

ASIATIC RESEARCHES;

OR,

TRANSACTIONS

OF THE

SOCIETY INSTITUTED IN BENGAL,

For inquiring into the

History and Antiquities;

THE

ARTS, SCIENCES, AND LITERATURE,

OF

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I TAKE this opportunity to correct two passages in former Essays; one in the IVth Vol. of the Asiatic Researches, p. 382; and the second in the first part of my Essay on the Sacred Isles in the West, p. 302.

In the latter, I said that the famous PR'A'N-PURÍ went no further than *El-Catif* and *Baharcin*, in his way to *Egypt*. But I was mistaken; for he even attempted to go up the *Tigris*, and went even as far as *Moc'hó*.

In the former, I asserted that by the *Surya-much'hí-gangá*, PR'A'N-PURÍ meant the *Volga*; but I was equally mistaken; for, from his narrative, he certainly understood the *Shát-al-Arab*, or the united stream of the *Tigris* and *Euphrates*.

I seldom saw PR'A'N-PURÍ, and he hardly condescended to answer my inquiries: hence the information which he communicated, was vague and desultory. I did not advert then to what Mr. DUNCAN has said on the subject in the Vth Vol. of the Asiatic Researches.

F. WILFORD.

BENARES, Feb. 20th, 1804.

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TRANSACTIONS
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I.

*Remarks on the State of AGRICULTURE, in the District
of DINA'JPUR.*

BY W. CAREY.

THE soil of the district of *Dinájpur* is considerably diversified. In the southern part the ground rises in gentle acclivities, which run from north to south, and are divided from each other by vallies running between them; the whole resembling large waves, or rather the appearance of the sea when there is a great swell. The width of each valley is two or three miles, and that of the elevations about the same. Each valley is watered with one or two little streams, as the *Tanguam*, the *Párnabhavá*, and several others, which empty themselves either into the *Mahánandá* or the *Ganges*. These small rivers swell in the rainy season to large lakes, fifty or sixty miles in length, and two or three in breadth, overflowing all the low lands, which are dry in the cold sea-

son. These vallies, at the distance of fifty miles from the *Ganges*, are scarcely higher than the surface of its waters; when therefore that river is swollen by the periodical rains, the waters of the vallies are not only prevented from running off, but are so much increased as to be navigable for vessels of very considerable burden.

The soil of the elevated portions of land is in general a stiff clay, in some places black, and somewhat porous, in others white and tenacious. The soil of some of the vallies resembles that of the elevated parts, and that of others is rich and loamy, with substratum, at a greater or lesser depth, of the same kind of clay which forms the higher grounds. These low lands are for the most part covered with long grass of different sorts, and afford pasture to a great number of buffaloes and to large herds of other cattle.

The northern parts of the district are more level than the southern ones, have a loamy soil, and are well cultivated. Some tracts of clay land are, however, to be found, and it is probable that clay is the substratum of the whole.

The higher lands in the southern parts of the district are principally inhabited by *Musulmans*, and the vallies by *Hindus*. The mode of cultivation and the productions of the elevated parts, differ widely from those of the vallies, so that those who have been accustomed to one of these sorts of land only, can seldom manage the other to advantage.

On the higher clay lands very little besides rice is produced, and, except in very small spots which

are well manured, only one crop in a year. The loamy vallies which do not lie so low as to endanger the inundating of the crop, produce, not only rice, but also a good crop of mustard, or pulse in the cold season. The land which produces two crops in a year is called *Pállí*, and is usually let at a rupee and half per Bighá. That which produces only one crop is called *Khár*, and is usually let at twelve annas per Bighá.

The people of the district of *Dinájpur* are, in general, extremely poor, and their farming utensils are therefore proportionably simple and wretched. A plough drawn by two bullocks, serves to prepare the soil. The plough is composed of four pieces; viz. the *Lángal* or body of the plough, which 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, called the *Is*. This staff may be called the beam of the plough, and is the part to which the bullocks are yoked, going between them and resting on the yoke by which they are coupled. The ploughshare (*Phál*) is a flat plate of iron, nearly of a lozenge shape, which is fastened to the under part of the *Lángal*, to prevent its being worn by the soil. The handle is a piece of wood, or bamboo, about two feet long, fastened to the upper extremity of the *Lángal*, and furnished, at a small distance from its upper end, with a pin about six inches long, called the *Mut*, to assist the hand in guiding the plough.

The oxen draw double, or side by side, being coupled together with the *Juál*, or yoke, which passes over the necks of both of them at once. The lower edge, which lies on the necks of the cattle,

is straight. The upper edge has two elevations, one over the neck of each ox, but is cut down at the middle and at each end, so as to remain about two inches deep. Four bamboo pins are passed through the yoke, one at each end, and two in the middle, which, descending on each side the animal's neck, are connected by a cord under its throat. The beam of the plough rests on the middle of the yoke, and is fastened to it by a cord.

Only one person attends a plough, holding the handle in one hand, and occasionally pulling the tails of the oxen with the other, to guide them, or striking them with a stick to quicken their pace. A pair of oxen may be purchased for six or eight rupees, a plough for five annas, and a yoke for four. An instrument called *Mai* is drawn over the field after it has been sufficiently ploughed. This may be called the harrow of the *Hindus*. It is made of bamboo, in the form of a ladder, and is four or five feet in length. A cord, fastened to the centre of this rude instrument, is connected with the centre of the yoke, and the driver stands on the harrow, assisting its operation by his weight, and guiding the cattle with his hands. Land pulverized and laid smooth with the *Mai* retains its moisture, and is fit to receive seed in dry weather, several days longer than it would be if this was neglected. The *Hindus* call the operation, when performed for that purpose, *Rasbándhan*, or the confining of the moisture.

In dry seasons it is often necessary to water the fields. For this purpose an instrument called a *Jánt* is used. The *Jánt* is a trough of light wood, from twelve to sixteen feet long, somewhat curved to admit a greater depth in the middle, the bottom is five or six

inches wide, the height of the sides in the middle part is six or eight inches, gradually decreasing towards the ends, one of which is excavated to a point, to prevent the water from running back and being lost. When this instrument is used, it is slung to three bamboos placed erect and crossing each other in the centre; a long and heavy bamboo, loaded at the further end with a large ball of earth, is then fastened to the end which is to be plunged into the water, and thrown over the three erect bamboos, resting on the top of them. A person standing on a stage, even with, or somewhat below the surface of the water of a pond, river, &c. then plunges the end of the *Jánt* into the water, with his foot, by which means it is filled. The weight at the end of the long bamboo assists him in raising it out of the water, and throwing its contents into a small reservoir, or pit, from which it is conveyed into the fields, by channels cut for that purpose. Two feet, or two and a half, is the height to which water can be thrown to effect by this machine; when the height is greater, two, three, or more *Jánt*s are used, and in that case the water is thrown into small reservoirs or pits, at a proper height above each other, and sufficiently deep to admit the next *Jánt* to be plunged deep enough to fill it. Water is by this means sometimes conveyed to the distance of a mile or more on every side of a large tank or reservoir of water.* I have seen fifty or sixty *Jánt*s at one time, in a large receptacle of

* *Qu.* Is not this the watering with the foot mentioned in Scripture, Deut. xi. ver. 10, and may not there be an allusion to the facility with which this water is directed at the will of the husbandman, in Prov. xxi. ver. 11

water called *Mahípál-dighí*, about six coss from *Dinájpur*.

To remove earth from one place to another, a yoke of bamboo is furnished with two appendages, called *Bhárua*, somewhat resembling a coarse sieve, the outside composed of split bamboos wattled or twisted over each other, and the middle part of twine, woven somewhat like the bottom of a sieve. These vessels are about a foot and a half in diameter; when loaded with earth, or any other substance, they are carried with the yoke. The yoke lies across one shoulder, one weight hanging before and the other behind, and is occasionally shifted from one shoulder to the other.

The *Kodáli*, or digging-hoe is, in this district, set much more towards the earth than in the southern parts of *Bengal*, forming an angle of about six degrees with the handle, whereas about *Calcutta* the angle is not more than thirty degrees. This instrument is used to dig the earth, or to grub up roots, and destroy the coarse grass, when land is to be first broken up. The *Kodáli* is a very useful instrument, answering the purpose of both spade and hoe.

The last instrument of husbandry which I shall mention is the *Kastyá* or *Indian* sickle. The blade is curved, and edge-toothed like a sickle, but it is much smaller and more rude than the *European* one. The length of the blade is about eight or ten inches, and its greatest width one and a half. It is fixed in a rude handle; and is used to cut corn, grass, or even brushwood upon occasion, being to the *Hindu* a very useful instrument, although a *European* la-

bourer would scarcely pick one of them up if he saw it lie in the road.

Rice is the staple production of the district. Four kinds (including several varieties) are principally cultivated; viz. the Bhadui, so called from its ripening in the month Bhádár, the Hemat so denominated from its ripening in the cold season, the Buni, and Bohara.

The first of these is chiefly, though not exclusively, cultivated on the lower, and loamy lands; on these soils it is constantly sown by broad cast, in March, April or May, and the quantity sown depends upon the quantity of rain which falls in those months. The season of cultivation is sometimes extended near a month longer than it would otherwise be, by transplanting the rice, while young, into the fields, or the more elevated lands. When it is sown early on the higher lands, a second crop is sometimes produced upon the same spot; but, that which is sown late in the season, ripening proportionably late, so much interferes with the planting of the Hemat rice, that the latter crop is often scarcely worth the gathering.

This rice, when sown on the lower and loamy soils, requires weeding. A large quantity of weeds, particularly *panicum ciliare*, often springs up among it: these weeds, if not extirpated, infallibly ruin the crop. It is also necessary to open the soil, after a heavy shower, by drawing a large drag over it; but no other attention is requisite, till the harvest, when it is cut and housed in the usual way.

The Hemat rice is usually cultivated on the higher and strong lands, a stiff soil being better calculated to

retain the water after the end of the periodical rains. This rice is usually sown at the end of May, or the beginning of June, in small beds, as thick as it can possibly grow. The plants come up in three or four days after the seed is sown, till which time the ground is kept barely moist: after the plants appear it should be kept quite moist, but not flooded. As soon as the rains commence and the earth is well watered, this rice is planted out in beds, (or compartments) each of which is surrounded with a balk, or border, about ten inches high, and a foot wide, to prevent the water from running off.

When a field is first formed, these mounds or borders are thrown up with the *Kodáli*. The earth is then repeatedly ploughed, till it is completely mixed with the water, and reduced to a soft mud. Five, six, and sometimes eight ploughings are necessary, to destroy the weeds and completely dissolve the clods, after which it is smoothed by drawing the *Maí* over it, till the surface is so level that the water stands at an equal height in every part. When the field is thus prepared, the young plants are transplanted from the seed-bed by the hand; eight or ten of them being usually planted in one hole. These holes, which are about nine inches asunder, are made by forcing the hand with the young plant into the mud; the plants are left there in an erect position, after which the admission of water settles the roots. When the whole spot is planted, water is admitted from a neighbouring compartment, or from a ditch, a trench or some other reservoir, and if possible constantly kept at the height of at least three (or four) inches. If there be too much water in the field, it is allowed to run off, by cutting a passage for it through the border, and when a sufficient quantity

is run off, the rest is retained, by shutting the passage with a clod of soft earth. This crop requires no weeding, or at most but a very trifling one, the water being sufficient to destroy the noxious weeds. If the season be very dry, the field must be supplied with water from some neighbouring pond or reservoir, as the only means of preserving the crop: attention to this is peculiarly necessary while the plants are young, for if the earth be permitted to grow hard, the plants seldom thrive afterwards; when they have acquired a size sufficient to overshadow the ground, the moisture is retained for a long time, and the crop suffers less, but water is absolutely necessary to the perfection of a crop of rice. In November this crop begins to ripen, and the harvest is usually finished by the end of December. As there is little fear of rain at this season, the crop is housed and stacked, without any loss or difficulty.

The Buná rice is usually sown in April or May, in low lands, where a flood of several feet deep may be expected; if the floods come suddenly while the plants are young, the water rises above them and the crop is lost; but if the plants are strong and the water increases gradually, the rice will grow as fast as the water rises. This crop will answer tolerably well, if the water be four, six, or even eight feet in depth, the stalks sometimes acquiring the length of ten or even fifteen feet; but as they are weak and lie in an oblique position, they do not easily rise above eight feet of water. This crop ripens in November. The upper part of the plants on one man's land being drawn by a gentle stream, or by some other cause, often fall on his neighbour's field and occasion quarrels at the time of reaping.

The Bohara rice is sown in October or November like the Hemat, and about January planted at the bottoms of tanks, or pits, or on very low ground where it can be supplied with water. It is treated in every respect like the Hemat, and ripens in April or May. This is an excellent sort of rice, but the quantity cultivated is necessarily small.

The next article of cultivation is indigo, a plant for which many parts of this district are improper, as it will not grow on the white clay lands called Balka, is sparingly produced on the black or red clays, and as most of the soft and loamy parts lie so low as to be subject to sudden inundations, which infallibly destroy the crop.

The proper season for sowing indigo is in April and May. Some have sown it at the end of September or the beginning of October, and others in any month from October to March. That sown in September, or October, or even in November, will frequently produce a crop, if the land be not low and damp. It is better to sow on low damp soils, in December, January and February, when the season will soon become warm enough to obviate the danger arising from the soil. Some have sown a winter crop with this indigo, which as it affords the young plants a shelter in the cold season, may be esteemed a good method. Mustard, ripening very early, is the most improper for this purpose, because it leaves the indigo exposed at the very season in which it requires shelter. The young plants, at this season of the year, are often greatly injured by the treading of cattle; and the crop is seldom so good as that which is sown in the proper season. If the season be favourable, and the whole crop be sown in March,

April or May, (for which repeated rain is absolutely necessary,) and be weeded before the periodical rains set in, an abundant crop may be expected. Indigo sown in June seldom repays the labour of the husbandman, the rains, then setting in, usually injure the plant while young, or produce weeds in such abundance, that it is choked by them, and generally perishes.

The present method of cultivating indigo is subject to many inconveniences, and therefore liable to many objections; but as the whole business is conducted by giving advances of money to the Ryots, previously to their sowing the seed, and by receiving the produce at a certain number of bundles of a given measure for a rupee, and as many of them scarcely ever intend to fulfil their engagements, the application of a remedy would be difficult, especially as the devising of it must depend upon experiments, to the making of which the poverty and prejudices of the cultivators would prove an almost invincible obstacle.

Corchorus olitorius, *Corchorus capsularis*, and *Crotalaria juncea* are sown in April, May, or June. The fibres of these plants are much used for cordage, and for making sackcloth, and are very valuable for these purposes. The *Æschynomene cannabina*, is sometimes, though but seldom, sown in this district, but is more abundantly cultivated in the southern parts of Bengal. The fibre of this plant is less valuable than that of the *Corchorus*. There are two varieties of the *Crotalaria juncea*; one, sown at this season, often grows ten or twelve feet high; the other variety is sown in October, and rises to the height of four or five feet.

After the earth is properly ploughed, cleansed, and pulverized, the seeds of these plants are sown very thickly. The natives say that they should be sown so close together that a serpent cannot creep between them. This prevents the plants from throwing out blanches, which would be highly injurious to the fibre.

As the growth of these plants is extremely rapid, the crops suffer but little from weeds; if the weeds however should be numerous, they must be extirpated by the hand.

When the Sana* has done flowering, and the seed vessels have nearly attained their full size, sometime before the seeds ripen, it is cut down, and tied in small bundles, each containing ten or a dozen plants. The bundles are then set upright in water (about a foot or a foot and a half of the lower part of the stalk being immersed) and continue in that situation one day; by this means the upper, and comparatively tender, part of the stalk is somewhat dried. This occasions a greater similarity in the quality of the fibre taken from different parts of the same plant.

After the Sana has thus stood erect for one day, it is steeped in a pond, or some other receptacle of water, to promote the separation of the fibre from the stalk. This process is as follows: a number of the small bundles abovementioned are laid one upon another, so as to form a heap five or six feet wide, on each side of which three or four stakes are previously set, to prevent its falling down. A quantity of cow-dung is then spread over the heap, about two

* *Crotalaria juncea*.

or three inches in thickness; upon this a layer of straw of about a foot and a half, and over the whole a quantity of earth sufficient to sink the heap till the upper part is five or six inches below the surface of the water. In two days and a half, or three days at farthest, the putrid fermentation is carried to a sufficient extent.

The Sana is then taken out, and the fibre stripped from the stalk in the following manner. A man standing up to his knees in the water, takes a few of the stalks, and, having broken them about a foot from the lower end, holds them with the large ends from him, and strikes them on the surface of the water, till the broken pieces are separated and fall off. Then turning them, he takes hold of the fibres which are freed from the broken pieces, and beats the small ends, in the same manner, on the water; till the fibre is entirely separated from the stalks; a few strokes are sufficient, and by a few more it is cleansed from any mucus, or fragments of stalks which may adhere to it. It is then dried and packed up for the market.

The chief thing to be attended to in this process, is the proper regulation of the putrid fermentation; if this be not carried to a sufficient extent, the fibre will not separate, and if carried too far, the quality is injured. The most experienced natives account two days and a half a proper medium. The fermentation is doubtless quickened or retarded by the state of the weather, but the difference occasioned thereby is so small, that the *Bengal* farmers entirely disregard it.

The *Crotalaria*, cultivated in the neighbourhood of

Calcutta, and probably that cultivated in all the southern parts of *Bengal*, is accounted much inferior to that cultivated in the northern parts of the country. The natives attribute this to the difference of soil. This may have some effect, but it is probable that the variety cultivated in the south, is inferior to that cultivated in the north; as, even there, the large variety is preferred to the smaller one.

Phaseolus Mungo is usually sown in small fields about the beginning of June, and generally produces a good crop; it will thrive only on high and good land. *Phaseolus radiatus* is sown in July and August, on land where another crop has failed, and, not unfrequently, on old sward, or on land which could not be regularly cultivated. The seed is scattered over the land, often without any ploughing at all, and at most the plough is only drawn over the surface so as to make a few slight scratches. This crop ripens in October. It is obvious that much produce is not to be expected from such a mode of culture. The crops are indeed light, but are often sufficient to pay the rent of the land. A more rational method of cultivation would doubtless be far more productive.

The low and loamy soils, after having produced a crop of early rice, are usually sown with the seeds of some other plant, in October or November. The mode of culture for all the cold season crops is nearly alike. The natives seldom begin to sow till about the full moon in October, supposing that the soil possesses a pernicious quality, which burns up the young plants, till the cold season is well set in. Indeed, before that time, the quantity of moisture in the soil is too great, and the heat of the season un-

friendly to [these productions; so that though the plants will come up, they are yellow and sickly, and either soon perish, or continue small, stunted, and unproductive.

Mustard seed is sown in great quantities at this season. Three kinds are usually cultivated; viz. Surshapa,* *vulg.* Sursha, Raya,† and Sheta Sursha.‡ The first is the most esteemed, though the other two kinds are as productive, and perhaps more so. The *Sinapis dichotoma* rises about two or three feet in height, flowers in the latter end of November, or the beginning of December, and is usually ripe in January. *S. ramosa* grows sometimes five or six feet high. It flowers in the end of December, or in January, and ripens in February. *S. glauca* grows two or three feet high, and ripens in February. This kind, having a strong and disagreeable smell, is less valued than the other sorts. When the crops of mustard are ripe, the plants are carefully pulled up by the hand, and carried to a place in the field, smoothed and prepared for the purpose, where it is soon after thrashed and winnowed.

Flax,§ though abundantly cultivated in the central parts of *Bengal*, for its use in making oil, is but little cultivated in this district. The natives know nothing of the use of its fibre to make thread. The oil-men usually mix the linseed with a quantity of mustard seed, to promote the expression of the oil. This so injures its quality, that *Indian* linseed oil is unfit for painting, or the other useful purposes to which it is applied in *Europe*.

* *Sinapis dichotoma*.

† *S. ramosa*.

‡ *S. glauca*.

§ *Linum usitatissimum*.

Many parts of this district are very proper for the cultivation of wheat and barley, notwithstanding which, very little of either is sown. The kind of wheat found in these parts is bad, the flour produced therefrom is of a very dark colour, and consequently finds no market among *Europeans*. The native merchants on this account make no advances for it, and this want of a market is the reason alleged why it is not cultivated to a greater extent. For the purpose of making a trial I sowed *Patna* wheat, on a large quantity of land, in the year 1798; the flour produced from which was of a very good quality,

Several kinds of pulse are sown at the commencement of the cold season, the principal of which are Kesari,* Mashuri,† and Bût.‡ The seeds of the first of these kinds are sometimes scattered among the stubble of the Buna rice, and produce a good crop without further trouble, but the most usual way is to sow it on land previously well ploughed and cleansed, in the same manner as for the other cold season crops.

Tobacco is cultivated to a considerable extent on low and loamy land. The seeds are sown on a small plat or seed bed, soon after the conclusion of the rains, where they are shaded, and watered, if necessary, till they are large enough to be transplanted into the field. The land for tobacco must be well ploughed, and manured, after which the young plants are transplanted in rows, much in the manner that cabbages are planted in *England*, and at the same distance. The young plants require continual attention, the ground between them must be

* *Lathyrus sativa.*

† *Ervum lens.*

‡ *Cicer arietinum.*

repeatedly loosened, and the earth drawn to the roots, till they have acquired a sufficient growth: they are then cut and dried for use.

The egg plant,* and several species of capsicum, are planted at the same time, and in exactly the same manner, as tobacco. The fruit of the egg plant is much used all over *India*, as an article of food, as is the capsicum to give a pungent taste to several *Indian* dishes. I have not observed that these plants are planted in this district at any time except the commencement of the cold season, and there is reason to suppose that they would not succeed if they were; though in the southern parts of *Bengal*, they prosper very well when planted at the commencement of the rainy season. Several other plants are cultivated as articles of food, some to a greater and others to a less extent. The cucurbitaceous plants are often sown in the fields, and the advantage of cultivating them is considerable. The sorts most cultivated are cucumbers of two sorts, the one sown in April and yielding fruit through the rainy season, and the other sown from November to February, and yielding fruit till the rainy season sets in. Karaila, † Terbúz, ‡ Dúdh Kushí, § Jhinga, ¶ Taroi, ¶¶ Kankrol, ** Láú, †† Kaddú †† and the Konhra, or Pumpkin. §§ The three last of these are suffered to run over the houses, and sometimes on a bamboo stage, and produce fruit sufficient for the expenditure of the cultivator, besides furnishing a large quantity for the markets.

* *Solanum Melongena.*

† *Cucurbita citrullus.*

‡ *Cucumis pentangulus.*

** *Momordica mixta.*

‡‡ *Cucurbita alba.*

† *Momordica carantia.*

§ *Trichosanthes anguina.*

¶ *Cucumis acutangulus.*

¶¶ *Cucurbita lagenaria.*

§§ *Cucurbita pepo.*

The sweet potatoe* is planted at different seasons in different parts of *Bengal*, but in this district it is planted at the beginning of October. The ground is previously ploughed to as great a depth as possible, and then cuttings, taken from a small spot reserved for that purpose, are planted; these cuttings soon take root, and afterwards require no further care, till the roots are fit to be taken up, which begins to be the case at the end of December, and continues till May, during which time the produce is dug up and carried to market as it suits the convenience of the cultivator. Another variety, of a white colour, which has very little sweetness, and a small species of yam, † the root of which is about the size of a goose's egg, are cultivated in the more northern parts of the district. The cuttings of the plants of the *convolvulus*, and the small roots of the yam, are planted in April or May, and the produce brought to market in October or November.

Three varieties of the *Arum esculentum*, (Cachú of the *Hindus*;) are usually planted in March or April. The cultivation of these roots, occupies a considerable portion of the soil, and the produce is as important as potatoes to the people of *England*. The offsets from the root are planted in rows, about a foot and a half or two feet asunder, and as the plant increases in size, are earthed up as potatoes are in *Europe*. The periodical rains being ended, the leaves die away; after which, from November to March, the roots are taken up, and carried to market, as suits the convenience of the cultivator. These roots abound with a farinaceous substance, or rather with

* *Convolvulus batatas*.

† *Dioscorea*.

a viscous, starchy substance, and are esteemed very nutritive. The *Mán Cachú*,* and the *Ol*,† are cultivated in small spots. The root of the first of these is often two or three feet long, and nine inches or a foot in diameter. It is necessary to lay this root to dry for two months or more, otherwise it is too acrid to be eaten; after this it is very wholesome, though not very palatable. As all the sorts of *Cachú* will keep for almost any length of time, it might be worth attention as an article of provision for sea voyages.

In shady situations, where the soil is rich and loamy, ginger and turmeric flourish. The offsets are planted at the same time with, and the whole culture is exactly the same as that observed for the arum. The leaves die off, like those of arum, soon after the rains, and the roots are fit to be taken up in January. The turmeric is very deficient in colour, and the ginger less pungent, if taken up too soon. The farmers therefore let it remain in the ground till the leaves are entirely dried up. Ginger is usually sold green, and only a small proportion dried for foreign market or home consumption. After the roots of the turmeric have been well cleansed and picked, they are boiled over a fire made with the decayed leaves of the plant, (the natives supposing such a fire to have a peculiar kind of virtue,) after which they are well dried in the sun, and reduced to powder by the *Pedal*, or by the wooden mortar and pestle. In this state they are usually carried to market. The roots are sold likewise before they are pulverized.

* *A. Campanulatum.*

† *Arum macrohizon.*

On moderately high spots, where the soil is good, the sugar-cane is planted in February and March. The spot designed for sugar-canes is usually surrounded with a ditch, the earth dug from which is heaped up round the field, in the manner of a wall, and serves to defend it from cattle. After the spot has been well ploughed, or dug up with the Kodali, cuttings of ripe canes, consisting of about three joints, are planted somewhat slanting, in rows; about two feet, or at most three feet distance, and about a foot asunder in the rows. The fields must be often watered and cleansed from weeds. When the canes are about four feet high, they are tied in bunches, about three or four stalks forming a bunch: this permits the air to circulate among them, and facilitates their ripening. The canes, when ripe, are cut, and either carried to the mill or to the market.

The cultivation of the plantain is a profitable branch of husbandry, requiring but little labour, and making a certain return. Spots near to the habitation are chosen for this purpose, to guard against the depredations of thieves. The young plants or suckers are taken from old plantations, and planted at about six or eight feet distance each way. They may be planted at any time of the year, but May or October is usually chosen. The root is all cut off previously to planting, except a small part with a few fibres. The ground is ploughed, either before or after planting, as it suits the convenience of the farmer; and a crop of some other plant is advantageously cultivated on it, the first year. In the second year the trees produce fruit, and continue to do so for some years; each clump will produce about two bunches in a year; It is necessary to plant a new field at the end of three or four years; because, when

ny,* the Sattin-wood,† the Chakrási,‡ the Tuna,|| and the Sirisha,§ should be principally chosen. The planting of these trees single, at the distance of a furlong from each other, would do no injury to the crops of corn, but would, by cooling the atmosphere, rather be advantageous. In many places, spots now unproductive, would be improved by clumps or small plantations of timber, under which ginger and and turmeric might be cultivated to great advantage.

In some situations Sál,¶ Pitsál,** Jaral,†† and some other sorts of less note would prosper.

Indeed the improvements that might be made in this country by the planting of timber, can scarcely be calculated. Teak,‡‡ that most useful wood, is at present brought from the *Burman* dominions; though it would grow in any part of *Bengal*, and perhaps in any part of *Hindustan*. It appears, from the annals of the National Museum of Natural History, that the *French* naturalists have begun to turn their attention to the culture of this valuable tree, as an object of national utility. This will be found impracticable in *France*, but may perhaps be attempted somewhere else. To *England*, the first commercial country in the world, its importance must be obvious, and the further encouragement ||| of the culture of it in this country, will eventually furnish a supply of excellent timber for ship building and various other

* *Swietenia Mahoganá.*

† *Swietenia chloroxylon.*

‡ *Swietenia Chakrasa.*

|| *Cedrela tóna.*

§ *Mimosa Secreca.*

¶ *Shorea robusta.*

** The genus of tree is not yet determined.

†† *Lagerstromia flos reginæ.*

‡‡ *Tectona grandis.*

||| The cultivation of Teak has been encouraged by Government.

important purposes, and obviate all apprehensions of the failure of the market where it is purchased, or of the destruction of the forests which have hitherto supplied it.

Most of the Palms, though useless as timber, deserve the attention of the agriculturist. The Sago-tree* would grow in all the high parts, and the Date-tree,† planted close, would greatly improve many spots now wholly unproductive. The juice of this tree is manufactured into sugar, in some parts of *Bengal*; and is highly valuable for that and other purposes. It is common to let a tree of this kind for two annas a year. Two hundred of these trees might be planted on a Bighá, which lets for a rupee and a half; this would be productive of a large income, after the first eight or ten years.

Few attempts have yet been made to improve orchards. The Mango, and other fruit trees, are often planted so close as to choke each other, and but little regard is paid by the planter to the quality of the fruit. Scarcely any attempt has been made to naturalize foreign fruits; even the Orange tree is almost a stranger to several parts of *Bengal*, though some late experiments prove that it might be introduced with success. The laudable attempts made by several *Europeans* excepted, the improving of fruits, by grafting, or by raising improved varieties from seed, has scarcely been attempted. In short, the fruits of *Hindustan* are not far removed from a state of nature.

* *Saguerus Rumphii*.

† *Phœnix Silvestris*.

The remedy for these evils is obvious to every one, and the application of it would fully reward any person who would engage heartily in it.

In this district several obstacles to agriculture present themselves to the farmer. Large numbers of wild buffaloes and hogs infest the fields, and make it necessary for the farmer to watch his crop, from the time it appears above ground, till the harvest is gathered in: as this watching is impracticable beyond a certain extent, is attended with much danger, and often ineffectual, the cultivation carried on by an individual must be proportionably limited.

The inundations which are occasioned by the sudden overflowing of the rivers, frequently destroy the crop through a large extent of country, or so much injure it, that by this alone, the laborious husbandman is often so reduced in his circumstances, as to be unable, or so discouraged as to be afraid, to carry on the cultivation of the soil with any degree of spirit. The beasts might be destroyed, or their ravages prevented, in various ways; but it is difficult to provide sufficiently against the effects of inundations.

Perhaps the encouragement of cold season crops would be the best remedy for both: for the long grass being destroyed by the cultivation of the low lands, the wild animals would find no shelter, and indeed no sustenance, when the crop was off, which might occasion them to desert the country, and the cold season crop, though often less valuable than a crop of rice, might prove a remuneration for the labours of the cultivator, and by some improvements might be brought to such a state as to become a source of considerable profit.

Though these remarks relate chiefly to the district of *Dinajpur*, yet it is obvious that many of them will equally apply to the other parts of *Bengal*.

The improvement of live stock, and introduction of dairies, the fencing and manuring of land, the introduction of wheel carriages, and a number of improvements of a similar kind, have not been hinted at, because the present state of society seems to render them to a great degree impracticable. Yet the rapid progress of agricultural improvements in *England* encourages the hope, that a gradual improvement may also be effected in *Hindustan*.

REFERENCES TO THE FIGURES.

PLATE I.

Fig. 1.—The Plough.

- a.* The *Lángala*, or body of the plough.
- b.* The *Is'*, or beam.
- c.* The *Phála*, or share.
- d.* The share, fixed on the plough.
- e.* The handle.
- f.* The *Moot*, or peg, to assist in holding the plough.

Fig. 2.—The Jooal, Beng, or Yoke. (Sans. Yuga.)

a. The under edge, which rests on the neck of the bullock.

b. b. The elevations on the upper part.

c. c. c. c. The pins, by which it is fastened to the neck of the ox.

Fig. 3.—The Māi, or harrow. (Sans. Loṣṭbhedhaná.)

Fig. 4.—The Jánt, slung for raising water.

a. The Jánt.

b. The end, excavated to a point.

c. c. c. The bamboo to which it is slung.

d. The bamboo, loaded at one end, to assist in raising the end *b* out of the water.

e. A man working it.

f. The reservoir, or channel, into which the water is thrown.

Fig. 5.—The Bharuá.

a. Bank, or yoke.

b. b. The Shikya, or string by which the weight is suspended.

c. c. The receptacles, in which the earth or other substance is carried.

Fig. 6.—The Kodáli, or digging-hoe.

Fig. 7.—The Kastya, or sickle.

