	Ceylon, American	2·
Paint	American ...	·5
Electrotyping ...	American, Ceylon	·25
Miscellaneous :—piano action, photographers, gilders' and hatters use, electrical supplies		·25
		100·00

COFFEE IN GUATEMALA.

It is reported from Guatemala that President Barrios has sent M. Laugier as special emigration agent to Yokohama with instructions to contract for 10,000 Japanese labourers for six years to work on the Guatemala coffee plantations.—*L and C. Express.*

THE CARE AND MANAGEMENT OF FARM-MANURE IN SOUTH INDIA.

The manure obtained from his cattle is almost everywhere the chief stand-by of the farmer for manuring his land.

It is only by manuring his land well and tilling it properly that the farmer can hope to secure good crops from it; and how greatly his success in this respect depends upon manure is a matter of common experience. With sufficient manure and abundance of water, there is scarcely any limit to the productiveness of the land in India. Manure and water are in this respect interdependent; the supply of water being that obtained in the falling rain or from irrigation works or wells. The matter at present to be considered is, however, the manure supply.

Unfortunately the amount of manure which the ryot finds at his disposal is usually but small. It is often also of but poor quality. Owing to want of proper care of the supplies available and to bad management, the stores of manure are generally small. Similar reasons explain the low quality of the manure.

In some places where wood fuel is scarce and near large towns, a very large proportion of the cattle dung is made into cakes and used for fuel; only a little ashes remaining for use as manure and even these, in cases where the cakes are sold into towns, being lost to the ryot. When his cattle dung is burnt by the ryot himself, the ashes are generally thrown into a heap in the open, where they become leached of much of their valuable matters. That the practice of burning cattle dung is a cause of great loss is known to every one. By using the dung of his cattle for fuel, the ryot makes only a very petty saving in expenditure, whilst he could by growing fences round his fields, as is done in parts of Coimbatore and Salem, or by setting apart a small portion of his fields on which to grow trees for fuel, easily provide himself with fuel sufficient for his wants. By such means the very wasteful practice of burning cattle dung may be avoided. Near large towns, the price of fuel is so high as to render the growth of fuel trees generally a profitable undertaking.

The more general practice of the ryot is, however, to accumulate the dung of his cattle in a loose heap in the open air. The dung there dries into hard lumps, and is thoroughly washed by any rain that falls. It suffers loss in every possible way, and the ultimate result is a small heap of very poor, almost valueless, stuff left to be carted to the fields. With the dung is to be seen a certain amount of straw and leaves. Each material is left to itself, the dung to lose its value, the stalks to become hard and desiccated. Because in India no litter is supplied to the cattle, not once in a thousand times is any attempt made to save the urine of the cattle when they are kept in the houses or sheds of their owners. Wasteful this process is, because the solid manure is exposed as described. Still more wasteful and injurious is it, because the liquid manure is not only not preserved, but is allowed to sink into the ground, and especially into the hollows made by the feet of the cattle. The soil on which the cattle stand is saturated below by the urine, and the air of the house or shed becomes foul and contaminated. Every one has noticed the strong and peculiar odour found in these sheds in the morning. This is due mainly to the evaporation of valuable matters contained in the urine which drops on the floor and is lost.

The value of the urine of his cattle as manure is not, it is to be feared, appreciated fully by the ryot, even if the value thereof is not totally unknown. The urine, as a matter of fact, is richer in fertilising matters than the solid excreta of cattle, and the loss involved in letting the urine go to waste is very large. This loss may be avoided by the use of litter to absorb the urine, or even by sprinkling the floors of the cattle-sheds with dry earth, if litter be unprocurable. By the latter process, much of the

urine could be saved; the earth being allowed to accumulate in the sheds till required for use as manure, or being removed as soon as it becomes saturated and carefully preserved in a manure pit as is described below. In cases where cattle are tethered or penned in the fields, the urine soaking into the land is not lost.

If the ryot be asked why he does not use litter for his stock, he usually says that he has not enough fodder to feed them properly, still less has he straw for use as litter. The appearance of so much waste straw, &c., in the manure heaps is, however, often evidence that this is not the reason, for these matters, as well as coarse grass, weeds, leaves, and rubbish of all sorts might be used as litter, and the quantity required, especially if dry earth be also sprinkled over the floors, is not large.

As has already been said, the most valuable portion of farm manure consists of the urine of the cattle. The manure comprises also, when properly made, the whole of the solid dung as well as the litter used for bedding the cattle. As it consists of litter and the voidings of animals fed on the produce of the soil, it forms in itself a complete fertiliser. In the making of good manure, it is of importance that all these matters should be thoroughly and intimately mixed and that they should be preserved carefully after they have been collected; so that the whole mass may ferment and decompose slowly and thoroughly. The value of farm-manure lies probably as much in the mechanical effect it has on the soil to which it is applied as on the fertilising matters it contains. The mechanical effect depends greatly, if not chiefly, on the state of decomposition in which the manure is when applied to the land.

An excellent method of managing farm-manure suited to the conditions of the ryot is described below. In this method the dung and the urine are not removed from the shed except at intervals of several months, when the manure is required. The litter used absorbs the urine.

The floor of the cattle-shed should be made 2 or 3 feet lower than the surrounding ground, and the sides and the bottom of the pit plastered with clay. On the floor a layer of ashes should then be spread once for all, and every day a layer of vegetable rubbish should be spread over the surface as litter, that is, for bedding. For this purpose leaves, coarse grass and other vegetable rubbish may be collected and stored during those parts of the year when they can be easily procured and when the ryot and his cattle have plenty of leisure. Waste fodder and various refuse portions of crops, such as the ear-heads from which corn has been threshed, &c., may be used as bedding. The shed may be 10 feet long and 6 feet broad for a pair of cattle. It is best that the cattle should be left loose in the shed so that they may tread on every part of the manure and press it down. If the manure is not pressed, it will rot too fast and become much heated and give off bad smells and the health of the cattle will be injured. Every morning the dung dropped by the cattle in the previous night should be evenly distributed and a thin layer of litter spread over it. In this manner the manure may be collected until the pit is filled, which may take about three months.

Too much bedding should not be supplied; otherwise the manure will be too dry and not decompose with sufficient slowness, and thus lose in value. The manure in the pit should always be thoroughly moist throughout its bulk. If the manure has an ash-colored appearance anywhere when it is being removed that is a sign that it has not decayed properly; this appearance being due to the great heat caused by the manure being too dry. If the straw, &c., supplied as bedding be long and hard, the manure will not rot properly; such litter should be cut up into short pieces. Unless the manure is well rotted, it will not be of much use to crops, as it will not act quickly. It will also make the soil too open, so that the crops thereon may suffer much from draught. The manure, if properly managed, will be of a black colour and of mellow substance, thoroughly rotted throughout so that it may almost be cut with a knife. In removing manure from the pit the unrotted portion near the surface should be placed on one side, and after the well-rotted portion has been taken out, should be put back again at the bottom of the pit, and manure may be collected again as before.

By this method of managing manure, about 5 to 7 tons of good manure may be obtained yearly for each head of cattle kept, whereas if the dung be thrown out in loose heaps in the open air, only about half a ton of very inferior manure will be obtained in the year. The only objections raised to the system are:—

(1) That it is supposed to cause unhealthiness amongst the cattle housed.

(2) That it requires a large amount of litter to be supplied.

In reference to the last, it may be noted that in some parts of South Canara the ryots take great pains to collect leaves and grass, and supply bedding to their cattle; but they remove the manure at intervals of a few days, and throw it out in a hollow place where it can be compressed by the carts travelling to and fro over it. In reference to the first objection, experience has shown that it is groundless.

If, for any reason, it is inconvenient to a ryot to collect manure in the above-mentioned manner, the following method may be adopted:—

The floor of the cattle-shed should be made smooth and compact with a gentle slope towards the back, where a small channel should be placed so that all the urine falling on the floor may be carried by the channel to a pot placed outside the shed at one end. The dung can be removed every day and thrown into a pit, the sides and bottom of which should be plastered with clay, and over which a low thatched roof has been erected. Whatever vegetable refuse is available on the farm may be thrown into the pit, and the urine collected poured over the heap daily. The whole mass of dung, urine and vegetable rubbish should be kept uniformly mixed and well trodden and pressed down so as to make the mass decay uniformly and slowly.

If the manure pit last described cannot be protected by a simple shed the heap should be covered with earth. It has in all cases been found very useful to cover manure heaps with earth, as this prevents the loss of valuable fertilising matters into the air. This practice is fully adopted in some places, *e.g.*, in Tinnevelly, with the best results. If the upper portions of a manure heap become dry, the heap should be turned over so as to mix the moisture and the drier portions together, and if there be any tendency for the heap to dry up generally, it may be watered slightly with advantage. The covering of the heaps with earth to a great extent prevents undue drying. The great aim should be to maintain the heap in a moist state, so that the whole mass may decay slowly and completely, and thus the fertilising matters of the manure may be preserved and rendered more immediately useful than as they are found naturally. —*Official Report, Madras.*

COFFEE PLANTING ONCE MORE IN CEYLON.

Old coffee planters—and there are some of them still to the front in Ceylon—will be pleased to read the particulars given in another column of the result of certain experiments carried out on old Kondesalle estate, Dumbara, with the replanting of coffee Arabica. Such fine prices are now realized for coffee—the current quotation for parchment in Colombo is R19 per bushel—that, if only a good maiden crop can be secured, it would evidently pay well to plant it in conjuction with cocoa or tea, especially in localities where the growth would be rapid. Whether there is any probability of success resulting from a clearing of coffee planted in old land may perhaps still be doubted, but, given a fairly rich soil, there must be less chance of disease in future now that so small an area is covered by coffee, and that it has almost entirely disappeared from the villages—the home of so much of the disease which once affected estates. Planted in conjuction with cocoa, however there is