

improved; and this important object has not been neglected. Experiments have been repeatedly made to employ the English plough in Indian agriculture, and on an extensive scale, by Mr. David Scott, at Goruckpore. They have all brought conviction to the employers, that they are not suited to the system of Indian cultivation.

There can be no rational doubt that as long as the Indian farms are so small, the cattle so diminutive (about three cwt. each), and the **ryots** so poor, that the English plough cannot be advantageously introduced. But it is, at the same time, equally certain, that as the objects to be attained by ploughing are the same, whether performed in the fields of Great Britain or in those of **Hindostan**, the English plough is **better** suited for attaining those objects than the implement which is used for the same purposes in India.

Mr. Cahill introduced, at Tirhoot, an implement which **he** called a plough, but which evidently was similar to the **scarifiers** employed in England by General **Beatson**. He described it as having six shares, each nine inches broad, attached to a frame upon four **wheels**, and drawn by four bullocks.

With this implement Mr. Cahill got over five acres a day, a task that would have required 30 bullocks with the ordinary Indian **ploughs**.— (*Trans. Agri-Hort. Soc. of India, i., 20.*)

Of the utility of such an instrument there is little room for doubt, but it is certainly more suited for paring off, and destroying weeds or grass, than to be commended as an improvement of the **Indian plough**.

Still more **recently** an American plough has been introduced into the Bombay and Madras Presidencies. It was manufactured at the **Porto Novo** Iron Works, near **Pondicherry**. It is thought that this plough will prove of much benefit to the Indian agriculture. The superiority of its performance over the ordinary plough in use, in that part of India, was so manifest in almost all instances to the native cultivators, before whom it was tried, that applications were made by several native gentlemen, **who possess estates** in the Madras territories for a supply of these ploughs, for the purpose of distribution among their tenants.

**The weight** \*of the cast and wrought iron-work of one of these ploughs is about sixty pounds, and they were supplied at **Porto Novo** for ten rupees, or about one pound each. Mr. Heath stated, that they were only suitable for dry grain soils, and not for ploughing rice (flooded) land. In light soil, they can be worked by a pair of bullocks or buffaloes; but when the cattle are small, two pairs will be required.

With two pairs of bullocks, **one** of these **ploughs** will do more work in turning up the soil in an efficient manner, than double the number of cattle could **do** in the same time with the native **plough**.—(*Trans. of Committee of Agri.<sup>s</sup> Royal Asiat. Society, p. 71.*)

The heavy weight of this plough, requiring for its useful employment more, or superior cattle, is at present an effectual hindrance to its general introduction. Mr. Harris tried it in **the** vicinity of Calcutta, and found that though two buffaloes mastered it effectually, yet **two** Bengalee bullocks would only draw it a few furrows and then lie down. Four of them would manage the plough well; but then the natives are too poor to employ so many, and the necessary drivers. Mr. Harris found the 'plough worked best in hard dry soils; but its not answering for soft low soils, in which ploughing is most required, is another bar to its-employment by the natives. He adds, that he could dig **up** land with the hoe much cheaper than he could cultivate it with this plough.

On the table-land of **Mysore** a somewhat more favorable report is made of the plough; but Mr. Munro, Secretary of the **Agri-Horticultural** Society of Bangalore, altered it first, by putting in a coulter and shortening the beam.

He justly observes, that a great fault in the implement is its having a cast-iron share, whereas, if of wrought **iron**, any blacksmith could repair it. Mr. **Munro** restricts his praise to its operation on dry soils; he says that two bullocks work it, but we must remember that the **Mysore** oxen are animals superior to the usual race of this description of Indian cattle.—(*Trans. Agri-Hort. Soc. of India, vol. vi., pp., 58, 232.*)

A slight alteration in the form of the Mangalore plough, by giving it a wooden breast, without increasing its breadth more than an inch, and adding a light coulter, would be, in my opinion, the most feasible improvement that at present could be introduced. From inquiries I have made, I conclude that this might be done at an additional expense of one rupee, eight **annas**, to the original cost of the plough, and would not make the entire implement weigh more than fourteen pounds. It would work equally well in wet as in dry soils.

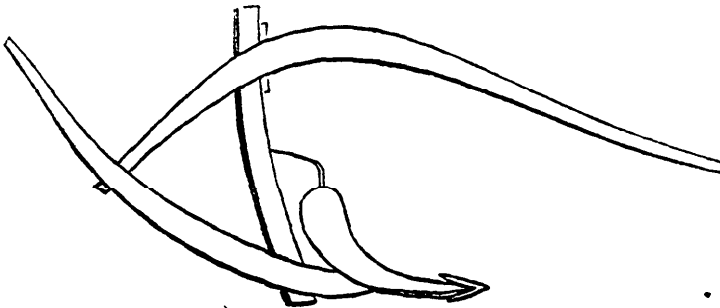
A plough having a weight of iron equal to sixty pounds, and with the heavy draught on it that is caused by the **Porto** Novo plough, is far too burdensome for the cattle of this part of the world. A share, **&c.**, made of the same form, but light, and to be fixed as a plating to a block of babool wood, about the **same** size as now used in the native plough of the north-west provinces, with an extreme breadth of not **more than** seven or eight inches at the heel, would answer well, **and** be

more desirable ; and if the beam were constructed lighter, after the **pattern** of the Chinese plough, it would be still better.

Mr. Speed, in a lecture delivered on Indian agriculture, whilst I was in that country in 1840, made the following observations and suggestions relative to this implement :—“The **Rungpore** and **Sekim** plough is triangular, and formed so as to have somewhat the effect of a double mould board, but it wants a share ; they use there also a mallet to break the clods, as I have before mentioned was customary in former days in England. The yoke is always clumsy and galling to the bullock, being a straight piece of board or a bamboo, which is connected with the plough by a bar of wood, adding not a little to this evil, which serves also to render the plough yet more inefficient than it naturally is, by a circumstance which has, I believe, escaped the notice of most **people**—and that is, the inattention to any rule for fixing the angle on which it stands with respect to the plough. It is generally so great as to **bring** the parts where it is united with the yoke considerably above the shoulder of the bullock, whence, in depressing to attach it to the yoke, the **plough** itself is raised on its point, and makes a mere scratch; this, combined with its natural inefficiency, makes it necessary to repeat the operation some six, nay, even, sometimes, twelve times before the land is **sufficiently** broken up to receive the seed. A furrow, properly so called, it never makes. It has been the study of my **brother** and myself,” adds **Mr. Speed**, “to obviate these evils as much as possible ; at the same time entertaining the firm conviction that the English plough was too heavy for the cattle in their present state; besides which, we were persuaded that the progress of improvement was more likely to be successful by keeping as near as possible to the **instrument** already in use, and thus, **by** progressive means, leading the native, rather than driving him, to an implement entirely new. Keeping this in view, we have adapted a light ploughshare to the same block of babool, or other hard wood, that forms the common Bengalee plough, **fashioning** this latter to the shape of something like what is called a mould-board in England. Its success has met our best wishes ; and it was found to do as much in one ploughing as was formerly effected by four repetitions of it. It appears rather egotistical to mention a circumstance of this kind, but I do so merely to show how very simple is the process of improvement, and to encourage others to make public even the smallest endeavors to guide our native brethren ; for I feel assured that there is more done by small means in the end than by mighty changes, and am myself happy if I can only have a part in giving to India a better ploughshare than that before used ; content if I may always ‘speed the plough’ as easily, **I may**

mention that the only **difference** in expense, and that is a great object to an impoverished people, is only a few **annas** more than the old plough ; and the only objection I have heard made to it by natives was, that from its comparative sharpness, should the cattle become unmanageable, or break **from** the ploughman, it might possibly cut their heels !

“ As an object of curiosity I also place before you **a** model of a Chinese plough, which exhibits some ingenuity, although **still** possessing many faults. One essential advantage, however, it possesses over that of India, is in having a bar to connect it with the bullocks by means of splinter bars at a distance from the yoke.” Dr. **Buchanan** states that in Dinajpur an average of five acres are cultivated by one yoke of oxen, whatever may be the soil ; for on light soils, though they bear several crops, yet the plough can be kept constantly employed ; and although this cannot be done on a heavy soil, yet there it **is only required for** one crop annually.



**THE CHINESE PLOUGH.**

A **pair** of oxen are usually yoked to the plough at a time, and worked all day, **allowing** for rest at noon ; but in some districts, and it is a practice the **climate sanctions** as beneficial, two pair are assigned to each plough, relieving each other at intervals until the day's task is **completed**. The time lost by this change of the draught cattle is very **small**, for there is no harness to **unfasten**, the animal merely pressing with its hump against the yoke, and the moment this is **uplifted**, the animal is at liberty. In other districts, as **Mysore**, the day's labor commences at sunrise, and continues until noon. The oxen then have three hours' rest, and a feed of straw, **after** which the ploughing is resumed, and continued until sunset, In **Dinajpur** they work **from** seven until **mid-day**, but do not **resume the** operation in the afternoon.

Several ploughs in succession deepen the same irregular **scratch**—furrow it is not the ploughing without any **coulters or breast**, and its imperfect share, penetrating not more than two inches below the unstirred **surface**. The idea of bringing a fresh soil to the surface by deep ploughing is almost unknown in the **ryot's** practice, for he is without the implement to enable him to effect the purpose.\*

A second **ploughing** is made across the first, and sometimes a third is given **diagonally** to the preceding. These require **to be frequently** repeated before the **tilth** is sufficiently fine to allow the sowing to **commence**.—(*Tennant's Ind. Res.* vol. ii., p. 12.)

The **point of draught** is a subject never entering into a native's philosophy, and hence his already bad instrument is rendered yet more **ineffective**. The general fault is, that the beam is **placed at** too **obtuse** an angle, and thus the point of draught becomes too much elevated for the size of the cattle, and the **plough in working**, therefore, brought upon the **extremity** of the share,

It seems difficult to account for the employment universally of oxen for **purposes of draught**.† Their flesh is not turned to account, as in Europe, **after** they have ceased to be worked; their hides are little worth, **and** they certainly are not characterized by superior power or activity. It is true that the native horses, or rather ponies, for they never exceed **13½** hands, are miserable, deformed, weak **animals**; but this undoubtedly arises mainly **from** neglect. Some may be met with that reward—the better care which their owners bestow upon them; but even the most wretched that are to be seen in the equally crazy **karanchees** (hackney-carriages) show, by the load of passengers with which they scramble on, that they are more fitted for draught than the equally diminutive cattle which are employed. I think a prize for the best colt or filly, entirely of native pedigree, would be productive of advantage.

\* I have found that the cultivators of Bengal are not **unconscious** of the benefit to be derived by **bringing** a fresh soil **to** the **surface**, but they object that the **labor** and expense prevent their obtaining the advantage. Mr. **Munro** says that about **Bangalore** the **ryots** actually dig their ground deep once in every three or **four years**, and mentions it **as** a-proof that they are aware of the necessity of **bringing** a fresh soil into use.—(*Trans. Agri.-Horticultural Society of India*, vi., 233.)

† I think that **Affghanistan** is the only district in which I find that any other plough animal but the ox is used. In some parts of that country, as **Shorabuk** and **Seweestaun** in the Indian desert, etc., the camel is employed to draw the plough, and in other parts of that region **asses** are used for the **same labor**.—(*Elphinstone's Cabool*, v. i., p. 487.)

Let not the opinion, so opposed to all efforts towards improvement, be entertained for a moment, that the climate is an insuperable bar to such improvement. Esperience denies this ; and, at all events, the argument does not apply in favor of continuing to employ the dwarfish little bullocks commonly in use. The fine powerful animals employed by the Government, are a proof that proper food and treatment will enable much more efficient animals to be kept. To look at one of these **noble** oxen, when standing by the side of the dimiutive Guanees of the hackeries (native **Carts**), a stranger **would** think them natives of a different clime ; **and** he certainly would scarcely credit the truth, that they are usually purchased from **Purneah** and its neighborhood, within 300 miles of **Calcutta**.

Upon the improvement of the breed of the smaller oxen of India I shall offer some remarks in another chapter of this treatise, but I here may animadvert more appropriately upon the wretched mode of applying the draught power of the animal.

The only reason for compelling the animal to press against the yoke, or **jual**, with his hump, is the saving of harness ; but this is dearly purchased by the loss of power it occasions. In these pages, it **would** be misplaced to dwell upon the **unnecessary** cruelty of this mode of draught; but it may be justly remarked, that the natural tenderness' of the hump, increased by the **abraded** wounds occasioned by the yoke, greatly diminish the animal's powers of traction. Let any one. try to remove a heavy body, by pressing against it with a bruised shoulder.

This, however, may be regarded as **an** accidental **impediment**; for, doubtless, oxen may be found, and kept to work, with **unchafed** humps; but the fundamental objection to making the hump the point **of** traction is 'the absolute loss of power, by throwing the **weight** so disadvantageously upon the animal lever.

Pulling is effected by throwing the body **forward** beyond the foot, which forms **the** fulcrum, and allowing the weight of **the** body, in its tendency to descend, to act against the load attached to it horizontally. As the load yields to the **impulsion**, the feet are carried forward, and the pulling continued.

**Now**, it can be mathematically demonstrated, that the **animal's** draught-power is diminished in proportion as the point to which the load is attached diverges from the centre of gravity. This centre, or point **upon which** the whole weight of the body may be most **advantageously** thrown, is just above the point of the shoulder both in the **ox** and horse ; and the natives, by attaching the load to the hump of the

first, have removed it to the greatest possible distance from that point, and, consequently, to the worst possible place.

I am quite convinced that the introduction of the English **spade**— and with it the spade husbandry—would be of great benefit to India. I am borne out in this opinion by Dr. Buchanan, who affirms, confidently, that one man with a spade would cultivate fully as much as he does with two oxen, and the cultivation would be more effectual. Besides, he adds, it would save much needless animal suffering ; no living creature, probably, being so miserable as the plough-ox of India. Their fodder **being**, by this means, saved, would enable more milch-cows to be kept; and thus, in another way, promote the production of human sustenance.

(To be continued.)

## ON THE PRESSURE OF THE ATMOSPHERE IN NEWFOUNDLAND,

AS INDICATED BY THE BAROMETER.

TO **THE** EDITOR OF **SIMMONDS'S** COLONIAL MAGAZINE.

DEAR **Sir**—**Having** deduced, from my meteorological observations in this country, certain **facts with** respect to the influence of the atmosphere upon the barometer, and from which I am of opinion that certain unerring principles (in the northern hemisphere) may be laid down, I am induced to send **you** the accompanying remarks **upon** this most important subject, in the hope that they may elicit from your more experienced correspondents some observations in **confirmation** of them.

I can only say that I have never heard of any similar observations having been made ; nor have **I**, in any work or treatise on the barometer, read, **of any such** theory **being** advanced, or principles attempted to be **established**.

If the observations I have made should appear to possess any merit, or should lead to further inquiry into the subject, **you** will probably assign them a place in **your** next publication; from which, **I** have great pleasure in saying, I have received a vast deal of useful information.

I am, Dear Sir, yours, respectfully,

J. TEMPLEMAN.

The following facts regarding the barometer being deduced from observations extending over a period of upwards of ten years, may be so far relied upon, as, in this country at least, to warrant the conclusion that the principles laid down will be found to be correct in *four* cases out of *five*.

If, having attained to much above the average height, the **barometer** should fall very rapidly, a gale always follows **from** the S.E. or **SS.E.** (with rain in summer and snow in winter), veering, in about six or eight hours, to the S.W. with rain ; but if the barometer falls slowly and gradually, though it may sink rather **low**, there will seldom be much wind until the barometer rests again, when a N.W. gale comes on.

If, after having fallen rapidly (as mentioned in the last **paragraph**)—say down to, or below, 29 in., the barometer should rise again, soon and rapidly, a gale generally of greater violence (than the southerly one) will come on from **the** N.W., verifying the seaman's axiom, that “a *north-wester* rarely remains long in debt to a *south-easter*.” But if the **barometer** rises *slowly*, there is seldom anything of a gale **from** any quarter.

If the barometer attains a great height, or even rises half an inch, *rapid*”, it is a sure indication of an approaching gale and bad weather from the quarter opposite that in which the wind was while the barometer was rising.

Again—if, with the wind between S.W. and W. (especially in **summer**), the barometer, being at or above the average height (say 29.99 to **30.20**), should fall two or three *tenths*, without **rain** or wind following shortly, the wind invariably shifts to the N.E. ; but should there be **rain** the wind will not shift. And if the wind, being about, but not to the southward of, E. (say E. to N.E.), the barometer should fall, either with or without rain or snow, the wind generally soon veers to the **N.** and N.W.

Should these observations be corroborated by those of more experienced meteorologists, they could not fail to prove of immense **importance** to navigators furnished with such an useful instrument as **the** marine barometer (and which no vessel' ought to be without). And if, from a few years' accurate observation, by skilful persons, in **different** parts of the globe, the facts above related should be so far established, **as** to be depended upon as an unerring principle in the action of the **atmosphere** upon the barometer, the discovery would prove of great practical value in meteorological science.

It is always important to note the *suddenness* and *rapidity* of 'the **barometrical** oscillations.

St. John's, Newfoundland, Jan. 4th.

## NEW BRUNSWICK AS AN EMIGRATION FIELD.

TO THE EDITOR OF **SIMMONDS'S** COLONIAL MAGAZINE.

SIR-Feeling deeply interested in the advancement and prosperity of this my native land, and aware that an increase of population is seriously required as a means to promote its future welfare, I have set myself down, in sober earnestness, **to** suggest, if possible, some plan whereby an object of such vital consequence might be carried into effect.

. With a heart warmly engaged in the cause of **suffering** humanity, my mind naturally turns to England, burthened as she now is with an overflowing and starving population, for that aid and sympathy which would so greatly conduce to her own internal peace and **tranquillity** to give. . Could New Brunswick be made the home of some tens of thousands of her destitute but industrious poor, how beneficial would it prove to both countries ! When I look around upon the wide forest that meets my eye here at every turn, and think of the many comforts which might be drawn from the soil now covered with trees; reading daily, too, of the countless number of people who are famishing in England for want of bread ; I feel an almost irresistible impulse to contribute to the relief of the most deserving part, by **endeavoring** to **write** them out; to this country, where the **staff** of **life** is **within** the reach of every industrious person. I will, at all events, make the effort now, while I can have the leisure which the season affords ; for, lo ! the winter has come, and the voice of the singing-bird is no more heard in the land. In other words, our northern winter has again spread his snowy mantle over the hills and valleys of New Brunswick, clothing the wide-spread primitive wild, now disrobed of its foliage, with a **pure** and graceful drapery **of** spotless white ; and the merry carol of sleigh bells again are heard in our streets-on our highways and **byeroads—** **on** our ice-bound, but beautiful, St. John, and on its broad and numerous **tributary** streams, **giving**, at all hours, a timely warning, in the words of the song, “ We come, we come ! ” to the pedestrian traveller, to keep **out** of the way, or risk the chance of being run over,

The winter season of this cold clime may not present many charms to the minds of those who know no more, nor care to know more than what can be gleaned by perusing false or inaccurate accounts of it, O ! **New Brunswick** !-land of my birth and dearest associations !-what an almost impenetrable mass of ignorance is there daily and hourly shewn in the mother **country** with regard to thee. Thy vast resources-thy great capabilities--are disregarded ; --~~the~~ home which thou offerest to the thousands and tens of thousands of her starving children, is taken into no account, as if it were a thing of nought ! And why? Because the dark curtain of ignorance has not yet been withdrawn between her and thee ! The scales have not yet fallen from the eyes of the wealthy and charitably disposed. That England displays a benevolent spirit (which is unequalled in any other part of the globe) in relieving the wants of the necessitous, I willingly acknowledge ; nevertheless, I hold many of her charities to be wrongly directed, and having a tendency to weaken the energies of the working classes, and serve to annihilate every feeling in their breasts approaching to ambition, What have the poor of England to live for ? What ray of light ever enters their benighted minds to direct them to a **better** home on earth, than is possible for them to obtain in their native land ? What spot of ground have they there which they can call their own ? None, save the grave ! and even that has been opened and re-opened, till the very earth which covers their mortal remains contains, perhaps, no small proportion of the dust of those who have gone before ~~them~~. The pale, haggard, frightful penury of the English poor is becoming too well known abroad. John Bull's longestablished character of being " well fed," alas ! is sadly changed-the cries of the famished have reached the inmost **recesses** of the wilderness, which however echoes back, I am sorry to add, no note of praise for those who, while wallowing in luxury themselves, witness daily the horrors of poverty which their less fortunate **fellow**-creatures have to endure. How aptly could those in affluence exclaim, in the words of that deep reader of human nature, Shakspeare, " When we in our viciousness grow hard (O, misery on it !), the wise gods seal our eyes **in** our own filth, drop our clear judgments, make us adore our errors ; laugh at us, while we strut to our confusion." Let them arise from their couches of luxury and **ease**--~~let~~ them still give donations to lighten the distresses of a starving people--but not in founding establishments for the needy, nor in parochial almsgiving; but to prepare the way for those who' are " an hungered" to leave their destitute places of abode, and gain in British America a comfortable home, on which the industrious man can look with a satisfied and grateful eye,