

INCLOSURES.—Closely connected with the arrangement of a farm, is the consideration of *inclosures*.

It is a fact established by long and extended observation, that the most highly productive countries are always the best inclosed. Defective **inclosures** are always evidence, either that the husbandry is defective or the soil unproductive.

One cause of injury is, that the cattle cannot obtain that advantage from their pasturage when under the care of a neat-herd which they could if allowed to range uncontrolled only by the boundaries of a hedge. The neat-herd will not allow them, whilst he is awake, to approach within a certain distance of the cultivated crops ; and a still greater damage occurs by their trespasses if he is drowsy or careless..

Another benefit lost to the cultivator by the absence of hedges, is the shelter and shade which they afford, not only to cattle but to the field itself, which is a subject of additional importance in a tropical climate, where every thing to check the evaporation of moisture from the soil is desirable.

In India inclosures are generally absent ; but it will be seen from the following references that the absence of fences in Hindostan is not universal ; and from the information they give, several useful hints may be gathered by those who are willing to extend their introduction.

Dr. Tennant says **that**, about Anopsheer, he observed the fields were tolerably fenced. The strong jungle grass is plaited into webs like a sort of basket-work, and these, placed upon their edges round the field, protect the crops from almost every animal but the wild hog. It evidently resembles **the** raddle hurdling of England. :

Euphorbium tirucalli, which is common in the Madras Presidency, makes an excellent hedge, and it may be formed with very little trouble. A trench must be dug where it is intended to be, at the beginning of the rainy reason ; in this, cuttings being placed, and the earth pressed about them, they establish themselves without further trouble. No cattle will touch the leaves, and in one year it becomes a tolerable fence. In the dry soils of the **Mysore** the *aloe* (*agave vivipara*) forms a strong hedge, and thrives **admirably**.—(*Buchanan's Journ. through Mysore, &c.*, vol. i., p. 36.) The natives employ it for that purpose, as they also do the *Cesalpina lacerans*.—(*Roxb.*)

Dr. Buchanan observed that the town of **Waluru** was girted by a **hedge** of the *mimosa saponaria*, the fruit of which the natives employ when washing their hair; and its acrid leaves are employed by them in **cookery**.—(*Buchanan*, vol. i. p. 38.)

In the Cnrnatic, inclosures are evideu **tly** much more frequently adopted

than in the northern districts of Hindostan. Dr. Buchanan describes the hedges near Seringapatam as formed of *euphorbium antiquorum*, &c., but not kept in good order. After the seed has been sown, the farmers fill up the gaps in the hedge-rows with the thorny branches of the *mimosa Indica* of Lamarck.

In Mysore, south of the Cavary, as about Muluro, the fields are either separated by hedges or by leaving between them intervals, or uncultivated spaces, from four to ten feet wide, which are covered with *mimosas* or other trees. This, Dr. Buchanan states, not only adds greatly to the beauty of the country, but, preserving the moisture, probably increases its fertility.*

They are not generally, in this district, unmindful of the advantages to be derived from the shade of fences; consequently, they have the tirucalli, of which they construct hedges to grow as high as twenty feet. This causes the bottom to become thin, and to fill up such vacancies, they plant *euphorbium antiquorum* or *euphorbium tirucalli*, which flourishes under the other, and thus united they make a beautiful and excellent fence. Sufficient care is not taken to clear them of convolvoli and other rank climbing plants.—(*Buchanan's Mysore*, vol. ii. p. 137.)

About Coimbatore a kind called *Mulu-kilivay* is employed in forming hedges. It is raised by cuttings about three cubits long, a part of which is buried in the earth; these are planted at the close of March, and readily striking out, at once form a fence. It is not employed so often as the euphorbiums, because these flourish in any soil, while the *mulu-kilivay* will not.

WORKMEN.—In a country like Hindostan, where climate as much as prejudice induces its inhabitants to adopt a vegetable diet, the numbers of its population would suffer no check for many centuries to come, beyond those which are offered by the difficulties of clearing jungly ground, if it were not restrained by the indolence of the natives and the political regulations of their rulers.

These regulations (already alluded to) check the only incentive to improved agriculture—the opportunity to dispose of its products to the advantage of the producer. A consequence is, that the ryots care but

* The laws of the ancient Hindu legislators show, that hedges must have been of frequent use, no less than that their services were held in esteem, as they held it venial to allow cattle to trespass where, near a village or high-road, a field is unprotected by a hedge or other fence, and advise a hedge to be made of such height that a camel might not look over.—(*Vide Colebrooke's Digest of Hindu Law*.)

little to endeavor to raise more from their lands than is **sufficient** to sustain themselves and families, after paying the dues to the Zemindar, or to the Government under which they live. Where the necessaries for sustenance and clothing are so limited, this is very trivial. **From** calculations which I have made, and which need not be detailed, **I** conclude that the annual average produce of a Bengal biggah of land, near Calcutta, is worth 3 rupees, or about 11 rupees 4 **annas** per English acre. A calculation which sufficiently agrees with one made by Dr. **Tennant**, about forty years since, to allow them to be considered as sustaining each other. He calculated that the annual average produce, per English acre in British India, was worth $10\frac{1}{2}$ rupees. A very moderate produce, he adds, but not disproportioned **to the exertions of Indian husbandry.**
 —(*Tennant's Indian Recreations, vol. ii, p. 4.*)

In a population so **constituted** of laborers, and without any encouragement to over-production, it is not a matter **justifying** surprise that the ryots are an idle race. They can obtain all that they require with a-very little labor; and it **would** be absurd to expect that they should be unnecessarily industrious, when the result would be only to increase the rapacity and profit of those of whom they hold their lands.

If the land were cultivated to the utmost, the number of laborers **re-**quisite would be somewhat greater than is required for a similar extent of surface in England. One reason for this is, that in India the season of vegetation continuing throughout the year, the land might be occupied with an uninterrupted succession of crops.+ A second reason is, that the physical powers of the laborers are less than those who have a more bracing climate; and a third reason will obtain until **better** habits are inculcated, namely, the waste of activity and power which occurs owing to the squatting position in which they work.

About **Benares** the reaper is paid **in kind**. When **employed in cutting** the most valuable grains, wheat and barley, he has **every** twentieth sheaf. Of the coarser kinds he receives the tenth. The interests of both parties are guarded by the reaper **and** the **employer selecting a** sheaf for the former alternately.—(*Tennant.*)

* **This is not a theoretical supposition.**—If the land were duly cultivated by the application of manures, the hoe, and a rational rotation of **crops**, it might be kept **as** in China, and as in the “field gardens” of England, constantly **producing**. There would be no want of crops to effect this; the **various** species of pulse and millet will proceed through their **various** stages of growth nearly at any season. Vegetating rapidly, they would be productive even after a late harvest, which interrupts the usual course of husbandry. The oil plants, usually ripen in the cold weather, except the sesame, which is harvested **during the rains.**—(*Tennant, Ind. Rec. ii, 6.*)

The laborer of Hindostan is certainly exemplary in his contentment. Rice and barley, with several varieties of pulse, are either **separately**, or mixed, the chief sustenance of the poor. Barley is too costly to be used by them daily, and therefore **it** is usually mixed with pulse, and ground by them into flour. Grain fried in oil, ground as **required**, and made into a gruel, is their most substantial food, mixed with vegetables and spices, but not always seasoned with salt, for this is expensive.

It is only the coarser varieties of rice that are within their means of acquisition; the finer kinds and wheat, being food only for the rich, Such, observes Dr. Tennant, is the lot of millions of the most useful of mankind : their house and clothing not worth a rupee; and their highest **luxury** a mixture of grain, which they can hardly afford to season with as much salt as you may hold between the finger and thumb. In England the **poor** are discontented if they cannot get flesh meat and tea once or twice a-day; they complain clamorously, if reduced to drink water for a week. Millions in India have tasted no other beverage between infancy and the grave ; yet they never complain, because they know that complaint would be ridiculous.

Every zemindary, however small, has its blacksmith and carpenter. About **Benares**, a **sochar**, or master artisan, receives from each plough a **maund** of grain. This is **in** the nature of a retaining fee, and is paid annually, in addition to his allowance when actually employed. When at work, the person employing him pays him one **pukha**, or **great** seer of grain, daily. In addition to these remunerations, he is entitled, at each of the three annual harvests, to a sheaf of three seers, either of wheat, barley, or rice, according to the nature of the **crop**.—(*Tennant's Ind.* Rec. ii., 193.)

The workmen and artisans, to which the farmer has annually to contribute, appear in several instances very strange to those accustomed to European manners. Thus at **Benares**, every zemindary has its barber, and to him each plough pays twenty seers of grain annually. The **potter** receives from every plough three sheaves at each of the annual harvests, besides being paid for each vessel according to its size. The **chumar**, or leather-cutter, receives the same contribution as the potter. For every set of ropes for a plough he has two seers and a half of grain. The wages of a **ploughman** are five seers of grain daily; and one rupee at each of the two yearly **bulwaries** or ploughing seasons. The wages of other country laborers are five seers of **grain** per day, and the twenty-fifth sheaf during harvest. The **akeer burdialh**, or neat-herd, is a servant necessary to every **farm** : the arable lands being unenclosed, and the pasturage often lying far from the farm, they

require an attendant. He receives as wages two maunds of grain per month, and the milk of every tenth cow, or of every fifth buffalo. The extra pay for the latter animals probably arises from the additional trouble their rambling habits and obstinate nature occasion. Sometimes the common pasturage is separated from the village by a river, in which case there is no difficulty in getting the animals, especially if buffaloes, to swim across ; and the neat-herd has scarcely more trouble to effect his own passage, which he accomplishes by taking hold of the tail of one of his herd !

A farm near Seringapatam, requiring five ploughs, must have ten servants, owing to the scarcity of forage; in other districts half that number is sufficient. In harvest and seed-time additional laborers are hired, chiefly women. Fourteen oxen are also required at these seasons. Within two miles of the last-named town, Dr. Buchanan found that a farming laborer, if employed throughout the year, received ten *sultany fanams* (6s. 8½d.) per month. They live in their own huts. In harvest, the daily wages of a man are six seers of rice. A woman transplanting rice is paid daily one quarter of a *sultany fanam*, or nearly two-pence, A male day-laborer gets rather more than three-pence.

The wages are lower as the distance from the city increases ; and in distant parts is no more monthly than one *fanam* and eighty *seers* of grain, half of which must be *ragy*.*

Near Allahabad an agricultural laborer is paid from two to three rupees per month. He usually works during the morning and evening, resting during the middle of the day on account of the heat.—(*Tram Agri-Horti. Soc. of India*, vol. i., p. 16.)

A ploughman's wages in Bengal average about one rupee a month ; though in some districts they are occasionally only half that sum. This, however, is not his only remuneration ; for his task, averaging a *biggah*, is concluded by noon, and he then is occupied with the cultivation of a plot of ground for his own profit. This he rents from his employer, to whom he usually gives half the produce. The space allotted to him varies, but custom regulates it in each district. It is generally three *biggahs*. This cannot yield him a profit of more than eight rupees a year.

When the day's ploughing terminates, the draught cattle are consigned to the care of the *neat-herd*. If the herd is sufficiently large

* Buchanan's *Mysore*, vol. i., p. 127. *Ragy* or *raghee* is a kind of pulse ; the seed of the *cynosurus corcoranus*.

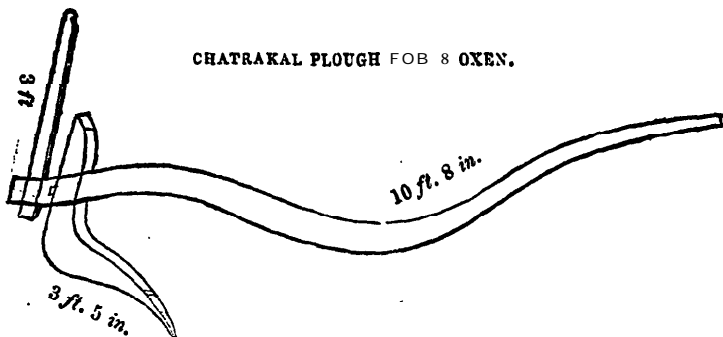
to employ one man, he is hired in Bengal for about a rupee **and a half** per month, paid partly in food and clothing. In general, one herdsman attends to the cattle of several occupiers, being paid half an **anna** per head; and as he can attend to fifty, this amounts to about as much as if he were the servant of one.

PLOUGHING.—The benefits to be obtained by ploughing are **not** confined to the mere mechanical facilities it affords for inserting the seeds or plants which are the objects of cultivation.

That its efficient performance is one of the most important of the farmer's operations, was known many centuries ago. "What is the **first** act of good **tillage**? To plough. What is the second? **To** plough. What is the third? **To** plough," are the forcible expressions of Cato Major. Later researches have shown *why* this **frequent** working of the soil is beneficial, but to obtain the full measure of good derivable **from** the operation, the ploughing ought to be deep, unless the sub-soil is bad, and the surface-soil superficial.

If the ploughing is well performed, it secures the following benefits **to the** crop :—First. It brings a fresh soil to the surface. Secondly. It ***exposes** it thoroughly to the action of the sun and atmosphere, Thirdly. It renders it more absorbent and retentive of moisture, **Fourthly**. It kills noxious insects and weeds. **Fifthly**. It facilitates the penetration of the roots,

First.—*It brings a fresh soil to the surface*, if at the drawing of each **furrow** the earth is completely turned over. The importance of this is known to every British farmer, and the cause of the practice being beneficial depends principally **upon** the fact, that a portion of this soil is brought to the surface which has been at rest for a time, **out**



of the reach of the roots of the previous crop, and, consequently, **accumulating** decomposing organic matter during a partial fallow. **To** obtain this benefit, derivable from the operation, **the ploughs of**

Hindustan are totally inefficient. They are little better than the British harrow, **and** certainly not superior to Beaton's **scarifiers**.

The natives are neither ignorant of the slight benefits produced by their superficial ploughings, or of the superior utility of deeper and better **tillage**. A striking example of this is **afforded** by the fact that, in Puraniya, and even in South Coimbatore, where the agriculture is **better** than in other parts of India, the mere pulling up by the roots of one of their crops (*holcus spicatus*) is considered a preparation for the next crop, equivalent to their ploughing, and the seed is sown without any further preparation.

The **evil** of the shallow ploughing was admitted by the native farmers of **Malabar** to Mr. Warden, a commissioner of the southern district. They said, **that** when the fields were ploughed by the **larger, and** consequently stronger cattle, the produce was double that when only the smaller oxen were employed.—(Buchanan's *India*, vol. ii., p. 380.)

Then, again, in the deep, rich, tenacious soil of the **Chatrakal** plains (**Mysore**), which, without **manure** or rest, continue to produce good crops of millet and *panicum italicum*, in constant succession, without even any attention to rotation, the **farmers** employ much heavier **ploughs, and stir** the earth deeper than is usual in India. The iron of some of the ploughs weighs as much as fourteen pounds, and they are drawn by from eight to sixteen, and even by as many as twenty-four oxen. This number is **rendered** additionally necessary by the hardness acquired by the soil, during the hot season, in which the **ploughing is** performed.

Secondly.—Ploughing **ought** to expose to the sun and atmosphere the whole texture of the soil, to a depth of at least six inches. Such exposure enables it to absorb oxygen and carbonic acid gases, and, **perhaps**, nitrogen-gases highly beneficial to the plants, to the roots of **which they are applied**.

The ploughs of the natives do this partially and imperfectly. By repeated scratching and attrition, they grub down to a depth of about five inches; but the soil which was **at the surface when** the operation **commenced**, is at the surface when the operation concludes.

Thirdly.—That ploughing, by thoroughly dividing and pulverizing the soil, renders it more absorbent and retentive of moisture, than if either left solid or in clods, is easily explained upon the principles of capillary attraction ; **and** by the fact, that air is a bad conductor of caloric (heat),

Air is one of the worst known conductors of heat ; a loose, **well-**pulverized soil, is thoroughly pervaded by air ; and, consequently, **t**

sun's rays have much less power in heating it than when its particles are in more close and complete contact, as they are previously to ploughing.

Fourthly and **Fifthly**.—That ploughing is destructive to slugs, weeds, as well as other noxious organic bodies, and **facilitates** the progress of the roots of plants through the soil.

The process performed by the Indian plough, assists the last-named progress as well as the British plough, but it is certainly not so effective in destroying insects and weeds. It does not expose them so much to the destructive action of the air and sun.

It is now time to consider more particularly the construction of the plough as it is found in various districts of Hindostan; and not one has come under my notice that deserves to be otherwise **characterised**, than as an implement most deficient in the essential qualities requisite for the purpose for which it is **designed**.

Dr. **Cary's** description of the Dinajpur plough, affords a correct **outline** of **all** which can be met with in Hindostan; for all are **specifically** alike, and differ only in minor points. The plough is constituted of four pieces. The *langal* or body, is a piece of wood forming two sides of an obtuse angled triangle, the other side being wanting, with a hole near the obtuse angle to admit a **staff of** wood or bamboo, about six feet long. This, which is really the **beam** of the plough, and to which the yoke is attached, is called the is. The ploughshare, *phal*, is a flat, lozenge-shaped plate of iron, with which the **langal** is shod to prevent its wearing.* The handle, about two feet long, is fastened to the upper extremity of the **langal**, and is perforated at a right angle by a pin, called *mut*, to be grasped by the guiding hand when the **plough** is in use.—(*Asiatic Researches*, vol.x. p. 3.) The **coulter** and breast, and any contrivance to regulate the depth to which the plough shall penetrate, are totally unknown.

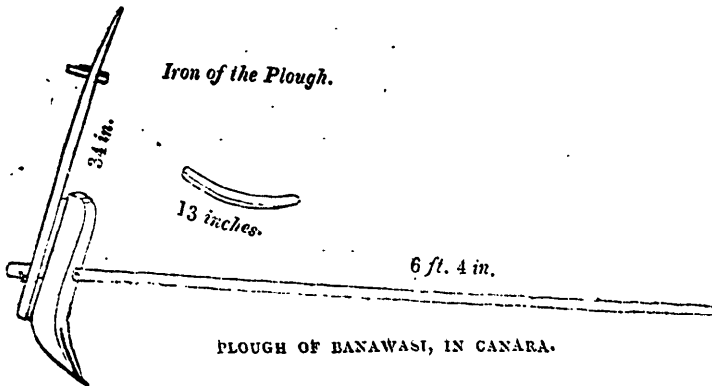
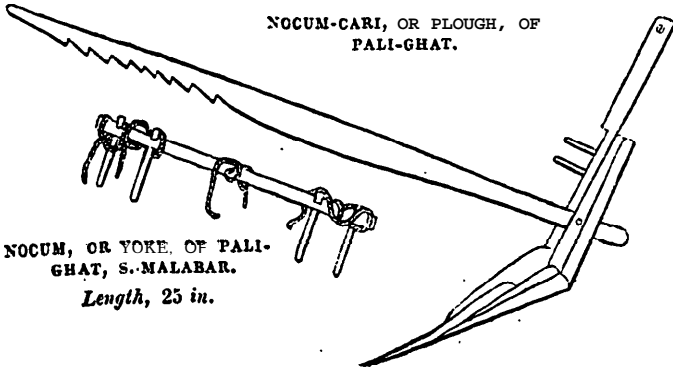
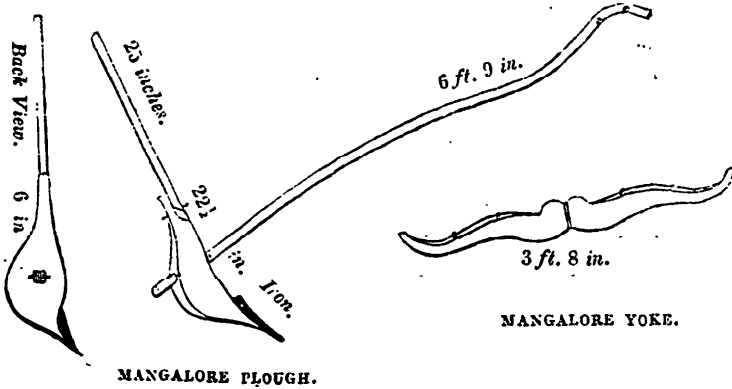
What **tillage** can be expected from such an implement which the **ploughman** can **lift** with one hand and carry to the field upon his shoulder? The surface of the light shallow soils of the upper provinces, may be easily and perhaps sufficiently stirred about with it; but the tenacious deep soils of Bengal, after repeated **scratchings** with **this** instrument, often show no more **tilth** than is raised by a slight harrowing upon a lay in **England**; and no soil can be ploughed by it to a sufficient depth.

There is one mode of ploughing, viz., whilst the soil is under water, where the Indian plough acts as well, probably, as the **British**

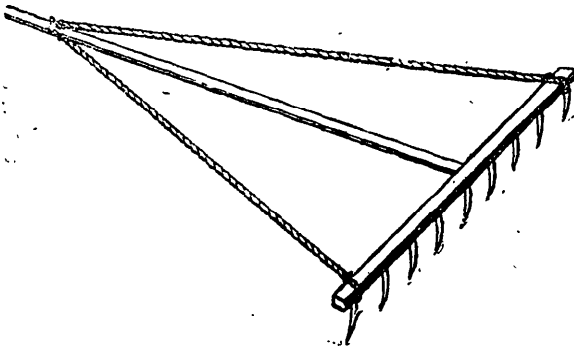
* In some parts of Dinajpur even this is wanting.—(*Buchanan's Dinajpur*, 215.)

implement would. Dr. Tennant justly observes, that the operation, then, more nearly resembles the potter preparing and setting his clay ; for it is really only making a mud by stirring and diffusing the soil through the supernatant water.—*Indian Rec.* ii. 126.

The accompanying sketches embrace, as far as I can ascertain, every



material variation in the form of the **plough** that can be met with in India. Imperfect as it is, yet the Mangalore plough was considered by one who had made very extensive personal researches, Dr. Buchanan, as neater than those which he had met with in other districts. Others have been mentioned, but neither very particularly, or with much commendation. Mr. Crawford merely **naming** the Ava plough, says that the only respectable part about it is the iron share, and this is imported **from** China. Sir J. Malcolm mentions an instrument used in **Malwa**, called the *koompuee*, which he says is a kind of rude paring plough. It is used to weed between the **furrows** (rows of the crops), and is generally drawn by **bullocks**.—(*Malcolm's Malwa Rep.* 414.) It rather seems to be a bullock hoe than a plough. The bullock hoe, or rather large rake of the following form, is used in many parts of Bengal for **thinning** the crops and weeding.



With the solitary exception of the Mangalore plough, just mentioned, I have never met with or heard of an **Indian** plough which weighed more than **from 8** to 10 lbs.

The cost of this implement is nowhere more than two rupees, and it may frequently be bought for half that sum, and even for 12 **annas**, the iron share being the only expensive' part. The plough and its team in **Bengal** are, therefore, **sufficiently** cheap ; the bullocks being worth about five or six rupees each, **and** the harness consisting merely of pieces of rope. The hire of such' an implement and its yoke of cattle is commensurately trifling, being almost universally two **annas** per day.

Having **seen** how important it is to have the operation performed effectively, and how imperfect an implement for the purpose is the plough of the natives, a very weighty consideration is, how it may be