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READY REMEDY
FOR
INDIA'S
EXCHANGE DIFFICULTIES:

BY

W. SEDGWICK, MAJOR, R.E.,

*Author of "Light, the Dominant Force of the Universe;" "Life: the
Explanation of It," &c.*

“* * * as regards India the depreciation of silver has been rather an embarrassment to the Government than a loss to the country. What it calls for, therefore, is mainly fertility of resource and a wise adaptation of means to ends.”—*Economist*, May 29th, 1886.

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PREFACE.

"The Government of India has not only to rule a great population but to turn a vast undeveloped estate to the best account."—*British India and its Rulers*, by H. S. CUNNINGHAM, M.A.

Speaking broadly, it may be said that all our works in India bear this inscription—"no time to spare." Is not this written clearly upon the face of a multitude of stereotyped Returns and Reports in which are buried every year facts of the liveliest interest, as would be plain enough if we had but time to look out for and disinter some of them? Is it not impressed deeply upon the face of works constructed after type drawings or type designs in a country where the conditions are almost infinitely various and scarcely any two districts absolutely alike?

We acquire provinces and apply one system of government and one system of taxation to all, having no time to spare for working out the details and watching the development of any other. For a like reason we construct in a country where all the conditions are un-English and where poverty is spread over a vast area and cheap transport the one thing essential our railways on the English system, which is suited to a country where wealth is compressed into a small space and everything must be the best of its

kind. We construct our irrigation works also on one system.

Irrespective of the great works which are needed, the amount of work to be done in a small way in opening up the country is enormous, while the details and the best way of accomplishing it are only to be learnt by the closest familiarity with the resources, condition and surroundings of each locality and with the habits and ways of the people. Moreover, full success can only be obtained by gaining the confidence of the people. But, how is time to be found for all this with present arrangements?

I have tried to show in "India for sale, Kashmir sold," that if we can find time to look closely into matters, we shall perceive that, in retaining the present disposition of our British troops in defenceless cantonments scattered all over the country, a disposition designed to meet the conditions obtaining in former times when rapid movements were impossible, and no railways were in existence to furnish the people with iron and steel in abundance for the manufacture of arms, we lose the advantages which a system of railways offers in the way of enabling a small force concentrated in two or three impregnable positions, with arsenals and factories inside and thus self-contained and provided with a secure base, to hold securely a vast extent of country. We have in the fine Volunteer Corps now in existence at all the large railway centres throughout the country a force available to man in case of emergency the defensive works which

are needed to protect the workshops, stores and rolling-stock of the railways, and thus give time for the arrival of a regular railway corps to take over the working of the railways. There is therefore nothing to prevent us from arranging to concentrate.

With our British troops thus concentrated in healthy situations and ready for immediate action, we should make it clear to all, and especially to the native mind, that we were prepared for every emergency, and thus inspire that confidence which is so necessary to the development of the country and at the same time grapple at all points with the Russian Difficulty now plainly impending, though perhaps about to take a form quite different from that against which we are preparing.

I shall try now to show that we shall further perceive that in India, with its great agricultural population crowded into certain districts and with great tracts of good land in other districts lying idle for want of population, and great rivers unutilized for want of irrigation works, there are potential stores of wealth in abundance at present locked up, but at the same time ready ways and means of getting at these stores of wealth and thereby enriching not only ourselves but perhaps also in course of time the whole of the Eastern World and at the same time disposing of the present Exchange Difficulties.

If, indeed, our present difficulties—namely the Exchange and the Russian Difficulties, with which I have

dealt in these two pamphlets—force us to look into these matters, they will assuredly prove blessings in disguise.

CALCUTTA ;

17th August, 1886.

A
READY REMEDY
FOR
INDIA'S
EXCHANGE DIFFICULTIES.

CHAPTER I.
DIAGNOSIS.

"GRIEVOUS as is the burden which the so-called loss by exchange imposes on Indian finance, and difficult as it is for the Indian Government to recruit its resources by additional taxation, I should, if I were forced to strike a balance between the gain and the loss, hesitate to say that on the whole India has, up to the present date, been a loser."—*The Theory of Bimetallism*, by D. BARBOUR, p. 154.

THE Exchange Difficulties of India arise, as we all know, from the fact that India has to pay debts and liabilities in England in gold with a monometallic silver currency becoming more and more depreciated every year, under the steady fall in the value of silver which is now taking place, and being already so much reduced in value that more rupees by two-fifths have now (July 1886) to be given in payment of a debt in gold than would have been required some few years back when the rupee was worth two shillings.

If it is remembered that England receives from the Government of India yearly a sum of at least fifteen millions of pounds sterling on account of interest on debts and on account of other liabilities which have to be paid in gold, the magnitude of one portion of India's Exchange Difficulties and the urgency of need for relief will be understood. And as this is undoubtedly the side on which relief is most required, we

may with advantage give it the chief share of our attention, though not forgetting altogether the other sides.

Several methods of dealing with India's Exchange Difficulties have, indeed, from time to time, been proposed, but all or almost all of these appear to have had reference to the coinage and to have advocated the adoption either of a mono-metallic gold or of a bimetallic standard, both of which are at present impracticable courses,—the one on account of its costliness and the other on account of the impossibility just now of getting a sufficient number of nations to agree as to the relative values to be assigned to the two metals.

There are, however, other ways than these of dealing with the matter.

One such way plainly is the encouragement of gold mining with a view to increasing the production of gold and thereby cheapening gold by making the available supply more nearly equal to the demand.

The Government of India has already done something in this way by bringing to public notice the value of the gold reefs of Southern India ; but might it not with advantage do something more by sinking trial shafts and making experimental crushings at different places, so as to give companies a fair start in the same way as the great Tea Industry of India was started by the action of Government in opening experimental gardens? Indeed, so greatly is the Government of India, with its depreciated rupees and its gold debts, interested in the matter of gold production that it is conceivable that it might be worth its while to encourage and even assist foreign Governments in gold-bearing countries, such as Northern China, in prospecting for gold in a more systematic way than at present, and in opening up such gold fields as are now difficult of access.

However, we are concerned here rather with the best way of turning revenue, whether in the shape of silver or of produce, into gold, than with the best way of outturning gold, and may now get on with our proper work. We may

note then that though, as already stated, the silver rupee of India along with silver generally has fallen greatly in value in relation to gold, and will not now purchase even three-fourths of the quantity of gold which could have been bought with it some twenty years ago, yet it has not fallen greatly in value in relation to the productions of India, since, as Mr. Barbour has shewn in the "Theory of Bimetallism," p. 115, it will still purchase about the same quantity on the average of wheat or other produce as could have been bought with it before the great fall in its gold-purchasing power began. We may note also that, though the gold price of produce of all kinds—or in other words, the gold-purchasing power of produce—has fallen greatly of late, yet the fall in the price of produce has not in all cases followed regularly the fall in the price of silver. In the case, for example, of English wheat, the statement of comparative prices of commodities in the *Economist* of June 12th, 1886, shews that there has been a rise from an average of 30s. 10'33*d.* per quarter in the three months ended 4th December, 1885, and of 29s. 8*d.* per quarter in the three months ended 6th March 1886 to 31s. 9'33*d.* in the three months ended 4th June 1886, whilst the value of the rupee has fallen from about 1s. 6½*d.* in the three months ended 30th November, 1855 and about 1s. 5¾½*d.* in the three months ended 8th March, 1886 to about 1s. 5¼½*d.* in the three months ended 5th June, 1886. From this it is quite clear that any Indian cultivator who wants to buy gold will act very unwisely if, in the first instance, he sells his produce for rupees while there is any possible way of selling his produce directly for gold; for by selling it for rupees, he will run a risk of losing heavily by his depreciated rupees.

But the Government of India also has produce to sell. For in India from time immemorial the Government of the country has been entitled, as owner of the land, to a share—to the extent of about one-fifth—of the produce of the land; and from this share of the produce the so-called Land Revenue

of India is derived. The Government of India, however, unlike its predecessors, does not take its share of the produce of the land in kind after every harvest, but makes from time to time Land Revenue Settlements, by which, in all but the permanently-settled districts, a demand in cash and not in kind is fixed for a term of years nominally on the bases of the area cultivated, the average yield, and the average prices current in the bazaar in a previous term of years. By this arrangement it is plain that the Government of India in reality sells its share of the produce of the land for rupees through the agency of the cultivator instead of selling it through the agency of Kardars, Thikadars, or Bunniahs, as former Governments of the country did, and, indeed, still do in the cases of some of the Native States.

With the Land Revenue thus obtained by the sale of its share of the produce of the land for rupees, the Government of India has to pay debts and liabilities in gold; and thus has, in fact, to purchase gold with depreciated rupees.

It has been shewn that it would be a bad arrangement for an Indian cultivator who wished to buy gold to sell his produce for rupees if there was any way of buying gold directly; and so also plainly must an arrangement of this sort—even setting aside altogether the fact of its being worked through the agency of the ignorant Indian cultivator, who must necessarily be a bad agent to employ for the sale of anything—be a bad one for the Government of India, which is obliged to buy gold and is under no compulsion to sell its share of the produce for silver.

Now, as the area of cultivation in the present condition of India is not increasing largely, and as in addition the price of produce in India is not rising, it is plain that the receipts from a Land Revenue based upon the area under cultivation and the price of produce cannot rise much year by year. But it is also plain that the value of the Land Revenue as a means of discharging debts in gold is diminishing rapidly year by year owing to the constant fall in the value of the

rupee in which it is taken. Hence it is quite clear that the Government of India, in the proceeds of its Land Revenue, which furnishes by far the largest portion of its income, as well as in the proceeds of its other taxes, is a great loser by the depreciation of the rupee. And as the price of produce has not risen in India, it is plain also that the cultivator has not gained, except to the extent of getting a firmer market, by the depreciation of the rupee.

But if the Government of India is a great loser and the cultivator no gainer, who then is the gainer by the fall in the value of the rupee? This can readily be shewn: for if it should so happen that while silver is steadily becoming depreciated the price of wheat and other produce in countries having a gold currency does not fall, and at the same time the price of wheat and other produce in India with its silver currency does not rise, it is plain that the merchant who takes advantage of the opportunity to buy produce in India for silver and sell it afterwards in England for gold at the same prices as he paid or obtained before silver became depreciated will be a gainer to the full extent of the depreciation which takes place in silver so long as the cost of carriage and of contingent expenses does not rise. This can be made quite clear by examples. First, then, let us suppose that when the rupee was exactly worth two shillings, a certain merchant who had bought a quarter of wheat in Patna for 12 rupees, was able after sending it to London at a cost of 12 shillings for freight and other charges, to sell it there for 40 shillings. Since the standard in England is a monometallic gold one, it is plain that the merchant, after paying the cost of carriage and other expenses, became by the transaction the possessor of gold to the value of twenty-eight shillings, for which, with exchange at two shillings per rupee, he would have been able to obtain exactly 14 rupees in India. Hence his profit by the transaction was just 2 rupees. But next let us suppose that the value of the rupee falls after a time from two shillings to eighteenpence, and that the

same merchant now again buys a quarter of wheat at Patna for 12 rupees, and after sending it, as before, to London at a cost of 12 rupees for freight and other expenses again sells it for forty shillings. It is plain that the merchant by this transaction will again, as before, become the possessor of gold to the value of twenty-eight shillings. But now, with exchange at eighteenpence per rupee, he will be able to obtain eighteen^a rupees ten annas and eight pies for his twenty-eight shillings in gold in place of 14 rupees only when exchange was at two shillings per rupee. His profit, therefore, will now be Rs 6-10-8 instead of Rs 2 only; and thus he will gain Rs 4-10-8 simply by the depreciation in the value of the rupee. It is true that if he wishes to remit his money again to England, his gains by the depreciation in the rupee will disappear. But if, instead of remitting his money to England, he continues to trade with it in India on the same terms over and over again, he will make Rs 4-10-8 as a gain by exchange in addition to ordinary profit each time he sends a quarter of wheat to London so long as the exchange continues at 1s. 6d. per rupee, and after a few years will have doubled or trebled his capital simply by the gain by exchange; and on remitting his money then to England will find that he has been a very great gainer.

It is thus clear that if the price of produce does not fall in England, the merchant who exports produce to England under present circumstances, which enable him to purchase produce at the same price as and to transport it to England at a cost no greater than before, is a gainer by the fall in the value of silver.

If, however, the price of produce does fall in England, how will the merchant fare then?

It is clear that the merchant will still be a gainer even if the price of produce in England falls so low as to leave him no profit other than the gain by exchange, or even if he clears only a portion of the gain by exchange. An ex-

^a16 Annas = 1 Rupee.
12 Pies = 1 Anna.

ample will shew this at once: for if we again take the case of the merchant whose transactions we before studied, and assume that while the value of the rupee is still eighteenpence, he once more buys a quarter of wheat in Patna for 12 rupees and sends it to London at a cost, as before, of 12 shillings for freight and other expenses, but is now, owing to a fall in the price of wheat, able only to get thirty-four shillings for it in place of forty shillings as before, he will, it is plain, after paying the cost of carriage, &c., this time realise gold to the value of 22 shillings only or six shillings less than before. But he will still make a profit by the transaction. For with exchange at eighteenpence per rupee he will be able to get fourteen rupees ten annas and eight pies for his gold, and will thus make a profit of Rs 2-10-8, although he would have been a loser to the extent of one rupee by the transaction if exchange had been at two shillings per rupee.

It is clear, therefore, that the merchant who exports produce from India is in the abstract a gainer by the depreciation of the rupee.

It is also clear that the depreciation of the rupee tends greatly to stimulate the export trade of India. For the fall in the value of silver is, of course, of no help to the export trade of countries having a gold coinage, which nevertheless have to sell their produce in the English market at the same prices as India obtains, while India gets in addition the gain by exchange. Hence India is benefited in its competition for the supply of raw produce to England with countries, such as America, having a gold coinage very largely by the depreciation of the rupee.*

Having thus established the fact that the Government of India is a heavy loser and the merchant who exports produce

* Mr. O'Connor, in his Note of the 13th July, 1886, "On the effect of a low rate of Exchange on the Indian export trade," has apparently omitted to notice the fact that a low rate of Exchange enables India to undersell in the English market countries which have a gold currency and consequently get no gain from Exchange. ✓

from India a great gainer by the depreciation of the rupee the question now naturally arises—is it possible for Government to recoup its losses by taking a share of the gains which export trade undoubtedly makes from the depreciation of the rupee? The idea will, perhaps, at once suggest itself that this might easily be done by taxing trade and thus directly appropriating a share of the profits made by trade from the depreciation of the rupee. But then immediately crops up this difficulty, that in these days of free trade it would clearly be a suicidal policy to tax our own export trade from India for this would be equivalent to putting on a protective duty in favour of America and Russia in their competition with India in the English market. And, indeed, this very trade is taxed already by a license or income tax, which, too, is plainly an objectionable tax as tending to protect American trade, which is under no such disability in its competition with India.

Any additional tax upon the export trade of India is therefore out of the question, unless the principle of free trade is surrendered, and a corresponding tax imposed in England upon the trade of America and Russia and other countries which compete with India. It may be objected that if a license tax is of the nature of a protective duty and benefits the foreigner in his competition with India in the English market, then the land revenue which the Government of India collects must also be a protective tax and so, indeed, it is beyond all question, so far as the land which yields export produce is concerned; for it most plainly enhances the cost of production, and thus is a tax which benefits the foreigner in competing with India. However, it is plainly a tax which cannot be given up.

But although further taxation is impossible, it is quite plain that there is no reason why the most should not be made of existing sources of revenue. And if, then, it can be shewn that by selling its share of the produce of the land for gold the Government of India can to a great extent avoid the losses by exchange which it now experiences with the present

arrangement of taking Land Revenue in depreciated rupees, an alteration in the present arrangement ought plainly, in the interest of the country, to be made.

The importance of the matter will be understood if it is remembered that the receipts from Land Revenue form by far the largest portion of the income of the Government of India, and amount yearly to about 2,200 lakhs of rupees, equivalent to £22,000,000 sterling, taking the rupee at two shillings, or £15,583,333 taking the rupee at seventeen pence.

At the same time, full compensation must, of course, be given to merchants whose trade will suffer by the alteration; and not only must compensation be given but other trade openings must be provided to supply the place of any which it may be necessary to close, as it is abundantly clear that the Government can by no means afford to drive any capital out of the country.

In the next chapter the advantage to Government of selling its share of the produce for gold will be explained, and the practicability of such an arrangement will be demonstrated.

CHAPTER II. THE REMEDY.

"We pronounce them to be exceedingly useful wheat; in fact hardly equalled for what is deficient and wanting in the English markets by any other wheats"

"there is no doubt an outlet in this country and the European continent for unlimited quantities at prices that shall prove remunerative to all parties concerned."

—*Report on Indian Wheat by Mc.Dougall Bros. of 10 Mark Lane, London, to the Secretary of State for India, dated 15th December, 1882.*

IT will be understood from the explanation in the preceding chapter that the Land Revenue of India, which, if the rupee were worth two shillings, would yield about £22,000,000 yearly, is from its nature a tax payable in kind in the shape of an actual share of the produce of each holding, though it is taken now in cash solely for the convenience of collection; also that it would be in accordance with ancient practice—and at the same time in all probability a more convenient arrangement for the cultivator—if the demand were again made in kind instead of in cash. And it may be remarked that provision for taking Land Revenue in kind has been made in the Punjab Land Revenue Act of 1836, chapter V, section 55, which states that "land revenue shall be assessed on each estate in cash or in kind."

It is also quite plain that there would be no sort of difficulty in converting the present demand in cash into a demand in kind. All that would have to be done would be to ascertain the average price of wheat in the nearest market during a previous term of years and then to let the cultivators know that instead of paying land revenue in rupees, they would be at liberty to pay in soft wheat at so many seers per rupee, quoting different prices for white and red wheat based upon the bazaar rates. The cultivators would have to be told beforehand about this, so that they might make their arrangements in advance; and would have to give notice

themselves of their intention to pay in kind, so that arrangements for receiving the wheat might be made; and would also have to deliver their wheat at the nearest Government depôt.

In subsequent land revenue settlements it would be easy to state the demand in kind.

It is quite plain that wheat taken from the cultivators in payment of land revenue in kind could be sold in England in the same way as opium is sold by the Government in Calcutta. For there is an increasing demand for Indian wheat both in the English market, and in the markets of several nations on the Continent of Europe, including France. And from a "Memorandum on the Indian Wheat Crop of the season 1885-86," published by the Revenue and Agricultural Department of the Government of India, under date of the 11th June 1886, it appears that only about one-half of the total quantity of wheat exported from India usually goes to the United Kingdom, the remainder being sold on the Continent, except a portion which is taken by Egypt.

It happens also that the Government of India having purchased the Scinde, Punjab and Delhi Railway this year, now own the whole of the Punjab Railways from Kurrachee, which is the nearest of the Indian seaports to England, and the natural outlet for the export trade of the Punjab right through to Ghaziabad on the east and to Peshawar on the north.

It so happens too that the Punjab with its cold winter is the largest wheat-growing province in India; and from the "Memorandum on the Indian Wheat Crop of the season 1885-86" before referred to, it appears that 4/5ths of the wheat grown in the Punjab is soft red wheat, which is suitable for the English market, though it does not fetch quite so high a price as soft white wheat.

If then the land revenue in the Punjab were taken in kind in the shape of wheat instead of being taken in cash in the shape of depreciated silver rupees, Government would be in a position to send its wheat thus received on account of

land revenue right down to the sea at Kurrachee by its own railway. Having got it to Kurrachee it could just as easily be shipped to England and sold by auction there as opium is now sent down to and sold in Calcutta by Government.

Thus in the Punjab all the circumstances are now favourable for making an experiment in the way of taking land revenue in kind in the shape of wheat. Let us now see what the result of the experiment is likely to be.

The following statement, compiled from the price lists in the Supplement of the Gazette of India, shows the average retail prices of wheat for the two years ended December, 1885, at the principal centres of wheat cultivation in the Punjab, all of which are actually on the railway :—

	Ferozepore. Seers per Rupee.	Amritsar. Seers per Rupee.	Jullundur. Seers per Rupee.	Gujrat. Seers per Rupee.
Last half of June 1884 ...	23 0	26 8	25 8	31 2
" Dec. 1884 ...	25 0	29 0	30 0	33 0
" June, 1885 ...	25 0	27 0	27 0	29 0
" Dec. 1885 ...	22 0	22 0	23 0	21 0
Average ...	23 12	26 2	26 6	28 8

The average wholesale price of wheat in the Punjab may therefore be safely assumed to be not more than twenty-three seers per rupee, allowing a good price so as to be able to insist upon getting well-cleaned grain and also to make it worth while to bring grain in from long distances. Taking then a seer as equal to 2 lbs avoirdupois, so as to allow something for loss by weight in drying, it follows that the payment in kind of a ton of wheat will be equivalent on the average to a payment in cash of Rs 48·7.

The average price of Punjab wheat in the English market may be put at thirty shillings per quarter of 480 pounds avoirdupois or £7·0·0 per ton if wheat is sent in large quantities and sold for what it will fetch, so as to displace American and Russian wheat. Indian wheat fetches now on the average as high a price as English wheat. And it is stated in the *Economist* of the 20th February, 1886, that the average price of English wheat in 1885 was 32s. 10d.

per quarter, and that it is necessary to look back more than a century to find another year with so low an average. We shall therefore probably be well on the right side in taking 30s. per quarter as the average price of Punjab wheat in the English market.

From the weekly Price Current and Market Report of the Kurrachee Chamber of Commerce it appears that freights from Kurrachee to London by steamer during the first six months of 1886 have been on the average 18s. 5d. per ton. And if then regular employment throughout the year, and at the same time return loads to some extent in the shape of Government stores and railway material, are given, the average freight charges by steamer from Kurrachee to London may perhaps safely be put at eighteen shillings per ton of twenty cwts.

It may be remarked that in an extract from a Resolution of the Government of the Punjab of the 19th March, 1886, quoted in the "Memorandum on the Indian Wheat Crop of the season 1885-86" before referred to, it is pointed out that "at the port of Kurrachee * * the sea freight is now 43 per cent. lower than it was in 1882."

With the Sind Sagar Railway now available to bring in wheat from the Shahpur, Jhang and Gujrat Districts, the average distance of the great wheat districts of the Punjab from Kurrachee will probably not exceed 850 miles, which is about the distance of Amritsar from Kurrachee.

The actual cost, according to the statistics, of carrying a ton of goods on the Indus Valley State Railway was 2.51 pies per mile in the first half of 1885, and the cost has been falling steadily as traffic has increased. The cost of working will in future be greatly reduced under the new regulations, which allow wagons to be loaded up to a maximum of twelve tons in place of the maximum of ten tons previously in force and will be further reduced as soon as the Sukkur Bridge is completed and the expense of working the ferry over the Indus got rid of. Hence the actual carrying cost of grain

in full train loads is not likely to exceed in the future 2·1 pies per ton per mile, which was the average cost of carrying a ton of goods one mile on the East Indian Railway in the first half of 1885 according to the statistics, which, however, it may be mentioned, are based upon a method of dividing the working expenses between passenger and goods traffic generally considered to favour passenger traffic unduly at the expense of goods traffic. Thus the actual average cost of carrying a ton of wheat with an average lead of 850 miles from the wheat-growing districts of the Punjab by rail to Kurrachee will probably not exceed $850 \times 2\cdot1$ pies = Rs 9-4-9, or about thirteen shillings and twopence with exchange at one shilling and fivepence per rupee. Adding to this Rs 2-8 (3s. 6½*d.*) per ton, yielding on a traffic of one million or one-and-a-half millions of tons of wheat from twenty-five to thirty-seven-and-a-half lakhs of rupees yearly, in order to pay a sufficient portion of the interest on capital expenditure on the North-Western Railway, the total cost by rail will be sixteen shillings and eightpence halfpenny per ton.

The cost of collecting, screening, bagging, shipping, and selling in England may perhaps be put at Rs 6 or 8s. 6*d.* per ton when large quantities are dealt with.

Hence the total cost of collecting, carrying to England, and selling may be put at forty-three shillings and twopence halfpenny per ton. Deducting this from the proceeds averaging, as already shewn, £7 per ton, the net receipts from the sale of the wheat in England may be expected to amount to about £4 16s. 9½*d.* per ton.

The cost of a ton of wheat purchased in India, allowing for dryage, may be, as already shewn, put at Rs. 48·7. Hence if the land revenue of the Punjab is taken in kind in the shape of wheat at 23 seers per rupee instead of in cash and the wheat is then sent for sale to England, every rupee of land revenue so taken in kind may be expected to realize on the average two shillings in cash in England. And thus in this way, supposing that sufficient wheat were sent home

to realise fifteen millions of pounds sterling yearly after the cost of carriage had been defrayed, the Government of India would be able to pay the whole of its English debts in gold and avoid all loss by exchange on revenue transactions.

To realise fifteen millions of pounds sterling after cost of carriage had been defrayed, it would be necessary to send a little over three millions of tons of wheat to England yearly.

From the statement in the *Economist* of the 20th February last it appears that the quantity of wheat and flour imported into England in the last three years has reached an average of 3,664,674 tons per year; and from the "Memorandum on the Indian Wheat Crop of 1885-86," issued by the Government of India, it appears that Continental Europe along with Egypt has actually taken an average of 464,000 tons of wheat yearly from India during the three years ended 31st March, 1886. Thus there seems no absolute reason why India should not if it is able to undersell America and Russia, be able to dispose of three millions of tons of wheat per year between the English and Continental markets. Indian wheat is fast coming into favour in England and will doubtless make still more rapid progress if it is properly cleaned and looked after. From the quotation at the head of this chapter it will be seen that it is the opinion of Messrs. McDougall Bros., of 10, Mark Lane, London, that a market can be found in England and on the continent of Europe for unlimited quantities of Indian wheat.

It must be remembered that the advantage of getting gold is so great that with exchange at under 1s. 5d. per rupee as at present (July 1886), the Government of India could, if the foregoing calculations as to cost of carriage and collection are correct, afford to sell its Punjab wheat for gold at twenty-five shillings per quarter in order to secure the English market. There can scarcely therefore be room for doubt as to the ability of the Government of India to undersell all other nations in the wheat market. And the safe working margin, even with the low prices now prevailing in the English

wheat market, is so large as to make it almost impossible that Government should be on the whole a loser by taking its land revenue in kind in the shape of wheat, even though mistakes might be made at the outset.

The supply of home-grown wheat in the English market will be available for making the mixture of wheats which English millers appear to consider necessary when grinding Indian wheat.

It may be well, before proceeding further, to study the following comparative statement shewing imports of wheat into the United Kingdom since 1883 from Russia, the United States, and India, extracted from the "Memorandum on the Indian Wheat Crops of the Season 1885-86" before referred to:—

	Russia. Tons.	United States. Tons.	British India. Tons.
Year ended 31st December, 1883 ...	664,667	1,303,291	5,62,174
" " 1884 ...	270,098	1,130,306	400,495
" " 1885 ...	599,317	1,213,935	605,098
3 Months ended 31st March, 1886 ...	60,005	176,461	162,110

The figures for the first three months of the current year deserve close attention, because the average price of English wheat in those three months fell below thirty shillings per quarter, and yet the imports from India shew no diminution though those from Russia and the United States fell off by nearly one-half. The steadiness in the case of India may in part have been due to time bargains, but nevertheless the figures are interesting.

Now it is plain that there will be no impossibility in arranging to obtain in India even such a quantity as three millions of tons of wheat for exportation, although the "Memorandum on the Indian Wheat Crop of the Season 1885-86" shows that as yet the largest quantity of wheat exported in any one year has been 1,053,000 tons, the quantity exported last year, 1885-86. For it must be remembered that there is a vast extent of good land still remaining uncultivated in the Punjab and in the Central Provinces and elsewhere.

The Administration Report of the Punjab Government for 1883-84 shows that the culturable area in the Punjab is about 75,933 square miles, whilst out of this about 36,922 square miles only are cultivated, so that an area of about 39,000 square miles, or considerably more than one-half of the culturable land, is at present uncultivated. And then there are no less than four noble rivers in the Punjab bringing down a never-failing supply of water from the eternal snows through these uncultivated tracts which want nothing but water to make them yield luxuriantly. These rivers—the Indus, Jhelum, Chenab and Beas—are at present untapped except by a few inundation canals, taking water when the rivers are in flood ; but they could be just as easily utilised as the Ravi, Sutlej and Jumna, whose waters are already taken off for irrigation ; and they have a sufficiency of water to secure every year, whether the rainfall is scanty or full, an additional yield of wheat two or three times as great as the yield now obtained in the Punjab, which, according to the "Memorandum on the Indian Wheat Crop of the Season 1885-86" before referred to, is estimated to have amounted last season to 2,693,060 tons from an area of 6,957,600 acres or 10,871 square miles under wheat cultivation.

From the same Memorandum it appears that the total area under wheat in the Central Provinces in 1885-86 is believed to have been about 3,902,707 acres with an estimated yield of 859,753 tons, and it is stated that "in the Central Provinces the export trade gives the chief impetus to wheat cultivation, and not more than half of the crop raised is consumed locally;" also that "a large quantity of fertile soil requiring little labour is available" for wheat cultivation in districts where the rains "rarely fail," and that "the only check to production is the existing difficulty of carriage."

If the projected Bengal-Nagpore Railway to connect Calcutta with Nagpore is completed as a State line, a large part of the wheat districts of the Central Provinces will be opened up. And if land revenue is then taken in kind in the

shape of wheat, the Government wheat so obtained can be brought in by the State Railway to Calcutta in the same way as Government wheat can be brought down from the Punjab to Kurrachee.

Hence it is abundantly clear that, with proper arrangements for opening up the country, the supply of wheat for exportation can be increased to any extent which can possibly be required without necessarily trenching in any way upon the large wheat supplies of the North-West Provinces, Oudh and Behar, where the country is densely populated, and from which supplies of labour to almost any extent can be obtained for employment in opening up the uncultivated tracts in the Central Provinces and above all in the Punjab. This labour is waiting only for the opportunity to be given it. The Punjab Administration Report for 1882-83 states, at page 232, that "the Punjab, fast developing under strong and settled rule, has attracted to itself population from the countries that surround it on all four sides—from the North-Western Provinces, Rajputana, the trans-frontier districts, and Kashmir. * * * The till lately almost uninhabited prairies of Hissar and Sirsa have tempted crowds of immigrants."

Hence labour plainly is ready to come. The eight or nine millions of people for whom there will be room in the Punjab when irrigation works are provided are all available, every one of them in the crowded districts in Oudh, Behar and the North-West Provinces. The last Census taken in 1881 shewed that in Behar, including towns and villages, the Sarun district had a population of 869,71 to the square mile, Mozufferpore 859,83, Patna 845,05, Durbungha 789,64 to the square mile. What a relief it would be to Behar to get one-third of its population—which, according to the Administration Report for 1884-85, of the Bengal Government, amounted to 23 millions of people on an area of 44,000 square miles—drawn off and comfortably provided for: and what a relief it would also be to Oudh, with its population by the last Census of 11,397,172

on an area of 24,216 square miles, to have one-third of its population drawn off. But the people will want facilities of traveling provided; will want emigrant trains at very low fares, such as the poor can afford to pay; will ask that the same amount of attention should be devoted to the cultivation of emigrant traffic as is given to export goods traffic, now carried at rates which would have been thought absolutely impossible a few years ago, whilst a reduction of about one-sixth only has been made in third class passenger fares in the last twenty-five years. They will want also irrigation works to secure them against drought, will ask that the ample supplies of precious water in the great rivers or draining off the hills should no longer be allowed to run to waste. But above all they will want protection before settling down on tracts so near the frontier as are the Punjab plains and so lately reduced to order from turbulence and anarchy; and before spreading out over such a land they will want assurance as to the stability of the present *regime*. With the Russian advance so long talked of in the bazaars of India, so narrowly watched, and now an accomplished fact up to the border of Afghanistan, it would be unreasonable to expect the timid Indian cultivators to trust themselves and all that they hold dear in the plains of the Punjab, Assam, Burmah, or the Central Provinces where all around there are wild hill tribes ready to swoop down at once on defenceless villages should trouble come, unless we take the trouble to convince them that we are strongly posted and ready for every possible emergency either from without or from within. They believe thoroughly in British troops if well fed and supplied with transport, but know that British troops are helpless if their supplies and transport are cut off—a result which may plainly happen to a scattered force dependent for transport and supplies upon railways which can readily be broken up if internal disturbances occur. They will require to see a strong British force posted in and about the Cashmere Valley and visibly dominating the Punjab.

There with its own arsenals and factories in the valley able not only to keep it constantly supplied with artillery, arms, ammunition, camp equipage, clothing, land transport, &c., but also to supply any additional force which may come up or be raised in the Punjab, and with a large area of reclaimed land in the Cashmere Valley available to furnish food supplies, such a force absolutely self-contained, with detachments on the outer slopes ready for service at a moment's notice, would, with such a position to operate from, hold, through the railways, the Punjab and its stout population firmly in its grip and inspire confidence everywhere.

Keeping all the facts which have been adduced in view, it will be seen that, in the present condition of Upper India, we have it in our power to open up to cultivation the whole of the great tracts of good land now lying idle in the Punjab and in the Central Provinces by setting to work resolutely and steadily to provide the necessary irrigation works, means of travelling, and arrangements for protection. An extensive system of railways has already been provided in the Punjab, and now between railways and navigable rivers the Punjab requires little to complete its communications except possibly a few branch lines, which can be constructed, very cheaply as surface railways, to important places. The Central Provinces are however very badly off in the way of railway communication.

It is certain also that the opening up of the Punjab by means of irrigation works at all the large rivers and by bringing in by means of emigrant trains, at very low fares, a sufficient population to cultivate the whole of the good land now lying waste over an area greater than the whole area at present under cultivation will lead, when these waste lands have been supplied with water, to a doubling and probably a trebling or even a quadrupling of the land revenue, which being taken in kind in the shape of wheat, can, by the sale of the wheat in England for gold, be remitted to England without loss by exchange, as already explained.

If the Central Provinces too are opened up by railways and by bringing in labour by means of emigrant trains, the land revenue there also can be largely increased, and being taken in wheat can also be remitted without loss by exchange to England.

In this way between the Punjab and the Central Provinces, it may be confidently anticipated that the whole of the present loss by exchange can in course of time be made good—one half of the loss, or more if necessary, being avoided by taking land revenue in kind and the other half being made good by the direct increase in the land revenue which will ensue.

It will be apparent that the remedy thus offered for loss by exchange will be gradual in its operation, though commencing to give relief at once and certain in the present condition of the country to give full relief in the end. The knowledge that complete relief will ultimately be afforded will perhaps enable a continually diminishing burden to be borne patiently for a few years.

The operation of the remedy can, however, be hastened, should it appear necessary to hasten it, by extending the principle of taking land revenue in kind in the shape of wheat not only to the Punjab and Central Provinces but also to the North-West Provinces and Oudh, where, according to the "Memorandum on the Indian Wheat Crop of the Season 1885-86" before referred to, the area under wheat in 1885-86 is believed to have been 5,240,381 acres and the yield 1,847,400 tons, and where the land revenue, taking the rupee at two shillings, amounts to four millions of pounds sterling per annum; or if the necessity for immediate relief on a large scale should be urgent, it can be obtained with this remedy by purchasing wheat in the open market by means of the various depôts at which wheat in payment of land revenue in kind is received. As the full market price will have to be allowed the cultivator in taking wheat in payment of land revenue in kind, the price which would have to be paid

for wheat purchased in the open market would not be greater than the price which would have to be allowed for wheat brought in payment of land revenue in kind.

By supplementing the amount of wheat obtained on account of land revenue paid in kind by purchases in the open market it would probably be possible to obtain $1\frac{1}{2}$ millions or even 2 millions of tons of wheat in the first year from the Punjab, North-West Provinces, Oudh and the Central Provinces together if early notice were given to the cultivators and at the same time advances were made to them as is done in the case of opium cultivation. The sale in England of $1\frac{1}{2}$ millions of tons of wheat, costing about 730 lakhs of rupees, might, as already shewn, be expected to realize in gold nearly £7,300,000 sterling after the cost of carriage and other incidental expenses had been defrayed : and thus it might be expected that nearly half the amount which has now to be remitted to England annually by the Government of India, could in this way be sent without loss by exchange, although in the case of wheat obtained from the North-West Provinces and Oudh, the first cost of the wheat, and the cost of carriage would be higher than in the case of wheat purchased in the Punjab ; and the gains therefore smaller.

The objection against a sudden commencement by the Government of India on a large scale of any system of sending wheat for sale to England, is of course the very grave one that the merchants now engaged in the wheat trade would not be given time to make other arrangements for employing their capital and the compensation which would have to be awarded them for the loss of the wheat trade.

The importance in a country such as India of fostering in every possible way every branch of trade, and in particular of avoiding any measure in any way tending to diminish confidence, and thus to prevent the investment of capital, cannot be too strongly insisted upon. Hence in every way it is advisable that the system of sending Government wheat for sale to England should be gradually introduced. And if then

full compensation were given to the merchants whose trade was interfered with ; and at the same time the construction of the railway from Calcutta to Nagpore and of other railways were vigorously pushed on so as to open up the Central Provinces and other tracts ; and measures to open up the Punjab were energetically proceeded with ; and thus fresh openings given to trade in rice, pulses, cotton, hides, fibres, &c., the merchants also would be gainers by the change as well as the Government of India.

However, a remedy of this sort, whether it is applied gradually or suddenly, will necessarily convert the export wheat trade in the end into a Government Monopoly. But then it will be a Monopoly requiring no Customs department with prosecutions and vexatious searchings and inquiries to protect it, and having none of the disadvantages of ordinary monopolies in the way of encouraging smuggling, cheating, misrepresentation, and other forms of immorality. Moreover, its introduction would to a great extent be a reversion to ancient practice in India ; and would simply involve the resumption of a right to a share of the produce of the land, which has been placed in abeyance by Government for its own convenience in consideration of a money payment ; and further, would doubtless in many cases benefit the cultivator, who would no longer be driven for loans to the bunniah.

Besides it is beginning to be recognised that State Monopolies are the least burdensome of all ways of raising the funds required by States for purposes of Government, as they do not hamper trade generally in its competition with other countries, as other ways of raising money too often do. And in India there is already in the opium trade a State Monopoly of the same kind in existence.

It must not be imagined that the slender profits which perhaps are all that the merchants engaged in the export wheat trade of India now in many cases make, afford any real indication of the full amount of gain which would result to the Government of India from a Monopoly of the export trade on a

greatly extended scale in Indian wheat carried by its own railways by land and by ships under regular contract by sea, and collected, examined and despatched in a thoroughly systematic and well regulated manner. The merchant engaged in the export wheat trade has in many cases to pay high rates for the carriage of his wheat by rail, and runs many risks of loss from high demurrage charges on railways or steamers, from rises in freights for shipping, from the impossibility of examining his consignments thoroughly, &c., all of which would be avoided with a Government Monopoly and a regular system of despatches going on throughout the year as would be practicable in the dry Punjab climate.

The objection that a Monopoly of this kind would involve the Government of the country in commercial speculations can be met at once by pointing out that all former Governments in India have been engaged to much the same extent in commercial speculations, inasmuch as they have taken a share of the produce of the land and then sold the produce so taken to farmers of the revenue or through kardars or bunniahs; and that the Government of India in particular is already deeply engaged in commercial speculations with its important opium trade and its Punjab salt mines and Wårdha colliery.

There will be no difficulty in carrying a million tons of wheat per year by railway to Kurrachee. The line has only, it is true, a single track; but if trains weighing 800 tons, made up of wagons weighing about 6 tons each and carrying loads of 12 tons each, are run in the same way as other railways are doing or arranging to do, one million tons will require an average of only about seven down and five up trains per day exclusive of Sundays.

It will be necessary of course to open depôts for taking over wheat and to erect sheds for storing it at every or perhaps every other railway station, and also at suitable places on the navigable rivers down which grain can be sent by boat more cheaply even than it can be carried

by rail. The wheat depôts can be visited in rotation on fixed days in the week, and thus several depôts be worked by the same staff.

There is not likely to be any more difficulty found in taking over wheat than in taking over opium.

The sheds for storing wheat can be cheaply made of old rails, with corrugated iron roofs and sides, in the same way as railway sheds are now built.

The cultivators have to carry their wheat for sale often for long distances to some bazaar or railway station. It will be no hardship therefore in the Punjab—where, with its railway system and its navigable rivers, there is hardly a village in the plains more than 20 or 30 miles away from a railway or navigable river except in the extreme east, where there are some villages as much as forty or fifty miles from the railway—for the cultivators to have to bring wheat to Government depôts, especially if a good price is allowed.

It must be remembered that prices in distant bazaars are much lower than at markets on the line of railway. This fact has been fully brought out in an extract from the last Agricultural Report of the Central Provinces, quoted in the "Memorandum on the Indian Wheat Crop of the Season 1885-86" before referred to, in which the prices of several pairs of districts are contrasted, "each pair including a district remote from the line of rail and the district on or comparatively near the line of rail to which its produce is carried," thus:—

		Average price of wheat in séers per rupee.
Damoh, 66 miles from the railway	}	... 31.9
Jubbulpore, on the railway	... }	... 23.9
Saugor, 85 miles from the railway	}	... 29.1
Narsinghpur on the railway	... }	... 20.3
Bilaspur, 112 miles from the railway	}	... 51.4
Raipur, 42 miles from the railway	}	... 35.2

It may also be remembered that the places shewn in the statement giving the average price of wheat at the chief wheat centres of the Punjab at p. 12 are all on the line of railway. If, then, it should appear advisable for the con-

venience of the cultivator to open additional depôts off the lines of railway or away from a navigable river, no actual loss need be apprehended, as the lower prices which would be paid at such depôts would in all probability enable advantageous arrangements to be made for transporting the grain to a railway or river.

By taking measures to clean the wheat properly before bagging it, the selling price in England will doubtless be improved. Also the cost of carriage will doubtless come down in course of time, if regular employment is given to the railway and to steamers, and also to the staff engaged in bagging the wheat.

When the revenues of the Government of India are in a flourishing condition, with an increased land revenue and a continually diminishing loss by exchange, the Government of India will perhaps be in a position to allow its officers to remit some fixed portion of their salaries to England at par for the benefit of their families. The Provident Funds, by which a provision is made for old age on railways and to which contributions are compulsory, might also in the case of all Railways without distinction be allowed to remit their assets to England at par. Thus another of the difficulties connected with the present state of the exchange would be got over.

It should be noticed that the proposed remedy, if applied in its entirety, will, while leaving the export trade of India generally in full possession of the advantages which the depreciation of silver confers upon it, in its competition with other countries for the supply of raw produce in the European markets, afford relief not only to the revenues of the Government of India, but also to the import trade of India, and through it to the depression of trade in England. For if the vast tracts of good land now lying idle for want of population in the Punjab, Central Provinces, Assam and Burmah are opened up by the transfer of the surplus population from the overcrowded districts

in the North-West Provinces, Oudh, Behar and elsewhere, assisted by the construction of irrigation or drainage works, by the provision of increased facilities for travelling by rail and river, and by the adoption of measures of protection suited to the changed circumstances of India, it is perfectly clear that the whole land will become abundantly productive. The tracts now lying idle will then yield abundantly. The tracts now eaten bare by an excess of population, or producing stunted crops for want of manure and rest, will then yield plentifully, and the whole condition of the people will be changed from a state of poverty to a state of prosperity; and their wants too will change with their condition, and will create a demand for finer cloths and better manufactures than those with which the people are now contented. The coarser articles will be supplied by Indian mills or factories, or by the craftsmen in Indian towns, but for finer articles India will indent upon England, which is able, if it chooses, to distance all other nations in the production of fine work.

We are, it must be remembered, dealing here in India with a population of some two hundred and fifty millions of people, whose wants, if they were in a condition of prosperity, would beyond the possibility of doubt give employment to the whole manufacturing population of Great Britain.

Under the advantage which the manufacturers of India enjoy from the depreciation of silver in their competition in the Indian market with countries having a gold standard, it is plain that England must lose a great part of the Indian trade in coarse articles. If India, however, should prosper, England will be able to regard with complacency the loss of the trade in coarse articles in the enjoyment of the advantages arising from the more remunerative trade in fine articles which the prosperity of India will bring.

England with its depressed trade is therefore deeply interested in this matter of opening up India, which will be discussed more fully in the next chapter.

CHAPTER III. APPLICATION.

IN India we have before us a great land as yet one may say wholly undeveloped.

Its great hill tracts and ranges would be able, if they were properly looked after, to produce fuel and timber sufficient to supply the wants of the whole population, and hay ensilage and green fodder sufficient for all the cattle in the country, which are now half starved, and in places wholly stunted for want of fodder during the dry season ; and would be able also, if they were clothed with forest, to lay hold of the drifting rain clouds and compel them to pour down rain in abundance upon the thirsty plains below, as indeed the whole of the forest-clad hills of India at present do.

But now these fine hill tracts and ranges are in many cases, as in the Punjab and Rajpootana, bare and desolate, yielding nothing but a scanty covering of grass during the rainy season, and driving for the most part from their heated tops the precious rain clouds far up into the air and away, because their trees have been improvidently hacked and hewn until no covering was left to prevent the good soil from being washed away ; or else, as in Assam and in Central and Southern India, their wealth is wholly unutilised, except by a few wild men who waste much of it periodically by burning and ringing noble trees in order to clear patches for cultivation.

Then too amongst arid plains, wanting nothing but water to make them abundantly fertile, there are almost everywhere to be found either, as in the Punjab, rivers and streams available to furnish abundant supplies of water if irrigation works are provided, or, as in Rajpootana, gorges amongst the hills, where large supplies of water for use in the dry season in the plains below could be impounded at small expense by

the construction of embankments. Moreover these rivers and streams and water-courses, running freely all over the country during the rainy season, would be available for transporting at very small cost yearly supplies of timber and firewood to villages in the plains if the hills were covered with forest.

Or again, on the other hand, there are, as in Eastern Bengal, great wet tracts where the richest land is covered by swamps and useless for want of drainage, channels and embankments with sluiced openings to prevent floods and tides from finding entrance.

Then also, as has been before stated, there are in the Punjab, Assam, Burmah, and the Central Provinces great tracts of good land lying uncultivated for want of population. As an example, we may take the three districts, of Shahpur, Jhang and Montgomery, in the Punjab, all of them, be it remarked, on this side of the River Indus, and therefore well protected against frontier raids. From the Administration Report of the Punjab Government for 1883-84, it appears that the Shahpur District, with 3,924 square miles of culturable land, has 871 square miles of land under cultivation and an average population of 90 persons to the square mile; that the Jhang District, with 5,675 square miles of culturable land, has 539 square miles under cultivation and an average population of 69 to the square mile; and that the Montgomery District, with 5,341 square miles of culturable land, has 572 square miles under cultivation and an average population of 77 to the square mile. Whilst, on the other hand, there are many tracts in India, into which the people were driven during the last century by the raids of the Mahrattas, Pathans and Pindharis, and in which they have ever since remained all huddled together, with the great fear inspired by the horrors of that time of anarchy still on them, and restraining them from venturing out, except perhaps on an annual tour in search of work to the thinly populated districts, terminating with the advent of the rains. In these tracts the people swarm so thickly over the land that their

labour is of little value and the soil is exhausted from over-cropping and for want of manure, which is burnt as fuel in the absence of firewood. As an illustration we may take the three districts before alluded to of Sarun, Mozufferpore and Durbungha in Behar. From the last Census, and from the Administration Report of the Government of Bengal for 1884-85, it appears that the Sarun District, with an area of 2,625 square miles, has an average population of 86971 to the square mile; that the Mozufferpore District, with an area of 3,004 square miles, has an average population of 85983 to the square mile; and Durbungha, with an area of 3,335 square miles, has a population of 78964 to the square mile.

It will of course be slow work getting forests to grow on bare hill sides from which the good soil has been washed off; but still it can be done by making a beginning in the hollows, where soil and water can be retained by bunds for the support of groves of quickly growing trees, which will extend of themselves and furnish cover for better kinds of timber afterwards. This plan has been already tried and found successful. And it is on the bare hills that forest operations are most of all required. In the plains groves of fruit trees are required, but not forests.

Experience has shewn that there is no difficulty in constructing irrigation works anywhere in India.

Experience on Indian Railways has shewn, beyond all possibility of doubt, that no difficulty will be found in getting the natives of India to travel by railway, and distribute themselves over the country if only the fare is made low enough, and if measures are taken to reassure their minds in the matter of protection. And it is now abundantly clear that if the same amount of attention were given to emigrant traffic as is given to export goods traffic, the cooly could be carried by rail just as cheaply as he can do a journey on foot, if the extra food he eats when doing a hard day's work, and the ferry and scrai charges he has to pay when on a journey, are taken into account. Export goods traffic is carried in

wagons weighing 6 tons and holding 10 tons or, say, 270 maunds of goods at a rate of $\frac{1}{4}$ th of a pie per maund per mile. A cooly weighing on the average with his luggage 2 maunds, ought at the same rate to be carried in a double-storeyed carriage weighing 8 tons and holding ninety persons at a fare of less than $\frac{1}{2}$ a pie per mile, or 24 miles for one anna. Measures can be taken to secure full loads for emigrant carriages by letting it be known in the towns and villages, that if full carriage loads are made up and 24 hours' notice, given to the railway, emigrant carriages will be attached to through goods trains on stated days in the week at a fare of $\frac{1}{2}$ pie per mile, just as measures are taken to secure full loads for goods wagons. Coolies load and unload themselves and entail no expense on that account.

Think what a difference it would make in the country if the bare hills of the Punjab, Rajpootana and Chota Nagpore were clothed with forest yielding ample supplies of timber and firewood for distribution over the plains by means of the rivers or streams which run everywhere during the rains, fodder for the dry season, and a secure retreat for the cattle in years of drought. If also the waters of the Indus, Jhelum and Chenab were brought by irrigation works on to the thirsty western plains of the Punjab, which need water only to make them abundantly fertile; and if tanks were freely made by putting embankments across the gorges in the hills, as has been done by former Governments of India and by ourselves also in many places: if too the population now huddled together in Behar, Oudh, and the North-West Provinces were distributed over the whole of Upper and Central India; and the great plains now lying idle dotted all over with villages, and all brought under cultivation, and covered with irrigation and drainage works, and with fields fertilized by an ample supply of water, and by ample supplies of manure no longer burnt as fuel for want of firewood. The whole face and character of the country would be altered; and India would become a wealthy land.

There is nothing impossible in this ; there is nothing in it which has not already been done on a tiny scale, here and there, by some Magistrate, Forest Officer, or Engineer who has faced the problem of making the best of available means and taken an interest in his work.

English capital and English skill can do it all. But we must set systematically and whole-heartedly to work, and take care that the works we undertake are suited to the country in its present condition, and are designed with a view to making the best use of available means. For example, almost every river in the land has now been spanned by a noble railway bridge with piers on wells sunk deep into the river bed. These piers have to be protected against the action of the river, which in high floods, when the current is strong, constantly tends to scour out and overturn the piers ; and this is done by constantly throwing in large masses of stone about the piers whenever scour takes place, so as to form in course of time a great accumulation of loose stone about each pier. Much of the stone is carried down by the current too far or gets displaced by scour, and thus the expenditure on stone protection on large bridges near the hills is practically continuous. In course of time it will doubtless come about in many cases that as much material will have been put in as stone protection as would have sufficed to build an anicut or weir right across the bed of the river ; and an anicut while effectually protecting the piers of the railway bridge against scour, would at the same time have enabled the water of the river to be drawn off by canals on either bank for purposes of irrigation. In most if not in all cases, the sites of railway bridges either are suitable in their present position or might have been shifted so as to be made suitable for the location of the head works of a canal. If each railway bridge were combined with an anicut or weir for irrigation, the anicut would protect the piers of the railway bridge and the deeply sunk piers of the bridge would add firmness to the anicut. Thus with a little arrangement a rail-

way bridge and the head works of a system of canals for both sides of the river, could have been built for little more than the cost of a railway bridge alone with stone protection about its piers as at present. A fine opportunity of getting head works for canals at very small cost on the Beas, Chenab and Jhelum rivers in the Punjab has thus been missed.

Besides constructing regular canals, much could be done in the way of irrigation by bunding up streams either according to the present native plan or with rough but permanent weirs. Natives thoroughly understand kutch irrigation works of this kind, but are unable in most cases to make them from the difficulty of getting a number of villages to combine.

The head works are the most expensive part of irrigation works, and the most difficult part to construct and maintain. But anicuts are not actually necessary in order to tap a river. Cases are known in which small rivers after running for a time, disappear entirely at some place where there is a loose stratum of boulders or sand, and perhaps emerge again further down. This can plainly be imitated in order to draw off by filtration the water of a river for purposes of irrigation wherever there is a stratum of boulders and sand underlying the bed of a river, by making a deep cut parallel to the river into the underlying stratum of boulders and sand, and thus tapping the river by filtration. Or if no natural filter bed exists, an artificial filter bed of boulders and sand can in many cases easily be made by carrying a deep filter cut from the surface of the country into the river bed at some point near to the place where the river breaks out from the hills, and where accordingly the bed of the river falls rapidly, and thus the length of the filter cut will not be great, and where at the same time the necessary supply of boulders, or masses of stone for the filter bed, will be available upon the spot.

There will be this great advantage in tapping a river by filtration, that the silt difficulty which adds so largely to the cost and trouble of ordinary irrigation works will be got rid of.

Then again in the matter of railways, in which so much is required to be done to open up the country as the great blank spaces on railway maps shew but too plainly, it might be well to remember that, though for trunk lines it may have been necessary to adopt the English system of railway construction with high banks, such a system is both costly and ill-suited to a country where railways have to traverse the drainage channels of vast areas subjected at times to very heavy rainfalls, causing floods which, if headed up, will do damage by submerging the country on one side and by erosion on the other, but if allowed a free passage will ordinarily pass off quietly without doing damage. Steel rails are very cheap now, and if we were satisfied to lay down surface lines, such lines could be very cheaply constructed, would require little land, and interfere very little with the drainage of the country. By using locomotives with high fire-boxes and with protection against injury from the contact of cold water with the heated metal it would be possible to run through ordinary floods, as indeed has already been shown to be practicable on other lines. In high floods traffic all over the country is interrupted, and but little inconvenience will be occasioned by closing branch lines for the short periods when floods are out. A surface line can at any time be converted into an embanked line if the traffic is good.

In many places the noble Indian rivers, if their channels were improved at bad places and regularly surveyed and marked out so as to enable steamers to run on them with high speed and regularity, would serve instead of railways, and could be made available immediately at very small cost. At important places the course could be lighted at night without much expense by two colored lights in line at each bend, as is done now in the case of channels used by steam ferries on railways, so as to enable steamers to run at night.

If, for example, the North Bengal State Railway had a branch to Kaliganj on the Brahmaputra, avoiding the river crossings on the Kaunia-Dharla Tramway, and if

then the channel of the Brahmaputra were regularly surveyed and marked out by a survey establishment permanently employed just as a permanent way establishment is employed on railways, and if lights were then provided at each bend from Kaliganj up to Gauhati, the journey between Calcutta and Gauhati could be done in thirty-six hours or two nights and one day. And if then a metre gauge line were laid from Gauhati *via* Dimapur and carried along one of the old embankments known as the Dhodar or Rajgarh Alis to Jaipur so as to connect with the existing Dibrugarh railway, the journey from Calcutta to Dibrugarh at the upper end of the Assam Valley would be done in about 60 hours, and the Assam Valley with its coal, petroleum and great ranges of hill, forest and wide stretches of splendid land, would be opened up. In this way the portion of the Assam Valley which is comparatively free from fogs, would be traversed by steamers and the other portion by the railway.

In the same way Cachar could be opened up by a light railway from a point on the left bank of the old Brahmaputra opposite Mymensingh on the Dacca Railway across to some point on the Kanks River, with a steamer canal across the low land between the Kanks and Soorma Rivers. If the Soorma River were then improved, there would be water communication between Sylhet and the Kanks River *via* Chuttnuck. With 60 miles of steamer canal and river and about 115 miles of railway between Dacca and Sylhet it would be possible to reach Dacca in 14 or 15 hours. If steamers then ran at night between Dacca and Goalundo, it would be possible to reach Calcutta in one-and-half days from Sylhet.

Where so much is required to be done not only in a large way, but also in a small and even a smallest way, it is necessary that every available means should be turned to account and everything done in the cheapest manner consistent with economy; but it is necessary that we should be up and doing—improving, enlarging and extending, and

thus setting systematically to work to open up the country and to develop the resources of each district.

This is no time for stopping expenditure, but a time for spending more largely than ever. We have in India come into possession of a noble estate in a grievously deteriorated and impoverished condition from the mismanagement and troubles of former proprietors. We have spent, it is true, a good deal of money upon it already, though only a small part of the whole expenditure required to restore its condition fully, but the results so far attained show beyond doubt, that if we will lay out money freely in improving it and developing its resources, and will at the same time look closely into its condition, capabilities, and wants, we shall in due time reap an abundant return; on the other hand, it is becoming pretty clear that if we fold our hands and sit still and do nothing, we shall run a great risk of being unable to meet our liabilities.

The facts which have been adduced show that we have in our possession a remedy for present troubles. It may not be a pleasant remedy: few remedies which are of real use ever are pleasant; but it is certain in its action if judiciously used, and if at the same time its use is persevered in, and it is applied in its entirety.

With the advent of the Russians on the border of Afghanistan, and with a rapidly falling exchange, it is now absolutely certain that before long we shall have to bestir ourselves, and wake up from pleasant dreams of prosperity assured to us without much effort on our part.

We shall now have to recognise the fact that a great change has taken place both in the Financial and in the Military situation, and to bring the Financier and the Soldier to the front in making our arrangements for dealing with difficulties, which if resolutely faced at once, will disappear and leave us far better off than ever we were before, but if neglected will gather strength and perhaps overwhelm us.

All who hope to continue to draw good salaries in the present and comfortable pensions in the future, or to get safe

investments for their Capital, or to have a safe field for their trading operations, are deeply interested in this matter ; for assuredly an effort will have to be made if these blessings are to be retained.

We sometimes hear fears expressed in regard to the future of India, on the ground of the rapidity with which the population is increasing in some of the provinces. The groundlessness of such fears will be manifest if it is remembered that in addition to the great tracts of good land still uncultivated for want of population in India, there is an immense area in Australasia available and suitable for occupation by the people of India. If only the timid Indian population can be persuaded to move out from the tracts in which they are now so thickly huddled together, they will find that there is plenty of land in India for all at present ; and, however rapidly they may increase in the future, they will find that there will be plenty of land available for all outside. We are required, as has already been pointed out, to make such dispositions of our British troops as will ensure the timid cultivators a reasonable amount of protection under all the complications which may arise in the future, and to provide works for opening up the country and cheap means of travelling. The people of India themselves will do the rest. They have responded hitherto freely to all our efforts to open up the country by Railways, Telegraphs, Irrigation works, and Post offices—all of which are largely used by the people. It is not therefore to be doubted that the people will respond to the utmost of their power if we make increased efforts to open up the country in the future. The result of giving the industrious Indian cultivator plenty of land, will be prosperity to India from a vast increase to its raw produce, and prosperity to ourselves from a vast increase to our manufactures in connection with the demand for articles of fine quality from prosperous India with its 250 millions of people.

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